270
5/8/77
uc-79 & plus
UK & Germany
Japan

HA. 1285-

ORNL/TM-5887

Reference Test Problems for the Venture Neutronics and Related Computer Codes

D. R. Vondy
T. B. Fowler

MASTER

cb

OAK RIDGE NATIONAL LABORATORY

OPERATED BY UNION CARBIDE CORPORATION FOR THE ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

Printed in the United States of America. Available from
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road, Springfield, Virginia 22161
Price: Printed Copy \$4.50; Microfiche \$3.00

This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the Energy Research and Development Administration/United States Nuclear Regulatory Commission, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

ORNL/TM-5887
Distribution Category
UC-79d-LMFBR Physics

Contract No. W-7405-eng-26

Neutron Physics Division

REFERENCE TEST PROBLEMS FOR THE VENTURE NEUTRONICS
AND RELATED COMPUTER CODES

D. R. Vondy and T. B. Fowler

Date Published: August 1977

NOTICE
This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the United States Energy Research and Development Administration, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.

NOTICE This document contains information of a preliminary nature. It is subject to revision or correction and therefore does not represent a final report.

OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37830
operated by
UNION CARBIDE CORPORATION
for the
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

leg

REFERENCE TEST PROBLEMS FOR THE VENTURE NEUTRONICS AND RELATED COMPUTER CODES

Abstract

Sixteen problems were selected which collectively use many of the options and different calculational paths implemented in the VENTURE diffusion theory neutronics computer program. The input data requirements and key results are presented. This set of problems can be used as an essential part of validation testing of an implementation of, or modification to, the VENTURE and related codes.

Background

In the development of a major system of computer codes, the originators carry an obligation and severe burden for reliable application. The local, original version of a program can and generally is tested extensively. Many different types of tests are used including the checking by hand calculation of intermediate data from special edits. Problems are solved which have known answers and others for which approximate results are known. Testing is done against experimental results to delimit the range of reliable application. The level of reliability in application is raised by incorporating procedures to reject a problem definition which is incomplete, inconsistent, or beyond the capability of the program. It is also raised by the support of application which permits the elimination of difficulties

identified in the required user instructions and their documentation, and in the interpretation of results.

A code converted for use on a different computer, or revised for extension or to achieve compatibility with other programs or with a computation system, must be tested. The originators can not be responsible for reliability, lacking control. Thus the individuals making conversion or revision are challenged to prove that reliability will be adequate for application.

Experience has shown that originators must carefully test coding changes; a variety of problems must often be solved which exercise a major portion of the programmed options and parallel procedures. Otherwise the probability that unreliable results will be produced would be so high that the code should not be used. All possible sources of error can not be eliminated; a major code can be brought to a level of reliability which reduces to an acceptable low level the probability that unreliable results will be produced. Thus emphasis in verification testing is placed on those possible causes of incorrect results. It is more important that an iterative procedure appear not to converge to a solution than that it always converges to some solution that may be incorrect.

We support the necessary testing by others of the reference codes with this set of test problems.

The Problems

These 16 problems came from many sources. They have been solved many times at ORNL with the reference codes and many of them have been

solved locally and at other installations with other codes. Thus we are confident that the solutions are reliable and adequately converged to allow critical comparison with results produced elsewhere. This does not mean that the same results would be obtained if parameters such as the number of meshpoints were changed or their distributions, or a different formulation (difference equations) were used. The results for the problems having only a few meshpoints and few energy groups contain significant error because of the coarse approximation; this does not affect their utility for the purpose intended here, but would limit their use for other purposes.

Many of these problems are not representative of application because more meshpoints would be used to adequately represent the flux distribution over complicated geometries and reduce the error associated with the finite-difference approximation. They were deliberately selected to reduce the amount of computer time required for testing. Such small problems can not be considered to challenge the solution methods, details of the iteration procedures and schemes used to accelerate convergence, because they converge rapidly to an acceptable result by most any method used. A few problems have been included which apply procedures and have behavior representative of application. Still these should be supplemented locally with other test problems to increase confidence in application.

The Codes Used

The codes used are module members of a local computation system.^a

---

^aD. R. Vondy, T. B. Fowler, G. W. Cunningham and L. M. Petrie, "A Computation System for Nuclear Reactor Core Analysis," ERDA Report ORNL-5158, (in press, 1977).

Not only are local special input processors used which have their own input requirements,^a but also an input processor which was coded at LASL.^b The local version of this input processor is used to generate a cross section data file from the user input data stream in a free form format.

The VENTURE diffusion theory code is used to solve the neutronics problems.^c The test problems include several of the usual flux-eigenvalue type for which the multiplication factor must be determined; others involve criticality searches which involve adjusting some aspect of the problem (dimensions, concentration, buckling) to effect a desired multiplication factor.

For some of the problems, the microscopic cross sections (or macroscopic cross sections used as pseudo microscopic) are supplied in the group-ordered form of file GRUPXS required by the VENTURE code. Others are in the nuclide ordered form of file ISOTXS which must be converted by the cross section processor for use. The reaction rate module is used to produce space, energy integrated reaction rate results. Primary documentation of these modules is contained in the VENTURE documenting report referenced earlier.

---

^aD. R. Vondy, T. B. Fowler, and G. W. Cunningham, "Input Data Requirements for Special Processors in the Computation System Containing the VENTURE Neutronics Code," ERDA Report ORNL-5229, (1976).

^bG. E. Bosler, "LASIP-III, A Generalized Processor for Standard Interface Files," ERDA Report LASL-6280-MS, (1976).

^cD. R. Vondy, T. B. Fowler, and G. W. Cunningham, "VENTURE: A Code Block for Solving Multigroup Neutronics Problems Applying the Finite-Difference Diffusion-Theory Approximation to Neutron Transport, Version II," ERDA report ORNL-5062, Revised, (in press 1977).

Input Data

The input data for these problems is shown in Table 1 for a single computer run in a job stream sense. Reference to the documents covering the input data requirements should allow the problem descriptions to be understood in the detail desired.

Results

The condensed edit from the computer run is shown in Table 2. Edits which document the actions taken by the control module, CONTRL1, are reported, and key results from the computation modules.

A tape containing the input data and the detailed results from the computer run is being made available with the source language for these codes at the Argonne Code Center.

A table of page numbers in this report for the input data and output for the individual problems is given on the next page.

IDENTIFICATION OF THE PROBLEMS BY TITLE

PROBLEM

PAGE NUMBERS

		<u>Input</u>	<u>Output</u>
1	Two-Dimensional, Non-Separable Water Reactor Problem (MIT-NSE 59, P63).	7	57
2-3	Two BWR Assembly Cases -- 2 Group, 12x12 and 24x24 Mesh.	9	58
4-7	Four Triangular-Z Cases -- Reflected, Repeating, 180 ROT., 60 ROT.	14	59
8-10	Three Theta-R Cases -- Normal, Repeating, and Repeating (ORNL-TM-3793).	17	60
11-12	Two Cases -- R-Z and Theta-R-Z to Compare (ORNL-TM-3793).	20	61
13	Search Case 3 from the VENTURE Report (ORNL 5062 - Rev. 1).	22	52
14	2-D Large LMFBR Reactor Model Benchmark Problem, P1 Approximation.	28	63
15	Three Dimensional IAEA Benchmark Problem -- 17x17x19 Mesh, 2 Groups.	39	64
16	Triangular-Z LMFBR Problem -- 46x23x16 Mesh, 6 Groups.	41	65

TABLE 1. INPUT FOR REFERENCE TEST PROBLEMS.

```

//USERID JOB (CHARG), 'USER ADDRESS - NAME',
// MSGLEVEL= (1,1)
// *CLASS CPU95=15M, IO=90, REGION=650K, LINES=19, CARDS=0
// STEP EXEC BOLDVENT,
// N2=400, N3=10, N5=150, N6=10, N7=5, N8=5, N9=43, N10=43, N11=54, N13=50,
// N14=20, N15=10, N16=400,
// GOSIZE=650K
// GO. SYSIN DD *
=CONTROL1
TWO-DIMENSIONAL, NON-SEPARABLE WATER REACTOR PROBLEM (MIT-NSE 59, P63).
018000
1 2 7 2 9 0
END
INPUT PROCESSOR
0V GRUPXS
1D 2 3 0 1 0 1 18 0 0 0 1 1 0 0
2D
* TWO-GROUP MACROS FOR THREE ZONES
*FUEL *ABS *MOD *
1.0 0.0 1.0 2R 0.0 3R
4D (*FUEL *ABS *MOD *) 3R 0.0 21R 0 3R
0 1 0 10R
5D .2321263 .3052503 .2157497 0.0 3R
.0068635 .003185 .000444 .0036465 0.0 2R
2.0 0.0 2R 0.0 3R
5D .8617718 .950480 1.066325 0.0 3R
.02525 .4021 .008736 .07655 0.0 2R
2.0 0.0 2R 0.0 3R
7D 1 1 1 1 1 1
8D 0.0 0.0 0.0
7D 2 1 2 1 1 1
8D 0.0 0.01596 0.0 0.0 0.02838
STOP
END
DVENTR
001
0
0
0
1 0 1 0
1 1 1 1 1 1 1 0 0 2 1 0 0 1 1 1 0 0 0 1 5 2
002
1

003
6 1 0 1 0
004
1 1.0 2 3.5 5 9.0 2 3.5 2 2.0 2 3.5
5 9. 2 3.5 2 2.0 2 3.5 3 4.5 3 18.
0
1 1.0 2 3.5 5 9.0 2 3.5 2 2.0 2 3.5
5 9. 2 3.5 2 2.0 2 3.5 3 4.5 3 18.
0

```

005

2	2	1	3	3	3	1	2	2	2	1	3
2	1	1	1	3	1	1	1	2	1	1	3
1	1	1	1	1	1	1	1	1	1	1	3
3	1	1	1	2	1	1	1	3	1	1	3
3	3	1	2	2	2	1	3	3	3	1	3
3	1	1	1	2	1	1	1	3	1	1	3
1	1	1	1	1	1	1	1	1	1	1	3
2	1	1	1	3	1	1	1	2	1	1	3
2	2	1	3	3	3	1	2	2	2	1	3
2	1	1	1	3	1	1	1	2	1	1	3
1	1	1	1	1	1	1	1	1	1	1	3
3	3	3	3	3	3	3	3	3	3	3	3

012

0

1	1	1	1
2	2	1	2
3	3	1	3

0

013

3

3

FUEL ABS MOD

020

1

1

FUEL 1.0

2

2

ABS 1.0

3

3

MOD 1.0

0

END

DUTLIN

RRTINS 0 0 0 16

0

0

1

0

0

1

1

1

0

0

2

1

0

6HBLANK

END

=CONTROL1

TWO BWR ASSEMBLY CASES-- 2 GROUP, 12X12 AND 24X24 MESH.

20000

2 2 6 2 7 2 7 0

END

DCMACR

7

CITATION MACROS TO MICROS.

008

2 1 0

1 1 1.31700 0.008983 0.005925

0.01069

1 2 0.581531 0.05892 0.09817

0.0

2 1 1.31441 0.008726 0.005242

0.01095

2 2 0.578001 0.05174 0.08228

0.0

3 1 1.31492 0.008587 0.004820

0.01112

3 2 0.575010 0.04717 0.07200

0.0

4 1 1.31596 0.008480 0.004337

0.01113

4 2 0.571070 0.04140 0.05900

0.0

5 1 1.33014 0.009593 0.005605

0.01016

5 2 0.569509 0.1626 0.02424

0.0

6 1 1.53468 0.001043

0.009095

6 2 0.70205 0.004394

0.0

7 1 1.34626 0.0001983

0.03682

7 2 0.296824 0.007796

0.0

0

1.0

END

DCRSPR

1 1 1
7

COMP1

COMP2

COMP3

COMP4

COMP5

COMP19

COMP20

END

DVENTR

001

0.0

0.0

-1

99

1 1 1 1

2 1

1

1

003

6 1 1 1 1

004

1	0.47498	1	0.34544	1	1.87452	1	1.87452	1	1.87452	1	1.87452
1	1.87452	1	1.87452	1	1.87452	1	0.34544	1	0.47625	1	0.47625
0											
1	0.47625	1	0.47625	1	0.34544	1	1.87452	1	1.87452	1	1.87452
1	1.87452	1	1.87452	1	1.87452	1	1.87452	1	0.34544	1	0.47498
0											

005

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	11
24	25	26	27	28	29	30	31	32	33	22	10
34	35	36	37	38	39	40	41	42	32	21	9
43	44	45	46	47	48	49	50	41	31	20	8
51	52	53	54	55	56	57	49	40	30	19	7
58	59	60	61	62	63	56	48	39	29	18	6
64	65	66	67	68	62	55	47	38	28	17	5
69	70	71	72	67	61	54	46	37	27	16	4
73	74	75	71	66	60	53	45	36	26	15	3
76	77	74	70	65	59	52	44	35	25	14	2
78	76	73	69	64	58	51	43	34	24	13	1

012

0			
1	78	1	1

013

7
7

COMP1 COMP2 COMP3 COMP4 COMP5 COMP19COMP20

020

1	24
COMP20	1.0
25	33
COMP19	1.0
34	34
COMP20	1.0
35	35
COMP19	1.0
36	36
COMP3	1.0
37	39
COMP2	1.0
40	41
COMP3	1.0
42	42
COMP4	1.0
43	43
COMP20	1.0
44	44
COMP19	1.0
45	47
COMP1	1.0
48	48
COMP5	1.0
49	49
COMP1	1.0
50	50
COMP2	1.0
51	51
COMP20	1.0
52	52
COMP19	1.0
53	57
COMP1	1.0
58	58
COMP20	1.0
59	59

```

COMP19 1.0
 60 60
COMP1 1.0
 61 61
COMP5 1.0
 62 63
COMP1 1.0
 64 64
COMP20 1.0
 65 65
COMP19 1.0
 66 68
COMP1 1.0
 69 69
COMP20 1.0
 70 70
COMP19 1.0
 71 72
COMP1 1.0
 73 73
COMP20 1.0
 74 74
COMP19 1.0
 75 75
COMP2 1.0
 76 76
COMP20 1.0
 77 77
COMP19 1.0
 78 78
COMP20 1.0
 0
END
DVENTR
001
0.0

0.0
      2 -1      99
1 1 1 1 1 0 0 1 1
003
6 1 1 1 1
004
2 0.47498 2 0.34544 2 1.87452 2 1.87452 2 1.87452 2 1.87452
2 1.87452 2 1.87452 2 1.87452 2 0.34544 2 0.47625 2 0.47625
0
2 0.47625 2 0.47625 2 0.34544 2 1.87452 2 1.87452 2 1.87452
2 1.87452 2 1.87452 2 1.87452 2 1.87452 2 0.34544 2 0.47498
0
005
1 2 3 4 5 6 7 8 9 10 11 12
13 14 15 16 17 18 19 20 21 22 23 11
24 25 26 27 28 29 30 31 32 33 22 10
34 35 36 37 38 39 40 41 42 32 21 9
43 44 45 46 47 48 49 50 41 31 20 8
51 52 53 54 55 56 57 49 40 30 19 7
58 59 60 61 62 63 56 48 39 29 18 6
64 65 66 67 68 62 55 47 38 28 17 5
69 70 71 72 67 61 54 46 37 27 16 4
73 74 75 71 66 60 53 45 36 26 15 3
76 77 74 70 65 59 52 44 35 25 14 2
78 76 73 69 64 58 51 43 34 24 13 1
012
0
1 78 1 1

```



```

013
 7
 7
COMP1 COMP2 COMP3 COMP4 COMP5 COMP19COMP20
020
 1 24
COMP20 1.0
 25 33
COMP19 1.0
 34 34
COMP20 1.0
 35 35
COMP19 1.0
 36 36
COMP3 1.0
 37 39
COMP2 1.0
 40 41
COMP3 1.0
 42 42
COMP4 1.0
 43 43
COMP20 1.0

 44 44
COMP19 1.0
 45 47
COMP1 1.0
 48 48
COMP5 1.0
 49 49
COMP1 1.0
 50 50
COMP2 1.0
 51 51
COMP20 1.0
 52 52
COMP19 1.0
 53 57
COMP1 1.0
 58 58
COMP20 1.0
 59 59
COMP19 1.0
 60 60
COMP1 1.0
 61 61
COMP5 1.0
 62 63
COMP1 1.0
 64 64
COMP20 1.0
 65 65
COMP19 1.0
 66 68
COMP1 1.0
 69 69
COMP20 1.0
 70 70
COMP19 1.0
 71 72
COMP1 1.0
 73 73
COMP20 1.0
 74 74

```

```
COMP19 1.0  
75 75  
COMP2 1.0  
76 76  
COMP20 1.0  
77 77  
COMP19 1.0  
78 78  
COMP20 1.0  
0  
END
```

FOUR TRIANGULAR-Z CASES--REFLECTED, REPEATING, 180 ROT., 60 ROT.
10000

1

DCMAC R

CITATION MACROS TO MICROS

6 2 0

0.

0

0

0.756   0.234   0.01

END

DCRSP R

1 1 1
2

ZONE 1

ZONE 2

END

DVENT R

001

0

0

0

•

1 1 1 1 2 1 1 1 2

003

9 1 1 1 1 1 1 0 0 0 0 1

004

8 53.0024

4 53.0024

005

2

006

1																	
1	3	1	1	1	4	1	1	2	2	1	4	8	8	3	3	1	4
6	8	4	4	1	4												
1																	
7	8	1	1	1	4	1	2	4	4	1	4						

```

0
012
0
1 2 1 1 1.0
0
013
2
2
ZONE 1ZCNE 2
020
1 1
ZONE 1 1.0
2 2
ZONE 2 1.0
0
END
DVENTR
001
0
0
0
1 1 1 1 2 4 1 1 1 2
003
9 3 3 1 2 1 1 0 0 0 0 0
004
8 53.0024
4 53.0024
005
2
006
1
1 2 1 1 0 0 6 8 1 1 0 0 8 8 2 2 0 0
1 1 3 3 0 0 1 3 4 4 0 0 7 8 4 4 0 0

012
0
1 2 1 1 1.0
0
013
2
2
ZONE 1ZCNE 2
020
1 1
ZONE 1 1.0
2 2
ZONE 2 1.0
0
END
DVENTR
001
0
0
0
1 1 1 1 2 4 1 1 1 2
003
9 1 5 1 1 1 1 0 0 0 0 1
004
8 53.0024
4 53.0024

```

```

005
2
006
1
1 3 1 1 1 4 1 1 2 2 1 4 8 8 3 3 1 4
6 8 4 4 1 4
1
7 8 1 1 1 4 1 2 4 4 1 4
0
012
0
1 2 1 1 1.0
0
013
2
2
ZONE 1ZONE 2
020
1 1
ZONE 1 1.0
2 2
ZONE 2 1.0
0
END
DVENTR
001
0
0
0
1 1 1 1 2 4 1 1 1 2
03
9 1 4 1 1 1 1 0 0 0 0 1
004
8 53.0024
4 53.0024
005
2
006
1
1 3 1 1 1 4 1 1 2 2 1 4 0 8 3 3 1 4
6 8 4 4 1 4
1
7 8 1 1 1 4 1 2 4 4 1 4
0
012
0
1 2 1 1 1.0
0
013
2
2
ZONE 1ZONE 2
020
1 1
ZONE 1 1.0
2 2
ZONE 2 1.0
0
END

```

=CONTROL1

THREE THATA-R CASES -- NORMAL, REPEATING, AND REPEATING (ORNL-TM-3793).
15000

2 2 6 2 7 2 7 2 7 0

END

DCMACR

3

CITATION MACROS TO MICROS.

008

3 1 0

1	1	1.677	0.0	0.0		
	0.0	0.04378	0.0			
1	2	0.8696	0.02864	0.00755	0.8	-13
	0.0	0.0	0.04295			
1	3	0.3346	0.1132	0.1088	1.0	-12
	0.0	0.0	0.0			
2	1	1.831	0.013	0.0		
	0.0	0.0043	0.0			
2	2	1.214	0.008	0.0		
	0.0	0.0	0.0025			
2	3	1.0				
	0.0	0.0	0.0			
3	1	1.367	0.0	0.0		
	0.0	0.02016	0.0			
3	2	1.022	0.0029	0.0		
	0.0	0.0	0.01392			
3	3	0.6602	0.00716	0.0		
	0.0	0.0	0.0			
0						
	0.6	0.4	0.0			

END

DCRSPR

1 1 1
3

ZONE 1

ZONE 2

ZONE 3

END

DVENTR

001

1 1 0 0 1 0 1 0 0 0 2 1 0 0 1 1 0 0 0 0 1 2

003

8 1 1 1 2 1 1 1 0 3 1

0.001

0.0 0.0 0.4692

2

004

2 .0853981 8 1.4 4 .1707963 8 1.4 2 .0853981

6 30.0 4 5.0 4 10.0 6 25.0

005

1 1 1 1 1

2 1 2 1 2

1 1 1 1 1

3 3 3 3 3

012

0

1 3 1 1 1.0

0

```

013
  3
  3
ZONE 1ZONE 2ZONE 3
020
  1  1
ZONE 1 1.0
  2  2
ZONE 2 1.0
  3  3
ZONE 3 1.0
  0
END
DVENTR
001

```

```

      1
1  1  0  0  1  0  1  0  0  0  0  0  0  0  1  1  0  0  0  0  1  2
003
  8  3  3  1  2  1  1  1  0  3  1
0.001
0.0      0.0      0.4692
  2
004
  2 .0853981  8      1.4  4 .1707963  8      1.4  2 .0853981
  6      30.0  4      5.0  4      10.0  6      25.0
005
  1  1  1  1  1
  2  1  2  1  2
  1  1  1  1  1
  3  3  3  3  3
012
  0
  1  3  1  1  1.0
  0
013
  3
  3
ZONE 1ZONE 2ZONE 3
020
  1  1
ZONE 1 1.0
  2  2
ZONE 2 1.0
  3  3
ZONE 3 1.0
  0
END
DVENTR
001

```

```

      1
1  1  0  0  1  0  1  0  0  0  0  0  0  0  1  1  0  0  0  0  1  2
003
  8  3  3  1  2  1  1  1  0  3  1
0.001
0.0      0.0      0.4692
  2

```

```

004
  4 .1707963 8      1.4 4 .1707963 8      1.4
  6      30.0 4      5.0 4      10.0 6      25.0
005
  1 1 1 1
  2 1 2 1
  1 1 1 1
  3 3 3 3
012
  0
  1 3 1 1 1.0
  0
013
  3
  3
ZONE 1ZONE 2ZONE 3
020
  1 1
ZONE 1 1.0
  2 2
ZONE 2 1.0
  3 3
ZONE 3 1.0
  0
END

```


=CONTROL1

TWO CASES-- R-Z AND THATA-R-Z TO COMPARE (ORNL-TM-3792).

