ORNL/CSD/TM-238

MARTIN MARIETTA

Validation of KENO V.a Comparison with Critical Experiments

W. C. Jordan
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L. M. Petrie

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ABSTRACT

Section 1 of this report documents the validation of KENO V.a against 258 critical experiments. Experiments considered were primarily high or low enriched uranium systems. The results indicate that the KENO V.a Monte Carlo Criticality Program accurately calculates a broad range of critical experiments. A substantial number of the calculations showed a positive or negative bias in excess of 1½% in k-effective (k_{eff}). Classes of criticals which show a bias include 3% enriched green blocks, highly enriched uranyl fluoride slab arrays, and highly enriched uranyl nitrate arrays. If these biases are properly taken into account, the KENO V.a code can be used with confidence for the design and criticality safety analysis of uranium-containing systems.

Section 2 of this report documents the results of investigation into the cause of the bias observed in Sect. 1. The results of this study indicate that the bias seen in Sect. 1 is caused by code bias, cross-section bias, reporting bias, and modeling bias. There is evidence that many of the experiments used in this validation and in previous validations are not adequately documented. The uncertainty in the experimental parameters overshadows bias caused by the code and cross sections and prohibits code validation to better than about 1% in k_{eff}.

1. VALIDATION OF KENO V.a IN Y12CSG

1.1 INTRODUCTION

The KENO V.a Monte Carlo Criticality Program is currently being validated in several different ways. Each of these validations will be reported separately. The intent of this study is to validate KENO V.a[1] in the Y12CSG package against critical experiments. Y12CSG is a frozen version of a system of nuclear criticality safety computer codes similar to the nuclear criticality safety codes available through the SCALE[2] package. The sequence which is being validated is the CSAS25 sequence documented in CSAS4 of the SCALE manual. The sequence uses control module CSAS25 created on 85.162 and program modules Q#$008 (BONAMI-2) created on 85.011, Q#$002 (NITAWL) created on 85.011, and Q#$009 (KENO V.a) created on 85.162. The 27-group ENDF/B-IV cross-section master library created on 84.066 and stored in data set Y.LMP12852.Y12CSG.X27 was used for all calculations.

The purpose of a code validation is manyfold. ANSI Standard ANS-8.1[3] requires that calculational methods used for criticality safety be validated and any bias be determined by correlating the results of critical experiments with calculations. In the past, the primary source of criticality safety information applicable to the handling of fissile material outside of nuclear reactors was obtained from critical experiments or from nuclear safety guides and handbooks based upon critical experiments. These experiments were costly and often took a substantial amount of time before the results were available. With the closing of many of the critical experiment facilities, using critical experiments for operational criticality safety approval has become virtually impossible. Increasing reliance is being placed upon calculational methods to fill in and extend existing experimental data. Extension of data has been accomplished by making use of trends in the bias established in code validation. It is essential that the computational methods used for nuclear criticality safety purposes be sufficiently accurate that one can be confident of subcriticality when adequate safety margins are applied. It is also important that the applied safety margins not be unduly conservative. To accomplish both of these goals simultaneously requires the ability to accurately predict the neutron multiplication factor of a system.

This portion of the KENO V.a validation is based primarily on uranium experiments which have been used in the past for KENO validation.[4–8] The validation is being done independent of any particular nuclear criticality safety organization, with close cooperation with the authors of the code and personnel familiar both with the codes and many of the critical experiments which were used in the earlier validations. In this manner, trends in the bias can be identified and areas of applicability can be established. In addition, calculational deficiencies may be identified and possibly eliminated.

A total of 258 low enriched (<5% U-235) and highly enriched (~90% U-235) experiments have been modeled. These include various solution systems, intermediate density systems, and uranium oxide and metal systems. Four primary sources of bias were identified during the course of the validation. These were (1) bias caused by approximations and the manner in which the theory was implemented in portions of the code (code bias), (2) bias caused by the group structure of the cross sections (cross-section bias), (3) bias caused by the manner in which the experiments were reported versus what was actually done (reporting bias), and (4) bias caused because of the manner in which the analyst chose to model the critical experiment (modeling bias). Mitigation of the bias for the first two cases is fairly straightforward since they are systematic and are introduced by the KENO program and control modules. If trends can be established, it may be possible to eliminate bias in future updates to the codes. The third source of bias, reporting bias, is not well defined and is much more difficult to resolve. Reporting bias is very difficult to distinguish from code and cross-section bias without additional information beyond what was originally reported. The necessary details which have been omitted are different from experiment to experiment and are influenced by the date the experiments were performed along with the prevailing belief of the experimenters of what was important and what could be ignored. The fourth source, modeling bias, is bias which stems from the analyst's model and is also difficult to distinguish from other forms of bias, especially when the analyst chooses to ignore (or include) specific portions of a model based on past experience with similar calculations.

The results of this validation are reported in Sect. 1. The discussion of the cause-and-effect of the identified bias for the experiments are presented in Sect. 2. In Sect. 2, many of the calculations were performed with modified versions of the code and with adjusted parameters. The results in Sect. 2 should not be considered part of the validation of the code. They are presented in order to aid in establishing the source of the bias observed in the validation.

1.2 DESCRIPTION OF THE CODE PACKAGE

1.2.1 CSAS25 Module

The CSAS25 control module allows simplified data input to the functional modules such as BONAMI, NITAWL, and KENO V.a. The module will calculate atomic densities for both mixtures and standard solutions. The module also generates input data for NITAWL, allowing various options for treatment of the cross sections in the resonance region for both homogeneous and heterogeneous systems. Since the earlier validations reported in refs. 6 and 7, several corrections have been made to the CSAS25 control module.

1.2.2 BONAMI

For the 27-group master cross-section library used in this validation, the primary purpose of the BONAMI functional module is to select the required material cross sections and to create a smaller master cross-section library to be processed by NITAWL. There is no data processing done in BONAMI for the 27-group cross-section library.

1.2.3 NITAWL

The NITAWL functional module treats the resonance region cross sections for resonance absorbers. The treatment is based on the Nordheim Integral Transform method. The analyst has the option of treating the resonance parameters in the manner most appropriate for the problem detail. The options include (1) an homogeneous medium treatment which treats the resonance region of the fissile mixture as if it were an infinite homogeneous media, and (2) a finite lump treatment which treats the resonance region as if the fissile mixture were in a discrete lump with a 1/E return flux at the boundary for problems where the system is substantially heterogeneous or where reflector effects are important. These options are automatically invoked in the CSAS25 module according to the keywords INFHOMMEDIUM, LATTICECELL, or MULTIREGION. The INFHOMMEDIUM option treats the fissile mixture as an infinite homogeneous medium. The LATTICECELL option utilizes a multiple repeated cell for the resonance self-shielding correction. With the MULTIREGION option, a single-cell resonance self-shielding calculation is made.

1.2.4 KENO V.a

KENO V.a is a substantial revision of KENO IV,[9] and includes an enhanced geometry package which allows modeling of a wide variety of complex three-dimensional geometries. The geometry package allows nested arrays and "holes" to be placed in the geometry model. The code allows the use of reflector options, including mirror reflection, differential albedo reflection, and an automatic reflector; the latter has the capability of using reflector region weighting functions which are based on one-dimensional adjoint calculations. The reflector options simplify geometry data input and/or reduce the running time of a specific problem. Cross-section input and atom density input are handled by the CSAS25 module. Most of the major KENO parameters have defaults which work for a wide variety of problems, but which can be overridden if the problem or analyst dictates. The major revision to KENO V.a since the validations reported in refs. 6 and 7 is that the program module ICE has been deleted, and KENO V.a mixes its own cross sections. In addition, there have been a few changes in the program logic involving the treatment of computer round-off error during tracking.

1.2.5 The 27-Group Neutron Cross-Section Library

The 27-group cross-section library was created in August 1981 from the ENDF/B-IV 218-group master library.[10] (It should be noted that ref. 10 does not include a discussion of all the nuclides which have been placed in the 218-group library and that several of the nuclides have been regenerated since the document was issued.) Prior to 1981, the primary cross-section set in use at ORNL was the Knight-Modified Hansen-Roach, 16-group cross-section library. The 27-group set is considered to be an improvement because more thermal neutron groups are available, upscatter is included in the set, and the origin of the base data used to create the data set is better documented. The 27-group set was collapsed with the weighting spectra which was generated with the 218-group library and which was based on the weighting spectra used to prepare the 218-group library from ENDF/B-IV data.

1.3 CALCULATIONAL PROCEDURE

In the KENO V.a validation process, many of the available options in CSAS25 and KENO V.a were exercised. These options include the automatic atomic density generation features, the various treatments in NITAWL, and the geometry and reflector options in KENO V.a. This was done in order to validate the mechanics and capabilities of the code for a broad spectrum of problems. The majority of the calculations repeat calculations which were modeled by different people at different times. Usually there are multiple ways that a problem may be specified, all of which are equally correct. The original input data were left substantially unchanged in order to allow testing for discrepancies or bias which might have been caused by the differences in analysts' problem specifications. A complete listing of the input data has been included in Appendix A.

The resonance treatment used was the one which appeared to most accurately fit the problem specifications. All problems were run for 103 generations of 600 neutrons per generation. Some problems were run using the adjoint reflector weighting (bias ID), whereas others were run using full neutron tracking in the reflector in order to test for bias which might be caused by one or the other treatment.

With KENO V.a, there is no single k_{eff} which is "the answer" for the problem. The code starts with an initial neutron distribution and calculates the effective multiplication for a generation of neutrons. The next generation uses a starting distribution based on the fission points of the previous generation and calculates the effective multiplication for the current generation. Since 103 generations were run, there are 103 different answers. In the ideal situation, once the source has converged and the original (and usually arbitrary) starting distribution has decayed, the difference in the batch-to-batch k_{eff} may be attributed to the statistical nature of the Monte Carlo calculation, and the "best" answer should be the average of the remaining calculations. The common practice in KENO V.a is to tabulate the average k_{eff} as a function of the number of generations skipped. Considerable judgment is then required in determining the answer. Many calculations do not approach the ideal situation. For example, undersampling may exist where the number of neutrons per generation is not sufficient to sustain a proper source distribution, or the number of generations is insufficient to converge the source distribution. In order to remove the element of judgment from the interpretation of the results and to mechanize the process of validating and comparing results to previous validation, the average k_{eff} by generation skipped with the lowest calculated standard deviation is reported here. This number appears as the "final value" in the plot of average k_{eff} by generation skipped in the KENO V.a output. The analyst is encouraged to review the tabulated results against the plots in Appendix B when using the validation for establishing safety margins for the different types of criticals which were run.

In each calculation, the optional parameter NUB was set to "yes" in KENO V.a so the program would calculate and print the average energy group of the neutron-causing fission. This parameter has been frequently used in past validations because of trends which have been observed and appear to be correlated.

1.4 PROBLEM DESCRIPTION AND RESULTS

A brief problem description and results are presented in Tables 1-6. The experimental models used to generate Table 1 are from low enriched uranium experiments obtained from ref. 8. These include experiments for homogeneous single-unit criticals, both reflected and unreflected, as well as heterogeneous uranium metal rods in water. The fissile compounds considered were UO_2F_2, U metal, and U_3O_8, all at 4.89% U-235 enrichment. The moderating materials were water, sterotex, and UO_2F_2 solution.

The experimental models used to generate Table 2 are from low enriched uranium experiments obtained from ref. 11. These experiments are formally undocumented experiments for 3.85% enriched uranium metal rods in water. The heterogeneous systems consist of large diameter rods which are water moderated. In some cases the rods have an internal hole which is also water moderated. The critical experiments were modeled in detail from descriptions in the experiment logbook. Extensive detail was included in these calculations in order to thoroughly test the KENO V.a geometry package.

Table 3 includes models from ref. 7 which were used for the validation of Y12CSG for the Oak Ridge Gaseous Diffusion Plant. The validation considered single-unit criticals, both reflected and unreflected, at several enrichments ranging from 1.4 to 4.98%. The first 30 experiments are UF_4/paraffin-moderated systems and UO_2F_2 solution systems at various moderation levels. The last 20 experiments are 4.46% enriched damp oxide experiments performed at Rocky Flats. These later experiments test the code's ability to handle both intermixed and interstitial moderation. Several of the damp oxide experiments, which were driven by highly enriched uranium systems, were added to the series.

Highly enriched uranium experiments from ref. 8 were used to generate Table 4. These are UO_2F_2 and $UO_2(NO_3)_2$ solution systems. Both single-unit and array systems were analyzed under a variety of reflection conditions including unreflected, fully water reflected, concrete reflected, and Plexiglas reflected.

Table 5 includes experiments from ref. 6 which were used for validation of Y12CSG for the Y-12 Plant. Single-unit reflected and unreflected systems for uranium metal, uranium alloy, UO_2F_2 solution and $UO_2(NO_3)_2$ solutions were considered. Extensive calculations were performed on arrays, including (1) arrays of metal units with and without interstitial moderation, (2) arrays of UO_2F_2 slab systems, and (3) arrays of 5-liter containers of $UO_2(NO_3)_2$ having varying reflector thicknesses of paraffin and/or Plexiglas.

Table 6 contains the experimental models and results from the eta experiments performed at Y-12.[12,13] These experiments are $UO_2(NO_3)_2$ solution experiments in simple unreflected geometry. The systems are typically very dilute. The experiments included boron poisoned solutions and U-233 systems.

Table 1. KENO V.a calculated k_{eff} for experimentally critical low enriched uranium systems (last modeled in ref. 8)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAA01	Experiment 1A. 401-4.89% U rods, 0.762-cm diam, 30-cm long, 1.3-cm pitch, H_2O moderated and reflected	14	0.9945 ± 0.0036
CAA02	Experiment 4B. 400-4.89% U rods, 0.762-cm diam, 30-cm long, 1.3-cm pitch, H_2O moderated and reflected	14	0.9912 ± 0.0030
CAA03	Experiment 11A. 240-4.89% U rods, 0.762-cm diam, 30-cm long, 1.3-cm pitch, H_2O moderated and reflected	14	0.9924 ± 0.0031
CAA04	Experiment 6A. 203-4.89% U rods, 0.762-cm diam, 30-cm long, 2.05-cm pitch, H_2O moderated and reflected	14	0.9942 ± 0.0032
CAA05	Experiment 8C. 400-4.89% U rods, 0.762-cm diam, 30-cm long, 2.05-cm pitch, H_2O moderated and reflected	14	0.9839 ± 0.0034
CAA06	Experiment 14A. 398-4.89% U rods, 0.762-cm diam, 30-cm long, 1.3-cm pitch, H_2O moderated, H_2O top reflector, Plexiglas bottom reflector, Pb reflected 1 face	14	0.9957 ± 0.0036
CAA07	Experiment 23B. 400-4.89% U rods, 0.762-cm diam, 30-cm long, 1.3-cm pitch, H_2O moderated, H_2O top reflector, Plexiglas bottom reflector, Pb reflected 4 faces	14	0.9778 ± 0.0036
CAA08	Experiment 26A. 215-4.89% U rods, 0.762-cm diam, 30-cm long, 1.3-cm pitch, H_2O moderated, H_2O top reflector, Plexiglas bottom reflector, Pb reflected 4 faces	14	0.9966 ± 0.0030
CAA09	Experiment 28A. 255-4.89% U rods, 0.762-cm diam, 30-cm long, 1.3-cm pitch, H_2O moderated, H_2O top reflector, Plexiglas bottom reflector, Pb reflected 4 faces, SS in center	14	0.9950 ± 0.0029
CAA10	Experiment 30C. 494-4.89% U rods, 0.762-cm diam, 30-cm long, 1.3-cm pitch, H_2O moderated, H_2O to reflector, Plexiglas bottom reflector, Pb reflected 4 faces, boral in row 6	14	1.0010 ± 0.0032
CAA11	Experiment 31C. 494-4.89% U rods, 0.762-cm diam, 30-cm long, 1.3-cm pitch, H_2O moderated, H_2O top reflector, Plexiglas bottom reflector, Pb reflected 4 faces, Cd in row 6	14	0.9921 ± 0.0033
CAA12	Experiment 32S. 11 x 12 array of 4.89% U rods in ~300 g U/l UO_2F_2 solution, 0.762-cm diam, 2.05-cm pitch, in 95.88-cm-diam tank	14	0.9885 ± 0.0026

Table 1 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAA13	Experiment 33S. 9 x 10 array of 4.89% U rods in ~300 g U/l UO_2F_2 solution, 0.762-cm diam, 2.05-cm pitch, in 95.88-cm-diam tank	14	1.0035 ± 0.0022
CAA14	Experiment 36S. 9 x 10 array of 4.89% U rods in ~300 g U/l UO_2F_2 solution, 0.762-cm diam, 2.453-cm pitch, in 95.88-cm-diam tank	14	0.9921 ± 0.0025
CAA15	Experiment 40S. 6 x 7 array of 4.89% U rods in ~300 g U/l UO_2F_2 solution, 1.31-cm diam, 2.99-cm pitch, in 95.88-cm-diam tank	14	0.9908 ± 0.0020
CAA16	Experiment 42S. 6 x 7 array of 4.89% U rods in ~300 g U/l UO_2F_2 solution, 1.31-cm diam, 3.40-cm pitch, in 95.88-cm-diam tank	14	0.9940 ± 0.0025
CAA17	Experiment 44S. 6 x 7 array of 4.89% U rods in ~300 g U/l UO_2F_2 solution, 1.31-cm diam, 3.94-cm pitch, in 95.88-cm-diam tank	14	0.9884 ± 0.0029
CAA18	Experiment 45S. 6 x 7 array of 4.89% U rods in ~300 g U/l UO_2F_2 solution, 1.31-cm diam, 4.40-cm pitch, in 95.88-cm-diam tank	14	0.9885 ± 0.0025
CAA19	4.89% U_3O_8 - Stereotex blocks 55.5 g U-235/l, unreflected	15	0.9875 ± 0.0035
CAA20	4.89% U_3O_8 - Stereotex blocks 40.6 g U-235/l (H/X = 395.0), unreflected	15	1.0030 ± 0.0031
CAA21	4.89% U_3O_8 - Stereotex blocks, 22.1 g U-235/l (H/X = 757.0), unreflected	15	1.0055 ± 0.0029
CAA22	4.89% U_3O_8 - Stereotex blocks 33.3 g U-235/l (H/X = 503.6), unreflected	15	1.0042 ± 0.0034
CAA23	4.89% U_3O_8 - Stereotex blocks 64.91 g U-235/l (H/X = 199.3), paraffin top reflector, H_2O reflected bottom and sides	15	0.9791 ± 0.0036
CAA24	4.89% U_3O_8 - Stereotex blocks 56.2 g U-235/l (H/X = 244.8), paraffin top reflector, H_2O reflected bottom and sides	15	0.9918 ± 0.0033
CAA25	4.89% U_3O_8 - Stereotex blocks 40.6 g U-235/l (H/X = 396.7), paraffin top reflector, H_2O reflected bottom and sides	15	1.0015 ± 0.0035

Table 1 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAA26	4.89% U_3O_8 - Stereotex blocks 22.2 g U-235/l (H/X = 756.5), paraffin top reflector, H_2O reflected bottom and sides	15	0.9991 ± 0.0025
CAA27	4.89% U_3O_8 - Stereotex blocks 81.1 g U-235/l (H/X = 146.8), paraffin top reflector, H_2O reflected bottom and sides	15	0.9991 ± 0.0040
CAA28	4.89% U_3O_8 - Stereotex blocks 107.0 g U-235/l (H/X = 82.7), paraffin top reflector, H_2O reflected bottom and sides	15	0.9739 ± 0.0035
CAA29	4.89% U_3O_8 - Stereotex blocks 33.3 g U-235/l (H/X = 504.1), paraffin top reflector, H_2O reflected bottom and sides	15	0.9938 ± 0.0031
CAA30	4.89% UO_2F_2 solution 42.54 g U-235/l (H/X = 524) in a 20-in.-diam SS cylinder, unreflected	15	0.9861 ± 0.0032
CAA31	4.89% UO_2F_2 solution 42.54 g U-235/l (H/X = 524) in a 20 x 20 in. aluminum box, unreflected	15	0.9936 ± 0.0032
CAA32	4.89% UO_2F_2 solution 31.79 g U-235/l (H/X = 735) in a 20-in.-diam SS cylinder, unreflected	15	0.9936 ± 0.0028
CAA33	4.89% UO_2F_2 solution 24.04 g U-235/l (H/X = 1002) in a 27.3-in.-diam aluminum sphere, unreflected	15	0.9949 ± 0.0027
CAA34	4.89% UO_2F_2 solution 24.28 g U-235/l (H/X = 991) in a 30-in.-diam aluminum cylinder, unreflected	15	0.9959 ± 0.0022
CAA35	4.89% UO_2F_2 solution 42.54 g U-235/l (H/X = 524) in a 15-in.-diam SS cylinder, H_2O reflected	15	1.0029 ± 0.0030
CAA36	4.89% UO_2F_2 solution 42.54 g U-235/l (H/X = 524) in a 20 x 20 in. aluminum box, H_2O reflected	15	1.0106 ± 0.0026
CAA37	4.89% UO_2F_2 solution 31.79 g U-235/l (H/X = 735) in a 15-in.-diam SS cylinder, H_2O reflected	15	0.9931 ± 0.0027
CAA38	4.89% UO_2F_2 solution 22.11 g U-235/l (H/X = 991) in a 27.3-in.-diam aluminum sphere, H_2O reflected	15	0.9927 ± 0.0022
CAA39	4.89% UO_2F_2 solution 24.22 g U-235/l (H/X = 994) in a 20-in.-diam SS cylinder, H_2O reflected	15	1.0001 ± 0.0025

Table 2. KENO V.a calculated k_{eff} for experimentally critical low enriched uranium systems (last modeled in ref. 11)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAB01	(EBJ.1) lattice 2. 15-3.85% U rods, 7.2 in. diam x 30 in. long in square lattice, 7.2 in. center to center, 77.8 cm water height	16	0.9893 ± 0.0026
CAB02	(EBJ.2X) lattice 5. 11-3.85% U rods, 7.2 in. diam x 30 in. long in square lattice, 7.95 in. center to center, 72.4 cm water height	16	1.0025 ± 0.0029
CAB03	(EBJ.3X) lattice 8. 24-3.85% U rods, 7.2 in. diam x 30 in.long in square lattice, 8.70 in. center to center, 75.0 cm water height	16	0.9927 ± 0.0025
CAB07	(EBJ.4) lattice 3. 16-3.85% U rods, 7.2 in. diam x 30 in. long in triangular lattice, 7.45 in. center to center, 79.3 cm water height	16	0.9897 ± 0.0025
CAB08	(EBJ.5X) lattice 9. 7-3.85% U rods, 7.2 in. diam x 30 in. long in triangular lattice, 8.20 in. center to center, 53.1 cm water height	16	0.9924 ± 0.0032
CAB09	(EBJ.6X) lattice 2. 11-3.85% U rods, 7.2 in. OD x 2.6 in. ID x 30 in. long in triangular lattice, 7.20 center to center, 77.2 cm water height	16	X*
CAB10	(EBJ.8) lattice 5. 6-3.85% U rods, 7.2 in. OD x 2.6 in. ID x 30 in. long in square lattice, 7.95 in. center to center, 91.4 cm water height (2 subcritical)	16	0.9998 ± 0.0024
CAB11	(EBJ.9) lattice 6. 16-3.85% U rods, 7.2 in. OD x 2.6 in. ID x 30 in. long in square lattice, 8.70 in. center to center, 49.2 cm water height	16	0.9953 ± 0.0025
CAB12	(EBJ.10) lattice 14. 20-3.85% U rods, 7.2 in. OD x 2.6 in. ID x 30 in. long in square lattice, 9.07 in. center to center, 79 cm water height	16	0.9943 ± 0.0028

Table 2 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAB13	(EBJ.11) lattice 19. 8-3.85% U rods, 7.2 in. OD x 2.6 in. ID x 30 in. long in square lattice, 7.2 in. center to center, 72.5 cm water height	16	0.9960 ± 0.0028
CAB14	(EBJ.12) lattice 3. 22-3.85% U rods, 2.5 in. diam x 30 in. long in square lattice, 2.85 in. center to center, 72.3 cm water height	16	1.0093 ± 0.0026
CAB15	(EBJ.13) lattice 9. 15-3.85% U rods, 2.5 in. diam x 30 in. long in square lattice, 3.25 in. center to center, 64.8 cm water height	16	0.9992 ± 0.0030
CAB16	(EBJ.14) lattice 2. 23-3.85% U rods, 2.5 in. diam x 30 in. long in square lattice 4.00 in. center to center, 68.9 cm water height	16	0.9877 ± 0.0029

*Job failed in execution.

Table 3. KENO V.a calculated k_{eff} for experimentally critical low enriched uranium systems (last modeled in ref. 7)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAS04	An unreflected rectangular parallelepiped of homogeneous $U(1.4)F_4$ and paraffin with an H/U-235 atomic ratio of 421.8; 93.1 cm x 93.0 cm x 123.8 cm	17	0.9998 ± 0.0022
CAS05	An unreflected rectangular parallelepiped of homogeneous $U(1.4)F_4$ and paraffin with an H/U-235 atomic ratio of 421.8; 100.0 cm x 99.9 cm x 103.1 cm	17	0.9989 ± 0.0026
CAS06	An unreflected rectangular parallelepiped of homogeneous $U(1.4)F_4$ and paraffin with an H/U-235 atomic ratio of 421.8; 130.7 cm x 130.6 cm x 74.2 cm	17	0.9967 ± 0.0022
CAS11	A reflected rectangular parallelepiped of homogeneous $U(2)F_4$ and paraffin with an H/U-235 atomic ratio of 195.2; 56.22 cm x 56.22 cm x 112.88 cm, reflected with 15.2 cm of paraffin on top and sides and 15.2 cm of Plexiglas on the bottom	18	1.0023 ± 0.0030
CAS12	An unreflected rectangular parallelepiped of homogeneous $U(2)F_4$ and paraffin with an H/U-235 atomic ratio of 195.2; 71.47 cm x 71.47 cm x 94.14 cm	18	1.0096 ± 0.0026
CAS13	A reflected rectangular parallelepiped of homogeneous $U(2)F_4$ and paraffin with an H/U-235 atomic ratio of 293.9; 51.11 cm x 51.11 cm x 73.87 cm, reflected with 15.2 cm of paraffin on top	18	1.0054 ± 0.0029
CAS14	An unreflected rectangular parallelepiped of homogeneous $U(2)F_4$ and paraffin with an H/U-235 atomic ratio of 293.9; 56.22 cm x 56.22 cm x 122.47 cm	18	1.0028 ± 0.0027
CAS15	A reflected rectangular parallelepiped of homogeneous $U(2)F_4$ and paraffin with an H/U-235 atomic ratio of 406.3; 53.67 cm x 53.67 cm x 54.29 cm, reflected with 15.2 cm of paraffin on top and sides and 15.2 cm of Plexiglas on the bottom	18	0.9967 ± 0.0024
CAS16	A reflected rectangular parallelepiped of homogeneous $U(2)F_4$ and paraffin with an H/U-235 atomic ratio of 495.9; 46.00 cm x 46.00 cm x 96.57 cm, reflected with 15.2 cm of paraffin on top and sides and 15.2 cm of Plexiglas on the bottom	18	1.0000 ± 0.0026
CAS17	A reflected rectangular parallelepiped of homogeneous $U(2)F_4$ and paraffin with an H/U-235 atomic ratio of 613.6; 56.32 cm x 61.29 cm x 54.08 cm, reflected with 15.2 cm of polyethylene on top and sides and 15.2 cm of Plexiglas on the bottom	18	0.9982 ± 0.0027

Table 3 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAS18	An unreflected rectangular parallelepiped of homogeneous $U(2)F_4$ and paraffin with an H/U-235 atomic ratio of 613.6; 61.3 cm x 66.54 cm x 66.52 cm	18	0.9975 ± 0.0024
CAS19	A reflected rectangular parallelepiped of homogeneous $U(2)F_4$ and paraffin with an H/U-235 atomic ratio of 971.7; 76.51 cm x 76.44 cm x 82.42 cm, reflected with 5.2 cm of polyethylene on top and sides and 15.2 cm of Plexiglas on the bottom	18	0.9885 ± 0.0020
CAS20	An unreflected rectangular parallelepiped of homogeneous $U(2)F_4$ and paraffin with an H/U-235 atomic ratio of 971.7; 81.45 cm x 86.70 cm x 88.22 cm	18	0.9846 ± 0.0018
CAS21	A reflected rectangular parallelepiped of homogeneous $U(3)F_4$ and paraffin with an H/U-235 atomic ratio of 133.4; 51.14 cm x 51.14 cm x 51.27 cm, reflected with 15.2 cm of paraffin on top and sides and 15.2 cm of Plexiglas on the bottom	18	1.0145 ± 0.0030
CAS22	A reflected rectangular parallelepiped of homogeneous $U(3)F_4$ and paraffin with an H/U-235 atomic ratio of 133.4; 43.47 cm x 43.47 cm x 86.39 cm, reflected with 15.2 cm of paraffin on top and sides and 15.2 cm of Plexiglas on the bottom	18	1.0228 ± 0.0030
CAS23	A reflected rectangular parallelepiped of homogeneous $U(3)F_4$ and paraffin with an H/U-235 atomic ratio of 133.4; 46.02 cm x 46.02 cm x 67.57 cm, reflected with 15.2 cm of paraffin on top and sides and 15.2 cm of Plexiglas on the bottom	18	1.0169 ± 0.0032
CAS24	A reflected rectangular parallelepiped of homogeneous $U(3)F_4$ and paraffin with an H/U-235 atomic ratio of 133.4; 56.25 cm x 56.25 cm x 43.41 cm, reflected with 15.2 cm of paraffin on top and sides and 15.2 cm of Plexiglas on the bottom	18	1.0129 ± 0.0026
CAS25	A reflected rectangular parallelepiped of homogeneous $U(3)F_4$ and paraffin with an H/U-235 atomic ratio of 133.4; 61.36 cm x 61.36 cm x 38.67 cm, reflected with 15.2 cm of paraffin on top and sides and 15.2 cm of Plexiglas on the bottom	18	1.0201 ± 0.0032
CAS26	An unreflected rectangular parallelepiped of homogeneous $U(3)F_4$ and paraffin with an H/U-235 atomic ratio of 133.4; 56.47 cm x 56.47 cm x 86.64 cm	18	1.0152 ± 0.0025

Table 3 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAS27	An unreflected rectangular parallelepiped of homogeneous $U(3)F_4$ and paraffin with an H/U-235 atomic ratio of 133.4; 56.25 cm x 61.36 cm x 74.38 cm	18	1.0187 ± 0.0030
CAS28	An unreflected rectangular parallelepiped of homogeneous $U(3)F_4$ and paraffin with an H/U-235 atomic ratio of 133.4; 61.4 cm x 61.4 cm x 66.0 cm	18	1.0180 ± 0.0028
CAS29	A reflected rectangular parallelepiped of homogeneous $U(3)F_4$ and paraffin with an H/U-235 atomic ratio of 276.9; 40.81 cm x 40.80 cm x 39.49 cm, reflected with 15.2 cm of polyethylene on top and sides and 15.2 cm of Plexiglas on the bottom	18	1.0131 ± 0.0030
CAS30	An unreflected rectangular parallelepiped of homogeneous $U(3)F_4$ and paraffin with an H/U-235 atomic ratio of 276.9; 40.90 cm x 40.93 cm x 116.80 cm	18	1.0173 ± 0.0030
CAS31	An unreflected rectangular parallelepiped of homogeneous $U(3)F_4$ and paraffin with an H/U-235 atomic ratio of 276.9; 48.59 cm x 51.14 cm x 48.53 cm	18	1.0131 ± 0.0030
CAS32	An unreflected rectangular parallelepiped of homogeneous $U(3)F_4$ and paraffin with an H/U-235 atomic ratio of 276.9; 81.71 cm x 81.66 cm x 31.34 cm	18	1.0124 ± 0.0030
CAS33	A composite cadmium/steel/water side reflected stainless steel cylinder of 0.079 cm wall thickness and 19.545 cm IR filled to a height of 54.45 cm with $U(4.98)O_2F_2$ solution at an H/U-235 atomic ratio of 488	19	0.9989 ± 0.0030
CAS34	A composite 1-in. steel/water side reflected steel cylinder of 0.079 cm wall thickness and 16.51 cm IR filled to a height of 143 cm with $U(4.98)O_2F_2$ solution at an H/U-235 atomic ratio of 488	19	1.0006 ± 0.0028 stainless
CAS35	An unreflected sphere of $U(4.98)O_2F_2$ with an H/U-235 atomic ratio of 490. Solution radius of 25.3873 cm and stainless steel container wall thickness of 0.0508 cm	20	0.9970 ± 0.0034
CAS36	An unreflected stainless steel cylinder of 0.07874 cm wall thickness and a 19.55 cm IR filled to a height of 101.7 cm with $U(4.98)O_2F_2$ solution at an H/U-235 atomic ratio of 496	21	1.0023 ± 0.0032