50000

2 2 6 2 7 2 7 0

END

DCMACR

3

CITATION MACROS TO MICROS.

008

4

1	1	1.79106	.677307 -04	.865769-04	0.865769 -10
		.00367288			
1	2	1.41991	0.995475-03	.690014-03	0.690014 -09
			.00911408		
1	3	1.43458	.00144402	8.68054 -04	0.68054 -10
				.0159922	
1	4	1.35637	.0020038	.00316148	3.16148 -09
0					
2	1	1.0339	7.3857 -07		
		.012715			
2	2	.883601	6.5211 -06		
			.016551		
2	3	.888521	2.6456 -05		
				.028573	
2	4	.84142	1.9184 -04		
			2.0227 -05		
3	1	1.0			
3	2	1.0			
3	3	1.0			

0

1.0

END

DCRSPR

1 1 1
3

ZONE 1

ZONE 2

ZONE 3

END

DVENTR

001

1	1	1	1	2	1	1	1	2
003								
7	1	2	1	2	2	2	0	6
	4	1						
0.0			0.01	0.0	0.01	0.01	0.01	0.01
0.01526		0.07453996	0.11023	0.1242099				
3								

004

4	10.0	9	20.0		
9	20.0	4	10.0	3	6.0
				4	10.0

005

1	1
3	1
1	1
2	2

```

012
0
1 3 1 1 1.0
0
013
3
3
ZONE 1ZONE 2ZONE 3
020
1 1
ZONE 1 1.0
2 2
ZONE 2 1.0
3 3
ZONE 3 1.0
0
END
DVENTR
001

```

```

0 1 0 0 0 0150
1 1 1 1 0 0 1 1 1 2
003
15 3 3 1 2 1 2 0 6 4 1
0.0 0.0 0.00 0.01 0.00 0.01
0.01526 0.07453996 0.11023 0.1242099
3
004
4 6.283186
4 10.0 9 20.0
9 20.0 4 10.0 3 6.0 4 10.0
005
1
1
3
1
1
1
2
2
012
0
1 3 1 1 1.0
0
013
3
3
ZONE 1ZONE 2ZONE 3
020
1 1
ZONE 1 1.0
2 2
ZONE 2 1.0
3 3
ZONE 3 1.0
0
END

```

=CONTROL1

SEARCH CASE 3 FROM THE VENTURE REPORT (ORNL 5062 - REV. 1).

18000

1 6 7 9 0

END

INPUT PROCESSOR DATA.

OV CONTRL

1D PROINS /

* 2-D 17X10 - 5 GROUP SEARCH PROBLEM *

* PRIMARY SEARCH = NUCLIDE(DIRECT) - SECONDARY SEARCH = DIMENSION *

* * * 0.0 74R 0 100R

1D DVRINS 0.0 100R 18000 0 99R

1D XCPINS 0.0 100R 0 3R 1 0 18R 1 1 0 76R

1D DTNINS /

0.0 3R 2345.0 1.0 0.5 0.0 4R 1.0E-6 5.0E-5 0.0 88R /
0 3R 1 3R 0 3R 7 0 9R 35 0 8R 1 1 0 1 1 0 1 0 0 1 5R

0 0 5 1 1 0 3R 1 0 1 0 3R 1 2 0 41R

1D RRTINS 0.0 100R 0 5R 1 0 0 0 1 1 1 0 1 0 86R

1D * * 0.0 100R 0 100R

OV ISOTXS

1D /

5 15 0 4 0 1 1 1

2D /

* 5 GROUP LMFBR CROSS SECTION SET. *

*O-16 * *NA-23 * *CR-N * *MN-55 * *FE-N * *NI-N * *MO-N *

TA-181 *U-235 * *U-238 * *PU-239* *PU-240* *PU-241* *PU-242*

*SSFP *

0.755037 0.238025 0.006938 0.0 2R /

2579.927 891.3213 324.5034 109.3773 41.77161 /

1.49182E+7 8.2085E+5 6.73795E+4 9118.816 748.5188 1.0E-4 /

0 3 6 9 12 15 18 21 24 27 30 33 36 39 42

4D /

*O-16 * *CITNXS* *O-16 * /

15.86200 0.0 5R /

0 0 0 0 5R 1 1 0 0 1 /

1 2 3 2 2 /

1 5R

5D /

2.001419E+00 3.538190E+00 3.530899E+00 3.586479E+00 3.802440E+00

0.0 0.0 0.0 0.0 0.0

6.058659E-03 0.0 0.0 0.0 4.388488E-16

7D /

2.166470E+00 3.647599E+00 4.272870E-01 3.463120E+00 1.759329E-01

1.122229E-07 3.562880E+00 1.304229E-01 3.677589E+00 8.492589E-02

4D /

*NA-23 * *CITNXS* *NA-23 * /

22.78600 0.0 5R /

6 1 1 0 5R 1 1 0 0 1 /

1 2 3 2 2 /

1 5R

5D /

2.036969E+00 3.538750E+00 4.970710E+00 1.154060E+01 3.192539E+00

0.0 0.0 0.0 0.0 0.0

1.786468E-03 5.146489E-04 1.094200E-03 1.207110E-02 5.816218E-03

1.541630E-06 0.0 0.0 0.0 0.0

2.000000E+00 0.0 0.0 0.0 0.0

7.550370E-01 2.380250E-01 6.937999E-03 0.0 0.0

7D /

2.622210E+00 3.743600E+00 4.186479E-01 4.857280E+00 1.324430E-01

1.452600E-04 1.609309E+01 1.414840E-01 3.054230E+00 5.449740E-02

```

4D /
  *CR-N * *CITNXS* *CR-N * /
  52.01000 0.0 5R /
  5 0 0 0 5R 1 1 0 0 1 /
  1 2 3 4 5 /
  1 5R
5D /
  1.895960E+00 2.847699E+00 4.099540E+00 1.258560E+01 4.485060E+00
  0.0 0.0 0.0 0.0 0.0
  3.482590E-03 4.594687E-03 7.548548E-03 1.374699E-01 1.257820E-01
7D /
  2.654610E+00 3.672379E+00 2.405180E-01 4.268359E+00 3.898390E-02
  6.128579E-03 1.243190E+01 1.094289E-01 0.0 4.783079E-04
  4.296340E+00 3.122900E-02 0.0 0.0 2.785960E-05
4D /
  *MN-55 * *CITNXS* *MN-55 * /
  54.46600 0.0 5R /
  5 1 1 0 5R 1 1 0 0 1 /
  1 2 3 4 2 /
  1 5R
5D /
  2.591649E+00 5.235530E+00 1.456410E+01 6.231160E+01 1.002660E+02
  0.0 0.0 0.0 0.0 0.0
  4.334409E-03 1.134890E-02 5.448210E-02 3.652869E-01 3.209069E+00
  1.073100E-04 0.0 0.0 0.0 0.0
  2.000000E+00 0.0 0.0 0.0 0.0
  7.550370E-01 2.380250E-01 6.937999E-03 0.0 0.0
7D /
  2.974719E+00 5.436890E+00 4.263680E-01 1.396750E+01 1.851780E-01
  1.911900E-02 7.817009E+01 4.328420E-01 5.918168E-03 5.526468E-04
  1.468200E+02 1.011980E-01
4D /
  *FE-N * *CITNXS* *FE-N * /
  55.84500 0.0 5R /
  5 0 0 0 5R 1 1 0 0 1 /
  1 2 3 4 2 /
  1 5R
5D /
  2.168090E+00 3.482690E+00 6.566119E+00 9.031090E+00 1.055570E+01
  0.0 0.0 0.0 0.0 0.0
  2.519850E-03 5.252499E-03 1.946380E-02 5.074910E-02 2.056830E-02
7D /
  2.565539E+00 3.926530E+00 3.419320E-01 7.636379E+00 3.941110E-02
  1.161280E-02 8.834049E+00 8.631974E-02 0.0 5.354248E-04
  1.047090E+01 6.575638E-02
4D /
  *NI-N * *CITNXS* *NI-N * /
  58.70500 0.0 5R /
  5 0 0 0 5R 1 1 0 0 1 /
  1 2 3 4 5 /
  1 5R
5D /
  2.299829E+00 4.373010E+00 1.716609E+01 1.579460E+01 1.633490E+01
  0.0 0.0 0.0 0.0 0.0
  7.411516E-02 9.023577E-03 1.714480E-02 1.964660E-02 3.636980E-02
7D /
  2.735749E+00 4.621889E+00 2.409970E-01 1.836949E+01 1.592640E-01
  5.383287E-03 1.589590E+01 9.364969E-02 0.0 5.395960E-04
  1.617560E+01 9.805179E-02 0.0 0.0 4.569250E-06
4D /
  *MO-N * *CITNXS* *MO-N * /
  95.06600 0.0 5R /
  5 1 1 0 5R 1 1 0 0 1 /
  1 2 3 3 4 /
  1 5R

```

5D /
 3.663779E+00 7.085640E+00 7.328959E+00 7.271429E+00 1.323520E+01
 0.0 0.0 0.0 0.0 0.0
 2.366135E-02 6.210750E-02 2.112700E-01 1.518339E+00 3.248449E+00
 1.485650E-03 0.0 0.0 0.0 0.0
 2.000000E+00 0.0 0.0 0.0 0.0
 7.550370E-01 2.380250E-01 6.937999E-03 0.0 0.0
 7D /
 4.577000E+00 8.479199E+00 8.577590E-01 7.315180E+00 7.333905E-02
 1.588170E-02 5.658710E+00 3.783630E-02 8.116618E-04 9.642159E+00
 2.030290E-02 0.0 2.710729E-05
 4D /
 TA-181 *CITNKS* *TA-181* /
 179.3900 0.0 5R /
 7 1 1 0 5R 1 1 0 0 1 /
 1 2 3 3 2 /
 1 5R
 5D /
 4.137730E+00 6.666160E+00 1.075010E+01 1.687169E+01 2.470959E+01
 0.0 0.0 0.0 0.0 0.0
 7.648069E-02 2.887599E-01 8.258290E-01 3.224420E+00 6.866340E+00
 3.773690E-03 0.0 0.0 0.0 0.0
 2.000000E+00 0.0 0.0 0.0 0.0
 7.550370E-01 2.380250E-01 6.937999E-03 0.0 0.0
 7D /
 5.053289E+00 7.277980E+00 1.300570E+00 1.042640E+01 1.379640E-01
 2.069130E-02 1.451040E+01 7.560796E-02 1.500330E-03 2.003560E+01
 3.956910E-02
 4D /
 *U-235 * *CITNKS* *U-235 * /
 233.0250 3.148100E-11 0.0 4R /
 1 1 1 0 5R 1 1 0 0 1 /
 1 2 3 3 3 /
 1 5R
 5D /
 4.760500E+00 8.222549E+00 1.359530E+01 1.914319E+01 3.180229E+01
 0.0 0.0 0.0 0.0 0.0
 6.753063E-02 2.953396E-01 8.323002E-01 2.340739E+00 6.114193E+00
 1.276409E+00 1.422770E+00 2.397539E+00 5.349660E+00 1.433350E+01
 2.667859E+00 2.457879E+00 2.433379E+00 2.430380E+00 2.430070E+00
 7.550370E-01 2.380250E-01 6.937999E-03 0.0 0.0
 7D /
 4.856970E+00 7.983669E+00 7.749810E-01 1.061980E+01 1.128620E-01
 6.262079E-03 1.135630E+01 3.006150E-02 6.019380E-04 1.172910E+01
 1.911250E-02 2.076550E-05
 4D /
 *U-238 * *CITNKS* *U-238 * /
 236.0060 3.162500E-11 0.0 4R /
 2 1 1 0 5R 1 1 0 0 1 /
 1 2 3 4 3 /
 1 5R
 5D /
 4.846760E+00 8.571039E+00 1.344970E+01 1.768149E+01 1.890230E+01
 0.0 0.0 0.0 0.0 0.0
 8.457595E-02 1.702173E-01 4.804530E-01 9.735650E-01 1.381539E+00
 3.346020E-01 2.376520E-04 0.0 0.0 0.0
 2.786519E+00 2.466439E+00 0.0 0.0 0.0
 7.550370E-01 2.380250E-01 6.937999E-03 0.0 0.0
 7D /
 4.988910E+00 1.002520E+01 1.818430E+00 1.325670E+01 1.357570E-01
 4.470190E-02 1.698059E+01 4.110790E-02 5.152000E-04 2.062660E-04
 1.838379E+01 1.897440E-02 3.887150E-04

4D /

PU-239 *CITNXS* *PU-239* /
 236.9990 3.258600E-11 0.0 4R /
 1 1 1 0 5R 1 1 0 0 1 /
 1 2 3 3 2 /

1 5R

5D /

4.954309E+00 8.718180E+00 1.417930E+01 1.948119E+01 3.271959E+01
 0.0 0.0 0.0 0.0 0.0
 1.869965E-02 1.703405E-01 5.475597E-01 1.758830E+00 5.105810E+00
 1.883070E+00 1.544629E+00 1.793650E+00 3.520470E+00 9.376289E+00
 3.159670E+00 2.908930E+00 2.874129E+00 2.870489E+00 2.870060E+00
 7.550370E-01 2.380250E-01 6.937999E-03 0.0 0.0

7D /

4.755099E+00 8.660600E+00 6.977440E-01 1.152080E+01 5.938330E-02
 1.403890E-02 1.228110E+01 5.996540E-02 1.393650E-04 1.321710E+01
 2.247640E-02

4D /

PU-240 *CITNXS* *PU-240* /
 237.9900 3.282700E-11 0.0 4R /
 2 1 1 0 5R 1 1 0 0 1 /
 1 2 3 4 3 /

1 5R

5D /

5.054469E+00 8.604670E+00 1.371420E+01 1.888170E+01 2.418489E+01
 0.0 0.0 0.0 0.0 0.0
 9.490967E-02 2.099380E-01 5.826710E-01 1.765706E+00 5.535801E+00
 1.543460E+00 2.327840E-01 1.008230E-01 8.248240E-02 5.786900E-02
 3.146529E+00 2.935940E+00 2.874260E+00 2.870649E+00 2.870070E+00
 7.550370E-01 2.380250E-01 6.937999E-03 0.0 0.0

7D /

4.944110E+00 1.004100E+01 9.152250E-01 1.332420E+01 9.741586E-02
 1.617920E-02 1.696700E+01 3.657120E-02 4.508259E-05 1.091320E-04
 1.921140E+01 3.237760E-02 1.642760E-05

4D /

PU-241 *CITNXS* *PU-241* /
 238.9780 3.305100E-11 0.0 4R /
 1 1 1 0 5R 1 1 0 0 1 /
 1 2 3 4 3 /

1 5R

5D /

5.104230E+00 8.643849E+00 1.269630E+01 1.976459E+01 3.767090E+01
 0.0 0.0 0.0 0.0 0.0
 2.668953E-02 2.172995E-01 6.064100E-01 1.668990E+00 5.614212E+00
 1.703650E+00 1.869960E+00 3.036860E+00 6.653950E+00 1.995859E+01
 3.256940E+00 3.005619E+00 2.973280E+00 2.969489E+00 2.969060E+00
 7.550370E-01 2.380250E-01 6.937999E-03 0.0 0.0

7D /

4.529670E+00 7.873819E+00 1.165449E+00 9.113990E+00 3.188040E-01
 7.122946E-02 1.127190E+01 4.141530E-02 5.656999E-03 2.550660E-04
 1.299900E+01 2.077500E-02 1.391030E-03

4D /

PU-242 *CITNXS* *PU-242* /
 240.1450 3.276200E-11 0.0 4R /
 3 1 1 0 5R 1 1 0 0 1 /
 1 2 3 2 3 /

1 5R

5D /

4.493779E+00 7.721160E+00 1.416950E+01 2.093379E+01 2.866119E+01
 0.0 0.0 0.0 0.0 0.0
 4.164982E-02 1.358470E-01 4.516167E-01 1.535060E+00 5.900109E+00
 1.453540E+00 1.398230E-01 4.632320E-02 0.0 0.0
 3.122800E+00 2.885630E+00 2.812289E+00 0.0 0.0
 7.550370E-01 2.380250E-01 6.937999E-03 0.0 0.0

```

7D /
5.051700E+00 9.356939E+00 6.037650E-01 1.433580E+01 1.291580E-01
1.092240E-02 1.935210E+01 4.589510E-02 2.431760E+01 3.522350E-02
6.624369E-05
4D /
*SSFP * *CITNXS* *SSFP * /
161.0000 0.0 5R /
4 0 0 0 5R 1 1 0 0 1 /
1 1 1 1 1 /
1 5R
5D /
3.563750E-02 1.371830E-01 3.716339E-01 9.294800E-01 3.085389E+00
0.0 0.0 0.0 0.0 0.0
3.680390E-02 1.409680E-01 3.771360E-01 9.283320E-01 3.130919E+00
7D /
0.0 0.0 0.0 0.0 0.0
0V GEODST
1D /
7 8 18 1 6 3 1 17 10 1 1 2 2 1 2 2 1 6 1 0 0 1 0 5R
3D /
0.0 12.482 42.482 57.482 77.912 98.659 113.899 /
0.0 12.24 30.34 56.06 /
2 3 5R /
3 3 4
5D /
5991.004 63406.07 57658.88 106365.1 140865.9 124564.3 8859.246
93762.25 85263.5 157288.2 208306.6 184200.5 12588.94 133235.6
121159.0 223505.7 296002.6 261747.9 /
0.0 /
0.0 0.4692 2R 0.0 0.4692 2R /
0.4692 /
1 8R /
7 6R 3 3R 4 6 8 1 3R 2 5 8 /
7D /
(1 1 2 3R 3 3R 4 3R 5 3R 6 3R) 3R /
(7 7 8 3R 9 3R 10 3R 11 3R 12 3R) 3R /
(13 13 14 3R 15 3R 16 3R 17 3R 18 3R) 4R /
0V NDXSRF
1D /
15 4 14 15 8 4
2D /
(*O-16 * *NA-23 * *CR-N * *MN-55 * *PE-N * *NI-N * *MO-N *
*TA-181* *U-235 * *U-238 * *PU-239* *PU-240* *PU-241* *PU-242*
*SSFP * ) 2R /
0.0 15R /
15.862 22.786 52.01 54.466 55.845 58.705 95.066 179.39 233.025
236.006 236.999 237.990 238.978 240.145 161.0 /
0 6 5 5R 7 1 2 1 2 1 3 4 /
(14 0 3R) 3R 7 0 3R /
1 2 3 4 5 6 / 8 10 11 12 13 14 15 /
(1 2 3 4 5 6 7 8 9 10 11 12 13 15) 2R /
2 3 4 5 6 7 8 0 7R /
1 2 3 4 5 6 7 8 0 9 10 11 12 13 14 /
(1 2 3 4 5 6 7 8 9 10 11 12 13 0 14) 2R /
0 1 2 3 4 5 6 7 0 7R /
3D /
266983.6 223505.7 107084.9 157288.2 296002.6 208306.6 498851.2
445948.4 /
1.0 0.0 1.0 6R /
55876.42 4R /
1 0 3 4R 4 4 /
2 4R /
2 4R /

```

OV ZNATDN

1D /

0.0 0 12 14 1

2D /

1.804800E-02 8.218598E-03 2.945900E-03 4.325500E-04 1.134900E-02

2.078700E-03 5.186498E-04 5.261999E-05 7.179096E-03 9.960700E-04

2.896199E-04 2.796900E-05 7.217899E-06 5.223998E-04

0.0 14R 1.804800E-02 /

8.218598E-03 2.945900E-03 4.325500E-04 1.134900E-02 2.078700E-03

5.186498E-04 5.261999E-05 2.124799E-05 8.596398E-03 1.841500E-04

6.197200E-06 9.999999E-16 4.515100E-05 1.804800E-02 8.218598E-03

2.945900E-03 4.325500E-04 1.134900E-02 2.078700E-03 5.186498E-04

5.261999E-05 2.124799E-05 8.596398E-03 1.841500E-04 6.197200E-06

9.999999E-16 4.515100E-05 1.804800E-02 8.218598E-03 2.945900E-03

4.325500E-04 1.134900E-02 2.078700E-03 5.186498E-04 5.261999E-05

2.124799E-05 8.596398E-03 1.841500E-04 6.197200E-06 9.999999E-16

4.515100E-05 1.804800E-02 8.218598E-03 2.945900E-03 4.325500E-04

1.134900E-02 2.078700E-03 5.186498E-04 5.261999E-05 2.124799E-05

8.596398E-03 1.841500E-04 6.197200E-06 9.999999E-16 4.515100E-05

4.359998E-03 1.149600E-02 1.688000E-03 4.428800E-02 8.111998E-03

2.024000E-03 9.999999E-16 /

0.0 7R 4.359998E-03 1.149600E-02 1.688000E-03

4.428800E-02 8.111998E-03 2.024000E-03 9.999999E-16

0.0 7R 1.804800E-02 /

8.218598E-03 2.945900E-03 4.325500E-04 1.134900E-02 2.078700E-03

5.186498E-04 5.261999E-05 2.124799E-05 8.596398E-03 1.841500E-04

6.197200E-06 9.999999E-16 4.515100E-05 1.804800E-02 8.218598E-03

2.945900E-03 4.325500E-04 1.134900E-02 2.078700E-03 5.186498E-04

5.261999E-05 2.124799E-05 8.596398E-03 1.841500E-04 6.197200E-06

9.999999E-16 4.515100E-05 1.804800E-02 8.218598E-03 2.945900E-03

4.325500E-04 1.134900E-02 2.078700E-03 5.186498E-04 5.261999E-05

2.124799E-05 8.596398E-03 1.841500E-04 6.197200E-06 9.999999E-16

4.515100E-05 1.804800E-02 8.218598E-03 2.945900E-03 4.325500E-04

1.134900E-02 2.078700E-03 5.186498E-04 5.261999E-05 2.124799E-05

8.596398E-03 1.841500E-04 6.197200E-06 9.999999E-16 4.515100E-05

OV SEARCH

1D /

7 2 0 18R /

2D /

1.01 0.0 0.00005 0.001 0.0 6R /

9 0 0 0 3R 3 1 2 0 0 0 8 0 17R /

5D /

1 2 /

*U-238 * *PU-240 * *PU-239 * /

0.0001 0.0002 0.0003

1D /

8 2 0 18R /

2D /

1.01 0.0 0.00005 0.001 0.0 6R /

5 0 7 6 3 1 0 0 2 0 0 0 0 18R /

3D /

1.0 1.0 1.0 1.0 0.0 0.0 /

0.0 0.0 0.5 /

0.0

1D /

-10 0 19R /

STOP

END

=CONTROL1

2-D LARGE LMFBR REACTOR MODEL BENCHMARK PROBLEM, P1 APPROXIMATION.