Table 3 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAR01	Experiment 1. 4.46% enriched U_3O_8, H/U = 0.77, 42 fuel cans with 2.44 cm interstitial moderation, plastic reflected	22	1.0081 ± 0.0034
CAR02	Experiment 2. 4.46% enriched U_3O_8, H/U = 0.77, 43 fuel cans with 2.44 cm interstitial moderation, plastic reflected	22	1.0052 ± 0.0031
CAR03	Experiment 3. 4.46% enriched U_3O_8, H/U = 0.77, 100 fuel cans with 0.929 cm interstitial moderation, plastic reflected	22	0.9876 ± 0.0030
CAR04	Experiment 13. 4.46% enriched U_3O_8, H/U = 0.77, 40 fuel cans with 2.44 cm interstitial moderation, concrete reflected	22	1.0089 ± 0.0029
CAR05	Experiment 15. 4.46% enriched U_3O_8, H/U = 0.77, 98 fuel cans with 0.929 cm interstitial moderation, concrete reflected	22	0.9998 ± 0.0027
CAR06	4.46% enriched U_3O_8, H/U = 0.77, driven by 93.12% enriched uranium metal sphere (29.870 kg), 120 + 4S fuel cans, plastic reflected	23	0.9951 ± 0.0031
CAR07	4.46% enriched U_3O_8, H/U = 0.77, driven by high concentration (14.844 kg 351.18 g/l) fuel cans, plastic reflected	23	0.9998 ± 0.0032
CAR08	4.46% enriched U_3O_8, H/U = 0.77, driven by low concentration (12.871 kg 86.42 g/l) 93.17% enriched $UO_2(NO_3)_2$, 119 + 2S fuel cans, plastic reflected	23	0.9980 ± 0.0036
CAR09	4.46% enriched U_3O_8, H/U = 0.77, driven by low concentration (13.001 kg 86.42 g/l) 93.17% enriched $UO_2(NO_3)_2$, 119 + 2S fuel cans, plastic reflected	23	0.9983 ± 0.0030
CAR10	4.46% enriched U_3O_8, H/U = 0.77, driven by low concentration (12.446 kg 86.42 g/l) 93.17% enriched $UO_2(NO_3)_2$, 119 + 2S fuel cans, concrete reflected	23	1.0008 ± 0.0034
CAR11	Experiment A. 4.46% enriched U_3O_8 H/U = 1.25, 38 fuel cans with 2.44 cm interstitial moderation, plastic reflected	24	1.0073 ± 0.0032
CAR12	Experiment B. 4.46% enriched U_3O_8 H/U = 1.25, 78 fuel cans with 0.929 cm interstitial moderation, plastic reflected	24	1.0109 ± 0.0031

Table 3 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAR13	Experiment C. 4.46% enriched U_3O_8 H/U = 1.25,80 fuel cans with 0.929 cm interstitial moderation, plastic reflected	24	1.0108 ± 0.0032
CAR14	4.46% enriched U_3O_8 H/U = 1.25, driven by high concentration (12.268 kg 351.64 gU/l), 93.17% enriched $UO_2(NO_3)_2$, 119 + 2S fuel cans, plastic reflected	24	0.9907 ± 0.0034
CAR15	4.46% enriched U_3O_8 H/U = 1.25, driven by high concentration (12.400 kg 351.65 gU/l), 93.17% enriched $UO_2(NO_3)_2$, 119 + 2S fuel cans, plastic reflected	24	1.0106 ± 0.0033
CAR16	4.46% enriched U_3O_8 H/U = 1.25, driven by low concentration (10.836 kg p 86.60 gU/l), 93.17% enriched $UO_2(NO_3)_2$, 119 + 2S fuel cans, plastic reflected	24	0.9978 ± 0.0036
CAR17	Experiment F. 4.46% enriched U_3O_8 H/U = 2.03, 48 fuel cans with 0.92 cm interstitial moderation, plastic reflected	25	1.0069 ± 0.0033
CAR18	Experiment G. 4.46% enriched U_3O_8 H/U = 2.03, 30 fuel cans with 2.44 cm interstitial moderation, plastic reflected	25	1.0005 ± 0.0030
CAR19	Experiment D. 4.46% enriched U_3O_8 H/U = 2.03, driven by 93.12% enriched uranium metal sphere (13.73 kg), 120 + 4S fuel cans, plastic reflected	25	1.0097 ± 0.0032
CAR20	Experiment E. 4.46% enriched U_3O_8 H/U = 2.03, driven by 93.12% enriched hollow uranium metal sphere (12.786 kg), 120 + 4S fuel cans, plastic reflected	25	0.9911 ± 0.0031

Table 4. KENO V.a calculated k_{eff} for experimentally critical highly enriched uranium systems (last modeled in ref. 8)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAA01	$U(93.2)O_2F_2$ solution sphere H/X = 1112, unreflected	26	1.0096 ± 0.0026
CAA02	$U(93.2)O_2F_2$ solution sphere H/X = 1393 unreflected	26	1.0036 ± 0.0023
CAA03	$U(93.2)O_2(NO_3)_2$ solution sphere H/X = 1379, unreflected	26	0.9998 ± 0.0023
CAA04	$U(93.2)O_2F_2$ solution sphere H/X = 76.1, H_2O reflected	26	1.0071 ± 0.0039
CAA05	$U(93.2)O_2F_2$ solution sphere H/X = 126.5, H_2O reflected	26	0.9971 ± 0.0046
CAA06	$U(93.2)O_2F_2$ solution sphere H/X = 1270, H_2O reflected	26	0.9964 ± 0.0023
CAA07	$U(93.2)O_2F_2$ solution sphere H/X = 268.8, H_2O reflected	27	1.0097 ± 0.0043
CAA08	$U(93.2)O_2F_2$ solution sphere H/X = 515.1, H_2O reflected	27	1.0212 ± 0.0033
CAA09	$U(93.2)O_2F_2$ solution sphere H/X = 203.5 unreflected	27	0.9991 ± 0.0039
CAA10	$U(93.2)O_2F_2$ solution sphere H/X = 239.3, H_2O reflected	27	1.0164 ± 0.0042
CAA11	$U(93.2)O_2F_2$ solution sphere H/X = 468.2, H_2O reflected	27	1.0351 ± 0.0039
CAA12	$U(93.2)O_2(NO_3)_2$ solution 142.92 g U/l, 28.01 cm diam cylinder, unreflected	28	1.0090 ± 0.0039
CAA13	$U(93.2)O_2(NO_3)_2$ solution 357.71 g U/l, 28.01 cm diam cylinder, unreflected	28	1.0060 ± 0.0035
CAA14	$U(93.2)O_2(NO_3)_2$ solution 54.89 g U/l, 33.01 cm diam cylinder, unreflected	28	1.0119 ± 0.0042
CAA15	$U(93.2)O_2(NO_3)_2$ solution 137.4 g U/l, 33.01 cm diam cylinder, unreflected	28	1.0027 ± 0.0046

Table 4 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAA16	$U(93.2)O_2(NO_3)_2$ solution 357.71 g U/l, 33.01 cm diam cylinder, unreflected	28	1.0024 ± 0.0045
CAA17	$U(93.2)O_2(NO_3)_2$ solution 144.38 g U/l, 28.01 cm diam cylinder, concrete reflected	28	1.0106 ± 0.0041
CAA18	$U(93.2)O_2(NO_3)_2$ solution 334.77 g U/l, 28.01 cm diam cylinder, concrete reflected	28	1.0145 ± 0.0044
CAA19	$U(93.2)O_2(NO_3)_2$ solution 144.38 g U/l, 33.01 cm diam cylinder, concrete reflected	28	1.0056 ± 0.0043
CAA20	$U(93.2)O_2(NO_3)_2$ solution 334.77 g U/l, 33.01 cm diam cylinder, concrete reflected	28	1.0037 ± 0.0044
CAA21	$U(93.2)O_2(NO_3)_2$ solution 144.38 g U/l, 28.01 cm diam cylinder, concrete reflected	28	1.0094 ± 0.0040
CAA22	$U(93.2)O_2(NO_3)_2$ solution 334.77 g U/l, 33.01 cm diam cylinder, concrete reflected	28	1.0092 ± 0.0037
CAA23	$U(93.2)O_2(NO_3)_2$ solution 147.66 g U/l, 28.01 cm diam cylinder, Plexiglas reflected	28	1.0085 ± 0.0040
CAA24	U(93.2) solution 345.33 g U/l, 28.01 cm diam cylinder, Plexiglas reflected	28	1.0113 ± 0.0047
CAA25	$U(93.2)O_2(NO_3)_2$ solution 147.66 g U/l, 33.01 cm diam cylinder, Plexiglas reflected	28	0.9947 ± 0.0041
CAA26	$U(93.2)O_2(NO_3)_2$ solution 345.33 g U/l, 33.01 cm diam cylinder, Plexiglas reflected	28	1.0033 ± 0.0040
CAA27	$U(93.2)O_2(NO_3)_2$ solution 147.66 g U/l, 28.01 cm diam cylinder, Plexiglas reflected	28	1.0157 ± 0.0034

Table 4 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAA28	$U(93.22)O_2(NO_3)_2$ solution 345.33 g U/l, 33.01 cm diam cylinder, Plexiglas reflected	28	1.0141 ± 0.0043
CAA29	$U(93.22)O_2(NO_3)_2$ solution 67.28 g U/l, 21.12 cm diam cylinder in a 4 x 4 array, concrete reflected	28	1.0046 ± 0.0033
CAA30	$U(93.12)O_2(NO_3)_2$ solution 364.11 g U/l, 21.12 cm diam cylinder in a 4 x 4 array, concrete reflected	28	1.0061 ± 0.0041
CAA31	$U(93.2)O_2(NO_3)_2$ solution 83.49 g U/l, 16.12 cm diam cylinder in a 4 x 4 array, concrete reflected	28	1.0119 ± 0.0035
CAA32	$U(93.2)O_2(NO_3)_2$ solution 359.55 g U/l, 16.12 c diam cylinder in a 4 x 4 array, concrete reflected	28	1.0056 ± 0.0041
CAA33	$U(93.2)O_2(NO_3)_2$ solution 76.09 g U/l, 21.12 cm diam cylinder in a 2 x 2 array, concrete reflected	28	1.0098 ± 0.0033
CAA34	$U(93.2)O_2(NO_3)_2$ solution 364.11 g U/l, 21.2 cm diam cylinder in a 2 x 2 array, concrete reflected	28	1.0014 ± 0.0038
CAA35	$U(93.2)O_2(NO_3)_2$ solution 359.55 g U/l, 16.12 cm diam cylinder in a 2 x 2 array, concrete reflected	28	1.0129 ± 0.0045
CAA36	$U(93.2)O_2(NO_3)_2$ solution 359.55 g U/l, 16.12 cm diam cylinder in a 2 x 4 array, concrete reflected	28	1.0099 ± 0.0039
CAA37	$U(93.2)O_2(NO_3)_2$ solution 60.32 g U/l, 21.12 cm diam cylinder in a 4 x 4 array, Plexiglas reflected	28	1.0000 ± 0.0034
CAA38	$U(93.2)O_2(NO_3)_2$ solution 355.94 g U/l, 21.12 cm diam cylinder in a 4 x 4 array, Plexiglas reflected	28	0.9961 ± 0.0038
CAA39	$U(93.2)O_2(NO_3)_2$ solution 60.32 g U/l, 16.12 cm diam cylinder in a 4 x 4 array, Plexiglas reflected	28	1.0045 ± 0.0034

Table 4 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAA40	$U(93.2)O_2(NO_3)_2$ solution 355.94 g U/l, 16.12 cm diam cylinder in a 4 x 4 array, Plexiglas reflected	28	0.9985 ± 0.0039
CAA41	$U(93.2)O_2(NO_3)_2$ solution 60.32 g U/l, 21.12 cm diam cylinder in a 2 x 2 array, Plexiglas reflected	28	0.9985 ± 0.0040
CAA42	$U(93.2)O_2(NO_3)_2$ solution 355.94 g U/l, 21.12 cm diam cylinder in a 2 x 2 array, Plexiglas reflected	28	1.0041 ± 0.0036
CAA43	$U(93.2)O_2(NO_3)_2$ solution 355.94 g U/l, 16.12 cm diam cylinder in a 3 x 2 array, Plexiglas reflected	28	0.9982 ± 0.0038

Table 5. KENO V.a calculated k_{eff} for experimentally critical highly enriched uranium systems (last modeled in ref. 6)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAS01	Y-12 validation case A-1. 93.8% U metal sphere, unreflected (GODIVA)	29	1.0004 ± 0.0027
CAS04	Y-12 validation case A-2. 93.2% U-Mo alloy cylinder annulus, unreflected	30	1.0067 ± 0.0028
CAS05	Y-12 validation case A-3. 93.2% UO_2F_2 solution, 19.992 g U/l, in Al sphere, unreflected	26	1.0023 ± 0.0027
CAS06	Y-12 validation case A-4. 93.18% $UO_2(NO_3)_2$ solution, 20.12 g U/l, in Al sphere, unreflected	31	1.0012 ± 0.0022
CAS07	Y-12 validation case A-5. 93.5% U metal hemispherical shell, H_2O reflected	32	1.0042 ± 0.0030
CAS08	Y-12 validation case A-6. 93.2% U metal cylinder annulus, graphite reflected	33	1.0124 ± 0.0031
CAS09	Y-12 validation case A-7. 94% U metal cuboid, natural U reflected	32	1.0027 ± 0.0025
CAS10	Y-12 validation case A-8. 93.1% U metal hemispherical shell, oil reflected	34	1.0114 ± 0.0034
CAS11	Y-12 validation case A-9. 93.1% U metal hemispherical shell, steel center and oil reflected	34	0.9977 ± 0.0035
CAS02	Y-12 validation case A-10. 97.67% U metal sphere, H_2O reflected	35	0.9995 ± 0.0031
CAS03	Y-12 validation case A-11. 93.172% $UO_2(NO_3)_2$ solution, 346.7 g U/l, in SS cylinder, unreflected	28	1.0029 ± 0.0044
CAS12	Y-12 validation case B-1. 93.2% U metal cylinder annulus, unreflected, smaller U cylinder in hole touching one wall	36	1.0004 ± 0.0031
CAS22	Y-12 validation case B-2. 93.2% U metal cylinder annulus, unreflected, smaller U block in hole touching one wall	36	1.0082 ± 0.0034
CAS23	Y-12 validation case B-3. 93.2% U metal, unreflected cylinders and cuboids in approximate circular arrangement, cylinder, cuboid, and hemisphere stack in center	36	0.9959 ± 0.0030

Table 5 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAS24	Y-12 validation case B-4. 93.2% U metal cylinders, 4 x 4 x 4 array, unreflected	37	0.9928 ± 0.0033
CAS25	Y-12 validation case B-5. 93.2% U metal cylinders, 2 x 2 x 2 array, each unit in the array is a smaller cylinder capped on each end by a larger cylinder, unreflected	37	1.0079 ± 0.0030
CAS26	Y-12 validation case B-6. 93.2% U metal cylinders, 2 x 2 x 2 array, paraffin reflected	37	1.0011 ± 0.0033
CAS27	Y-12 validation case B-7. 93.2% U metal cylinders, 2 x 2 x 2 array, each unit in the array is a smaller cylinder capped on each end by a larger cylinder, paraffin reflected	37	1.0083 ± 0.0031
CAS28	Y-12 validation case B-8. 93.2% U metal cylinders each in a Plexiglas box, 2 x 2 x 2 array of these units unreflected	37	1.0102 ± 0.0037
CAS29	Y-12 validation case B-9. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 3 x 3 x 3 array, unreflected (see also problem U4B271F)	38	0.9872 ± 0.0041
CAS13	Y-12 validation case B-10. 92.6% $UO_2(NO_3)_2$ solution, 63.3 g U/l, in Plexiglas cylinders, 3 x 3 x 3 array, unreflected (see also problem U6B271F)	38	0.9854 ± 0.0035
CAS14	Y-12 validation case B-11. 93.2% $UO_2(NO_3)_2$ solution, 505 g U/l, in SS cylinders, 4 x 4 array, standing in a solution slab, Plexiglas reflected	39	1.0585 ± 0.0038
CAS15	Y-12 validation case B-12. 93.2% U metal cylinders, 2 x 2 x 2 array, graphite moderated and polyethylene reflected	40	1.0126 ± 0.0030
CAS16	Y-12 validation case B-13. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 4 x 4 x 4 array, unreflected (see also (problem U4B641F)	38	0.9879 ± 0.0037