56000

1 6 2 7 9

END

INPUT DATA TC INPUT PROCESSOR

OV CONTRL

1D PRCINS

*2-D LARGE LMFBR REACTOR MODEL BENCHMARK PROBLEM VENTURE (DV-4-1-76) *

* P-1 CALCULATION *

* DV ** DV * .0 74R 0 100R

1D DVRINS 0. 100R 56000 0 99R

1D XCPINS 0. 100R 0 0 0 1 0 0.1 2 0 14R 0 0 0 76R /

1D RRTINS 0. 100R 0 5R 1 0 4R 1 1 0 1 0 86R /

1D * * 0. 100R 0 100R

OV ISOTXS ISOTXS* OV ISOTXS *

1D 4 30 0 4 3 1 1 4

2D * LARGE CORE X-SECTIONS *

```

*
      6HMAT 10      6HMAT 11      6HMAT 12      6HMAT 13      6HMAT 14      6HMAT 15
      6HMAT 16      6HMAT 28      6HMAT 40      6HMAT 44      6HMAT 50      6HMAT 56
      6HMAT 60      6HMAT 88      6HMAT112      6HMAT135      6HMAT138      6HMAT139
      6HMAT140      6HMAT141      6HMAT142      6HMAT176      6HMAT224      6HMAT238
      6HMAT239      6HMAT240      6HMAT242      6HMAT335      6HMAT338      6HMAT352
7.59691E-01 2.37146E-01 3.12704E-03 3.56784E-05
1.87602E+09 5.56731E+08 1.58760E+08 4.29811E+07 1.64900E+07
8.20800E+05 4.08700E+04 2.03500E+03 1.00000E-05
0 6 12 18 24 30 36 42 48 54 60 66 72 78 84 90 96 102 108 114 120 120
138 144 150 156 162 168 174 180
4D 6H 2400 6HENDFB3 6H 2400
5.19000E+01 0. 0. 7.54100E+02 0.
2.98000E-03
      5      0      0      0      0      0      0      0      1      1      0      0
      4      1      2      3      2      1      1      1      1
5D 2.33235E+00 3.54714E+00 7.75291E+00 5.44459E+00
   3.20264E+00 4.54219E+00 8.78597E+00 5.53049E+00 4.50048E-03
6.33641E-03 4.11306E-02 1.05545E-01
7D 2.75295E+00 2.83041E+00 3.92193E+00 2.80821E+00
7D 4.45973E+00 4.44267E-01 2.51688E+00 -7.90821E-02 3.02754E+00
2.63614E-02 5.68594E-01 -6.09239E-02
7D 8.70974E+00 7.61311E-02 9.15585E-04 1.18568E+00 -9.34981E-03
0. 8.78031E-01 1.48475E-03 0. 1.43001E-01
-2.24772E-03 0.
7D 5.42495E+00 3.50977E-02 5.39420E-01 -1.68461E-03 6.65444E-02
2.31478E-04 1.04175E-02 4.33112E-06
4D 6H 2600 6HENDFB3 6H 2600
5.58000E+01 0. 0. 7.54100E+02 0.
6.26000E-03
      5      0      0      0      0      1      0      0      1      1      0      0
      4      1      2      3      2      1      1      1      1
5D 2.24952E+00 3.15837E+00 7.30377E+00 8.94202E+00
   3.05733E+00 3.45882E+00 7.38715E+00 9.04876E+00 7.50050E-03
6.25554E-03 1.36236E-02 9.30693E-02 1.03797E-04 0.
0. 0.
7D 2.67772E+00 2.55839E+00 3.61294E+00 2.68880E+00
7D 3.40849E+00 3.68014E-01 9.13481E-01 -4.77720E-02 7.23790E-01
2.90930E-02 6.03011E-02 -3.45142E-02
7D 7.33931E+00 4.40735E-02 4.20349E-03 3.76253E-01 -3.66885E-02
0. 1.30976E-02 -1.65278E-03 0. 7.90672E-03
-5.31547E-05 0.
7D 8.95569E+00 3.42184E-02 7.30917E-01 -2.10968E-03 1.43617E-02
-6.95149E-05 2.05680E-03 1.50532E-06

```

```

4D 6H 2800 6HENDFB3 6H 2800
5.87000E+01 0. 0. 7.54100E+02 0.
5.26000E-03
5 0 0 0 0 0 0 0 1 1 0 0
4 1 2 3 2 1 1 1 1
5D 2.54869E+00 4.75729E+00 1.90691E+01 1.68520E+01
3.33512E+00 5.41051E+00 2.08627E+01 1.70404E+01 8.64997E-02
1.22271E-02 4.95660E-02 2.60255E-02
7D 2.89038E+00 2.45436E+00 3.60082E+00 2.17086E+00
7D 5.34095E+00 3.57451E-01 9.54340E-01 -9.28700E-02 8.00514E-01
4.22839E-02 1.11095E-01 -4.86727E-02
7D 2.07420E+01 5.73395E-02 7.94368E-04 9.43129E-01 -5.11606E-02
0. 2.35401E-02 1.42520E-03 0. 2.53220E-02
-3.05852E-03 0.
7D 1.70144E+01 7.11062E-02 1.32935E+00 -4.21176E-03 2.34824E-02
-1.13265E-04 2.94590E-04 -5.50757E-06
4D 6H 4200 6HENDFB3 6H 4200
9.54000E+01 0. 0. 7.54100E+02 0.
2.60000E-04
5 0 0 0 1 0 0 1 1 0 0
4 1 2 3 2 1 1 1 1
5D 3.54254E+00 6.90495E+00 8.38855E+00 1.18955E+01
5.28878E+00 8.49950E+00 8.65850E+00 1.19878E+01 1.81308E-02
5.91863E-02 3.04344E-01 1.33673E+00 2.77422E-03 0.
0. 0.
7D 4.40190E+00 4.76555E+00 4.60645E+00 2.53093E+00
7D 8.39322E+00 8.68723E-01 4.44968E+00 -2.01772E-02 3.11844E+00
-1.75404E-02 4.93996E-01 -4.46339E-02
7D 8.32582E+00 4.70868E-02 2.80074E-03 6.70220E-01 -3.18630E-02
0. 4.56965E-01 6.39066E-04 0. 8.40591E-02
-1.98538E-03 0.
7D 1.06511E+01 2.83314E-02 4.67296E-01 -1.75103E-03 -3.87137E-02
-3.08855E-05 7.29742E-02 1.80738E-06
4D 6H 1100 6HENDFB3 6H 1100
2.29000E+01 0. 0. 7.33000E+02 0.
8.08000E-03
6 0 0 0 1 0 0 1 1 0 0
4 1 2 3 2 1 1 1 1
5D 1.88299E+00 3.79083E+00 5.69793E+00 5.06238E+00
2.81754E+00 4.11496E+00 7.63787E+00 5.30336E+00 2.54849E-03
9.15280E-04 4.73260E-03 1.23878E-02 2.87633E-06 0.
0. 0.
7D 2.40129E+00 2.62368E+00 1.77327E+00 8.48669E-01
7D 4.00529E+00 4.13709E-01 1.28070E+00 -5.66158E-02 7.83393E-01
-7.06304E-02 1.51952E-01 -3.02357E-02
7D 7.37813E+00 1.08752E-01 4.49804E-07 6.33518E-01 -6.98305E-02
-1.12076E-04 -1.48618E-02 -3.46485E-03 0. 5.69363E-02
1.76865E-03 0.
7D 5.29097E+00 2.55000E-01 4.79892E-01 -1.55226E-01 -1.68477E-02
-1.49696E-02 4.31747E-02 8.18265E-03
4D 6H 9999 6HENDFB3 6H 9999
1.00000E+02 0. 0. 7.54100E+02 0.
2.40000E-04
4 0 0 0 0 0 0 0 1 1 0 0
4 1 2 3 2 1 1 1 1
5D 7.61564E+00 1.18709E+01 1.63518E+01 2.32574E+01
1.20669E+01 1.43187E+01 1.68633E+01 2.34475E+01 5.17349E-02
2.25078E-01 8.72613E-01 3.62165E+00
7D 1.01484E+01 0. 0. 0.
7D 1.40217E+01 1.85852E+00 0. 0. 0.
0. 0. 0.
7D 1.59495E+01 7.18814E-02 8.26870E-03 0. 0.
0. 0. 0. 0.
0. 0.

```

```

7D 1.98259E+01 4.11351E-02 0. 0. 0.
0. 0. 0.
4D 6H 80 6HENDFB3 6H 80
0. 1.60000E+01 0. 0. 7.54100E+02
0.
0 0 0 0 0 0 0 0 1 1 0 0
4 1 2 3 2 1 1 1 1
5D 1.84106E+00 3.37143E+00 3.55431E+00 3.54834E+00
2.29848E+00 3.65670E+00 3.68258E+00 3.70277E+00 7.60674E-03
7.03775E-08 2.46771E-07 9.11535E-07
7D 1.70943E+00 1.55943E+00 1.57117E+00 1.03743E+00
7D 3.52899E+00 5.81445E-01 7.81718E-01 -6.69221E-01 2.73563E-01
4.04679E-01 -6.40970E-02 -3.43764E-01
7D 3.63567E+00 1.27702E-01 0. 4.39456E-01 -9.22067E-02
0. 1.28088E-02 -5.43040E-03 0. -3.76322E-03
-2.25909E-04 0.
7D 3.70277E+00 4.69054E-02 5.53870E-01 -1.49726E-02 2.45044E-02
-1.42290E-03 -3.14881E-03 -6.19015E-05
4D 6H 1100 6HENDFB3 6H 1100
2.29000E+01 0. 0. 7.33000E+02 0.
2.40000E-04
6 0 0 0 1 0 0 1 1 0 0
4 1 2 3 2 1 1 1 1
5D 1.88126E+00 3.78723E+00 5.61962E+00 5.15836E+00
2.81565E+00 4.11631E+00 7.48718E+00 5.40284E+00 2.58715E-03
8.99325E-04 4.59006E-03 1.26002E-02 2.91533E-06 0.
0.
7D 2.41591E+00 2.61735E+00 1.76899E+00 8.48821E-01
7D 4.01340E+00 3.97157E-01 1.29933E+00 -5.24129E-02 8.04842E-01
-6.58456E-02 1.54017E-01 -2.81874E-02
7D 7.24074E+00 1.02011E-01 4.56092E-07 6.15884E-01 -6.51143E-02
-1.12148E-04 -1.60026E-02 -3.22923E-03 0. 5.73021E-02
1.64838E-03 0.
7D 5.39024E+00 2.41849E-01 4.88727E-01 -1.46232E-01 -1.65540E-02
-1.38272E-02 4.32681E-02 7.62484E-03
4D 6H 510 6HENDFB3 6H 510
1.00000E+01 0. 0. 7.33000E+02 0.
7.64000E-03
7 0 0 0 0 0 0 0 1 1 0 0
4 1 2 3 2 1 1 1 1
5D 1.77863E+00 4.33870E+00 6.61554E+00 1.98988E+01
2.11493E+00 4.63642E+00 7.08710E+00 2.02025E+01 3.91142E-01.
1.48332E+00 4.80291E+00 1.80004E+01
7D 1.28623E+00 1.18141E+00 1.06180E+00 4.99398E-01
7D 3.02699E+00 4.37556E-01 7.56191E-01 -2.85524E-01 6.09673E-02
-6.59237E-02 -1.67021E-02 -4.38706E-02
7D 2.26335E+00 1.26102E-01 1.91998E-06 4.71773E-01 -8.51694E-02
0. 2.11862E-02 -1.36908E-02 0. 8.39774E-04
-1.90739E-04 0.
7D 2.20206E+00 2.08453E-02 4.43614E-01 -3.62908E-03 2.23660E-02
-3.05483E-03 -8.13884E-05 5.40707E-04
4D 6H 2600 6HENDFB3 6H 2600
5.58000E+01 0. 0. 7.54100E+02 0.
4.04000E-03
5 0 0 0 1 0 0 1 1 0 0
4 1 2 3 2 1 1 1 1
5D 2.26052E+00 3.38777E+00 7.85045E+00 9.35125E+00
3.07216E+00 3.69899E+00 7.85133E+00 9.45486E+00 7.36585E-03
6.45551E-03 1.38873E-02 9.58798E-02 1.00434E-04 0.
0.
7D 2.64793E+00 2.59397E+00 3.62538E+00 2.73682E+00
7D 3.63332E+00 4.13103E-01 8.96494E-01 -6.91871E-02 6.83597E-01
4.21347E-02 5.55666E-02 -4.99861E-02
7D 7.79648E+00 5.92151E-02 3.86137E-03 4.19812E-01 -5.08390E-02
0. 1.26474E-02 -2.29025E-03 0. 7.22608E-03

```

```

-7.36560E-05 0.
7D 9.35898E+00 4.09641E-02 6.46574E-01 -2.85099E-03 1.17629E-02
-9.39413E-05 1.62822E-03 2.03426E-06
4D 6H 511 6HENDFB3 6H 511
1.10000E+01 0. 0. 7.33000E+02 0.
1.14700E-02
7 0 0 0 0 0 0 1 1 0 0
4 1 2 3 2 1 1 1 1
5D 1.73615E+00 3.42551E+00 4.78647E+00 4.72473E+00
2.05105E+00 4.00126E+00 5.08279E+00 5.03208E+00 5.57323E-05
3.05045E-06 1.13341E-04 2.38576E-05
7D 1.54688E+00 1.75580E+00 2.48781E+00 2.42997E+00
7D 3.78083E+00 5.04120E-01 2.23749E+00 -3.95786E-01 1.72690E+00
1.97893E-01 2.03608E+00 -2.63857E-01
7D 5.03719E+00 2.20429E-01 3.36695E-07 9.83103E-01 -1.47816E-01
0. 4.94136E-02 -2.70254E-02 0. 4.25957E-02
3.50373E-03 0.
7D 5.03206E+00 4.54811E-02 9.37201E-01 -1.03168E-02 3.27589E-02
-1.01188E-02 4.17965E-02 -2.85593E-03
4D 6H 1100 6HENDFB3 6H 1100
2.29000E+01 0. 0. 7.33000E+02 0.
6.07000E-03
6 0 0 0 0 1 0 0 1 1 0 0
4 1 2 3 2 1 1 1 1
5D 1.86462E+00 3.85874E+00 6.54646E+00 4.61370E+00
2.79934E+00 4.16738E+00 8.75648E+00 4.80573E+00 2.50659E-03
1.02756E-03 5.91149E-03 1.15346E-02 2.78311E-06 0.
0.
7D 2.26824E+00 2.63137E+00 1.79949E+00 8.68069E-01
7D 4.02037E+00 5.28590E-01 1.23539E+00 -8.26657E-02 7.17516E-01
-9.98742E-02 1.49176E-01 -4.27545E-02
7D 8.43387E+00 1.45983E-01 4.36968E-07 7.88954E-01 -9.65361E-02
-1.16271E-04 -1.76155E-02 -4.79706E-03 0. 5.86585E-02
2.44869E-03 0.
7D 4.79420E+00 3.16701E-01 4.38588E-01 -2.22687E-01 -1.86450E-02
-1.22208E-02 4.31936E-02 8.92225E-03
4D 6H 600 6HENDFB3 6H 600
1.20000E+01 0. 0. 7.33040E+02 0.
4.78000E-03
7 0 0 0 0 0 0 0 1 1 0 0
4 1 2 3 2 1 1 1 1
5D 1.74016E+00 3.52596E+00 4.39388E+00 4.47585E+00
1.97401E+00 3.93815E+00 4.67754E+00 4.74853E+00 8.43481E-04
0. 1.72470E-07 1.62503E-05
7D 1.52330E+00 8.76627E-01 1.14773E+00 2.25600E-01
7D 3.74393E+00 4.49861E-01 1.07948E+00 -2.84811E-01 6.99146E-02
-9.46540E-02 -2.26115E-02 -1.76463E-02
7D 4.63630E+00 1.94213E-01 2.57901E-08 8.55565E-01 -1.33676E-01
0. 2.62407E-02 -2.02786E-02 0. 1.05809E-02
-2.13460E-04 0.
7D 4.74852E+00 4.12408E-02 8.51489E-01 -7.84017E-03 -2.25226E-02
-5.32243E-03 3.70802E-02 2.46687E-03
4D 6H 2600 6HENDFB3 6H 2600
5.58000E+01 0. 0. 7.59100E+02 0.
3.53700E-02
5 0 0 0 0 1 0 0 1 1 0 0
4 1 2 3 2 1 1 1 1
5D 2.22851E+00 2.84999E+00 5.92953E+00 9.86922E+00
2.96834E+00 3.22998E+00 6.27016E+00 1.00560E+01 5.61198E-03
6.33207E-03 1.17788E-02 6.22297E-02 6.66970E-05 0.
0. 0.

```

```

7D 2.25502E+00 2.45272E+00 3.10389E+00 2.35338E+00
7D 3.15492E+00 7.03797E-01 8.35531E-01 -2.86344E-01 6.75575E-01
1.74383E-01 5.82053E-02 -2.06877E-01
7D 6.17417E+00 6.87290E-02 3.98328E-03 4.54641E-01 -5.12971E-02
0. 1.26516E-02 -2.31088E-03 0. 6.51846E-03
-7.43198E-05 0.
7D 9.99379E+00 8.42155E-02 5.46682E-01 -6.61011E-03 8.61790E-03
-2.17806E-04 1.01718E-03 4.71651E-06
4D 6H 1100 6HENDFB3 6H 1100
2.29000E+01 0. 0. 7.33000E+02 0.
1.4530CE-02
6 0 0 0 0 1 0 0 1 1 0 0
4 1 2 3 2 1 1 1 1
5D 1.89180E+00 3.71570E+00 4.83263E+00 5.49786E+00
2.80455E+00 4.04965E+00 6.28268E+00 5.74576E+00 2.38604E-03
8.45860E-04 3.31712E-03 1.33330E-02 2.75148E-06 0.
0. 0.
7D 2.37685E+00 2.63881E+00 1.77877E+00 0.42538E-01
7D 3.94767E+00 4.25317E-01 1.20343E+00 -6.89963E-02 7.06622E-01
-8.39994E-02 1.37096E-01 -3.59587E-02
7D 6.13216E+00 1.01135E-01 4.28348E-07 4.49817E-01 -6.71384E-02
-1.08653E-04 -2.25754E-02 -3.33658E-03 0. 5.89132E-02
1.70318E-03 0.
7D 5.73243E+00 1.47209E-01 5.20398E-01 -6.35929E-02 -1.54741E-02
-7.23829E-03 4.35453E-02 3.68873E-03
4D 6H 9235 6HENDFB3 6H 9235
2.35000E+02 0. 0. 1.29240E+03 0.
1.90000E-05
1 0 1 0 0 1 0 0 1 1 0 0
4 1 2 3 3 1 1 1 1
5D 4.68474E+00 8.29209E+00 1.44278E+01 2.47463E+01
7.09742E+00 1.00796E+01 1.47427E+01 2.47577E+01 5.83333E-02
3.51060E-01 1.04574E+00 4.07153E+00 1.24073E+00 1.46579E+00
2.89339E+00 9.07953E+00 2.68931E+00 2.44889E+00 2.42468E+00
2.42311E+00 1.08886E-02 0. 0. 0.
7D 5.07314E+00 7.18453E+00 8.70044E+00 9.33651E+00
7D 8.21003E+00 7.31972E-01 4.05412E+00 -9.71930E-03 2.39699E+00
-4.07565E-03 7.94664E-01 -1.23997E-03
7D 1.07908E+01 5.26434E-02 4.14506E-03 4.34149E-01 -1.71151E-02
0. 2.13208E-01 1.28588E-04 0. -1.00074E-01
-1.38464E-03 0.
7D 1.16066E+01 1.28007E-02 3.23548E-05 2.32129E-01 -7.79134E-04
0. 1.13918E-03 -5.29766E-06 0. -1.45744E-04
2.4945CE-07 0.
4D 6H 9238 6HENDFB3 6H 9238
2.38000E+02 0. 0. 1.29240E+03 0.
7.69000E-03
2 0 1 0 0 1 0 0 1 1 0 0
4 1 2 3 3 1 1 1 1
5D 4.72115E+00 8.54519E+00 1.33366E+01 1.25213E+01
7.31035E+00 1.06397E+01 1.35690E+01 1.25538E+01 6.39481E-02
1.79014E-01 6.16305E-01 1.41179E+00 3.70183E-01 3.48353E-04
4.84479E-05 3.93085E-04 2.77311E+00 2.41872E+00 2.32700E+00
2.32700E+00 1.87891E-02 0. 0. 0.
7D 5.17222E+00 7.59296E+00 9.40953E+00 9.27894E+00
7D 1.03988E+01 1.71294E+00 4.63825E+00 -1.26947E-02 2.72961E+00
1.26391E-03 1.07326E+00 -4.47621E-03
7D 1.29366E+01 6.14318E-02 9.84888E-03 5.26012E-01 -2.14643E-02
0. 1.56261E-02 -1.19166E-03 0. -4.15939E-03
-1.1663CE-04 0.
7D 1.11416E+01 1.61135E-02 8.48086E-05 4.05428E-01 -8.73499E-04
0. 6.19264E-02 -2.38389E-04 0. -2.63784E-01

```

```

-8.32866E-04 0.
4D 6H 9439 6HENDFB3 6H 9439
2.39000E+02 0. 0. 1.29240E+03 0.
7.60000E-04
1 0 1 0 0 1 0 0 1 1 0 0
4 1 2 3 3 1 1 1 1
5D 4.69324E+00 8.19171E+00 1.39951E+01 2.30947E+01
7.38207E+00 1.05141E+01 1.45548E+01 2.31397E+01 1.16223E-02
2.04450E-01 1.05720E+00 4.91931E+00 1.89780E+00 1.59197E+00
1.96675E+00 5.74588E+00 3.18890E+00 2.91595E+00 2.88218E+00
2.88012E+00 2.32297E-03 0. 0. 0.
7D 4.68501E+00 7.51210E+00 9.53904E+00 9.81709E+00
7D 8.66930E+00 7.84199E-01 5.57968E+00 1.56795E-03 3.14428E+00
4.82478E-04 1.26424E+00 -4.97315E-03
7D 1.15022E+01 4.83271E-02 5.76564E-03 8.69183E-01 -1.44639E-02
0. 1.51273E-01 -1.75988E-03 0. -3.41819E-04
-4.26567E-04 0.
7D 1.24745E+01 2.85658E-02 1.81555E-05 2.59107E-01 -9.08307E-04
0. 3.26233E-03 -3.06065E-06 0. -3.37100E-03
5.29385E-07 0.
4D 6H 9440 6HENDFB3 6H 9440
2.40000E+02 0. 0. 1.29240E+03 0.
2.90000E-04
2 0 1 0 0 1 0 0 1 1 0 0
4 1 2 3 3 1 1 1 1
5D 4.75812E+00 8.03104E+00 1.38680E+01 2.21745E+01
7.37734E+00 1.04544E+01 1.44583E+01 2.22164E+01 6.04094E-02
2.23054E-01 7.36510E-01 3.41123E+00 1.50403E+00 2.51700E-01
1.00587E-01 2.05348E-01 3.11872E+00 2.94155E+00 2.89171E+00
2.89012E+00 6.33798E-03 0. 0. 0.
7D 5.11263E+00 7.88369E+00 9.65253E+00 1.01647E+01
7D 9.88296E+00 7.03193E-01 6.00451E+00 -1.06486E-03 3.83659E+00
-1.63315E-03 1.25194E+00 -5.28048E-04
7D 1.36061E+01 9.63796E-02 3.42027E-03 1.32031E+00 -1.88371E-02
0. 1.02958E+00 3.71227E-04 0. -2.93439E-03
-1.87463E-03 0.
7D 1.85998E+01 1.50681E-02 3.51853E-04 4.83732E-01 -9.67939E-04
0. 1.65721E-01 6.70093E-05 0. 8.43658E-01
1.11316E-04 0.
4D 6H 9441 6HENDFB3 6H 9441
2.41000E+02 0. 0. 1.29240E+03 0.
1.40000E-04
1 0 1 0 0 1 0 0 1 1 0 0
4 1 2 3 3 1 1 1 1
5D 4.65262E+00 8.69088E+00 1.47979E+01 2.63804E+01
7.58592E+00 1.14937E+01 1.54023E+01 2.64162E+01 8.71624E-02
2.71861E-01 7.77532E-01 2.95514E+00 1.64303E+00 1.92557E+00
3.36957E+00 1.11019E+01 3.25761E+00 2.97067E+00 2.93821E+00
2.93614E+00 1.75066E-02 0. 0. 0.
7D 5.08252E+00 8.67568E+00 1.07354E+01 1.09560E+01
7D 9.21145E+00 7.83679E-01 7.18052E+00 5.45323E-03 3.63793E+00
3.06505E-03 1.28544E+00 -7.60261E-03
7D 1.12422E+01 8.46050E-02 7.03386E-03 1.37131E+00 -1.34035E-02
0. 1.49891E-01 -2.71540E-03 0. 2.40056E-03
-3.40558E-04 0.
7D 1.23591E+01 1.30478E-02 1.79024E-04 2.36922E-01 -7.86128E-04
0. 1.04397E-03 -4.94463E-06 0. -9.74953E-05
-1.05490E-06 0.
4D 6H 9442 6HENDFB3 6H 9442
2.42000E+02 0. 0. 1.29240E+03 0.
8.00000E-05
0 0 1 0 0 1 0 0 1 1 0 0
4 1 2 3 3 1 1 1 1
5D 4.43459E+00 7.85891E+00 1.61521E+01 3.33309E+01

```

```

7.14177E+00 1.01113E+01 1.69210E+01 3.33626E+01 3.86613E-02
1.57409E-01 6.30532E-01 3.48330E+00 1.46922E+00 1.60931E-01
3.75722E-02 0. 3.15128E+00 2.89001E+00 2.81119E+00
0. 7.01546E-03 0. 0. 0.
7D 5.03320E+00 8.13410E+00 1.02191E+01 1.03068E+01
7D 9.72183E+00 6.02978E-01 5.48247E+00 -8.04722E-03 3.34038E+00
5.20966E-03 1.27165E+00 -4.24229E-03
7D 1.62260E+01 7.11672E-02 4.71878E-03 1.19297E+00 -1.90693E-02
0. 2.90973E-01 -1.78102E-03 0. 3.74945E-03
-5.19789E-04 0.
7D 2.98793E+01 2.69626E-02 2.82795E-06 5.74568E-01 -1.70085E-03
0. -1.54437E-01 -1.12526E-05 0. -1.11066E-01
1.98456E-06 0.
4D 6H 2600 6HENDFB3 6H 2600
5.58000E+01 0. 0. 7.54100E+02 0.
6.26000E-03
5 0 0 0 1 0 0 1 1 0 0
4 1 2 3 3 1 1 1 1
5D 2.25038E+00 3.16307E+00 7.39224E+00 8.74893E+00
3.05462E+00 3.42694E+00 7.38679E+00 8.87860E+00 7.13862E-03
6.22619E-03 1.36146E-02 9.10613E-02 9.92917E-05 0.
0.
7D 2.66971E+00 2.51645E+00 3.55700E+00 2.62294E+00
7D 3.37894E+00 3.74033E-01 8.93892E-01 -5.64228E-02 6.78277E-01
3.43613E-02 5.40698E-02 -4.07642E-02
7D 7.35357E+00 4.17796E-02 3.84292E-03 3.51557E-01 -3.60155E-02
0. 1.44874E-02 -1.62246E-03 0. 8.70623E-03
-5.21796E-05 0.
7D 8.78754E+00 1.96008E-02 0. 8.19012E-01 -8.78260E-04
0. 1.69827E-02 -2.89391E-05 0. 2.25160E-03
6.26664E-07 0.
4D 6H 1100 6HENDFB3 6H 1100
2.29000E+01 0. 0. 7.33000E+02 1.83200E-02
6.26000E-03
6 0 0 0 1 0 0 1 1 0 0
4 1 2 3 3 1 1 1 1
5D 1.91211E+00 3.66470E+00 4.87979E+00 4.53246E+00
2.82589E+00 3.99815E+00 6.77505E+00 4.95225E+00 2.34797E-03
8.00667E-04 3.64182E-03 1.17056E-02 2.67263E-06 0.
0.
7D 2.38030E+00 3.66972E+00 1.70073E+00 8.33054E-01
7D 3.88750E+00 4.43247E-01 1.12670E+00 -7.20932E-02 6.32032E-01
-8.85621E-02 1.25730E-01 -3.79120E-02
7D 6.53672E+00 1.09849E-01 4.16718E-07 4.76613E-01 -7.32497E-02
-1.07327E-04 -1.13113E-02 -3.64341E-03 0. 5.50963E-02
1.85980E-03 0.
7D 4.94055E+00 2.34691E-01 0. 4.31529E-01 -8.09329E-02
0. -1.81755E-02 -1.85765E-02 0. 4.23988E-02
7.54460E-03 0.
4D 6H 9238 6HENDFB3 6H 9238
2.38000E+02 0. 0. 1.29240E+03 0.
7.23000E-03
2 0 1 0 0 1 0 0 1 1 0 0
4 1 2 3 3 1 1 1 1
5D 4.71790E+00 8.47037E+00 1.33625E+01 1.26739E+01
7.31242E+00 1.05828E+01 1.35983E+01 1.27056E+01 6.37775E-02
1.76722E-01 6.14084E-01 1.43077E+00 3.70720E-01 3.59312E-04
4.90293E-05 3.81712E-04 2.77541E+00 2.41907E+00 2.32700E+00
2.32700E+00 1.90889E-02 0. 0.
7D 5.17875E+00 7.60586E+00 9.43140E+00 9.30723E+00
7D 1.03473E+01 1.70837E+00 4.69376E+00 -1.17761E-02 2.78465E+00
1.17245E-03 1.10368E+00 -4.15229E-03

```

```

7D 1.29689E+01 5.83547E-02 9.89101E-03 5.31710E-01 -1.99736E-02
0. 1.59605E-02 -1.10890E-03 0. -3.94136E-03
-1.08530E-04 0.
7D 1.12745E+01 1.53333E-02 7.97368E-05 4.31720E-01 -8.24907E-04
0. 6.60450E-02 -2.25128E-04 0. -2.48578E-01
-7.86535E-04 0.
4D 6H 9439 6HENDFB3 6H 9439
2.39000E+02 0. 0. 1.29240E+03 0.
1.01000E-02
1 0 1 0 0 1 0 0 1 1 0 0
4 1 2 3 3 1 1 1 1
5D 4.69169E+00 8.11945E+00 1.39570E+01 2.24568E+01
7.38411E+00 1.04580E+01 1.45144E+01 2.25069E+01 1.15952E-02
2.01419E-01 1.04271E+00 4.73989E+00 1.89707E+00 1.59081E+00
1.95960E+00 5.52732E+00 3.19035E+00 2.91682E+00 2.88221E+00
2.88013E+00 2.36028E-03 0. 0. 2.98023E-07
7D 4.68850E+00 7.52637E+00 9.56303E+00 9.84932E+00
7D 8.62007E+00 7.83536E-01 5.62511E+00 1.45421E-03 3.20386E+00
4.47477E-04 1.29650E+00 -4.61238E-03
7D 1.14846E+01 4.57164E-02 5.76496E-03 8.80571E-01 -1.34561E-02
0. 1.53925E-01 -1.63724E-03 0. -3.43937E-04
-3.96843E-04 0.
7D 1.22397E+01 2.75043E-02 1.72659E-05 2.64953E-01 -8.49332E-04
0. 3.02304E-03 -2.86192E-06 0. -2.77827E-03
4.95013E-07 0.
4D 6H 9440 6HENDFB3 6H 9440
2.40000E+02 0. 0. 1.29240E+03 0.
4.10000E-04
2 0 1 0 0 1 0 0 1 1 0 0
4 1 2 3 3 1 1 1 1
5D 4.75598E+00 7.95748E+00 1.38110E+01 2.15603E+01
7.37912E+00 1.03962E+01 1.44002E+01 2.16060E+01 6.02559E-02
2.20485E-01 7.29371E-01 3.26456E+00 1.50417E+00 2.57590E-01
1.00331E-01 2.04446E-01 3.11971E+00 2.94206E+00 2.89173E+00
2.89013E+00 6.43841E-03 0. 0. 0.
7D 5.11442E+00 7.89496E+00 9.67257E+00 1.01914E+01
7D 9.82620E+00 7.03257E-01 6.05308E+00 -9.87661E-04 3.88475E+00
-1.51475E-03 1.28632E+00 -4.89767E-04
7D 1.35563E+01 9.15838E-02 3.45118E-03 1.33115E+00 -1.75245E-02
0. 1.04012E+00 3.45359E-04 0. -2.65870E-03
-1.74400E-03 0.
7D 1.81370E+01 1.41961E-02 3.30811E-04 5.01766E-01 -9.05015E-04
0. 1.55069E-01 6.26531E-05 0. 8.78725E-01
1.04079E-04 0.
4D 6H 9442 6HENDFB3 6H 9442
2.42000E+02 0. 0. 1.29240E+03 0.
1.12000E-04
0 0 1 0 0 1 0 0 1 1 0 0
4 1 2 3 3 1 1 1 1
5D 4.43405E+00 7.78332E+00 1.60967E+01 3.30550E+01
7.14308E+00 1.00484E+01 1.68644E+01 3.30948E+01 3.85623E-02
1.55429E-01 6.24791E-01 3.39261E+00 1.47067E+00 1.65483E-01
3.79382E-02 0. 3.15289E+00 2.89051E+00 2.81120E+00
0. 7.12688E-03 0. 0. 0.
7D 5.03556E+00 8.13901E+00 1.02342E+01 1.03294E+01
7D 9.65986E+00 6.00700E-01 5.52765E+00 -7.46423E-03 3.40960E+00
4.83224E-03 1.30645E+00 -3.93495E-03
7D 1.61762E+01 6.76346E-02 4.71148E-03 1.20615E+00 -1.77405E-02
0. 2.95364E-01 -1.65691E-03 0. 3.81597E-03
-4.83568E-04 0.
7D 2.97022E+01 2.54621E-02 2.65883E-06 5.85813E-01 -1.59402E-03
0. -1.30600E-01 -1.05458E-05 0. -9.14438E-02
1.85991E-06 0.

```


4D 6H 9235 6HENDFB3 6H 9235

2.35000E+02 0. 0. 1.29240E+03 0.

4.20000E-05

1	0	1	0	0	1	0	0	1	1	0	0
4	1	2	3	3	1	1	1	1			

5D 4.68293E+00 8.63408E+00 1.46030E+01 2.79653E+01

7.09973E+00 1.03633E+01 1.48699E+01 2.79047E+01 5.75815E-02

3.80684E-01 1.07410E+00 5.12103E+00 1.24297E+00 1.50987E+00

2.97315E+00 1.11918E+01 2.68902E+00 2.44610E+00 2.42457E+00

2.42308E+00 1.07322E-02 0. 0. 0.

7D 5.07343E+00 7.21762E+00 8.75274E+00 9.41878E+00

7D 8.40859E+00 7.32276E-01 3.82743E+00 -1.41484E-02 2.24134E+00

-5.93293E-03 7.00180E-01 -1.80502E-03

7D 1.08074E+01 6.41510E-02 4.20327E-03 4.14343E-01 -2.38195E-02

0. 1.91564E-01 1.78959E-04 0. -8.98597E-02

-1.92704E-03 0.

7D 1.15918E+01 1.51799E-02 4.20589E-05 1.99987E-01 -1.04337E-03

0. 8.09082E-04 -7.09434E-06 0. -3.02904E-04

3.34051E-07 0.

4D 6H 9238 6HENDFB3 6H 9238

2.38000E+02 0. 0. 1.29240E+03 0.

1.40100E-02

2	0	1	0	0	1	0	0	1	1	0	0
4	1	2	3	3	1	1	1	1			

5D 4.71980E+00 8.85015E+00 1.30441E+01 1.13609E+01

7.30768E+00 1.08804E+01 1.32182E+01 1.14086E+01 6.28789E-02

1.90045E-01 6.14909E-01 1.22303E+00 3.78375E-01 3.09868E-04

4.63034E-05 3.82381E-04 2.76659E+00 2.41733E+00 2.32700E+00

2.32700E+00 1.85889E-02 0. 0. 0.

7D 5.13058E+00 7.61779E+00 9.44650E+00 9.33980E+00

7D 1.06129E+01 1.74491E+00 4.40492E+00 -1.84904E-02 2.52570E+00

1.84094E-03 9.73918E-01 -6.51980E-03

7D 1.25856E+01 7.70606E-02 9.52718E-03 4.93923E-01 -2.98213E-02

0. 1.39200E-02 -1.65562E-03 0. -6.14626E-03

-1.62039E-04 0.

7D 1.01852E+01 1.76742E-02 1.10245E-04 2.58947E-01 -1.08155E-03

0. 9.16334E-03 -2.95169E-04 0. -3.29603E-01

-1.03124E-03 0.

4D 6H 2600 6HENDFB3 6H 2600

5.58000E+01 0. 0. 7.54100E+02 0.

6.26000E-03

5	0	0	0	0	1	0	0	1	1	0	0
4	1	2	3	3	1	1	1	1			

5D 2.24227E+00 3.07496E+00 6.49763E+00 9.08309E+00

3.03635E+00 3.31385E+00 6.71439E+00 9.14454E+00 7.11246E-03

6.23925E-03 1.32693E-02 7.89989E-02 9.64467E-05 0.

0. 0.

7D 2.64596E+00 2.48192E+00 3.50995E+00 2.56240E+00

7D 3.26114E+00 3.79213E-01 8.46621E-01 -5.89365E-02 6.17087E-01

3.58922E-02 4.73087E-02 -4.25803E-02

7D 6.66580E+00 4.64676E-02 4.16895E-03 3.27900E-01 -4.02697E-02

0. 1.23960E-02 -1.81411E-03 0. 8.15362E-03

-5.83432E-05 0.

7D 9.06554E+00 3.53218E-02 0. 6.39369E-01 -1.33154E-03

0. 1.16337E-02 -4.38747E-05 0. 1.92270E-03

9.50090E-07 0.

STOP

END

DVENTR

001

3.085 +6 1.0 1.282 -3

0
012

0	1	1	1	1	1.0
2	2	1	2	1.0	
3	3	1	3	1.0	
4	4	1	4	1.0	
5	5	1	5	1.0	
6	8	1	6	1.0	

0 13
0 30
0 30

MAT 10MAT 11MAT 12MAT 13MAT 14MAT 15MAT 16MAT 28MAT 40MAT 44MAT 50MAT 56
MAT 60MAT 88MAT 112MAT 135MAT 138MAT 139MAT 140MAT 141MAT 142MAT 176MAT 224MAT 238
MAT 239MAT 240MAT 242MAT 335MAT 338MAT 352

020

[illegible]

=CONTROL1

THREE DIMENSIONAL IAEA BENCHMARK PROBLEM -- 17X17X19 MESH, 2 GROUPS.

80000

1

2 2 6 2 7 0

END

DCMACR

6

CITATION MACRCS TO MICROS

008

2 1 0

1 1 1.5 0.01

.02

1 2 .4 .08 .135

0

2 1 1.5 .01

.02

2 2 .4 .085 .135

0

3 1 1.5 .01

.02

3 2 .4 .13 .135

0

4 1 2.0

.04

4 2 .3 .01

0

5 1 2.

.04

5 2 .3 .055

0

6 1 1.0

6 2 1.0

0

1.0

END

DCRSPR

1 1 1 0 0 0 0

0 1

6

ZONE 1

ZONE 2

ZONE 3

ZONE 4

ZONE 5

ZONE 6

END

DVENTR

001

.25
.00005

99

1 1 0 1

2 1 0

1

003

14 1 2 1 2 2 2

1

6

004

1 10. 2 20. 2 20. 2 20. 2 20. 2 20.

2 20. 2 20. 2 20.

1 10. 2 20. 2 20. 2 20. 2 20. 2 20.

2 20. 2 20. 2 20.

1 20. 17 340. 1 20.