Table 5 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAS17	Y-12 validation case B-14. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 3 x 3 x 3 array, paraffin reflected (see also problem U4R27I1F)	38	1.0250 ± 0.0037
CAS18	Y-12 validation case B-15. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 3 x 3 x 3 array, Plexiglas reflected (see also problem U4R27G1F)	38	1.0010 ± 0.0045
CAS19	Y-12 validation case B-16. 93.1% $UO_2(NO_3)_2$ solution, 450.8 g U/l, in SS containers, square central column with 8 perpendicular cylindrical arms unreflected	41,42	1.0329 ± 0.0046
CAS20	Y-12 validation case B-17. 93.17% $UO_2(NO_3)_2$ solution, 355.9 g U/l, in Al cylinders, 4 x 4 array, Plexiglas reflected	28	1.03654 ± 0.0037
CAS21	Y-12 validation case B-18. 93.17% $UO_2(NO_3)_2$ solution, 364.1 g U/l, in Al cylinders, 4 x 4 array, concrete reflected	28	1.0239 ± 0.0043
CAS30	Problem S333SPO. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs, 3 7.62 cm slabs in 3 x 1 array, 0 cm separation, unreflected, cylindrical tank, floor and walls in experiment room included	43	0.9978 ± 0.0038
CAS32	Problem S333SP1. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs, 3 7.62 cm slabs in 3 x 1 array, 2.54 cm separation, unreflected, cylindrical tank, floor, and walls in experiment room included	43	0.9805 ± 0.0039
CAS34	Problem S333SP3. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs, 3 7.62 cm slabs in 3 x 1 array, 7.62 cm separation, unreflected, cylindrical tank, floor, and walls in experiment room included	43	0.9803 ± 0.0039
CAS36	Problem S333SP4. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs, 3 7.62 cm slabs in 3 x 1 array, 11.43 cm separation, unreflected, cylindrical tank, floor, and walls in experiment room included	43	0.9933 ± 0.0035

Table 5 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAS38	Problem S333SP5. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs, 3 7.62 cm slabs in 3 x 1 array, 13.97 cm separation, unreflected, cylindrical tank, floor, and walls in experiment room included	43	0.9881 ± 0.0035
CAS40	Problem S333SP6. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs, 3 7.62 cm slabs in 3 x 1 array, 15.24 cm separation, unreflected, cylindrical tank, floor, and walls in experiment room included	43	0.9824 ± 0.0041
CAS31	Problem S333SPOR. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs, 3 7.62 cm slabs in 3 x 1 array, 0 cm separation, H_2O reflected	43	0.9949 ± 0.0035
CAS33	Problem S333SP1R. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs, 3 7.62 cm slabs in 3 x 1 array, 2.54 cm separation, H_2O reflected	43	0.9995 ± 0.0039
CAS35	Problem S333SP3R. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs, 3 7.62 cm slabs in 3 x 1 array, 7.62 cm separation, H_2O reflected	43	0.9906 ± 0.0036
CAS37	Problem S333SP4R. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs, 3 7.62 cm slabs in 3 x 1 array, 11.43 cm separation, H_2O reflected	43	1.0030 ± 0.0031
CAS39	Problem S333SP5R. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs, 3 7.62 cm slabs in 3 x 1 array, 13.97 cm separation, H_2O reflected	43	0.9952 ± 0.0035
CAS42	Problem S36SP2. 93.2% UO_2F_2 solution, 81.8 g U/l in Al slabs, 7.62 cm and 14.834 cm slabs in 2 x 1 array, 5.08 cm separation, unreflected	43	0.9916 ± 0.0037
CAS41	Problem S36SP15. 93.2% UO_2F_2 solution, 81.8 g U/l in Al slabs, 7.62 cm and 14.834 cm slabs in 2 x 1 array, 38.1 cm separation, unreflected	43	0.9767 ± 0.0038

Table 5 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAS43	Problem S36SP30. 93.2% UO_2F_2 solution, 81.8 g U/l in Al slabs, 7.62 cm and 14.834 cm slabs in 2 x 1 array, 76.2 cm separation, unreflected	43	0.9835 ± 0.0037
CAS44	Problem S36SP48. 93.2% UO_2F_2 solution, 81.8 g U/l in Al slabs, 7.62 cm and 14.834 cm slabs in 2 x 1 array, 121.92 cm separation, unreflected	43	0.9757 ± 0.0035
CAS45	Problem S363SPO. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs, 7.62 cm, 14.834 cm, and 7.62 cm slabs in 3 x 1 array, 0 cm separation, unreflected	43	0.9871 ± 0.0040
CAS46	Problem S363SP10. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs, 7.62 cm, 14.834 cm, and 7.62 cm slabs in 3 x 1 array, 25.4 cm separation, unreflected	43	0.9832 ± 0.0040
CAS47	Problem S363SP20. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs, 7.62 cm, 14.834 cm, and 7.62 cm slabs in 3 x 1 array, 50.8 cm separation, unreflected	43	0.9819 ± 0.0037
CAS48	Problem S363SP32. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs, 7.62 cm, 14.834 cm, and 7.62 cm slabs in 3 x 1 array, 81.28 cm separation, unreflected	43	0.9813 ± 0.0039
CAS52	Problem S63SP6. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs. One slab is made up from two 7.62 cm slabs snugly fit together, the other is 7.62 cm, 2 x 1 array, 15.24 cm separation, unreflected	43	0.9852 ± 0.0038
CAS49	Problem S63SP12. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs. One slab is made up from two 7.62 cm slabs snugly fit together, the other is 7.62 cm, 2 x 1 array, 30.48 cm separation, unreflected	43	0.9831 ± 0.0045

Table 5 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAS50	Problem S63SP18. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs. One slab is made up from two 7.62 cm slabs snugly fit together, the other is 7.62 cm, 2 x 1 array, 45.72 cm separation, unreflected	43	0.9814 ± 0.0038
CAS51	Problem S63SP30. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs. One slab is made up from two 7.62 cm slabs snugly fit together, the other is 7.62 cm, 2 x 1 array, 76.2 cm separation, unreflected	43	0.9791 ± 0.0036
CAS54	Problem S66SP2. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs. One slab is 14.834 cm, and the other is made up from two 7.62 cm slabs snugly fit together, 2 x 1 array, 5.08 cm separation, unreflected	43	0.9831 ± 0.0034
CAS58	Problem S66SP2. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs. One slab is 14.834 cm, and the other is made up from two 7.62 cm slabs snugly fit together, 2 x 1 array, 15.24 cm separation, unreflected	43	0.9824 ± 0.0037
CAS53	Problem S66SP15. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs. One slab is 14.834 cm, and the other is made up from two 7.62 cm slabs snugly fit together, 2 x 1 array, 38.1 cm separation, unreflected	43	0.9884 ± 0.0039
CAS55	Problem S66SP20. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs. One slab is 14.834 cm, and the other is made up from two 7.62 cm slabs snugly fit together, 2 x 1 array, 50.8 cm separation, unreflected	43	0.9876 ± 0.0038

Table 5 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAS56	Problem S66SP30. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs. One slab is 14.834 cm, and the other is made up from two 7.62 cm slabs snugly fit together, 2 x 1 array, 76.2 cm separation, unreflected	43	0.9869 ± 0.0042
CAS57	Problem S66SP48. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs. One slab is 14.834 cm, and the other is made up from two 7.62 cm slabs snugly fit together, 2 x 1 array, 121.92 cm separation, unreflected	43	0.9864 ± 0.0041
CAS59	Problem S66SP66. 93.2% UO_2F_2 solution, 81.8 g U/l, in Al slabs. One slab is 14.834 cm, and the other is made up from two 7.62 cm slabs snugly fit together, 2 x 1 array, 167.64 cm separation, unreflected	43	0.9836 ± 0.0036
CAS91	Problem U6B271F. 92.6% $UO_2(NO_3)_2$ solution, 63.3 g U/l, in Plexiglas cylinders, 3 x 3 x 3 array, unreflected, walls, floor, and tank in experiment room included	38	1.0052 ± 0.0036
CAS60	Problem U2B271F. 92.6% $UO_2(NO_3)_2$ solution, 279 g U/l, in Plexiglas cylinders, 3 x 3 x 3 array, unreflected, walls, floor, and tank in experiment room included	38	0.9998 ± 0.0036
CAS61	Problem U2B81F. 92.6% $UO_2(NO_3)_2$ solution, 279 g U/l, in Plexiglas cylinders, 2 x 2 x 2 array, unreflected, walls, floor, and tank in experiment room included	38	1.0005 ± 0.0038
CAS62	Problem U4B1251F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 5 x 5 x 5 array, unreflected, walls, floor, and tank in experiment room included	38	0.9934 ± 0.0039

Table 5 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAS64	Problem U4B641F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 4 x 4 x 4 array, unreflected, walls, floor, and tank in experiment room included	38	0.9963 ± 0.0038
CAS63	Problem U4B271F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 3 x 3 x 3 array, unreflected, walls, floor, and tank in experiment room included	38	1.0050 ± 0.0044
CAS65	Problem U4B81F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 2 x 2 x 2 array, unreflected, walls, floor, and tank in experiment room included	38	1.0081 ± 0.0039
CAS90	Problem U4U2B27. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 3 x 3 x 3 array, unreflected, 279 g U/l in 5 central units, walls, floor, and tank in experiment room included	38	0.9977 ± 0.0042
CAS66	Problem U4R27A1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 3 x 3 x 3 array, reflected, 15.24 cm paraffin on bottom, 1.27 cm Plexiglas on other faces	38	1.002 ± 0.0037
CAS67	Problem U4R27B1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 3 x 3 x 3 array, reflected, 15.24 cm paraffin on bottom, 2.54 cm Plexiglas on other faces	38	1.0217 ± 0.0038
CAS68	Problem U4R27C1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 3 x 3 x 3 array, reflected, 15.24 cm paraffin on bottom, 1.27 cm Plexiglas on other faces	38	1.0170 ± 0.0042
CAS69	Problem U4R27D1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 3 x 3 x 3 array, reflected, 15.24 cm paraffin on 5 faces, 15.24 cm Plexiglas on 1 face	38	1.0227 ± 0.0040

Table 5 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAS70	Problem U4R27E1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 3 x 3 x 3 array, reflected, 15.24 cm paraffin on bottom, 3.81 cm paraffin on other faces	38	1.0205 ± 0.0039
CAS71	Problem U4R27F1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 3 x 3 x 3 array, reflected, 15.24 cm paraffin on bottom, 7.62 cm paraffin on other faces	38	1.0302 ± 0.0040
CAS72	Problem U4R27G1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 3 x 3 x 3 array, reflected, 1.27 cm Plexiglas all faces	38	1.0016 ± 0.0038
CAS73	Problem U4R27H1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 3 x 3 x 3 array, reflected, 1.27 cm paraffin all faces	38	1.0134 ± 0.0041
CAS74	Problem U4R27I1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 3 x 3 x 3 array, reflected, 15.24 cm paraffin all faces	38	1.0172 ± 0.0035
CAS75	Problem U4R27J1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 3 x 3 x 3 array, reflected, 3.81 cm paraffin all faces	38	1.0300 ± 0.0037
CAS76	Problem U4R8A1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 2 x 2 x 2 array, reflected, 15.24 cm paraffin on bottom, 1.27 cm Plexiglas on other faces	38	1.0046 ± 0.0044
CAS77	Problem U4R8B1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 2 x 2 x 2 array, reflected, 15.24 cm paraffin on bottom, 11.43 cm Plexiglas on other faces	38	1.0225 ± 0.0040

Table 5 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAS78	Problem U4R8C1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 2 x 2 x 2 array, reflected, 15.24 cm paraffin on bottom, 15.24 cm Plexiglas on other faces	38	1.0237 ± 0.0045
CAS79	Problem U4R8D1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 2 x 2 x 2 array, reflected, 15.24 cm paraffin on bottom, 2.54 cm Plexiglas on other faces	38	1.0137 ± 0.0036
CAS80	Problem U4R8E1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 2 x 2 x 2 array, reflected, 15.24 cm paraffin on bottom, 4.45 cm Plexiglas on other faces	38	1.0223 ± 0.0045
CAS81	Problem U4R8F1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 2 x 2 x 2 array, reflected, 15.24 cm paraffin on bottom, 6.35 cm Plexiglas on other faces	38	1.0197 ± 0.0037
CAS82	Problem U4R8G1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 2 x 2 x 2 array, reflected, 15.24 cm paraffin on bottom, 1.27 cm Plexiglas on other faces	38	1.0195 ± 0.0038
CAS83	Problem U4R8H1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 2 x 2 x 2 array, reflected, 15.24 cm paraffin on bottom, 3.81 cm Plexiglas on other faces	38	1.0225 ± 0.0039
CAS84	Problem U4R8I1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 2 x 2 x 2 array, reflected, 15.24 cm paraffin on bottom, 7.62 cm Plexiglas on other faces	38	1.0247 ± 0.0041

Table 5 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAS85	Problem U4R8J1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 2 x 2 x 2 array, reflected, 1.27 cm Plexiglas all faces	38	1.0175 ± 0.0046
CAS86	Problem U4R8K1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 2 x 2 x 2 array, reflected, 1.27 cm paraffin all faces	38	1.01675 ± 0.0042
CAS87	Problem U4R8L1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 2 x 2 x 2 array, reflected, 15.24 cm paraffin all faces	38	1.0177 ± 0.0042
CAS88	Problem U4R8M1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 2 x 2 x 2 array, reflected, 3.81 cm paraffin all faces	38	1.0177 ± 0.0041
CAS89	Problem U4R8N1F. 92.6% $UO_2(NO_3)_2$ solution, 415 g U/l, in Plexiglas cylinders, 2 x 2 x 2 array, reflected, 7.62 cm paraffin all faces	38	1.0169 ± 0.0046

Table 6. KENO V.a calculated k_{eff} for experimentally critical highly enriched uranium systems

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAS01	Experiment 1. U(93.2) $O_2(NO_3)_2$ H/X=1378 in 27.24-in. diam sphere	12,13	0.9979 ± 0.0022
CAS02	Experiment 2. U(93.2) $O_2(NO_3)_2$ H/X=1177, B poisoned, in 27.24-in. diam sphere	12,13	0.9960 ± 0.0023
CAS03	Experiment 3. U(93.2) $O_2(NO_3)_2$ H/X=1033, B poisoned, in 27.24-in. diam sphere	12,13	0.9920 ± 0.0027
CAS04	Experiment 4. U(93.2) $O_2(NO_3)_2$ H/X=972, B poisoned, in 27.24-in. diam sphere	12,13	1.0020 ± 0.0024
CAS05	Experiment 5. U-233 $O_2(NO_3)_2$ H/X=1533, in 27.24-in. diam sphere	12,13	1.0086 ± 0.0022
CAS06	Experiment 6. U-233 $O_2(NO_3)_2$ H/X=1470, B poisoned, in 27.24-in. diam sphere	12,13	1.0079 ± 0.0025
CAS07	Experiment 7. U-233 $O_2(NO_3)_2$ H/X=1417, B poisoned, in 27.24-in. diam sphere	12,13	1.0045 ± 0.0023
CAS08	Experiment 8. U-233 $O_2(NO_3)_2$ H/X=1368, B poisoned, in 27.24-in. diam sphere	12,13	1.0065 ± 0.0023
CAS09	Experiment 9. U-233 $O_2(NO_3)_2$ H/X=1835, in 48.04-in. diam sphere	12,13	1.0084 ± 0.0023
CAS10	Experiment 10. U(93.2)$O_2(NO_3)_2$ H/X=1835, in 48.04-in. diam sphere	12,13	0.9979 ± 0.0017
CAS11	Experiment 11. U-233 $O_2(NO_3)_2$ H/X=1986, in 48.04-in. diam sphere	12,13	0.9959 ± 0.0017
CAS12	Experiment 12. U(93.2) $O_2(NO_3)_2$ H/X=1604, in 60.92-in. diam cylinder	12,13	0.9989 ± 0.0023
CAS13	Experiment 13. U(93.2) $O_2(NO_3)_2$ H/X=1634, in 60.92-in. diam cylinder	12,13	0.9983 ± 0.0022
CAS14	Experiment 14. U(93.2) $O_2(NO_3)_2$ H/X=1821, in 60.92-in. diam cylinder	12,13	0.9992 ± 0.0017

Table 6 (continued)

Case	Experimental description	Reference	$k_{eff} \pm \sigma$
CAS15	Experiment 15. U(93.2) $O_2(NO_3)_2$ H/X=1905, in 60.92-in. diam cylinder	12,13	0.9925 ± 0.0019
CAS16	Experiment 16. U(93.2) $O_2(NO_3)_2$ H/X=1981, in 60.92-in. diam cylinder	12,13	0.9976 ± 0.0016
CAS17	Experiment 17. U-233 $O_2(NO_3)_2$ H/X=1819, in 60.92-in. diam cylinder	12,13	0.9952 ± 0.0020
CAS18	Experiment 18. U-233 $O_2(NO_3)_2$ H/X=1900, in 60.92-in. diam cylinder	12,13	0.9973 ± 0.0018
CAS19	Experiment 19. U-233 $O_2(NO_3)_2$ H/X=1996, in 60.92-in. diam cylinder	12,13	0.9916 ± 0.0015
CAS20	Experiment 20. U-233 $O_2(NO_3)_2$ H/X=2106, i 60.92-in. diam cylinder	12,13	0.9927 ± 0.0015
CAS21	Experiment 21. U(93.2) $O_2(NO_3)_2$ H/X=1955, in 107.7-in. diam cylinder	12,13	0.9923 ± 0.0015
CAS22	Experiment 22. U(93.2) $O_2(NO_3)_2$ H/X=2004, in 107.7-in. diam cylinder	12,13	0.9915 ± 0.0014
CAS23	Experiment 23. U(93.2) $O_2(NO_3)_2$ H/X=2052, in 107.7-in. diam cylinder	12,13	0.9991 ± 0.0014

1.5 DISCUSSION

The experiments modeled were parameterized such that trend analysis could be performed. Table C.1 (Appendix C) is a relisting of the results of the 258 experiments which were calculated, along with the parameters which describe the experiments. Table C.1 is partitioned to correspond to Tables 1-6. Table 7 gives the average value of k_{eff} for each table of results. The mean values of k_{eff} are in excellent agreement with the experiments. The spread in data, however, indicates that there may be problems with certain types of calculations. The cause of the spread in data will be discussed more fully in Sect. 2.