005

5	4	4	4	5	4	4	4	4
4	4	4	4	4	4	4	4	4
4	4	5	4	4	4	4	4	4
4	4	4	4	4	4	4	4	4
5	4	4	4	5	4	4	4	6
4	4	4	4	4	4	4	4	6
4	4	4	4	4	4	4	6	6
4	4	4	4	4	4	6	6	6
4	4	4	4	6	6	6	6	6
3	2	2	2	3	2	2	1	4
2	2	2	2	2	2	2	1	4
2	2	2	2	2	2	1	1	4
2	2	2	2	2	2	1	4	4
3	2	2	2	3	1	1	4	6
2	2	2	2	1	1	4	4	6
2	2	1	1	1	4	4	6	6
1	1	1	4	4	4	6	6	6
4	4	4	4	6	6	6	6	6
4	4	4	4	4	4	4	4	4
4	4	4	4	4	4	4	4	4
4	4	4	4	4	4	4	4	4
4	4	4	4	4	4	4	4	4
4	4	4	4	4	4	4	4	6
4	4	4	4	4	4	4	4	6
4	4	4	4	4	4	6	6	6
4	4	4	4	6	6	6	6	6

006

3					
4	5	4	5	2	5

0

012

0

1	6	1	1

0

013

6

6

ZONE 1ZONE 2ZONE 3ZONE 4ZONE 5ZONE 6

020

1

ZONE 1 1.0

2

ZONE 2 1.0

3

ZONE 3 1.0

4

ZONE 4 1.0

5

ZONE 5 1.0

6

ZONE 6 1.0

0

END

=CONTROL1

TRIANGULAR-Z LMFBR PROBLEM -- 46X23X16 MESH, 6 GROUPS.

61000

1

2 2 6 2 7 2 9 0

END

DCMACR

52

CITATION MACRCS TO MICROS.

008

6 5 0

1	1	0.32211E 01	0.55664E-02	0.15027E-01	0.	0.50360E-02
0.65474E-01	0.31138E-01	0.12846E-02	0.21056E-04	0.	0.	0.
1	2	0.19888E 01	0.24434E-02	0.44419E-02	0.	0.15117E-02
0.	0.15566E 00	0.94858E-02	0.10154E-04	0.89506E-10	0.	0.
1	3	0.14387E 01	0.34208E-02	0.41358E-02	0.	0.14334E-02
0.	0.	0.22303E 00	0.52336E-02	0.21804E-05	0.	0.
1	4	0.11800E 01	0.66704E-02	0.49725E-02	0.	0.17304E-02
0.	0.	0.	0.27076E 00	0.50481E-02	0.	0.
1	5	0.93500E 00	0.15210E-01	0.10985E-01	0.	0.38269E-02
0.	0.	0.	0.	0.33792E 00	0.33730E-02	0.
1	6	0.85962E 00	0.26506E-01	0.26510E-01	0.	0.92301E-02
0.	0.	0.	0.	0.	0.36126E 00	0.
2	1	0.30155E 01	0.65357E-02	0.18137E-01	0.	0.59778E-02
0.69934E-01	0.32679E-01	0.13648E-02	0.22433E-04	0.	0.	0.
2	2	0.19478E 01	0.32528E-02	0.67002E-02	0.	0.22761E-02
0.	0.15890E 00	0.89685E-02	0.10909E-04	0.13033E-09	0.	0.
2	3	0.13898E 01	0.42568E-02	0.62786E-02	0.	0.21738E-02
0.	0.	0.23046E 00	0.51147E-02	0.21669E-05	0.	0.
2	4	0.11459E 01	0.79115E-02	0.75390E-02	0.	0.26201E-02
0.	0.	0.	0.27802E 00	0.49696E-02	0.	0.
2	5	0.85193E 00	0.18224E-01	0.15959E-01	0.	0.55511E-02
0.	0.	0.	0.	0.37004E 00	0.30109E-02	0.
2	6	0.78238E 00	0.35095E-01	0.40529E-01	0.	0.14092E-01
0.	0.	0.	0.	0.	0.39095E 00	0.
3	1	0.28079E 01	0.61692E-02	0.15434E-01	0.	0.55463E-02
0.69767E-01	0.40886E-01	0.18576E-02	0.32225E-04	0.	0.	0.
3	2	0.16098E 01	0.15414E-02	0.17173E-03	0.	0.69162E-04
0.	0.19095E 00	0.14557E-01	0.14009E-04	0.	0.	0.
3	3	0.11684E 01	0.32541E-02	0.10997E-03	0.	0.45247E-04
0.	0.	0.27482E 00	0.72142E-02	0.44128E-05	0.	0.
3	4	0.98086E 00	0.70026E-02	0.18272E-03	0.	0.75373E-04
0.	0.	0.	0.32670E 00	0.61361E-02	0.	0.
3	5	0.92177E 00	0.11018E-01	0.50371E-03	0.	0.20788E-03
0.	0.	0.	0.	0.34505E 00	0.55582E-02	0.
3	6	0.91370E 00	0.14487E-01	0.13293E-02	0.	0.54862E-03
0.	0.	0.	0.	0.	0.35033E 00	0.
4	1	0.19475E 01	0.57566E-03	0.	0.	0.
0.12724E 00	0.42622E-01	0.71615E-03	0.25029E-05	0.	0.	0.
4	2	0.17574E 01	0.39621E-03	0.	0.	0.
0.	0.18073E 00	0.85497E-02	0.27028E-07	0.	0.	0.
4	3	0.10672E 01	0.69310E-03	0.	0.	0.
0.	0.	0.30024E 00	0.11417E-01	0.82197E-07	0.	0.
4	4	0.18109E 01	0.84663E-03	0.	0.	0.
0.	0.	0.	0.17764E 00	0.55862E-02	0.	0.
4	5	0.49279E 00	0.48587E-02	0.	0.	0.
0.	0.	0.	0.	0.66045E 00	0.11112E-01	0.
4	6	0.39169E 00	0.56078E-02	0.	0.	0.
0.	0.	0.	0.	0.	0.84541E 00	0.
5	1	0.19042E 02	0.10741E-03	0.	0.	0.
0.12891E-01	0.43578E-02	0.14837E-03	0.68444E-06	0.	0.	0.
5	2	0.16177E 02	0.40652E-04	0.	0.	0.
0.	0.19569E-01	0.99675E-03	0.30408E-07	0.	0.	0.
5	3	0.96721E 01	0.86969E-04	0.	0.	0.
0.	0.	0.33237E-01	0.11398E-02	0.17814E-07	0.	0.

0.	5	4	0.85103E 01	0.17315E-03	0.	0.	0.
0.			0.	0.	0.38137E-01	0.85818E-03	0.
0.	5	5	0.43878E 01	0.55115E 03	0.	0.	0.
0.			0.	0.	0.	0.74368E-01	0.11363E-02
0.	5	6	0.38732E 01	0.83889E-03	0.	0.	0.
0.			0.	0.	0.	0.	0.85223E-01
0.	6	1	0.52025E 01	0.31026E-03	0.	0.	0.
0.48403E-01			0.15017E-01	0.34065E-03	0.17294E-05	0.	0.
0.	6	2	0.32921E 01	0.84749E-04	0.	0.	0.
0.			0.95411E-01	0.57567E-02	0.45174E-07	0.	0.
0.	6	3	0.25055E 01	0.18302E-03	0.	0.	0.
0.			0.	0.12915E 00	0.37129E-02	0.41994E-07	0.
0.	6	4	0.18491E 01	0.36570E-03	0.	0.	0.
0.			0.	0.	0.17357E 00	0.63351E-02	0.
0.	6	5	0.13970E 01	0.16276E-02	0.	0.	0.
0.			0.	0.	0.	0.23442E 00	0.25548E-02
0.	6	6	0.13459E 01	0.21565E-02	0.	0.	0.
0.			0.	0.	0.	0.	0.24551E 00
0.	7	1	0.52148E 01	0.31393E-03	0.	0.	0.
0.48303E-01			0.14960E-01	0.34108E-03	0.17555E-05	0.	0.
0.	7	2	0.32946E 01	0.84637E-04	0.	0.	0.
0.			0.95361E-01	0.57288E-02	0.45200E-07	0.	0.
0.	7	3	0.24845E 01	0.18318E-03	0.	0.	0.
0.			0.	0.13037E 00	0.36176E-02	0.41778E-07	0.
0.	7	4	0.17680E 01	0.36680E-03	0.	0.	0.
0.			0.	0.	0.18098E 00	0.71906E-02	0.
0.	7	5	0.12589E 01	0.16409E-02	0.	0.	0.
0.			0.	0.	0.	0.26111E 00	0.20303E-02
0.	7	6	0.12664E 01	0.23407E-02	0.	0.	0.
0.			0.	0.	0.	0.	0.26087E 00
0.	8	1	0.52206E 01	0.31290E-03	0.	0.	0.
0.48221E-01			0.14973E-01	0.34099E-03	0.17494E-05	0.	0.
0.	8	2	0.33043E 01	0.84263E-04	0.	0.	0.
0.			0.95242E-01	0.55511E-02	0.44773E-07	0.	0.
0.	8	3	0.24774E 01	0.18211E-03	0.	0.	0.
0.			0.	0.13092E 00	0.34446E-02	0.42246E-07	0.
0.	8	4	0.17104E 01	0.36620E-03	0.	0.	0.
0.			0.	0.	0.18684E 00	0.76795E-02	0.
0.	8	5	0.10696E 01	0.16797E-02	0.	0.	0.
0.			0.	0.	0.	0.30839E 00	0.15793E-02
0.	8	6	0.12256E 01	0.24276E-02	0.	0.	0.
0.			0.	0.	0.	0.	0.26955E 00
0.	9	1	0.52148E 01	0.31393E-03	0.	0.	0.
0.48303E-01			0.14960E-01	0.34108E-03	0.17555E-05	0.	0.
0.	9	2	0.32946E 01	0.84637E-04	0.	0.	0.
0.			0.95361E-01	0.57288E-02	0.45200E-07	0.	0.
0.	9	3	0.24845E 01	0.18318E-03	0.	0.	0.
0.			0.	0.13037E 00	0.36176E-02	0.41778E-07	0.
0.	9	4	0.17680E 01	0.36680E-03	0.	0.	0.
0.			0.	0.	0.18098E 00	0.71906E-02	0.
0.	9	5	0.12589E 01	0.16409E-02	0.	0.	0.
0.			0.	0.	0.	0.26111E 00	0.20303E-02
0.	9	6	0.12664E 01	0.23407E-02	0.	0.	0.
0.			0.	0.	0.	0.	0.26087E 00
0.	10	1	0.52206E 01	0.31290E-03	0.	0.	0.
0.48221E-01			0.14973E-01	0.34099E-03	0.17494E-05	0.	0.
0.	10	2	0.33043E 01	0.84263E-04	0.	0.	0.
0.			0.95242E-01	0.55511E-02	0.44773E-07	0.	0.
0.	10	3	0.24774E 01	0.18211E-03	0.	0.	0.
0.			0.	0.13092E 00	0.34446E-02	0.42246E-07	0.
0.	10	4	0.17104E 01	0.36620E-03	0.	0.	0.
0.			0.	0.	0.18684E 00	0.76795E-02	0.

10	5	0.10696E 01	0.16797E-02	0.	0.	0.
0.		0.	0.	0.	0.30839E 00	0.15793E-02
10	6	0.12256E 01	0.24276E-02	0.	0.	0.
0.		0.	0.	0.	0.	0.26955E 00
11	1	0.52206E 01	0.31290E-03	0.	0.	0.
0.48221E-01		0.14973E-01	0.34099E-03	0.17494E-05	0.	0.
11	2	0.33043E 01	0.84263E-04	0.	0.	0.
0.		0.95242E-01	0.55511E-02	0.44773E-07	0.	0.
11	3	0.24774E 01	0.18211E-03	0.	0.	0.
0.		0.	0.13092E 00	0.34446E-02	0.42246E-07	0.
11	4	0.17104E 01	0.36620E-03	0.	0.	0.
0.		0.	0.	0.18684E 00	0.76795E-02	0.
11	5	0.10696E 01	0.16797E-02	0.	0.	0.
0.		0.	0.	0.	0.30839E 00	0.15793E-02
11	6	0.12256E 01	0.24276E-02	0.	0.	0.
0.		0.	0.	0.	0.	0.26955E 00
12	1	0.52206E 01	0.31290E-03	0.	0.	0.
0.48221E-01		0.14973E-01	0.34099E-03	0.17494E-05	0.	0.
12	2	0.33043E 01	0.84263E-04	0.	0.	0.
0.		0.95242E-01	0.55511E-02	0.44773E-07	0.	0.
12	3	0.24774E 01	0.18211E-03	0.	0.	0.
0.		0.	0.13092E 00	0.34446E-02	0.42246E-07	0.
12	4	0.17104E 01	0.36620E-03	0.	0.	0.
0.		0.	0.	0.18684E 00	0.76795E-02	0.
12	5	0.10696E 01	0.16797E-02	0.	0.	0.
0.		0.	0.	0.	0.30839E 00	0.15793E-02
12	6	0.12256E 01	0.24276E-02	0.	0.	0.
0.		0.	0.	0.	0.	0.26955E 00
13	1	0.31182E 01	0.70986E-02	0.20389E-01	0.	0.65609E-02
0.68655E-01		0.29919E-01	0.12069E-02	0.19651E-04	0.	0.
13	2	0.19984E 01	0.40572E-02	0.93593E-02	0.	0.31769E-02
0.		0.15364E 00	0.90930E-02	0.91096E-05	0.10695E-09	0.
13	3	0.14225E 01	0.50103E-02	0.88773E-02	0.	0.30722E-02
0.		0.	0.22402E 00	0.52921E-02	0.18152E-05	0.
13	4	0.11677E 01	0.88185E-02	0.10628E-01	0.	0.36911E-02
0.		0.	0.	0.27155E 00	0.50931E-02	0.
13	5	0.88043E 00	0.21245E-01	0.22750E-01	0.	0.79068E-02
0.		0.	0.	0.	0.35390E 00	0.34562E-02
13	6	0.79119E 00	0.40115E-01	0.53043E-01	0.	0.18432E-01
0.		0.	0.	0.	0.	0.38119E 00
14	1	0.29431E 01	0.80021E-02	0.23302E-01	0.	0.74414E-02
0.72672E-01		0.31283E-01	0.12777E-02	0.20859E-04	0.	0.
14	2	0.19597E 01	0.48600E-02	0.11606E-01	0.	0.39368E-02
0.		0.15663E 00	0.85873E-02	0.97780E-05	0.14714E-09	0.
14	3	0.13771E 01	0.58519E-02	0.11037E-01	0.	0.38186E-02
0.		0.	0.23104E 00	0.51639E-02	0.18053E-05	0.
14	4	0.11376E 01	0.10019E-01	0.13186E-01	0.	0.45780E-02
0.		0.	0.	0.27800E 00	0.50042E-02	0.
14	5	0.80732E 00	0.24115E-01	0.27835E-01	0.	0.96696E-02
0.		0.	0.	0.	0.38568E 00	0.30916E-02
14	6	0.72163E 00	0.49361E-01	0.69365E-01	0.	0.24093E-01
0.		0.	0.	0.	0.	0.41256E 00
15	1	0.52206E 01	0.31290E-03	0.	0.	0.
0.48221E-01		0.14973E-01	0.34099E-03	0.17494E-05	0.	0.
15	2	0.33043E 01	0.84263E-04	0.	0.	0.
0.		0.95242E-01	0.55511E-02	0.44773E-07	0.	0.
15	3	0.24774E 01	0.18211E-03	0.	0.	0.
0.		0.	0.13092E 00	0.34446E-02	0.42246E-07	0.
15	4	0.17104E 01	0.36620E-03	0.	0.	0.
0.		0.	0.	0.18684E 00	0.76795E-02	0.
15	5	0.10696E 01	0.16797E-02	0.	0.	0.
0.		0.	0.	0.	0.30839E 00	0.15793E-02
15	6	0.12256E 01	0.24276E-02	0.	0.	0.
0.		0.	0.	0.	0.	0.26955E 00

16	1	0.52148E 01	0.31393E-03	0.	0.	0.
0.48303E-01		0.14960E-01	0.34108E-03	0.17555E-05	0.	0.
16	2	0.32946E 01	0.84637E-04	0.	0.	0.
0.		0.95361E-01	0.57288E-02	0.45200E-07	0.	0.
16	3	0.24845E 01	0.18318E-03	0.	0.	0.
0.		0.	0.13037E 00	0.36176E-02	0.41778E-07	0.
16	4	0.17680E 01	0.36680E-03	0.	0.	0.
0.		0.	0.	0.18098E 00	0.71906E-02	0.
16	5	0.12589E 01	0.16409E-02	0.	0.	0.
0.		0.	0.	0.	0.26111E 00	0.20303E-02
16	6	0.12664E 01	0.23407E-02	0.	0.	0.
0.		0.	0.	0.	0.	0.26087E 00
17	1	0.52206E 01	0.31290E-03	0.	0.	0.
0.48221E-01		0.14973E-01	0.34099E-03	0.17494E-05	0.	0.
17	2	0.33043E 01	0.84263E-04	0.	0.	0.
0.		0.95242E-01	0.55511E-02	0.44773E-07	0.	0.
17	3	0.24774E 01	0.18211E-03	0.	0.	0.
0.		0.	0.13092E 00	0.34446E-02	0.42246E-07	0.
17	4	0.17104E 01	0.36620E-03	0.	0.	0.
0.		0.	0.	0.18684E 00	0.76795E-02	0.
17	5	0.10696E 01	0.16797E-02	0.	0.	0.
0.		0.	0.	0.	0.30839E 00	0.15793E-02
17	6	0.12256E 01	0.24276E-02	0.	0.	0.
0.		0.	0.	0.	0.	0.26955E 00
18	1	0.52206E 01	0.31290E-03	0.	0.	0.
0.48221E-01		0.14973E-01	0.34099E-03	0.17494E-05	0.	0.
18	2	0.33043E 01	0.84263E-04	0.	0.	0.
0.		0.95242E-01	0.55511E-02	0.44773E-07	0.	0.
18	3	0.24774E 01	0.18211E-03	0.	0.	0.
0.		0.	0.13092E 00	0.34446E-02	0.42246E-07	0.
18	4	0.17104E 01	0.36620E-03	0.	0.	0.
0.		0.	0.	0.18684E 00	0.76795E-02	0.
18	5	0.10696E 01	0.16797E-02	0.	0.	0.
0.		0.	0.	0.	0.30839E 00	0.15793E-02
18	6	0.12256E 01	0.24276E-02	0.	0.	0.
0.		0.	0.	0.	0.	0.26955E 00
19	1	0.52148E 01	0.31393E-03	0.	0.	0.
0.48303E-01		0.14960E-01	0.34108E-03	0.17555E-05	0.	0.
19	2	0.32946E 01	0.84637E-04	0.	0.	0.
0.		0.95361E-01	0.57288E-02	0.45200E-07	0.	0.
19	3	0.24845E 01	0.18318E-03	0.	0.	0.
0.		0.	0.13037E 00	0.36176E-02	0.41778E-07	0.
19	4	0.17680E 01	0.36680E-03	0.	0.	0.
0.		0.	0.	0.18098E 00	0.71906E-02	0.
19	5	0.12589E 01	0.16409E-02	0.	0.	0.
0.		0.	0.	0.	0.26111E 00	0.20303E-02
19	6	0.12664E 01	0.23407E-02	0.	0.	0.
0.		0.	0.	0.	0.	0.26087E 00
20	1	0.33664E 01	0.30090E-02	0.93139E-02	0.	0.
0.62693E-01		0.31135E-01	0.12794E-02	0.20271E-04	0.	0.
20	2	0.19558E 01	0.10160E-02	0.10754E-03	0.	0.43315E-04
0.		0.15778E 00	0.11633E-01	0.87791E-05	0.	0.
20	3	0.13918E 01	0.21894E-02	0.70253E-04	0.	0.28905E-04
0.		0.	0.23110E 00	0.62091E-02	0.28352E-05	0.
20	4	0.11041E 01	0.49854E-02	0.11786E-03	0.	0.48620E-04
0.		0.	0.	0.28996E 00	0.69735E-02	0.
20	5	0.94936E 00	0.97581E-02	0.32508E-03	0.	0.13416E-03
0.		0.	0.	0.	0.33648E 00	0.48769E-02
20	6	0.94785E 00	0.13737E-01	0.89138E-03	0.	0.36788E-03
0.		0.	0.	0.	0.	0.33793E 00

21	1	0.33679E 01	0.38602E-02	0.92282E-02	0.	0.33186E-02
0.62698E-01		0.31124E-01	0.12699E-02	0.20101E-04	0.	0.
21	2	0.19539E 01	0.10134E-02	0.10693E-03	0.	0.43071E-04
0.		0.15798E 00	0.11598E-01	0.87211E-05	0.	0.
21	3	0.13942E 01	0.22032E-02	0.70445E-04	0.	0.28984E-04
0.		0.	0.23065E 00	0.62250E-02	0.28574E-05	0.
21	4	0.10958E 01	0.51231E-02	0.11723E-03	0.	0.48358E-04
0.		0.	0.	0.29204E 00	0.70245E-02	0.
21	5	0.92700E 00	0.11072E-01	0.32852E-03	0.	0.13558E-03
0.		0.	0.	0.	0.34362E 00	0.48914E-02
21	6	0.92919E 00	0.17401E-01	0.90738E-03	0.	0.37448E-03
0.		0.	0.	0.	0.	0.34133E 00
22	1	0.52179E 01	0.32340E-03	0.	0.	0.
0.48346E-01		0.14866E-01	0.34553E-03	0.18108E-05	0.	0.
22	2	0.32227E 01	0.87593E-04	0.	0.	0.
0.		0.96576E-01	0.67680E-02	0.48403E-07	0.	0.
22	3	0.23882E 01	0.19510E-03	0.	0.	0.
0.		0.	0.13505E 00	0.43322E-02	0.37023E-07	0.
22	4	0.15625E 01	0.38376E-03	0.	0.	0.
0.		0.	0.	0.20178E 00	0.11164E-01	0.
22	5	0.11376E 01	0.16605E-02	0.	0.	0.
0.		0.	0.	0.	0.28800E 00	0.33641E-02
22	6	0.13810E 01	0.19851E-02	0.	0.	0.
0.		0.	0.	0.	0.	0.23938E 00
23	1	0.34791E 01	0.19558E-02	0.	0.	0.
0.71108E-01		0.22423E-01	0.32220E-03	0.17221E-05	0.	0.
23	2	0.20485E 01	0.36047E-02	0.	0.	0.
0.		0.14383E 00	0.15288E-01	0.45265E-07	0.	0.
23	3	0.14832E 01	0.94681E-02	0.	0.	0.
0.		0.	0.20531E 00	0.99636E-02	0.40956E-07	0.
23	4	0.11308E 01	0.22522E-01	0.	0.	0.
0.		0.	0.	0.26432E 00	0.79241E-02	0.
23	5	0.81368E 00	0.70643E-01	0.	0.	0.
0.		0.	0.	0.	0.33307E 00	0.59499E-02
23	6	0.65781E 00	0.15444E 00	0.	0.	0.
0.		0.	0.	0.	0.	0.35229E 00
24	1	0.34791E 01	0.19558E-02	0.	0.	0.
0.71108E-01		0.22423E-01	0.32220E-03	0.17221E-05	0.	0.
24	2	0.20485E 01	0.36047E-02	0.	0.	0.
0.		0.14383E 00	0.15288E-01	0.45265E-07	0.	0.
24	3	0.14832E 01	0.94681E-02	0.	0.	0.
0.		0.	0.20531E 00	0.99636E-02	0.40956E-07	0.
24	4	0.11308E 01	0.22522E-01	0.	0.	0.
0.		0.	0.	0.26432E 00	0.79241E-02	0.
24	5	0.81368E 00	0.70643E-01	0.	0.	0.
0.		0.	0.	0.	0.33307E 00	0.59499E-02
24	6	0.65781E 00	0.15444E 00	0.	0.	0.
0.		0.	0.	0.	0.	0.35229E 00
25	1	0.23748E 01	0.41921E-02	0.	0.	0.
0.10286E 00		0.32994E-01	0.31628E-03	0.17886E-05	0.	0.
25	2	0.13585E 01	0.82740E-02	0.	0.	0.
0.		0.20985E 00	0.27244E-01	0.43235E-07	0.	0.
25	3	0.94979E 00	0.21955E-01	0.	0.	0.
0.		0.	0.31125E 00	0.17750E-01	0.44600E-07	0.
25	4	0.74404E 00	0.52442E-01	0.	0.	0.
0.		0.	0.	0.38638E 00	0.91834E-02	0.
25	5	0.53357E 00	0.15842E 00	0.	0.	0.
0.		0.	0.	0.	0.45745E 00	0.88528E-02
25	6	0.39544E 00	0.34709E 00	0.	0.	0.
0.		0.	0.	0.	0.	0.49585E 00
26	1	0.23748E 01	0.41921E-02	0.	0.	0.
0.10286E 00		0.32994E-01	0.31628E-03	0.17886E-05	0.	0.
26	2	0.13585E 01	0.82740E-02	0.	0.	0.
0.		0.20985E 00	0.27244E-01	0.43235E-07	0.	0.

26	3	0.94979E 00	0.21955E-01	0.	0.	0.
0.		0.	0.31125E 00	0.17750E-01	0.44600E-07	0.
26	4	0.74404E 00	0.52442E-01	0.	0.	0.
0.		0.	0.	0.38638E 00	0.91834E-02	0.
26	5	0.53357E 00	0.15842E 00	0.	0.	0.
0.		0.	0.	0.	0.45745E 00	0.88528E-02
26	6	0.39544E 00	0.34709E 00	0.	0.	0.
0.		0.	0.	0.	0.	0.49585E 00
27	1	0.23748E 01	0.41921E-02	0.	0.	0.
0.10286E 00		0.32994E-01	0.31628E-03	0.17886E-05	0.	0.
27	2	0.13585E 01	0.82740E-02	0.	0.	0.
0.		0.20985E 00	0.27244E-01	0.43235E-07	0.	0.
27	3	0.94979E 00	0.21955E-01	0.	0.	0.
0.		0.	0.31125E 00	0.17750E-01	0.44600E-07	0.
27	4	0.74404E 00	0.52442E-01	0.	0.	0.
0.		0.	0.	0.38638E 00	0.91834E-02	0.
27	5	0.53357E 00	0.15842E 00	0.	0.	0.
0.		0.	0.	0.	0.45745E 00	0.88528E-02
27	6	0.39544E 00	0.34709E 00	0.	0.	0.
0.		0.	0.	0.	0.	0.49585E 00
28	1	0.23748E 01	0.41921E-02	0.	0.	0.
0.10286E 00		0.32994E-01	0.31628E-03	0.17886E-05	0.	0.
28	2	0.13585E 01	0.82740E-02	0.	0.	0.
0.		0.20985E 00	0.27244E-01	0.43235E-07	0.	0.
28	3	0.94979E 00	0.21955E-01	0.	0.	0.
0.		0.	0.31125E 00	0.17750E-01	0.44600E-07	0.
28	4	0.74404E 00	0.52442E-01	0.	0.	0.
0.		0.	0.	0.38638E 00	0.91834E-02	0.
28	5	0.53357E 00	0.15842E 00	0.	0.	0.
0.		0.	0.	0.	0.45745E 00	0.88528E-02
28	6	0.39544E 00	0.34709E 00	0.	0.	0.
0.		0.	0.	0.	0.	0.49585E 00
29	1	0.98920E 01	0.26402E-03	0.	0.	0.
0.24900E-01		0.82357E-02	0.29606E-03	0.18250E-05	0.	0.
29	2	0.06757E 01	0.76106E-04	0.	0.	0.
0.		0.36851E-01	0.14942E-02	0.46211E-07	0.	0.
29	3	0.51394E 01	0.15388E-03	0.	0.	0.
0.		0.	0.63346E-01	0.13581E-02	0.43188E-07	0.
29	4	0.38645E 01	0.33700E-03	0.	0.	0.
0.		0.	0.	0.84597E-01	0.13216E-02	0.
29	5	0.22071E 01	0.82741E-03	0.	0.	0.
0.		0.	0.	0.	0.14959E 00	0.61171E-03
29	6	0.17430E 01	0.20092E-02	0.	0.	0.
0.		0.	0.	0.	0.	0.18923E 00
30	1	0.45229E 01	0.19174E-02	0.	0.	0.
0.53771E-01		0.17718E-01	0.29004E-03	0.18037E-05	0.	0.
30	2	0.28896E 01	0.35240E-02	0.	0.	0.
0.		0.10019E 00	0.11637E-01	0.46228E-07	0.	0.
30	3	0.19052E 01	0.93456E-02	0.	0.	0.
0.		0.	0.15807E 00	0.75424E-02	0.42158E-07	0.
30	4	0.14607E 01	0.22641E-01	0.	0.	0.
0.		0.	0.	0.20017E 00	0.53932E-02	0.
30	5	0.10422E 01	0.59523E-01	0.	0.	0.
0.		0.	0.	0.	0.25796E 00	0.23491E-02
30	6	0.71953E 00	0.15096E 00	0.	0.	0.
0.		0.	0.	0.	0.	0.31231E 00
31	1	0.45229E 01	0.19174E-02	0.	0.	0.
0.53771E-01		0.17718E-01	0.29004E-03	0.18037E-05	0.	0.
31	2	0.28896E 01	0.35240E-02	0.	0.	0.
0.		0.10019E 00	0.11637E-01	0.46228E-07	0.	0.
31	3	0.19052E 01	0.93456E-02	0.	0.	0.
0.		0.	0.15807E 00	0.75424E-02	0.42158E-07	0.
31	4	0.14607E 01	0.22641E-01	0.	0.	0.
0.		0.	0.	0.20017E 00	0.53932E-02	0.

0.	31	5	0.10422E 01	0.59523E-01	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.25796E 00	0.23491E-02
0.	31	6	0.71953E 00	0.15096E 00	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.31231E 00
0.24837E-01	32	1	0.99133E 01	0.26528E-03	0.	0.	0.
0.	0.82245E-02	0.29623E-03	0.18376E-05	0.	0.	0.	0.
0.	32	2	0.86652E 01	0.76060E-04	0.	0.	0.
0.	0.36907E-01	0.14851E-02	0.46183E-07	0.	0.	0.	0.
0.	32	3	0.49632E 01	0.15447E-03	0.	0.	0.
0.	0.	0.65688E-01	0.13182E-02	0.43005E-07	0.	0.	0.
0.	32	4	0.34306E 01	0.33744E-03	0.	0.	0.
0.	0.	0.	0.95680E-01	0.11487E-02	0.	0.	0.
0.	32	5	0.21575E 01	0.78571E-03	0.	0.	0.
0.	0.	0.	0.	0.15324E 00	0.47143E-03	0.	0.
0.	32	6	0.16027E 01	0.22026E-02	0.	0.	0.
0.	0.	0.	0.	0.	0.20578E 00	0.	0.
0.24837E-01	33	1	0.99133E 01	0.26528E-03	0.	0.	0.
0.	0.82245E-02	0.29623E-03	0.18376E-05	0.	0.	0.	0.
0.	33	2	0.86652E 01	0.76060E-04	0.	0.	0.
0.	0.36907E-01	0.14851E-02	0.46183E-07	0.	0.	0.	0.
0.	33	3	0.49632E 01	0.15447E-03	0.	0.	0.
0.	0.	0.65688E-01	0.13182E-02	0.43005E-07	0.	0.	0.
0.	33	4	0.34306E 01	0.33744E-03	0.	0.	0.
0.	0.	0.	0.95680E-01	0.11487E-02	0.	0.	0.
0.	33	5	0.21575E 01	0.78571E-03	0.	0.	0.
0.	0.	0.	0.	0.15324E 00	0.47143E-03	0.	0.
0.	33	6	0.16027E 01	0.22026E-02	0.	0.	0.
0.	0.	0.	0.	0.	0.20578E 00	0.	0.
0.94016E-01	34	1	0.25690E 01	0.41699E-02	0.	0.	0.
0.	0.31262E-01	0.30197E-03	0.18645E-05	0.	0.	0.	0.
0.	34	2	0.15087E 01	0.81248E-02	0.	0.	0.
0.	0.18816E 00	0.24664E-01	0.43954E-07	0.	0.	0.	0.
0.	34	3	0.10211E 01	0.21772E-01	0.	0.	0.
0.	0.	0.28894E 00	0.15743E-01	0.45608E-07	0.	0.	0.
0.	34	4	0.79990E 00	0.52612E-01	0.	0.	0.
0.	0.	0.	0.35408E 00	0.10030E-01	0.	0.	0.
0.	34	5	0.60073E 00	0.13915E 00	0.	0.	0.
0.	0.	0.	0.	0.41081E 00	0.49262E-02	0.	0.
0.	34	6	0.40631E 00	0.34355E 00	0.	0.	0.
0.	0.	0.	0.	0.	0.47685E 00	0.	0.
0.24798E-01	35	1	0.99214E 01	0.26337E-03	0.	0.	0.
0.	0.82379E-02	0.29599E-03	0.18204E-05	0.	0.	0.	0.
0.	35	2	0.86797E 01	0.75831E-04	0.	0.	0.
0.	0.36875E-01	0.14535E-02	0.45508E-07	0.	0.	0.	0.
0.	35	3	0.48821E 01	0.15452E-03	0.	0.	0.
0.	0.	0.66832E-01	0.12898E-02	0.43201E-07	0.	0.	0.
0.	35	4	0.32576E 01	0.33782E-03	0.	0.	0.
0.	0.	0.	0.10098E 00	0.10039E-02	0.	0.	0.
0.	35	5	0.21402E 01	0.79207E-03	0.	0.	0.
0.	0.	0.	0.	0.15449E 00	0.47090E-03	0.	0.
0.	35	6	0.15405E 01	0.22722E-02	0.	0.	0.
0.	0.	0.	0.	0.	0.21411E 00	0.	0.
0.94016E-01	36	1	0.25690E 01	0.41699E-02	0.	0.	0.
0.	0.31262E-01	0.30197E-03	0.18645E-05	0.	0.	0.	0.
0.	36	2	0.15087E 01	0.81248E-02	0.	0.	0.
0.	0.18816E 00	0.24664E-01	0.43954E-07	0.	0.	0.	0.
0.	36	3	0.10211E 01	0.21772E-01	0.	0.	0.
0.	0.	0.28894E 00	0.15743E-01	0.45608E-07	0.	0.	0.
0.	36	4	0.79990E 00	0.52612E-01	0.	0.	0.
0.	0.	0.	0.35408E 00	0.10030E-01	0.	0.	0.
0.	36	5	0.60073E 00	0.13915E 00	0.	0.	0.
0.	0.	0.	0.	0.41081E 00	0.49262E-02	0.	0.

36	6	0.40631E 00	0.34355E 00	0.	0.	0.
0.		0.	0.	0.	0.	0.47685E 00
37	1	0.99214E 01	0.26337E-03	0.	0.	0.
0.24798E-01		0.82379E-02	0.29599E-03	0.18204E-05	0.	0.
37	2	0.86797E 01	0.75831E-04	0.	0.	0.
0.		0.36875E-01	0.14535E-02	0.45508E-07	0.	0.
37	3	0.48821E 01	0.15452E-03	0.	0.	0.
0.		0.	0.66832E-01	0.12898E-02	0.43201E-07	0.
37	4	0.32576E 01	0.33782E-03	0.	0.	0.
0.		0.	0.	0.10098E 00	0.10039E-02	0.
37	5	0.21402E 01	0.79207E-03	0.	0.	0.
0.		0.	0.	0.15449E 00	0.47090E-03	0.
37	6	0.15405E 01	0.22722E-02	0.	0.	0.
0.		0.	0.	0.	0.21411E 00	0.
38	1	0.25690E 01	0.41699E-02	0.	0.	0.
0.94016E-01		0.31262E-01	0.30197E-03	0.18645E-05	0.	0.
38	2	0.15087E 01	0.81248E-02	0.	0.	0.
0.		0.18816E 00	0.24664E-01	0.43954E-07	0.	0.
38	3	0.10211E 01	0.21772E-01	0.	0.	0.
0.		0.	0.28894E 00	0.15743E-01	0.45608E-07	0.
38	4	0.79990E 00	0.52612E-01	0.	0.	0.
0.		0.	0.	0.35408E 00	0.10030E-01	0.
38	5	0.60073E 00	0.13915E 00	0.	0.	0.
0.		0.	0.	0.41081E 00	0.49262E-02	0.
38	6	0.40631E 00	0.34355E 00	0.	0.	0.
0.		0.	0.	0.	0.47685E 00	0.
39	1	0.99214E 01	0.26337E-03	0.	0.	0.
0.24798E-01		0.82379E-02	0.29599E-03	0.18204E-05	0.	0.
39	2	0.86797E 01	0.75831E-04	0.	0.	0.
0.		0.36875E-01	0.14535E-02	0.45508E-07	0.	0.
39	3	0.48821E 01	0.15452E-03	0.	0.	0.
0.		0.	0.66832E-01	0.12898E-02	0.43201E-07	0.
39	4	0.32576E 01	0.33782E-03	0.	0.	0.
0.		0.	0.	0.10098E 00	0.10039E-02	0.
39	5	0.21402E 01	0.79207E-03	0.	0.	0.
0.		0.	0.	0.15449E 00	0.47090E-03	0.
39	6	0.15405E 01	0.22722E-02	0.	0.	0.
0.		0.	0.	0.	0.21411E 00	0.
40	1	0.25690E 01	0.41699E-02	0.	0.	0.
0.94016E-01		0.31262E-01	0.30197E-03	0.18645E-05	0.	0.
40	2	0.15087E 01	0.81248E-02	0.	0.	0.
0.		0.18816E 00	0.24664E-01	0.43954E-07	0.	0.
40	3	0.10211E 01	0.21772E-01	0.	0.	0.
0.		0.	0.28894E 00	0.15743E-01	0.45608E-07	0.
40	4	0.79990E 00	0.52612E-01	0.	0.	0.
0.		0.	0.	0.35408E 00	0.10030E-01	0.
40	5	0.60073E 00	0.13915E 00	0.	0.	0.
0.		0.	0.	0.41081E 00	0.49262E-02	0.
40	6	0.40631E 00	0.34355E 00	0.	0.	0.
0.		0.	0.	0.	0.47685E 00	0.
41	1	0.37705E 01	0.54926E-02	0.14900E-01	0.	0.49897E-02
0.53622E-01		0.28004E-01	0.12645E-02	0.21292E-04	0.	0.
41	2	0.24972E 01	0.24273E-02	0.44219E-02	0.	0.15044E-02
0.		0.12390E 00	0.71472E-02	0.10497E-04	0.86595E-10	0.
41	3	0.16988E 01	0.33765E-02	0.41376E-02	0.	0.14339E-02
0.		0.	0.18909E 00	0.37491E-02	0.21719E-05	0.
41	4	0.14232E 01	0.66290E-02	0.49923E-02	0.	0.17373E-02
0.		0.	0.	0.22486E 00	0.27320E-02	0.
41	5	0.11168E 01	0.13182E-01	0.94220E-02	0.	0.32823E-02
0.		0.	0.	0.	0.28403E 00	0.12524E-02
41	6	0.92177E 00	0.25803E-01	0.25898E-01	0.	0.90169E-02
0.		0.	0.	0.	0.33582E 00	0.

42	1	0.36321E 01	0.69996E-02	0.20174E-01	0.	0.64862E-02
0.56798E-01		0.26772E-01	0.11848E-02	0.19800E-04	0.	0.
42	2	0.25119E 01	0.40346E-02	0.93306E-02	0.	0.31660E-02
0.		0.12189E 00	0.67640E-02	0.92791E-05	0.10354E-09	0.
42	3	0.16812E 01	0.49679E-02	0.88836E-02	0.	0.30742E-02
0.		0.	0.18951E 00	0.37887E-02	0.18218E-05	0.
42	4	0.14067E 01	0.87878E-02	0.10646E-01	0.	0.36974E-02
0.		0.	0.	0.22537E 00	0.27940E-02	0.
42	5	0.10451E 01	0.18418E-01	0.19624E-01	0.	0.68200E-02
0.		0.	0.	0.	0.29925E 00	0.12877E-02
42	6	0.84341E 00	0.39123E-01	0.51858E-01	0.	0.18020E-01
0.		0.	0.	0.	0.	0.35610E 00
43	1	0.30352E 01	0.64581E-02	0.17916E-01	0.	0.59026E-02
0.69610E-01		0.32378E-01	0.13550E-02	0.22299E-04	0.	0.
43	2	0.19593E 01	0.32072E-02	0.65972E-02	0.	0.22411E-02
0.		0.15799E 00	0.89246E-02	0.10767E-04	0.12837E-09	0.
43	3	0.13995E 01	0.41942E-02	0.61808E-02	0.	0.21400E-02
0.		0.	0.22897E 00	0.50070E-02	0.21408E-05	0.
43	4	0.11546E 01	0.77977E-02	0.74181E-02	0.	0.25781E-02
0.		0.	0.	0.27577E 00	0.51201E-02	0.
43	5	0.84981E 00	0.17923E-01	0.15625E-01	0.	0.54352E-02
0.		0.	0.	0.	0.37135E 00	0.29678E-02
43	6	0.79050E 00	0.35329E-01	0.40850E-01	0.	0.14204E-01
0.		0.	0.	0.	0.	0.38635E 00
44	1	0.33477E 01	0.62503E-02	0.18130E-01	0.	0.57524E-02
0.65892E-01		0.26399E-01	0.10132E-02	0.15602E-04	0.	0.
44	2	0.22185E 01	0.38524E-02	0.93408E-02	0.	0.31678E-02
0.		0.13875E 00	0.76445E-02	0.69096E-05	0.10247E-09	0.
44	3	0.15759E 01	0.45875E-02	0.88787E-02	0.	0.30715E-02
0.		0.	0.20232E 00	0.46121E-02	0.12593E-05	0.
44	4	0.12647E 01	0.77587E-02	0.10588E-01	0.	0.36756E-02
0.		0.	0.	0.24994E 00	0.58569E-02	0.
44	5	0.86324E 00	0.18968E-01	0.22198E-01	0.	0.77103E-02
0.		0.	0.	0.	0.36440E 00	0.27706E-02
44	6	0.81699E 00	0.39607E-01	0.56414E-01	0.	0.19593E-01
0.		0.	0.	0.	0.	0.36839E 00
45	1	0.28079E 01	0.61689E-02	0.15434E-01	0.	0.55464E-02
0.69767E-01		0.40887E-01	0.18576E-02	0.32226E-04	0.	0.
45	2	0.16091E 01	0.15411E-02	0.17063E-03	0.	0.68723E-04
0.		0.19100E 00	0.14596E-01	0.13920E-04	0.	0.
45	3	0.11685E 01	0.32536E-02	0.10996E-03	0.	0.45244E-04
0.		0.	0.27481E 00	0.72078E-02	0.44117E-05	0.
45	4	0.98119E 00	0.70004E-02	0.18265E-03	0.	0.75342E-04
0.		0.	0.	0.32661E 00	0.61139E-02	0.
45	5	0.92146E 00	0.11016E-01	0.50333E-03	0.	0.20772E-03
0.		0.	0.	0.	0.34520E 00	0.55309E-02
45	6	0.91373E 00	0.14490E-01	0.13298E-02	0.	0.54883E-03
0.		0.	0.	0.	0.	0.35032E 00
46	1	0.19475E 01	0.57537E-03	0.	0.	0.
0.12724E 00		0.42626E-01	0.71603E-03	0.25000E-05	0.	0.
46	2	0.17568E 01	0.39640E-03	0.	0.	0.
0.		0.18077E 00	0.85733E-02	0.27072E-07	0.	0.
46	3	0.10661E 01	0.69370E-03	0.	0.	0.
0.		0.	0.30051E 00	0.11456E-01	0.81947E-07	0.
46	4	0.18097E 01	0.84677E-03	0.	0.	0.
0.		0.	0.	0.17775E 00	0.55923E-02	0.
46	5	0.49280E 00	0.48588E-02	0.	0.	0.
0.		0.	0.	0.	0.66045E 00	0.11107E-01
46	6	0.39166E 00	0.56067E-02	0.	0.	0.
0.		0.	0.	0.	0.	0.84547E 00
47	1	0.19042E 02	0.10736E-03	0.	0.	0.
0.12891E-01		0.43581E-02	0.14836E-03	0.68378E-06	0.	0.
47	2	0.16170E 02	0.40667E-04	0.	0.	0.
0.		0.19574E-01	0.99987E-03	0.30466E-07	0.	0.