Figures 1-3 are histograms showing frequency of k_{eff}, average energy group of the neutrons causing fission (average energy group), and the assay distribution for all 258 experiments. From Fig. 2 it can be seen that the majority of the calculations were for thermal systems. Figure 3 indicates that the modeled experiments did not include enrichments between 5 and 90%.

Figure 4 shows the value of calculated k_{eff} as a function of the average energy group of the neutron-causing fission.

Figure 5 is a plot of calculated k_{eff} as a function of the reference from which the experiments were modeled. In some of the cases where a number of experiments were run from the same reference, there seems to be a natural break. If all the cases had been equivalent as far as modeling and code treatment, k_{eff} should be normally distributed around a mean value. The natural break may be an indication of possible code and/or cross-section problems.

Figures 6 and 7 show the value of k_{eff} as a function of the assay for low-enriched and high-enriched experiments, respectively. In Fig. 6, the calculated k_{eff} of the 3% enriched experiments are considerably higher than those of other low-enriched experiments. Reasons for this trend are discussed in Sect. 2.

Figures 8-13 are plots of k_{eff} versus average energy group for each table of results. Closed-band tolerance limits similar to those discussed in ref. 7 have been plotted. The dashed line on these curves represents the lower tolerance limit for 99.9% of the population with a 95% confidence level.

Figure 12 was split into two portions (Figs. 12a and 12b) because of the large gap in average energy group of the neutron-causing fission between groups 12 and 20. This caused the tolerance band width to be smaller in Figs. 12a and 12b. The slope of the curve fit through the data changed considerably in Fig. 12b. Figure 12b highlights the importance of knowing the cause of bias in calculated results. If the bias were caused by a systematic code or cross-section error, then, according to Fig. 12b, systems similar to those used in the figure and with an average energy group in the range of 21 would have a tolerance limit of 0.97. However, if the bias were caused because of reporting bias, then Fig. 12b shows a false trend; and the tolerance limit is unknown.

1.6 CONCLUSIONS

The KENO V.a code accurately calculates a broad range of critical experiments. In some past validations, the average energy group of the neutron-causing fission has been used to report calculated results. There is no strong evidence that calculated results are highly correlated to the average energy group of the neutron-causing fission. In review, a substantial number of the calculations show a positive or negative bias in excess of 1-1/2% in k_{eff}. Classes of criticals which show a bias include 3% enriched green blocks, highly enriched uranyl fluoride slab arrays, and highly enriched uranyl nitrate arrays. If these biases are properly taken into account, the KENO V.a code in the Y12CSG package can be used

Table 7. Average k_{eff} by table

Variable	Label	N	Mean	Standard Deviation	Minimum Value	Minimum Value
			Table=1			
k_{eff}	k-effective	39	0.99369744	0.00771453	0.97390000	1.01080000
			Table=2			
k_{eff}	k-effective	12	0.99568333	0.00620349	0.98770000	1.00930000
			Table=3			
k_{eff}	k-effective	49	1.00434082	0.00911375	0.98460000	1.02280000
			Table=4			
k_{eff}	k-effective	43	1.00673721	0.00759245	0.99470000	1.03510000
			Table=5			
k_{eff}	k-effective	91	1.00278132	0.01630369	0.97570000	1.05850000
			Table=6			
k_{eff}	k-effective	23	0.99842609	0.00554061	0.99150000	1.00860000

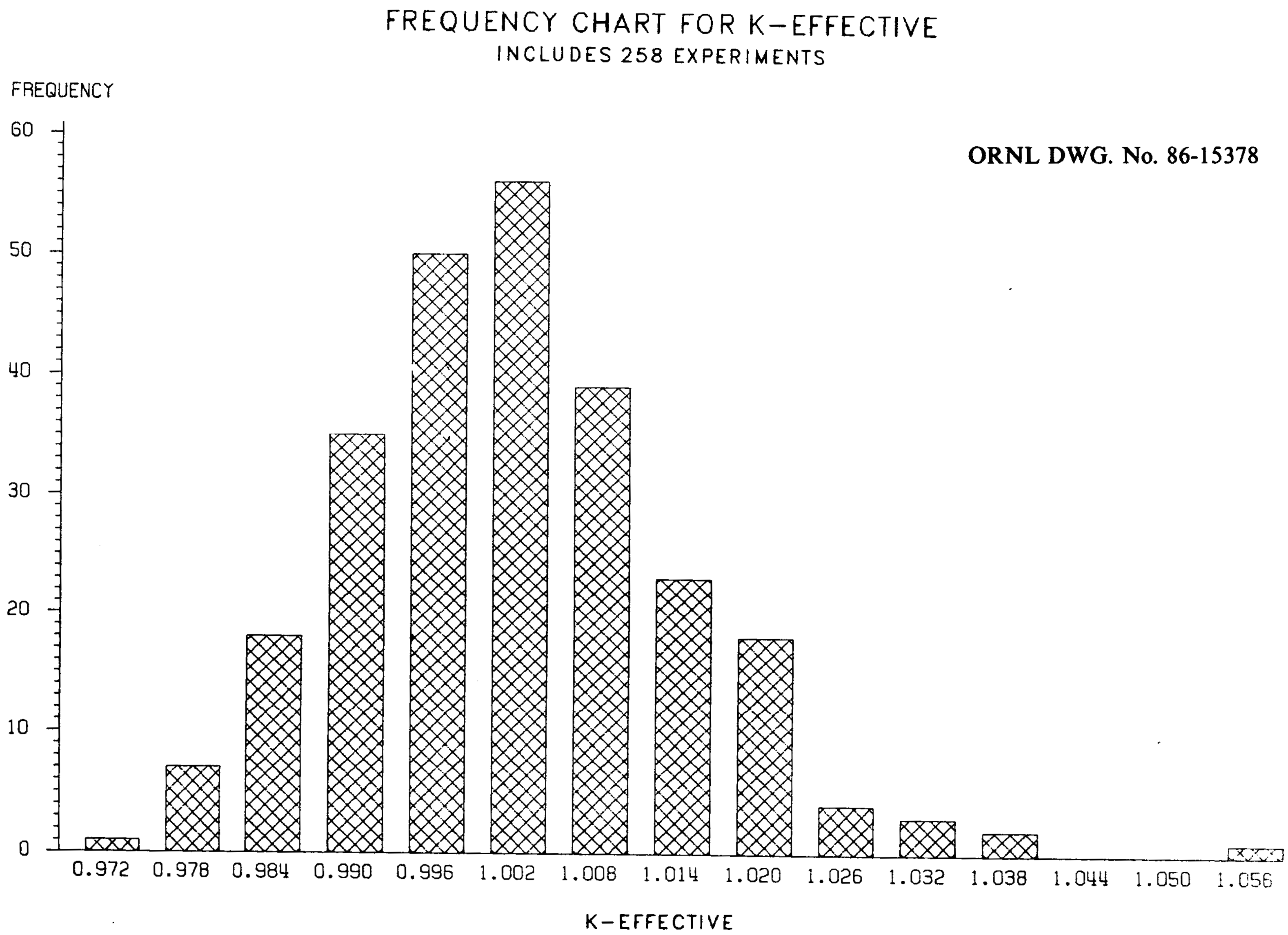
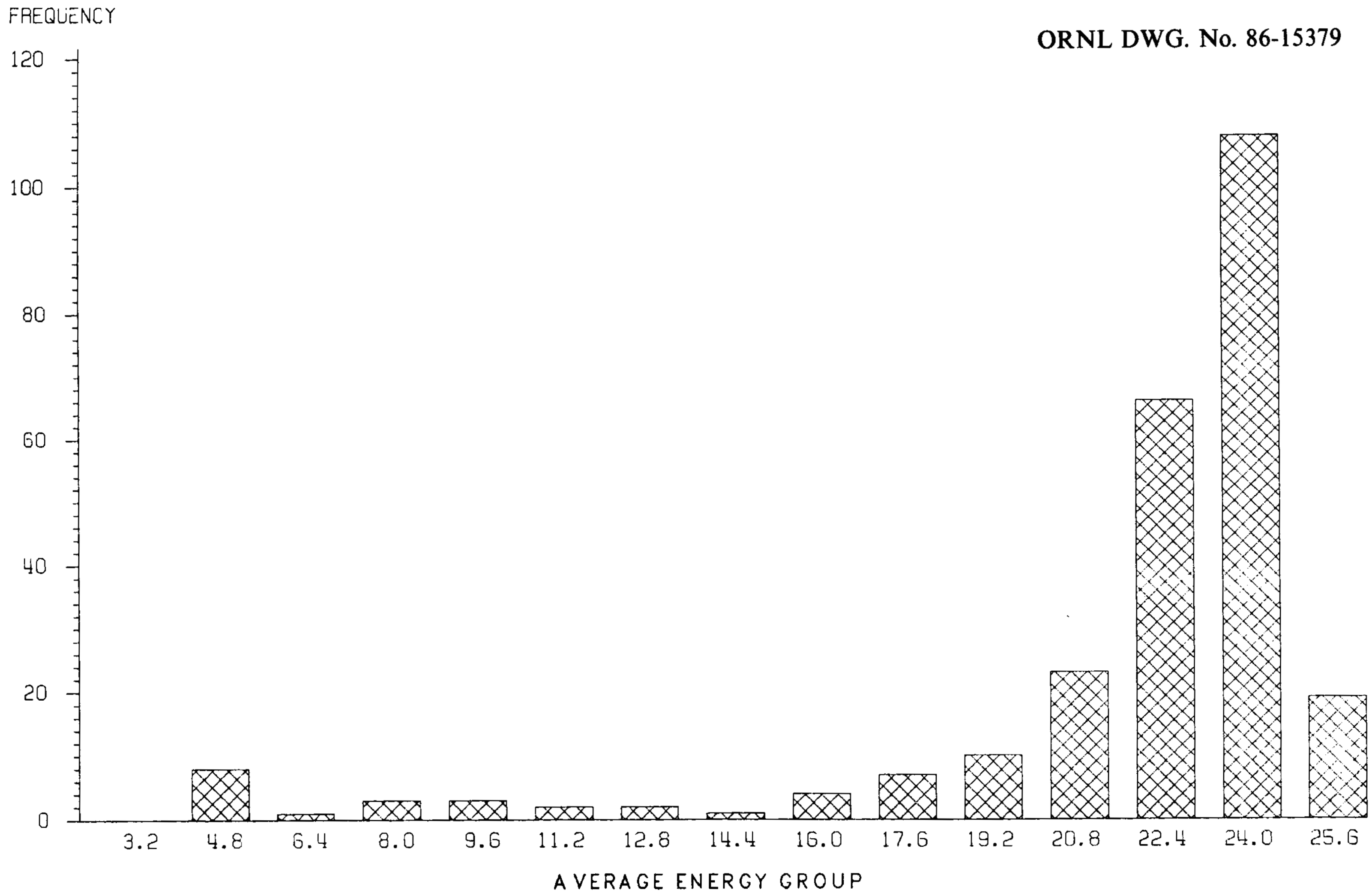


Fig. 1. Frequency chart for k-effective.

FREQUENCY CHART FOR AVERAGE ENERGY GROUP

INCLUDES 258 EXPERIMENTS



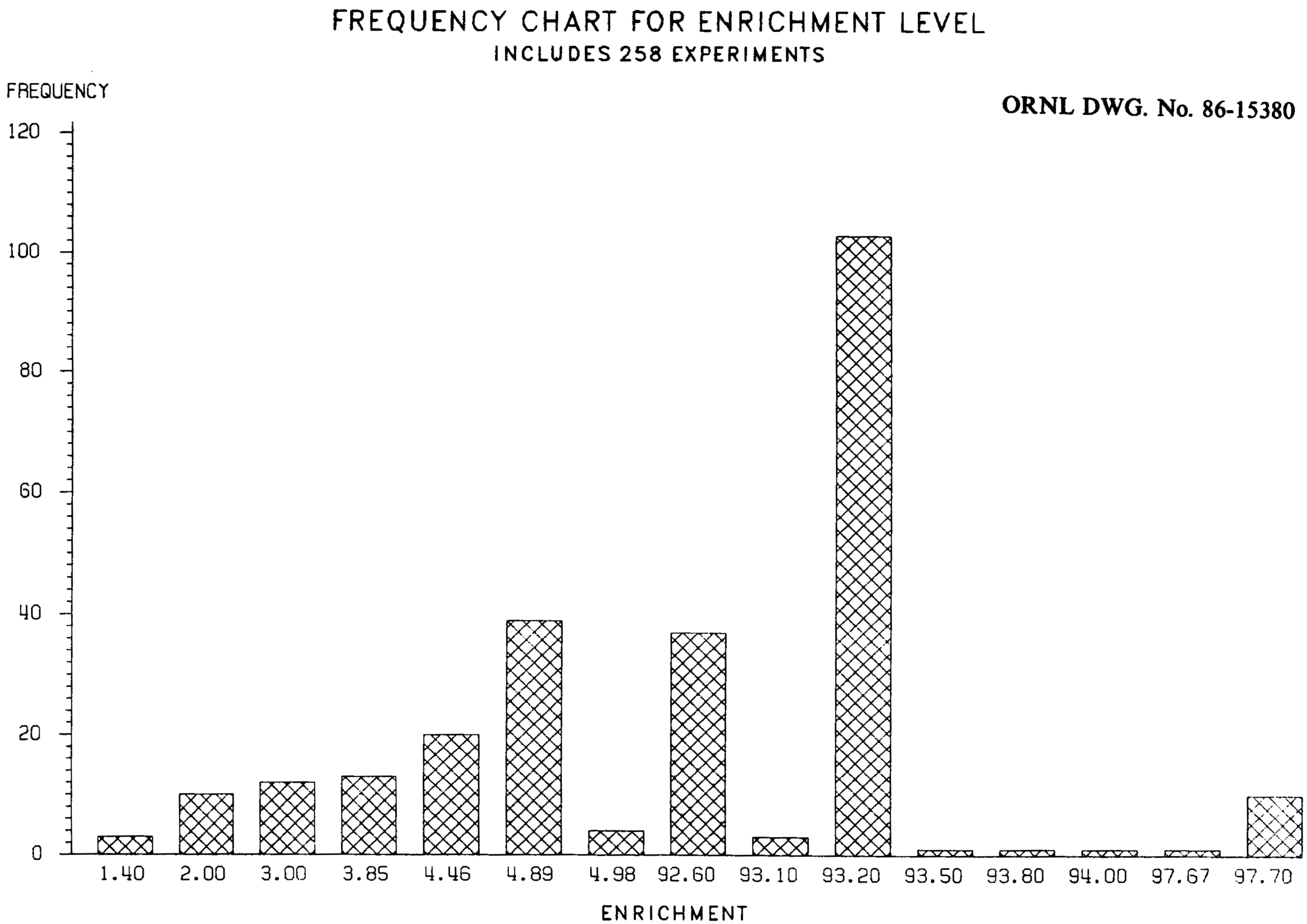


Fig. 3. Frequency chart for enrichment level.