47	3	0.96656E 01	0.87059E-04	0.	0.	0.
0.		0.	0.33256E-01	0.11438E-02	0.17760E-07	0.
47	4	0.85067E 01	0.17317E-03	0.	0.	0.
0.		0.	0.	0.38152E-01	0.85910E-03	0.
47	5	0.43828E 01	0.55117E-03	0.	0.	0.
0.		0.	0.	0.	0.74368E-01	0.11357E-02
47	6	0.38727E 01	0.83891E-03	0.	0.	0.
0.		0.	0.	0.	0.	0.85235E-01
48	1	0.34956E 01	0.63653E-02	0.17711E-01	0.	0.58378E-02
0.58260E-01	0.29386E-01	0.13252E-02	0.22123E-04	0.	0.	0.
48	2	0.24257E 01	0.31922E-02	0.65830E-02	0.	0.22357E-02
0.		0.12748E 00	0.67333E-02	0.10969E-04	0.12381E-09	0.
48	3	0.16344E 01	0.41701E-02	0.61883E-02	0.	0.21425E-02
0.		0.	0.19596E 00	0.38167E-02	0.21321E-05	0.
48	4	0.13686E 01	0.77711E-02	0.74182E-02	0.	0.25781E-02
0.		0.	0.	0.23351E 00	0.22156E-02	0.
48	5	0.10357E 01	0.16534E-01	0.14524E-01	0.	0.50518E-02
0.		0.	0.	0.	0.30373E 00	0.15839E-02
40	6	0.82986E 00	0.32608E-01	0.31400E-01	0.	0.13004E-01
0.		0.	0.	0.	0.	0.36907E 00
49	1	0.41025E 01	0.61270E-02	0.17845E-01	0.	0.56644E-02
0.51637E-01	0.22494E-01	0.97876E-03	0.15436E-04	0.	0.	0.
49	2	0.30253E 01	0.38331E-02	0.93193E-02	0.	0.31596E-02
0.		0.10132E 00	0.50229E-02	0.69595E-05	0.98887E-10	0.
49	3	0.19746E 01	0.45630E-02	0.88858E-02	0.	0.30739E-02
0.		0.	0.16106E 00	0.31866E-02	0.12643E-05	0.
49	4	0.16098E 01	0.77566E-02	0.10616E-01	0.	0.36853E-02
0.		0.	0.	0.19733E 00	0.19814E-02	0.
49	5	0.11329E 01	0.17332E-01	0.20535E-01	0.	0.71328E-02
0.		0.	0.	0.	0.27551E 00	0.13818E-02
49	6	0.87555E 00	0.36525E-01	0.51660E-01	0.	0.17941E-01
0.		0.	0.	0.	0.	0.34419E 00
50	1	0.28593E 01	0.28864E-02	0.	0.	0.
0.85857E-01	0.27468E-01	0.36708E-03	0.20454E-05	0.	0.	0.
50	2	0.16997E 01	0.54567E-02	0.	0.	0.
0.		0.17102E 00	0.19633E-01	0.44442E-07	0.	0.
50	3	0.11834E 01	0.14458E-01	0.	0.	0.
0.		0.	0.25436E 00	0.12856E-01	0.52033E-07	0.
50	4	0.90438E 00	0.34507E-01	0.	0.	0.
0.		0.	0.	0.32597E 00	0.80988E-02	0.
50	5	0.63479E 00	0.10442E 00	0.	0.	0.
0.		0.	0.	0.	0.41428E 00	0.64128E-02
50	6	0.49176E 00	0.22846E 00	0.	0.	0.
0.		0.	0.	0.	0.	0.44938E 00
51	1	0.28593E 01	0.28864E-02	0.	0.	0.
0.85857E-01	0.27468E-01	0.36708E-03	0.20454E-05	0.	0.	0.
51	2	0.16997E 01	0.54567E-02	0.	0.	0.
0.		0.17102E 00	0.19633E-01	0.44442E-07	0.	0.
51	3	0.11834E 01	0.14458E-01	0.	0.	0.
0.		0.	0.25436E 00	0.12856E-01	0.52033E-07	0.
51	4	0.90438E 00	0.34507E-01	0.	0.	0.
0.		0.	0.	0.32597E 00	0.80988E-02	0.
51	5	0.63479E 00	0.10442E 00	0.	0.	0.
0.		0.	0.	0.	0.41428E 00	0.64128E-02
51	6	0.49176E 00	0.22846E 00	0.	0.	0.
0.		0.	0.	0.	0.	0.44938E 00
52	1	0.28593E 01	0.28864E-02	0.	0.	0.
0.85857E-01	0.27468E-01	0.36708E-03	0.20454E-05	0.	0.	0.
52	2	0.16997E 01	0.54567E-02	0.	0.	0.
0.		0.17102E 00	0.19633E-01	0.44442E-07	0.	0.
52	3	0.11834E 01	0.14458E-01	0.	0.	0.
0.		0.	0.25436E 00	0.12856E-01	0.52033E-07	0.

52	4	0.90438E 00	0.34507E-01	0.	0.	0.
0.		0.	0.	0.32597E 00	0.80988E-02	0.
52	5	0.63479E 00	0.10442E 00	0.	0.	0.
0.		0.	0.	0.	0.41428E 00	0.64128E-02
52	6	0.49176E 00	0.22846E 00	0.	0.	0.
0.		0.	0.	0.	0.	0.44938E 00

5.88416-1   3.79349-1   3.07043-2   1.45358-3   7.30528-5   3.83243-6   CHI
 END
 DCRSPR

1   1   1
 52

NOP

ZONE1
 ZONE2
 ZONE3
 ZONE4
 ZONE5
 ZONE6
 ZONE7
 ZONE8
 ZONE9
 ZONE10
 ZONE11
 ZONE12
 ZONE13
 ZONE14
 ZONE15
 ZONE16
 ZONE17
 ZONE18
 ZONE19
 ZONE20
 ZONE21
 ZONE22
 ZONE23
 ZONE24
 ZONE25
 ZONE26
 ZONE27
 ZONE28
 ZONE29
 ZONE30
 ZONE31
 ZONE32
 ZONE33
 ZONE34
 ZONE35
 ZONE36
 ZONE37
 ZONE38
 ZONE39
 ZONE40
 ZONE41
 ZONE42
 ZONE43
 ZONE44
 ZONE45
 ZONE46
 ZONE47
 ZONE48
 ZONE49
 ZONE50

0.33333333

005

[illegible]

[illegible]

```

10 10 10 10 9 9 9 16 16 16 16 16 16 16 16 16 16 16 16 9 9 9
10 10 10 9 9 9 16 16 16 16 16 16 16 16 16 16 16 16 16 16 9
10 10 9 9 9 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16
10 9 9 9 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16
10 9 9 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16
10 10 9 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16
10 9 9 9 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16
9 9 9 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16
9 9 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16
10 9 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16
10 9 9 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16
10 10 9 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16
10 9 9 9 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16
10 9 9 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16
10 10 9 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16
10 10 9 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16
10 10 10 9 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16
10 10 10 9 9 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16
10 10 10 10 9 16 16 16 16 16 16 16 16 16 16 16 16 16 16 16
10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10
10 10 10 10 10 10 10 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9
10 10 10 10 10 9 9 9 17 9 9 17 17 17 17 17 9 9 17 9 9 9 10 10
10 10 10 10 9 9 9 17 17 17 17 17 17 17 17 17 17 17 17 17 9 9 9
10 10 10 9 9 9 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 9
10 10 9 9 9 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17
10 9 9 9 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17
10 9 9 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17
10 10 9 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17
10 9 9 9 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17
9 9 9 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17
9 9 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17
10 9 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17
10 9 9 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17
10 10 9 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17
10 10 9 9 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17
10 10 10 9 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17
10 10 10 9 9 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17
10 10 10 10 9 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17 17

```

006

```

1
39 39 12 12 5 12 43 43 13 13 5 12
2
31 31 7 7 5 12 35 35 8 8 5 12 39 39 9 9 5 12
43 43 10 10 5 12 21 21 18 18 5 12 23 23 20 20 5 12
25 25 22 22 5 12
3
45 46 23 23 2 16
4
33 35 20 20 2 16 34 36 21 21 2 16 39 41 17 17 2 16
40 42 18 18 2 16
5
27 29 23 23 2 16 27 29 14 14 2 16 28 30 15 15 2 16
45 46 14 14 2 16 46 46 14 14 2 16
6
21 23 17 17 2 16 22 24 18 18 2 16 33 35 11 11 2 16
34 36 12 12 2 16
7
13 13 16 16 5 12 15 15 18 18 5 12 17 17 20 20 5 12
19 19 22 22 5 12 29 29 5 5 5 12 33 33 6 6 5 12
37 37 7 7 5 12 41 41 8 8 5 12 45 45 9 9 5 12

```

10																	
3	3	9	9	1	16	1	1	13	13	1	16	3	3	15	15	1	16
3	3	18	18	1	16	5	5	20	20	1	16	7	7	22	22	1	16

11																	
27	27	3	3	1	1	19	19	4	4	1	1	31	31	4	4	1	1
37	37	4	4	1	1	41	41	5	5	1	1	45	45	6	6	1	1

12																	
27	27	3	3	2	2	19	19	4	4	2	2	31	31	4	4	2	2
37	37	4	4	2	2	41	41	5	5	2	2	45	45	6	6	2	2

[illegible][illegible][illegible][illegible]

17																		
27	27	3	3	15	16	19	19	4	4	15	16	31	31	4	4	15	16	
37	37	4	4	15	16	41	41	5	5	15	16	45	45	6	6	15	16	

012
0
1 17 1 1 1.0

0

013

52

17

ZONE1 ZONE2 ZONE3 ZONE4 ZONE5 ZONE6 ZONE7 ZONE8 ZONE9 ZONE10ZONE11ZONE12
ZONE13ZONE14ZONE15ZONE16ZONE17

020

1 1

ZONE 1 1.0

2 2

ZONE2 1.0

3 3

ZONE3 1.0

4 4

ZONE4 1.0

```

5 5
ZONE5 1.0
6 6
ZONE6 1.0
7 7
ZONE7 1.0
8 8
ZONE8 1.0
9 9
ZONE9 1.0
10 10
ZONE10 1.0
11 11
ZONE11 1.0
12 12
ZONE12 1.0
13 13
ZONE13 1.0
14 14
ZONE14 0.3089790
15 15
ZONE15 1.0
16 16
ZONE16 1.0
17 17
ZONE17 1.0

```

```

028
1
1.0      0.0      0.000001
7 0 0    1 1 0 0 1 5
14 14
ZONE14

```

```

END
DUTLIN
RRTINS
0 0 1 0 0 1 1 1 0 0 2 1 0
6HBLANK
END
/*
//

```

TABLE 2. CONDENSED EDIT FROM COMPUTER RUN

BOLD VENTURE VEPS-2 RUN AT K-25 ON 360/195. CONTROL MOD=CONTROL1. DATE=04-12-77. TIME=04.53.27. JOBNAME=TBFX

INITIALIZATION. REFERENCE - REMAINING I/O=*****. CPU MIN= 25.00

RUN TITLE AND CONTROL MODULE DATA

TWO-DIMENSIONAL, NON-SEPARABLE WATER REACTOR PROBLEM (MIT-NSE 55, P63).

18000 0 0 0 0 0 0 0 0 0 0 0 0 0 0
1 2 7 2 9

MODULES TO BE ACCESSED IN ORDER

1 2 7 2 9

INITIAL I/O FILE MANAGEMENT TABLES FILE NAME SUPPLIED BY

FILE NUMBER	SEEK	USER-EXIST	USER-STACK	VERSION	WRITTEN
10	CONTRL			1	1
READ DATA AND ACCESS MODULE 1 - REMAINING I/O=*****. CPU MIN= 24.99					
READ DATA FOR A SPECIAL PROCESSOR - REMAINING I/O=*****. CPU MIN= 24.98					
ACCESS PROCESSOR 'DVENTR' - REMAINING I/O=*****. CPU MIN= 24.98					
READ INPUT DATA ONLY (LOCK-AHEAD) - REMAINING I/O=*****. CPU MIN= 24.97					
ACCESS MODULES 7 0 0 0 0 - REMAINING I/O=*****. CPU MIN= 24.97					
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K - 13 -3.380670-05 0.0 2.11841E-14 1.0418795					
ADJOINT - ITERATIONS, CONVERGENCE, K - 13 -2.97545D-05 1.0418757					
PROMPT NEUTRON LIFETIME, K/(INTEGRAL(CHI,NUSIGF,PHI,PHI*)) - 4.53150E 01 4.73554E 03					
ACCESS PROCESSOR 'DJTLIN' - REMAINING I/O=*****. CPU MIN= 24.67					
ACCESS MODULES 9 0 0 0 0 - REMAINING I/O=*****. CPU MIN= 24.65					
FISSILE INVENTORY 0.0 <G, CONVERSION RATIO(RR) 0.0 . FISSILE CONSUMPTION RATE 0.0 KG/G-SEC					

FINAL I/O FILE MANAGEMENT TABLES FILE NAME SUPPLIED BY

FILE NUMBER	SEEK	USER-EXIST	USER-STACK	VERSION	WRITTEN
10	CONTRL			1	1
11	GPJPRS			1	1
12	GEOST			1	1
13	NDXSRF			1	1
14	ZNATDN			1	1
15	PZFLUX			1	1
16	RTFLUX			1	1
17	ATFLUX			1	1

WRAP-UP NOW COMPLETE. -- DRIVER TO SEEK NEW CASE - REMAINING I/O=*****. CPU MIN= 24.65 - TIME=05.00.10

BOLD VENTURE VERS-2 RUN AT K-25 ON 360/195. CONTROL MOD=CONTROL1, DATE=06-12-77 TIME=05.00.14, JOBNAME=T8=X .

INITIALIZATION, REFERENCE - REMAINING I/O=*****, CPU MIN= 24.65

RUN TITLE AND CONTROL MODULE DATA

TWO BWR ASSEMBLY CASES-- 2 GROUP. 12X12 AND 24X24 MESH.

20000 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0
2 2 6 2 7 2 7

MODULES TO BE ACCESSED IN ORDER

2 2 5 2 7 2 7

INITIAL I/O FILE MANAGEMENT TABLES
FILE NAME SUPPLIED BY

FILE NUMBER	SEEK	USER-EXIST	USER-STACK	VERSION	WRITTEN
10	CONTROL			1	1

READ DATA FOR A SPECIAL PROCESSOR - REMAINING I/O=*****, CPU MIN= 24.64

ACCESS PROCESSOR 'DLMACR' - REMAINING I/O=*****, CPU MIN= 24.64

READ DATA FOR A SPECIAL PROCESSOR - REMAINING I/O=*****, CPU MIN= 24.54

ACCESS PROCESSOR 'DORSPR' - REMAINING I/O=*****, CPU MIN= 24.63

READ INPUT DATA ONLY (LOOK-AHEAD) - REMAINING I/O=*****, CPU MIN= 24.63

ACCESS MODULES 6 0 0 0 0 - REMAINING I/O=*****, CPU MIN= 24.62

ACCESS PROCESSOR 'DVENTR' - REMAINING I/O=*****, CPU MIN= 24.61

READ INPUT DATA ONLY (LOOK-AHEAD) - REMAINING I/O=*****, CPU MIN= 24.59

ACCESS MODULES 7 0 0 0 0 - REMAINING I/O=*****, CPU MIN= 24.59
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K - 13 -1.19117D-03 0.0 7.23486E-03 1.0923E42

ACCESS PROCESSOR 'DVENTR' - REMAINING I/O=*****, CPU MIN= 24.44

ACCESS MODULES 7 0 0 0 0 - REMAINING I/O=*****, CPU MIN= 24.43
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K - 13 -4.24949D-03 0.0 7.77024E-03 1.0875974

FINAL I/O FILE MANAGEMENT TABLES
FILE NAME SUPPLIED BY

FILE NUMBER	SEEK	USER-EXIST	USER-STACK	VERSION	WRITTEN
10	CONTROL			1	1
11	EXSPAR			1	1
12	ISOTCS			1	1
13	GRJPES			1	1
14	GEODST			1	1
15	NDXSPF			1	1
16	ZNATION			1	1
17	RTFLUX			1	1

WRAP-UP NOW COMPLETE. -- DRIVER TO SEEK NEW CASE - REMAINING I/O=*****, CPU MIN= 24.25 - TIME=05.00.39

BOLD VENTURE VERS-2 RUN AT K-25 ON 360/195, CONTROL MOD=CONTROL1, DATE=06-12-77, TIME=05.06.43, JOBNAME=TBFX

INITIALIZATION, REFERENCE - REMAINING I/O=*****, CPU MIN= 24.25

RUN TITLE AND CONTROL MODULE DATA

FOUR TRIANGULAR-Z CASES-- REFLECTED, REPEATING, 180 ROT., 60 ROT.

10000 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0
2 2 6 2 7 2 7 3 7 2 7

MODULES TO BE ACCESSED IN ORDER

2 2 6 2 7 2 7 2 7 2 7

INITIAL I/O FILE MANAGEMENT TABLES
FILE NAME SUPPLIED BY

FILE NUMBER	SEEK	USER-EXIST	USER-STACK	VERSION	WRITTEN
10	CONTR			1	1
READ DATA FOR A SPECIAL PROCESSOR - REMAINING I/O=*****, CPU MIN= 24.24					
ACCESS PROCESSOR 'DCMACR' - REMAINING I/O=*****, CPU MIN= 24.24					
READ DATA FOR A SPECIAL PROCESSOR - REMAINING I/O=*****, CPU MIN= 24.24					
ACCESS PROCESSOR 'DCPSPR' - REMAINING I/O=*****, CPU MIN= 24.23					
READ INPUT DATA ONLY (LOOK-AHEAD) - REMAINING I/O=*****, CPU MIN= 24.23					
ACCESS MODULES 6 0 0 0 0 - REMAINING I/O=*****, CPU MIN= 24.22					
ACCESS PROCESSOR 'DVENTR' - REMAINING I/O=*****, CPU MIN= 24.21					
READ INPUT DATA ONLY (LOOK-AHEAD) - REMAINING I/O=*****, CPU MIN= 24.20					
ACCESS MODULES 7 0 0 0 0 - REMAINING I/O=*****, CPU MIN= 24.20					
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K - 12 3.43358D-05 0.0 5.85699E-02 1.0085669					
ADJOINT - ITERATIONS, CONVERGENCE, K - 10 1.59132D-05 1.0068663					
PROMPT NEUTRON LIFETIME, K/(INTEGRAL(CHI,NUSIGF,PHI,PHI*)) - 8.65340E 01 7.71286E 03					
ACCESS PROCESSOR 'DVENTR' - REMAINING I/O=*****, CPU MIN= 24.10					
READ INPUT DATA ONLY (LOOK-AHEAD) - REMAINING I/O=*****, CPU MIN= 24.09					
ACCESS MODULES 7 0 0 0 0 - REMAINING I/O=*****, CPU MIN= 24.09					
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K - 14 -4.76371D-05 0.0 1.19637E-01 0.8338352					
ADJOINT - ITERATIONS, CONVERGENCE, K - 10 -4.86274D-05 0.8333159					
PROMPT NEUTRON LIFETIME, K/(INTEGRAL(CHI,NUSIGF,PHI,PHI*)) - 7.79015E 01 5.77423E 03					
ACCESS PROCESSOR 'DVENTR' - REMAINING I/O=*****, CPU MIN= 24.00					
READ INPUT DATA ONLY (LOOK-AHEAD) - REMAINING I/O=*****, CPU MIN= 23.99					
ACCESS MODULES 7 0 0 0 0 - REMAINING I/O=*****, CPU MIN= 23.98					
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K - 22 4.85126D-05 0.0 1.57710E-01 0.9969322					
ADJOINT - ITERATIONS, CONVERGENCE, K - 13 3.35172D-05 0.9969302					
PROMPT NEUTRON LIFETIME, K/(INTEGRAL(CHI,NUSIGF,PHI,PHI*)) - 8.52295E 01 5.83759E 03					
ACCESS PROCESSOR 'DVENTR' - REMAINING I/O=*****, CPU MIN= 23.88					
ACCESS MODULES 7 0 0 0 0 - REMAINING I/O=*****, CPU MIN= 23.87					
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K - 17 -2.00831D-06 0.0 5.85677E-02 1.0088670					
ADJOINT - ITERATIONS, CONVERGENCE, K - 13 2.13541D-06 1.0088553					
PROMPT NEUTRON LIFETIME, K/(INTEGRAL(CHI,NUSIGF,PHI,PHI*)) - 8.65340E 01 7.71289E 03					

BOLD VENTURE VERS-2 RUN AT K-25 ON 360/195. CONTROL MOD=CONTROL1. DATE=05-12-77. TIME=05.15.29. JOBNAME=FBFX

INITIALIZATION, REFERENCE - REMAINING I/O=*****. CPU MIN= 23.77

RUN TITLE AND CONTROL MODULE DATA

THREE THATA-R CASES -- NORMAL, REPEATING, AND REPEATING (ORNL-TM-3793).

1500 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0
2 2 6 2 7 2 7 2 7

MODULES TO BE ACCESSSED IN ORDER

2 2 6 2 7 2 7 2 7

INITIAL I/O FILE MANAGEMENT TABLES
FILE NAME SUPPLIED BY

FILE NUMBER	SEEK	USER-EXIST	USER-STACK	VERSION	WRITTEN
10	CONTROL			1	1
READ DATA FOR A SPECIAL PROCESSOR - REMAINING I/O=*****. CPU MIN= 23.77					
ACCESS PROCESSOR 'DCMACH' - REMAINING I/O=*****. CPU MIN= 23.77					
READ DATA FOR A SPECIAL PROCESSOR - REMAINING I/O=*****. CPU MIN= 23.76					
ACCESS PROCESSOR 'DCRSPR' - REMAINING I/O=*****. CPU MIN= 23.76					
READ INPUT DATA ONLY (LOOK-AHEAD) - REMAINING I/O=*****. CPU MIN= 23.75					
ACCESS MODULES 6 0 0 0 0 - REMAINING I/O=*****. CPU MIN= 23.75					
ACCESS PROCESSOR 'DVENTR' - REMAINING I/O=*****. CPU MIN= 23.74					
READ INPUT DATA ONLY (LOOK-AHEAD) - REMAINING I/O=*****. CPU MIN= 23.73					
ACCESS MODULES 7 0 0 0 0 - REMAINING I/O=*****. CPU MIN= 23.73					
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K - 19 -1.206140-05 0.0 4.69290E-15 0.6119773					
ADJOINT - ITERATIONS, CONVERGENCE, K - 11 1.289040-05 0.6119772					
PROMPT NEUTRON LIFETIME, $k/(INTEGRAL(CHI, NUSIGF, PHI, PHI*))$ - 3.45372E 01 7.37944E 03					
ACCESS PROCESSOR 'DVENTR' - REMAINING I/O=*****. CPU MIN= 23.51					
READ INPUT DATA ONLY (LOOK-AHEAD) - REMAINING I/O=*****. CPU MIN= 23.49					
ACCESS MODULES 7 0 0 0 0 - REMAINING I/O=*****. CPU MIN= 23.49					
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K - 19 -1.206130-05 0.0 4.69290E-15 0.6119773					
ADJOINT - ITERATIONS, CONVERGENCE, K - 11 1.289720-05 0.6119772					
PROMPT NEUTRON LIFETIME, $k/(INTEGRAL(CHI, NUSIGF, PHI, PHI*))$ - 3.45372E 01 7.37944E 03					
ACCESS PROCESSOR 'DVENTR' - REMAINING I/O=*****. CPU MIN= 23.26					
ACCESS MODULES 7 0 0 0 0 - REMAINING I/O=*****. CPU MIN= 23.25					
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K - 19 -1.979970-05 0.0 4.69292E-15 0.6119780					
ADJOINT - ITERATIONS, CONVERGENCE, K - 11 1.065540-05 0.6119773					
PROMPT NEUTRON LIFETIME, $k/(INTEGRAL(CHI, NUSIGF, PHI, PHI*))$ - 3.45373E 01 7.37944E 03					

FINAL I/O FILE MANAGEMENT TABLES
FILE NAME SUPPLIED BY

FILE NUMBER	SEEK	USER-EXIST	USER-STACK	VERSION	WRITTEN
10	CONTROL			1	1
11	DCRSPR			1	1
12	ISOTXS			1	1
13	SRUPXS			1	1
14	GEODST			1	1

BOLD VENTURE VERS-2 RUN AT K-25 ON 360/195. CONTROL MOD=CONTROL1, DATE=06-12-77, TIME=05.22.57, JOBNAME=T8FX

INITIALIZATION, REFERENCE - REMAINING I/O=*****, CPU MIN= 23.03

RUN TITLE AND CONTROL MODULE DATA

TWO CASES-- R-Z AND THATA-R-Z TO COMPARE (ORNL-TM-3792).

50000 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0
2 2 6 2 7 2 7

MODULES TO BE ACCESSED IN ORDER

2 2 6 2 7 2 7

INITIAL I/O FILE MANAGEMENT TABLES
FILE NAME SUPPLIED BY

FILE NUMBER	SEEK	USER-EXIST	USER-STACK	VERSION	WRITTEN
10	CONTRL			1	1

READ DATA FOR A SPECIAL PROCESSOR - REMAINING I/O=*****, CPU MIN= 23.03

ACCESS PROCESSOR 'DCMACR' - REMAINING I/O=*****, CPU MIN= 23.03

READ DATA FOR A SPECIAL PROCESSOR - REMAINING I/O=*****, CPU MIN= 23.02

ACCESS PROCESSOR 'DCRSPR' - REMAINING I/O=*****, CPU MIN= 23.02

READ INPUT DATA ONLY (LOOK-AHEAD) - REMAINING I/O=*****, CPU MIN= 23.01

ACCESS MODULES 6 0 0 0 0 - REMAINING I/O=*****, CPU MIN= 23.01

ACCESS PROCESSOR 'DVENTR' - REMAINING I/O=*****, CPU MIN= 23.03

READ INPUT DATA ONLY (LOOK-AHEAD) - REMAINING I/O=*****, CPU MIN= 22.99

ACCESS MODULES 7 0 0 0 0 - REMAINING I/O=*****, CPU MIN= 22.76
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K - 22 -2.17923D-06 0.0 1.10624E-11 0.4952333
ADJOINT - ITERATIONS, CONVERGENCE, K - 20 3.28105D-05 0.4952237
PROMPT NEUTRON LIFETIME, K/(INTEGRAL(CHI,NUSIGF,PHI,PHI*)) - 5.60120E 02 3.11553E 05

ACCESS PROCESSOR 'DVENTP' - REMAINING I/O=*****, CPU MIN= 22.78

ACCESS MODULES 7 0 0 0 0 - REMAINING I/O=*****, CPU MIN= 22.77
ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K - 29 4.93594D-05 0.0 1.10624E-11 0.4952319
ADJOINT - ITERATIONS, CONVERGENCE, K - 27 -1.37297D-05 0.4952527
PROMPT NEUTRON LIFETIME, K/(INTEGRAL(CHI,NUSIGF,PHI,PHI*)) - 5.60095E 02 3.11536E 05

FINAL I/O FILE MANAGEMENT TABLES
FILE NAME SUPPLIED BY

FILE NUMBER	SEEK	USER-EXIST	USER-STACK	VERSION	WRITTEN
10	CONTRL			1	1
11	CXSPRP			1	1
12	ISOTXS			1	1
13	GRUPXS			1	1
14	GEODST			1	1
15	VDXSRF			1	1
16	ZNATON			1	1
17	RTFLUX			1	1
18	ATFLUX			1	1

WRAP-UP NOW COMPLETE. -- DRIVER TO SEEK NEW CASE - REMAINING I/O=*****, CPU MIN= 21.64 - TIME=05.28.42

BOLD VENTURE VERS-2 RUN AT K-25 ON 360/195. CONTROL MOD=CONTROL1. DATE=05-12-77. TIME=05.28.45. JOBNAME=TBFX

INITIALIZATION, REFERENCE - REMAINING I/O=*****. CPU MIN= 21.63

RUN TITLE AND CONTROL MODULE DATA

SEARCH CASE 3 FROM THE VENTURE REPORT (ORNL 5062 - REV. 1).

18000 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0
1 6 7 9

MODULES TO BE ACCESSED IN ORDER

1 6 7 9

INITIAL I/O FILE MANAGEMENT TABLES
FILE NAME SUPPLIED BY

FILE NUMBER	SEEK	USER-EXIST	USER-STACK	VERSION	WRITTEN
10	CONTRL			1	1

READ DATA AND ACCESS MODULE 1 - REMAINING I/O=*****. CPU MIN= 21.63

ACCESS MODULES 5 7 9 0 0 - REMAINING I/O=*****. CPU MIN= 21.56

ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K - 1 1.17510E-05 0.0 3.22342E-03 1.0099993
PRIMITIVE CONVERSION RATIO, ALSO FOR CRITICAL SYSTEM, FUEL CONSUMPTION(ATOMS/WATT-SEC) - 1.23325 1.26293 2.99028E 10
ADJOINT - ITERATIONS, CONVERGENCE, K - 11 -3.687620-05 1.0099993
PROMPT NEUTRON LIFETIME, K/(INTEGRAL(C4I,MUSIGF,PHI,PHI*)) - 2.17055E-01 3.40568E-08
FISSILE INVENTORY 9.947813E 02 KG, CONVERSION RATIO(RR) 1.23325, FISS LE CONSUMPTION RATE 1.176790E-14 KG/W-SEC

FINAL I/O FILE MANAGEMENT TABLES
FILE NAME SUPPLIED BY

FILE NUMBER	SEEK	USER-EXIST	USER-STACK	VERSION	WRITTEN
10	CONTRL			1	1
11	ISOTXS			1	1
12	SEDDST			1	1
13	WDXSRF			1	1
14	INATDN			1	1
15	SEARCH			1	1
16	GRUPXS			1	1
17	INATDN			2	1
18	SEDDST			2	1
19	WDXSRF			2	1
20	RZFLUX			1	1
30	RTFLUX			1	1
31	PWDINT			1	1
32	LTFLUX			1	1
33	PERTUB			1	1

WRAP-UP NOW COMPLETE. -- DRIVER TO SEEK NEW CASE - REMAINING I/O=*****. CPU MIN= 21.67 - TIME=05.34.32

BOLD VENTURE VERS-2 RUN AT K-25 ON 360/195. CONTROL MOD=CONTROL1. DATE=06-12-77. TIME=05.34.35. JOBNAME=TBFX

INITIALIZATION, REFERENCE - REMAINING I/O=*****, CPU MIN= 21.07

RUN TITLE AND CONTROL MODULE DATA

2-D LARGE LMFBR REACTOR MODEL BENCHMARK PROBLEM, P1 APPROXIMATION.
56000 0 0 0 0 0 0 0 0 0 0 0 0 0
1 6 2 7 9

MODULES TO BE ACCESSED IN ORDER

1 6 2 7 9

INITIAL I/O FILE MANAGEMENT TABLES FILE NAME SUPPLIED BY

FILE NUMBER	SEEK	USER-EXIST	USER-STACK	VERSION	WRITTEN
10	CONTRL			1	1
11	GRUPXS			1	0
12	GENDST			1	0
13	NDXSFF			1	0
14	ZNATON			1	0
15	SEARCH			1	0
16	KSTRTP			1	0
17	ATFLUX			1	0
18	RTFLUX			1	0
19	RZFLUX			1	0
20	PWDINT			1	0
30	CXSPRR			1	0
31	ISDTXS			1	0
32	ISDTXS			2	0
33	FIXSEC			1	0

READ DATA AND ACCESS MODULE : - REMAINING I/O=*****, CPU MIN= 21.07

READ INPUT DATA ONLY (LOOK-AHEAD) - REMAINING I/O=*****, CPU MIN= 20.97

ACCESS MODULES 6 0 0 0 0 - REMAINING I/O=*****, CPU MIN= 20.96

ACCESS PROCESSOR 'DVENTR' - REMAINING I/O=*****, CPU MIN= 20.94

ACCESS MODULES 7 9 0 0 0 - REMAINING I/O=*****, CPU MIN= 20.92

ITERATIONS, CONVERGENCE, SEARCH, PEAK PRODUCTION, K - 23 -2.572980-05 0.0 1.29600E-04 1.0270436
PRIMITIVE CONVERSION RATIO, ALSO FOR CRITICAL SYSTEM, FUEL CONSUMPTION(ATOMS/ATT-SEC) - 1.13641 1.21324 5.00072E-05
ADJOINT - ITERATIONS, CONVERGENCE, K - 20 2.651930-05 1.0265434
PROMPT NEUTRON LIFETIME, K/(INTEGRAL(CHI,NUSIGF,PHI,PHI*)) - 3.79343E-07 3.30992E-04
FISSILE INVENTORY 3.40243E-03 KG, CONVERSION RATIO(KR) 1.13641, FISSILE CONSUMPTION RATE 0.0 KG/W-SEC

FINAL I/O FILE MANAGEMENT TABLES FILE NAME SUPPLIED BY

FILE NUMBER	SEEK	USER-EXIST	USER-STACK	VERSION	WRITTEN
10	CONTRL			1	1
11	GRUPXS			1	1
12	GENDST			1	1
13	NDXSFF			1	1
14	ZNATON			1	1
15	SEARCH			1	0
16	KSTRTP			1	0
17	RTFLUX			1	1
18	ATFLUX			1	1
19	RZFLUX			1	1
20	PWDINT			1	0
30	CXSPRR			1	0
31	ISDTXS			1	0

BOLD VENTURE VERS-2 RUN AT K-25 ON 360/195. CONTROL MOD=CONTRD-1, DATE=06-12-77, TIME=05.41.15, JOBNAME=T6FX

INITIALIZATION, REFERENCE - REMAINING I/O=*****, CPU MIN= 20.11

RUN TITLE AND CONTROL MODULE DATA

THREE DIMENSIONAL IAEA BENCHMARK PROBLEM -- 17X17X19 MESH, 2 GROUPS.

80000 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
2 2 6 2 7

MODULES TO BE ACCESSED IN ORDER:

2 2 5 2 7

INITIAL I/O FILE MANAGEMENT TABLES FILE NAME SUPPLIED BY

FILE NUMBER	SEEK	USER-EXIST	USER-STACK	VERSION	WRITTEN
10	CONTRL			1	1

READ DATA FOR A SPECIAL PROCESSOR - REMAINING I/O=*****, CPU MIN= 20.11

ACCESS PROCESSOR 'DCMACR' - REMAINING I/O=*****, CPU MIN= 20.10

READ DATA FOR A SPECIAL PROCESSOR - REMAINING I/O=*****, CPU MIN= 20.10

ACCESS PROCESSOR 'DCRSPR' - REMAINING I/O=*****, CPU MIN= 20.10

READ INPUT DATA ONLY (LOOK-AHEAD) - REMAINING I/O=*****, CPU MIN= 20.09

ACCESS MODULES 6 0 C 0 0 - REMAINING I/O=*****, CPU MIN= 20.09

ACCESS PROCESSOR 'DVENTR' - REMAINING I/O=*****, CPU MIN= 20.07

ACCESS MODULES 7 0 C 0 0 - REMAINING I/O=*****, CPU MIN= 20.05

ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K - S1 4.375630-05 0.0 4.26679E-07 1.029133d

FINAL I/O FILE MANAGEMENT TABLES FILE NAME SUPPLIED BY

FILE NUMBER	SEEK	USER-EXIST	USER-STACK	VERSION	WRITTEN
10	CONTRL			1	1
11	DCRSPR			1	1
12	ISOTXS			1	1
13	GRUPXS			1	1
14	GEODST			1	1
15	NDXSRF			1	1
16	ZMATDN			1	1

WRAP-UP NOW COMPLETE. -- DRIVER TO SEEK NEW CASE -- REMAINING I/O=*****, CPU MIN= 18.47 - TIME=05.48.20

BOLD VENTURE VERS-2 RUN AT K-25 ON 360/195. CONTROL MOD=CONTROL1, DATE=06-12-77, TIME=05.43.23, JOBNAME=TBFA

INITIALIZATION, REFERENCE - REMAINING I/O=*****. CPU MIN= 18.46

RUN TITLE AND CONTROL MODULE DATA

TRIANGULAR-Z LMFBR PROBLEM -- 46X23X15 MESH, 6 GROUPS.

61000 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0
2 2 6 2 7

MODULES TO BE ACCESSED IN ORDER

2 2 6 2 7

INITIAL I/O FILE MANAGEMENT TABLES FILE NAME SUPPLIED BY

FILE NUMBER	SEEK	USER-EXIST	USER-STACK	VERSION	WRITTEN
10	CONTRL			1	1

READ DATA FOR A SPECIAL PROCESSOR - REMAINING I/O=*****. CPU MIN= 18.46

ACCESS PROCESSOR 'DCMACR' - REMAINING I/O=*****. CPU MIN= 18.43

READ DATA FOR A SPECIAL PROCESSOR - REMAINING I/O=*****. CPU MIN= 18.44

ACCESS PROCESSOR 'DCPSPR' - REMAINING I/O=*****. CPU MIN= 18.43

READ INPUT DATA ONLY (LOOK-AHEAD) - REMAINING I/O=*****. CPU MIN= 18.42

ACCESS MODULES 6 0 0 0 0 - REMAINING I/O=*****. CPU MIN= 18.42

ACCESS PROCESSOR 'DVENTR' - REMAINING I/O=*****. CPU MIN= 18.37

ACCESS MODULES 7 0 0 0 0 - REMAINING I/O=*****. CPU MIN= 18.33

ITERATIONS, CONVERGENCE, SEARCH, PEAK POWER DENSITY, K - 23 -4.39349D-05 0.0 4.28786E-07 1.0000005

FINAL I/O FILE MANAGEMENT TABLES FILE NAME SUPPLIED BY

FILE NUMBER	SEEK	USER-EXIST	USER-STACK	VERSION	WRITTEN
10	CONTRL			1	1
11	CXSPR			1	1
12	ISOTXS			1	1
13	GRJPXS			1	1
14	GEODST			1	1
15	NDXSRF			1	1
16	ZNATON			1	1

WRAP-UP NOW COMPLETE. -- DRIVER TO SEEK NEW CASE - REMAINING I/O=*****. CPU MIN= 13.83 - TIME=06.15.00

THIS PAGE
WAS INTENTIONALLY
LEFT BLANK

ORNL/TM-5887
 Distribution Category
 UC-79d-LMFBR Physics

INTERNAL DISTRIBUTION

1-3. L. S. Abbott	47. E. M. Oblow
4. E. J. Allen	48. M. Y. Ozal
5. R. G. Alsmiller	49. J. V. Pace
6. D. E. Bartine	50. R. W. Peelle
7. T. J. Burns	51. F. G. Perey
8. R. L. Childs	52. L. M. Petrie
9. S. N. Cramer	53. W. A. Rhoades
10. F. L. Culler	54. J. C. Robinson
11. G. W. Cunningham	55. D. L. Selby
12. J. D. Drischler	56. D. B. Simpson
13. M. B. Emmett	57. T. M. Sims
14. W. W. Engle	58. C. O. Slater
15. G. F. Flanagan	59. J. H. Swanks
16. V. M. Forsberg	60. J. S. Tang
17-26. T. B. Fowler	61. M. L. Tobias
27. S. K. Fraley	62. E. T. Tomlinson
28. W. E. Ford	63. D. R. Vondy
29. E. H. Gift	64. C. C. Webster
30. H. Goldstein, consultant	65. C. R. Weisbin
31. N. M. Greene	66. J. E. White
32. W. O. Harms	67. G. E. Whitesides
33. R. Hibbs	68. L. R. Williams
34. T. J. Hoffman	69. M. L. Williams
35. J. R. Knight	70. R. Q. Wright
36. R. A. Lillie	71. A. Zucker
37. J. L. Lucius	72. Paul Greebler, consultant
38. R. E. Maerker	73. W. W. Havens, consultant
39. F. C. Maienschein	74. A. F. Henry, consultant
40. J. H. Marable	75. R. E. Uhrig, consultant
41. R. G. Mashburn	76-77. Central Research Library
42. J. M. McAdoo	78. Y-12 Document Reference Section
43. S. R. McNeany	79-80. Laboratory Records Department
44. F. R. Mynatt	81. Laboratory Records, ORNL, RC
45. B. Nakhai	82. ORNL Patent Office
46. H. Postma	83-93. NPD Records Office

EXTERNAL DISTRIBUTION

- 94-118. Argonne National Laboratory, Computer Code Center, 9700 South Cass Avenue, Argonne, Illinois 60439
- 119-120. Director, Division of Reactor Research and Development, ERDA, Washington, D. C. 20545
121. Research and Technical Support Division, ERDA-ORO
122. Director, Reactor Division, ERDA-ORO
- 123-393. Given distribution as shown in TID-4500 under category for LMFBR Physics, Base Technology