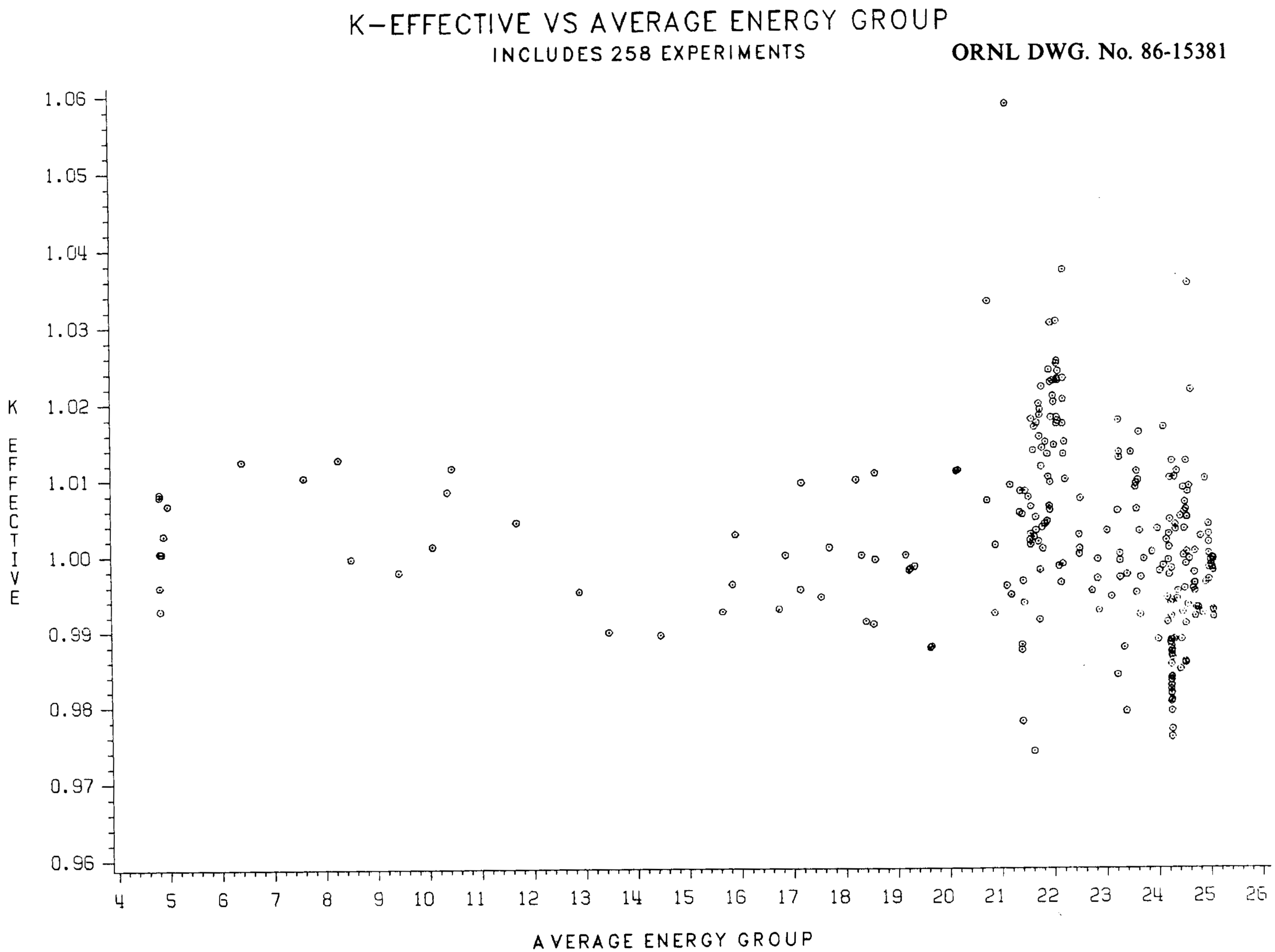


Fig. 4. K-effective vs average energy group.

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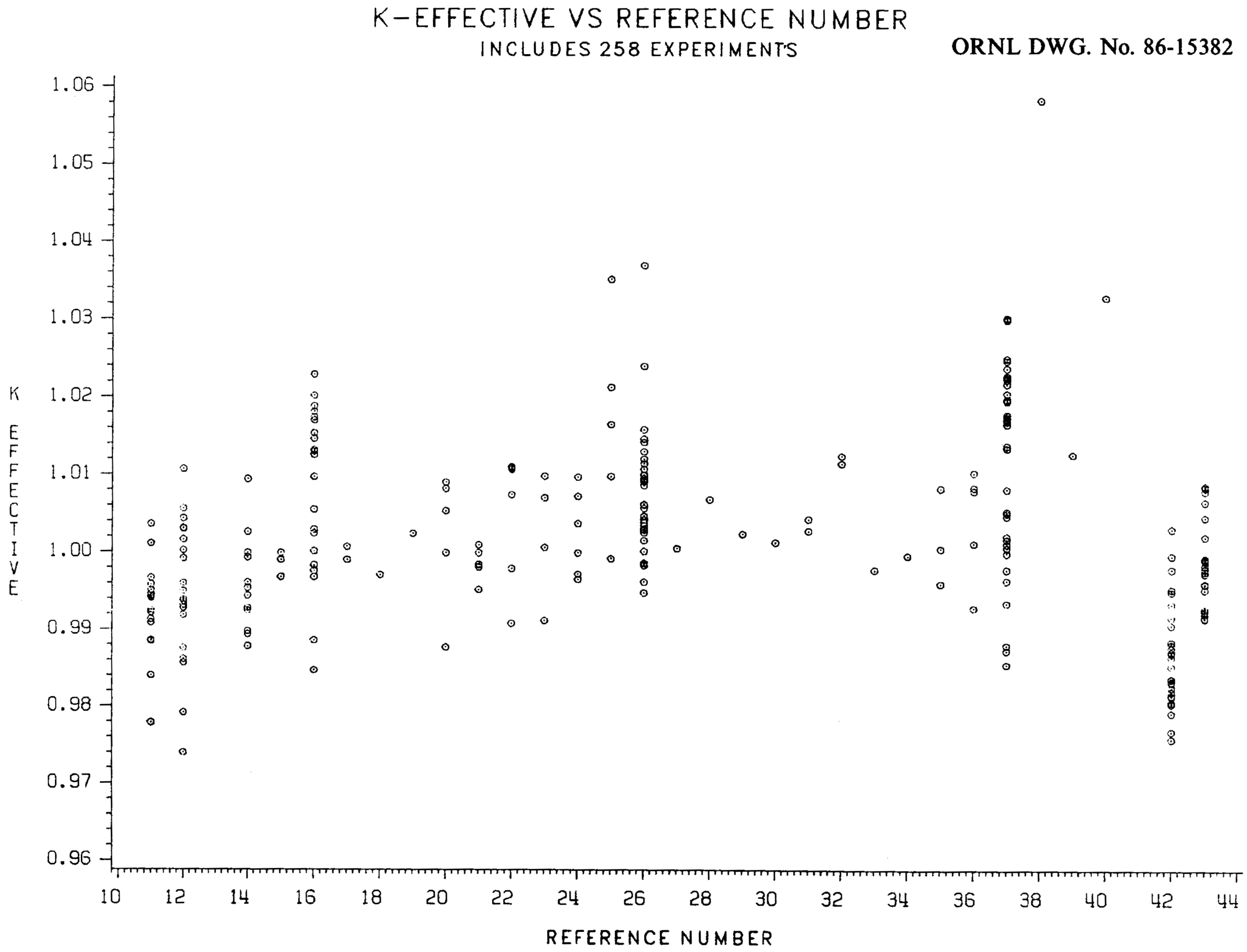

Fig. 5. K-effective vs reference number.

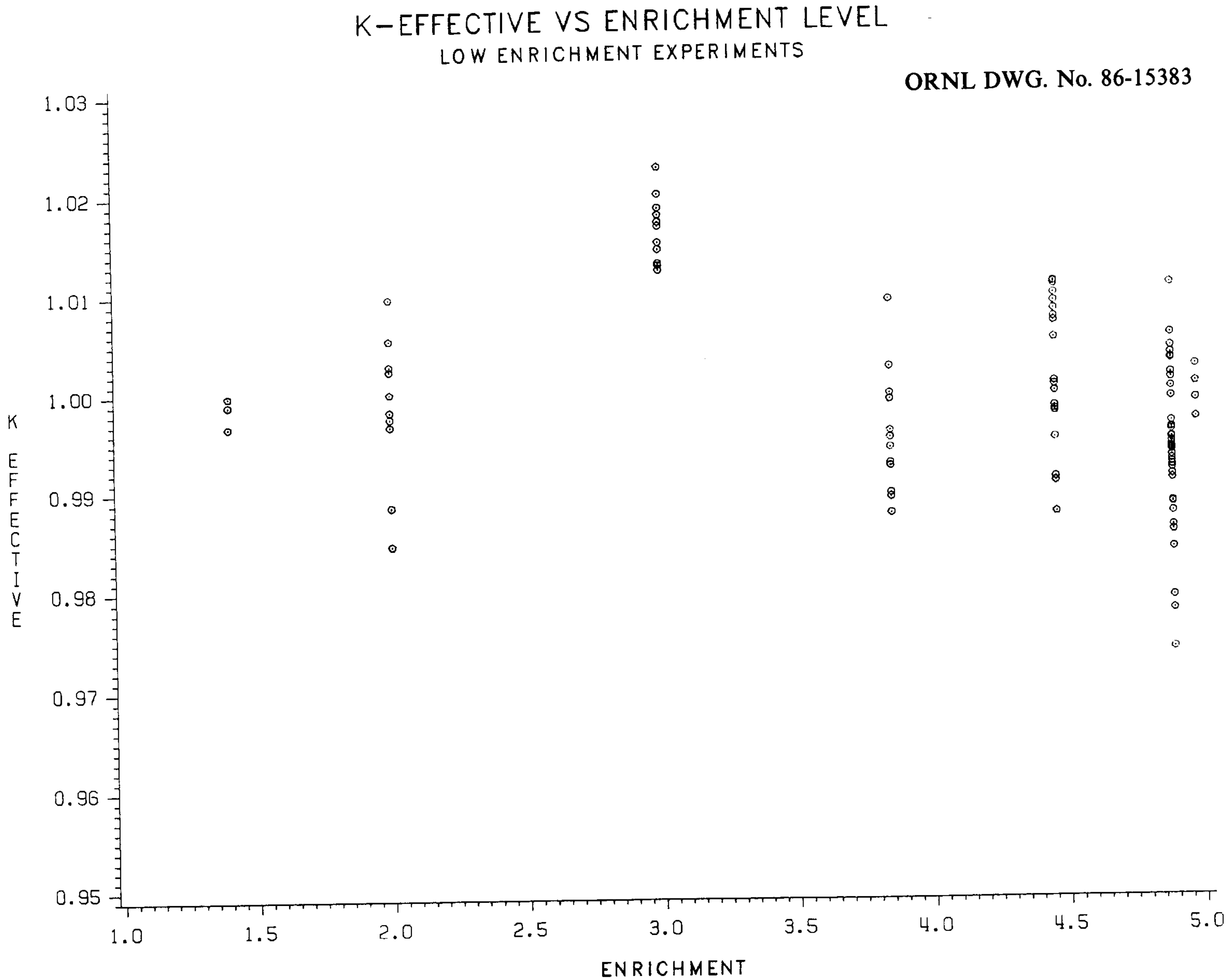

Fig. 6. K-effective vs enrichment level for low enrichment experiments.

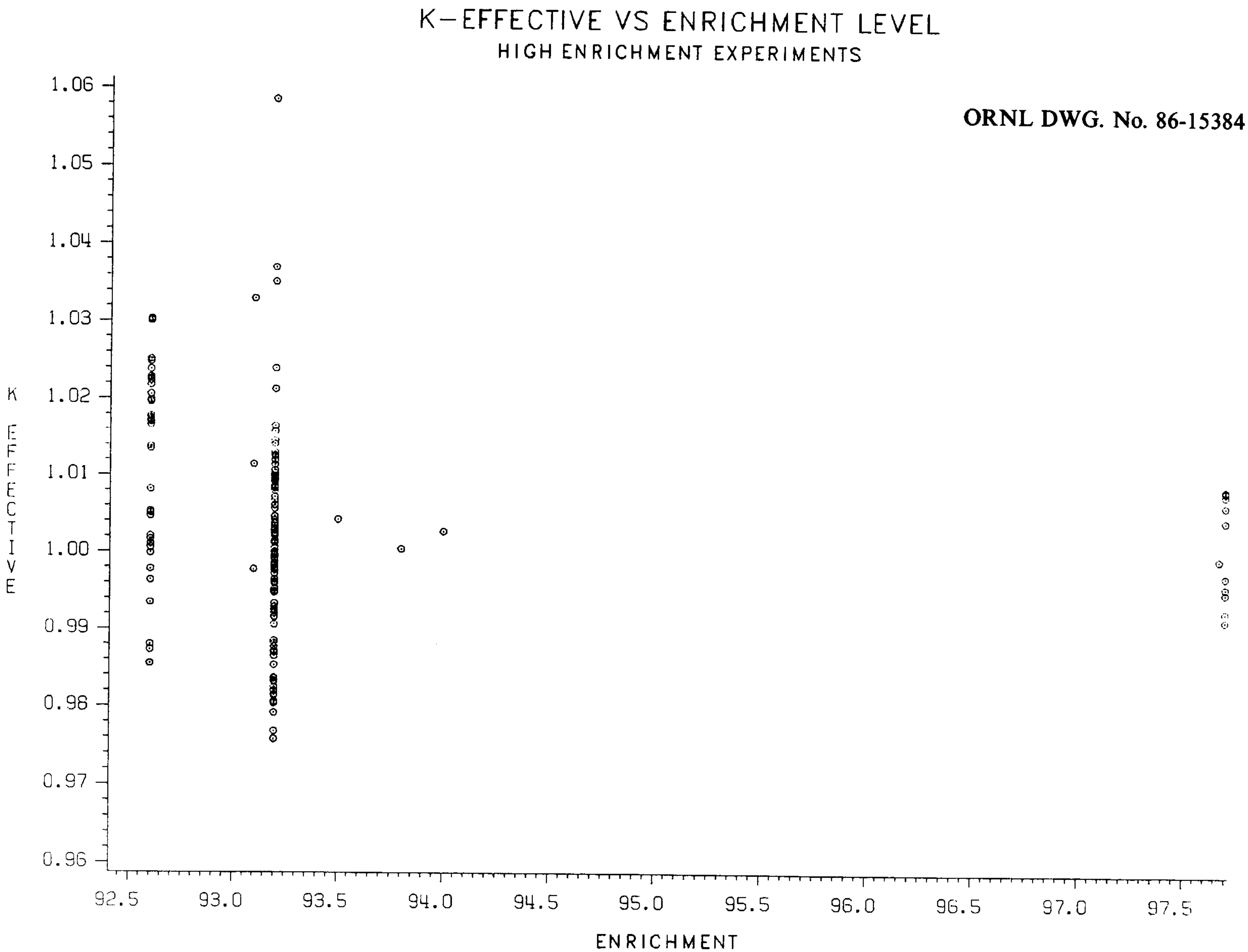

Fig. 7. K-effective vs enrichment level for high enrichment experiments.

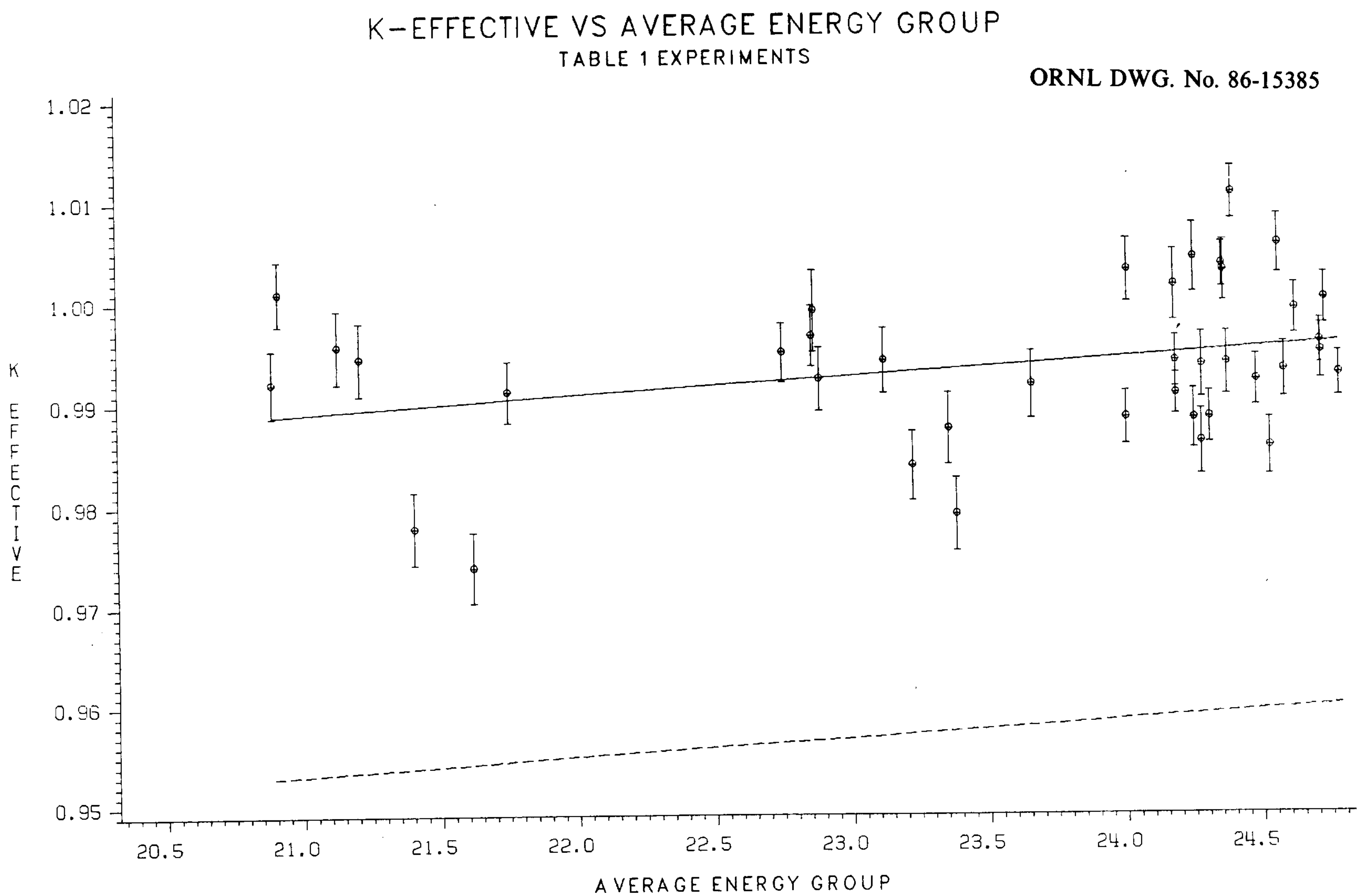

Fig. 8. K-effective vs average energy group for Table 1 experiments.

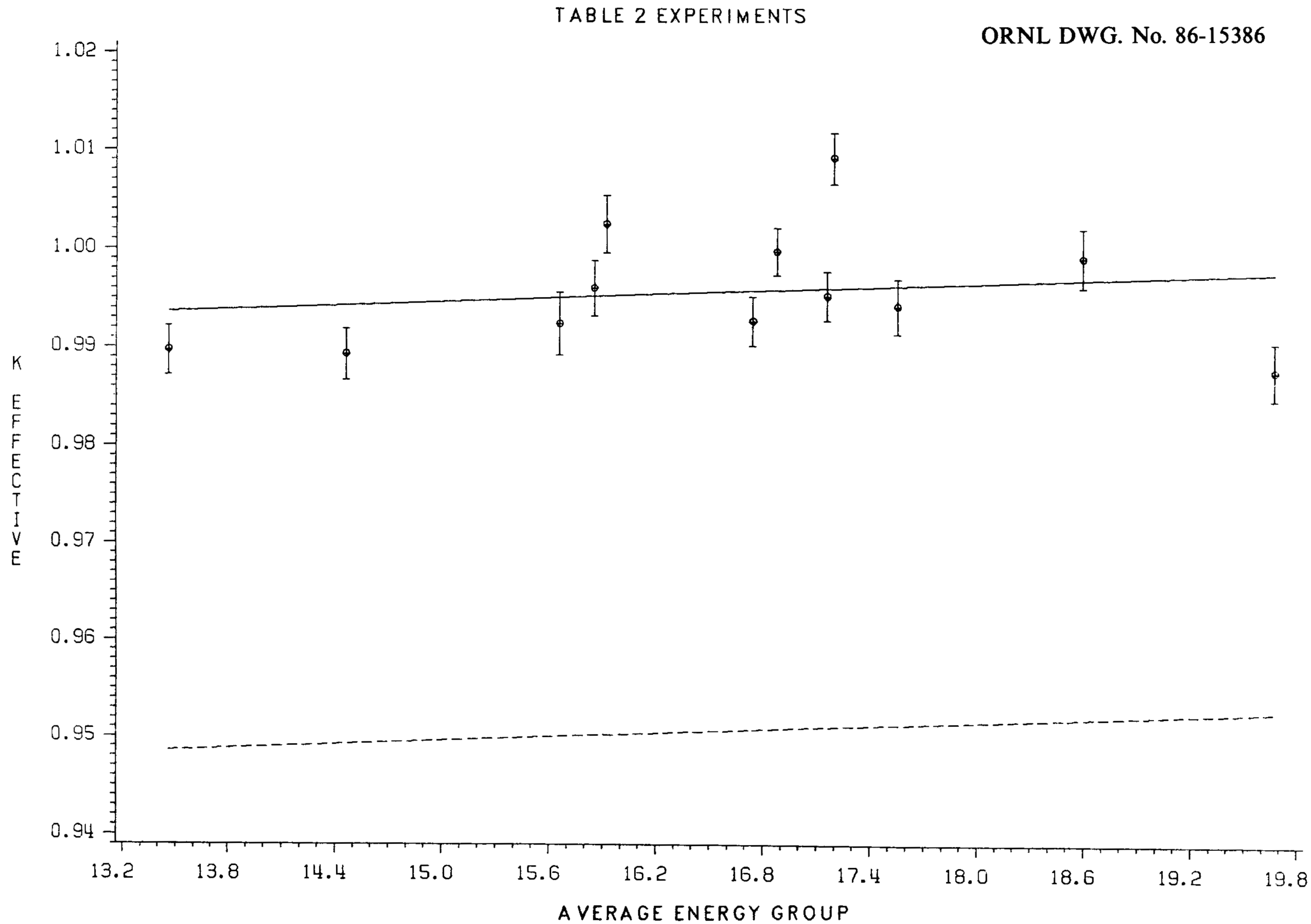

Fig. 9. K-effective vs average energy group for Table 2 experiments.

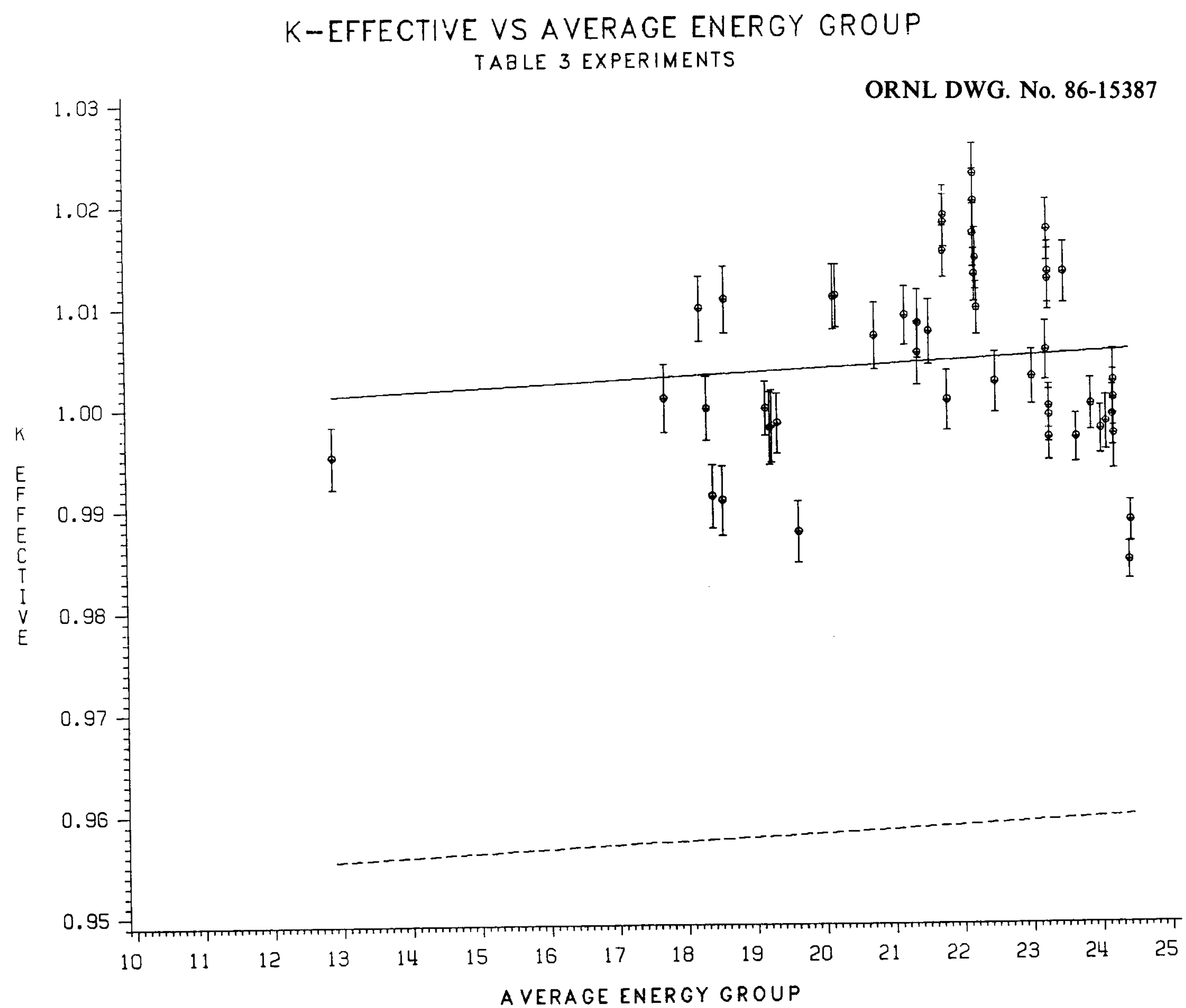

Fig. 10. K-effective vs average energy group for Table 3 experiments.

ORNL DWG. No. 86-15388

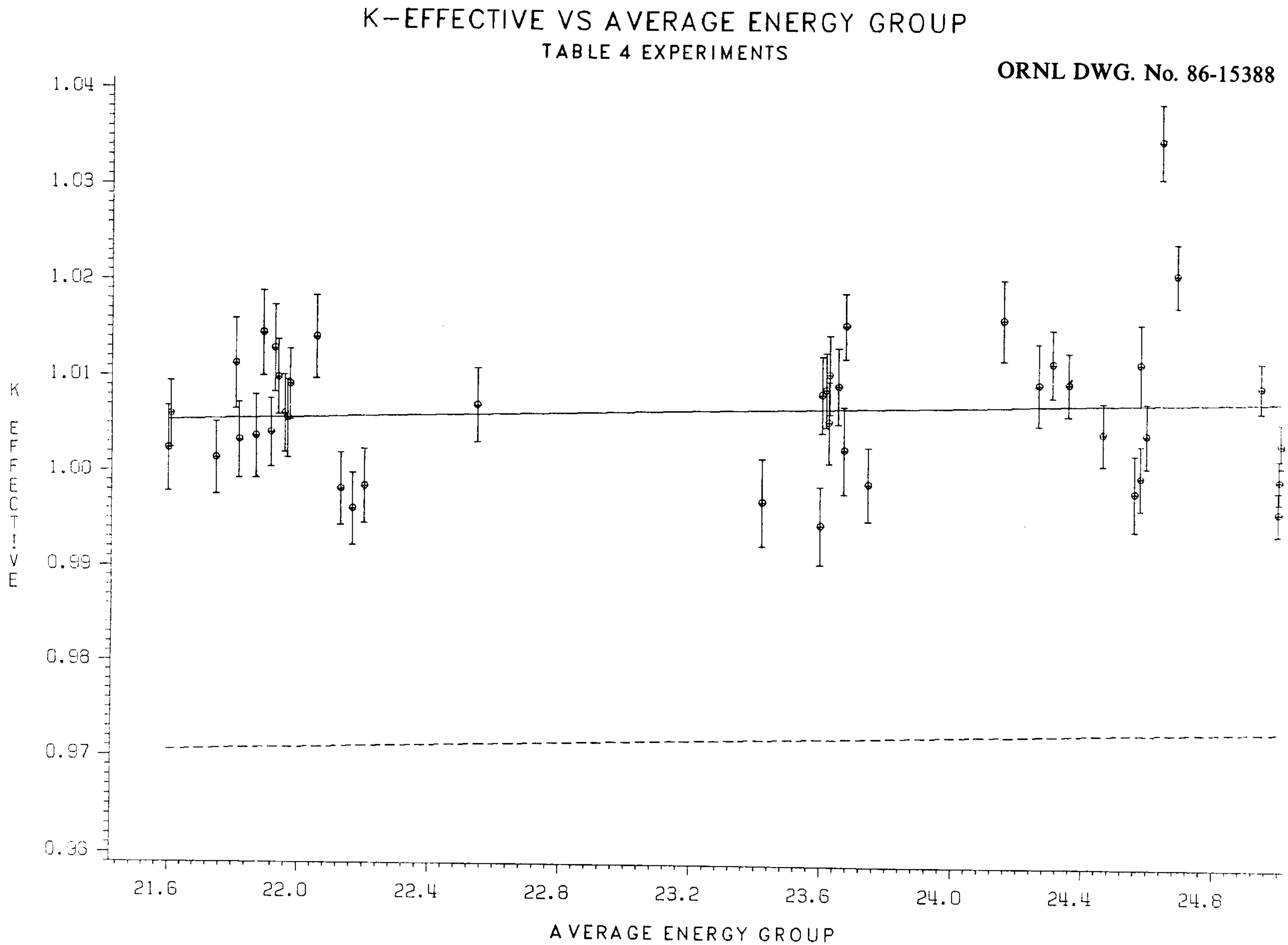

Fig. 11. K-effective vs average energy group for Table 4 experiments.

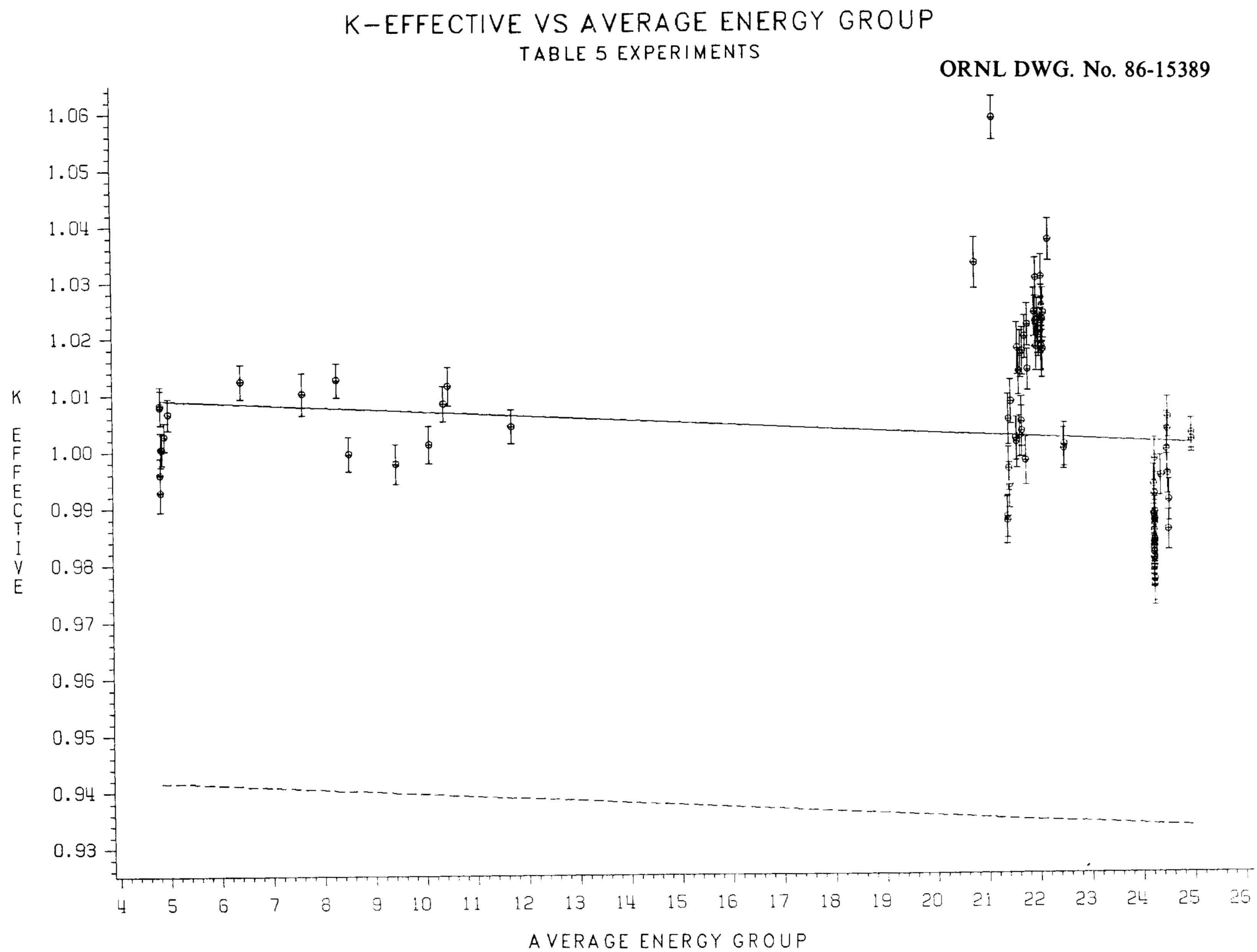

Fig. 12. K-effective vs average energy group for Table 5 experiments.

ORNL DWG. No. 86-15390

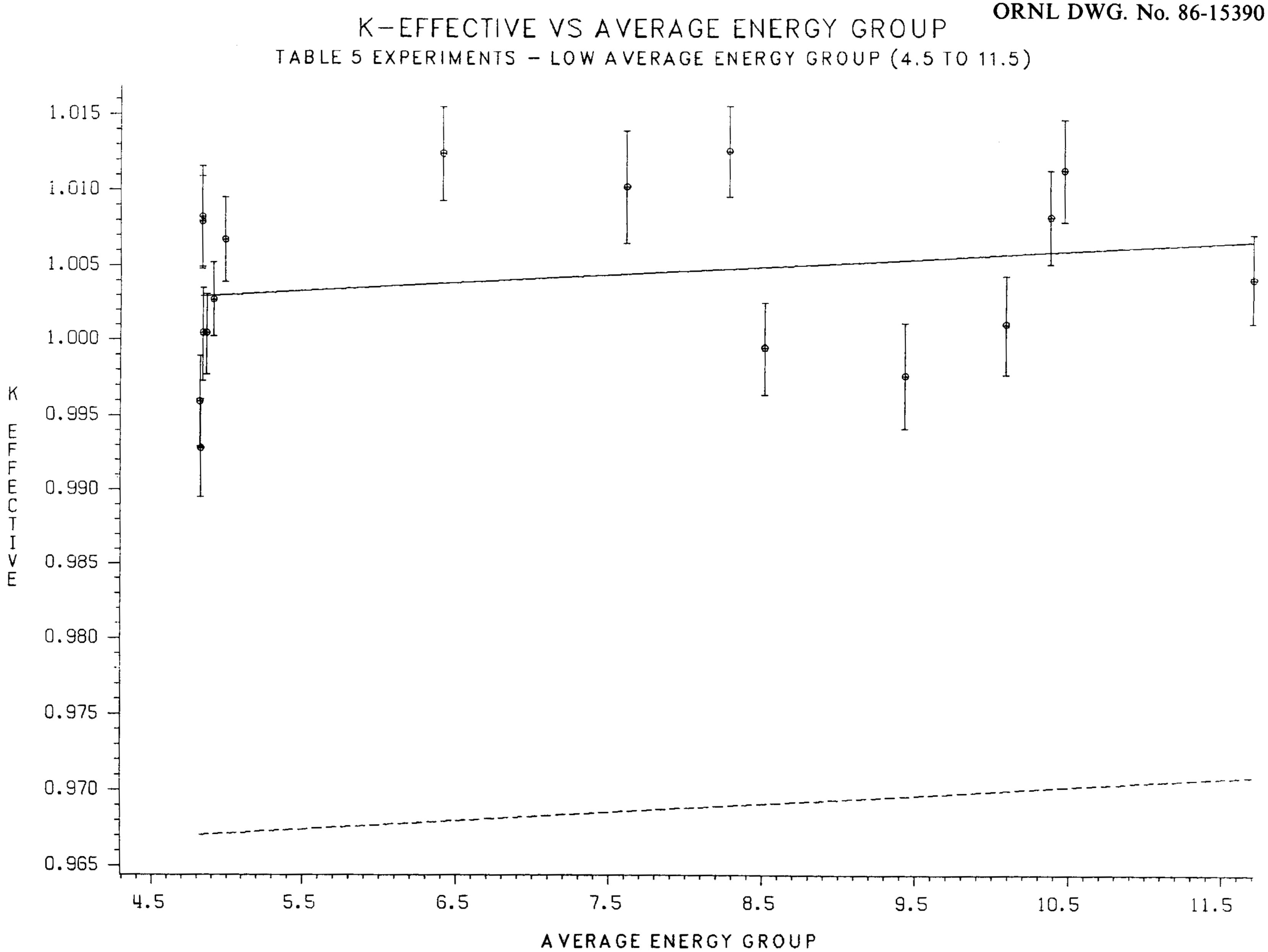

Fig. 12a. K-effective vs average energy group for Table 5 experiments, low average energy group (4.5 to 11.5).

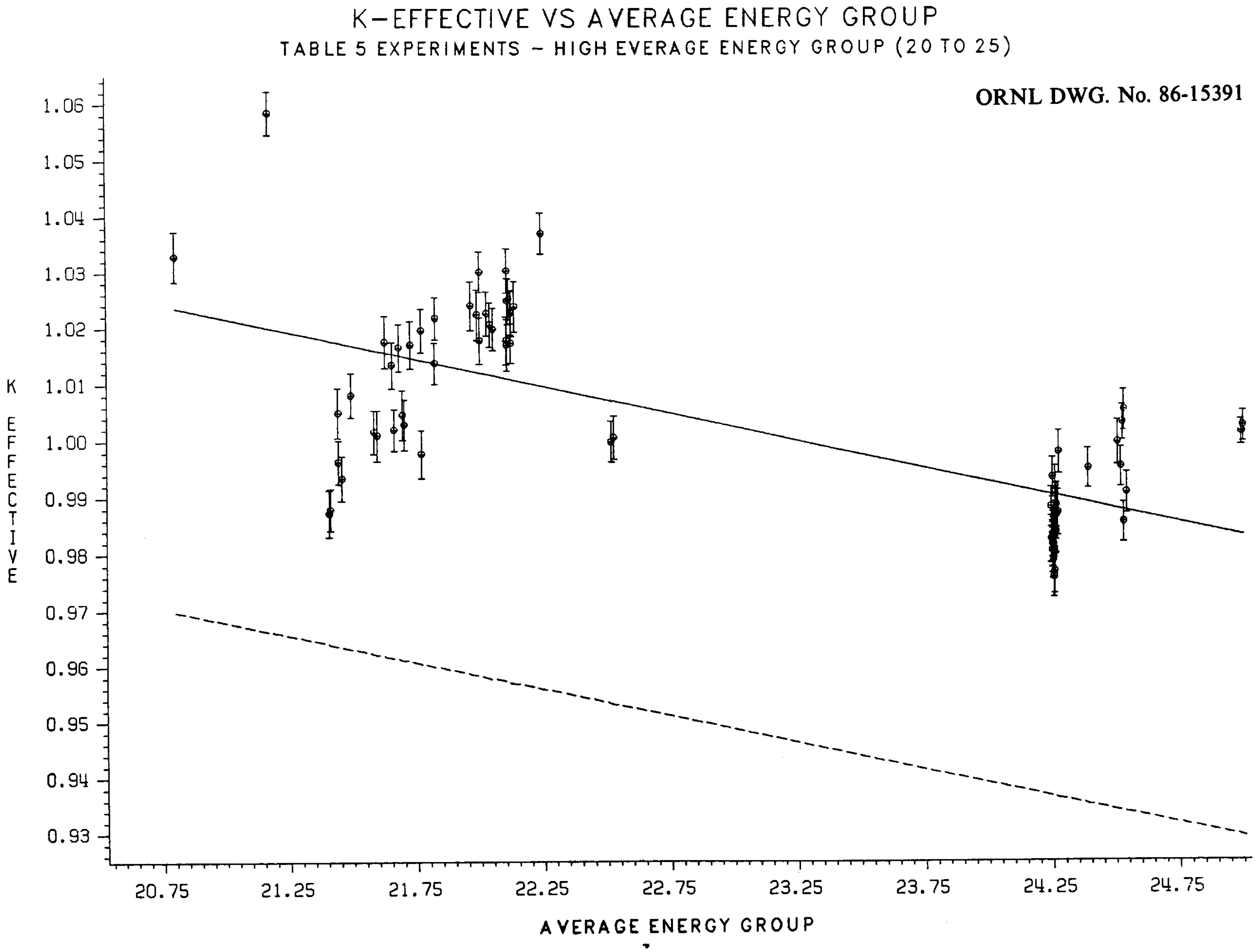

Fig. 12b. K-effective vs average energy group for Table 5 experiments, high average energy group (20 to 25).

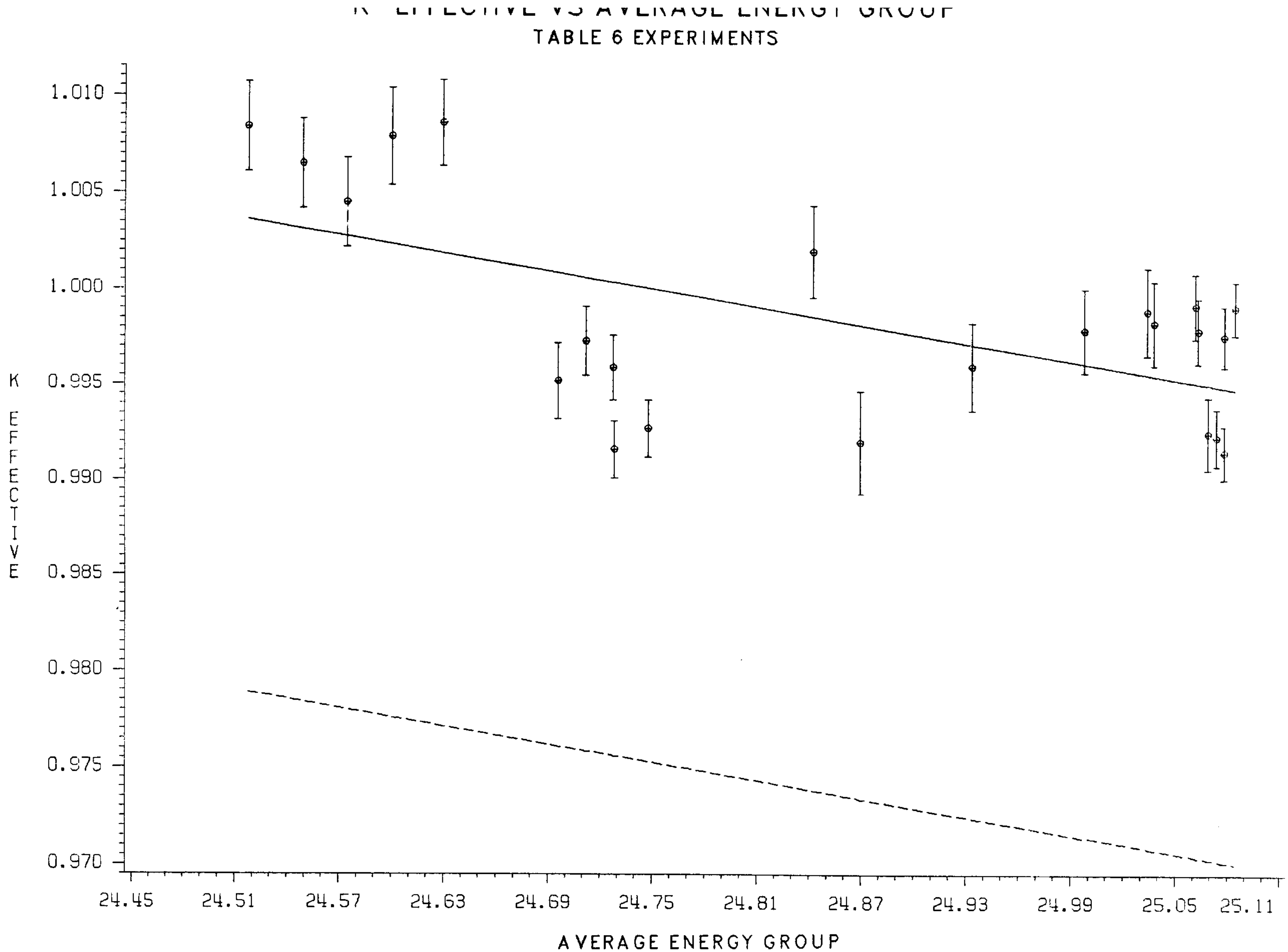

Fig. 13. K-effective vs average energy group for Table 6 experiments.

with great confidence for the design and criticality safety analysis of uranium-containing systems. It appears that slight extensions outside the range of validation would be acceptable. It should be noted that only a fraction of the available options and geometry types have been exercised. Proper performance of the options validated here does not imply that all the options in the code perform as well. It must be emphasized that the calculated k_{eff} from KENO V.a is an estimate of the eigenvalue of the system and has an associated degree of uncertainty due to the statistical nature of the code. Several suggestions are offered to the users of the code.

1. Never base the design or safety of a system on a single calculation. Make at least two calculations in which the random sequence is somehow changed (starting random number, slight change in geometry or materials, etc.) to ensure that the calculated k_{eff} is a reasonable estimate of the calculational mean for the system.

2. Substantial effort may be required to ensure that the problem has converged to a reasonable estimate of the true k_{eff} of the system. Undersampling (insufficient neutrons per generation) or problems with convergence of the source distribution (insufficient generations or a very poor initial starting distribution) are not uncommon.

3. Only validated options and geometry types should be used for the criticality safety design of a system.

2. EVALUATION OF BIAS IN THE KENO V.a VALIDATION

2.1 INTRODUCTION

Several sources of bias were observed during the validation. Most of the validation cases were problems which were already modeled and which had been included in previous validations. A detailed study of all of the experiments included in this validation was not done. Instead, the experimental models were cursorily reviewed against the experimental descriptions in the reference documents. Obvious errors in the experimental models were corrected; otherwise, the models were left unchanged.

The bias, in a series of critical experiments, was studied if (1) the calculated k_{eff} differed from 1.00 by more than about 1% for several of the experiments or, (2) the calculated k_{eff} differed from 1.00 by more than about 2% for a single experiment. For the majority of the calculations, the standard deviation was on the order of ± 0.004. For a single calculation, it could be expected that about 5% of the time the calculated k_{eff} would be more than 1% above or below 1.00 due to the statistics of the calculation. It would be highly unusual for the statistics to give a 2% bias. For any series of experiments, if more than 5% of the calculations exceed 1% deviation from 1.00, it is an indication that a bias exists.

When bias was suspected, the experimental model was checked against the experimental description. If no discrepancies were observed, then a detailed review of the potential sources of bias was done. The results for the problems reviewed are given in this section. Some recommendations based on the findings of the review are included.

2.2 DISCUSSION

2.2.1 Bias in the 3% Enriched Green Block Calculations from Ref. 18

Cases CAS21-CAS32 in Table 3 all show a positive bias of greater than 1.5%. Review of the reference document did not show major discrepancies between the experimental model and the experimental description. Since the experimental logbook was available for review, a comparison of the logbook description versus the reported description of the experiments was made. It was noted that the reported critical dimensions were not measured dimensions but, rather, were based on nominal block dimensions with a correction factor applied for stacking voids. The correction factor was obtained from measurements of a very few stacked assemblies which resulted in a conversion factor for nominal size in inches to reported critical size in centimeters. In most cases, the nominal horizontal dimension was increased by 0.61%, and the nominal vertical dimension was increased by 0.45%, as reported in ORNL-CF-59-4-120.[44] The effects of this approximation were investigated. The results indicated that the potential error in the experimental size did not account for the 1.5% bias in the 3% enriched experiments, and did not explain why the 2% enriched experiments (CAS11-CAS20 in Table 3) gave good results, whereas the 3% calculations were biased.

Case CAS21 was arbitrarily chosen for detailed examination. A 218-group calculation was performed with 120,000 neutron histories yielding a k_{eff} = 1.0012 ±0.0020. The difference between the 27-group and 218-group calculations was examined by running XSDRN and collapsing the cross sections by flux weighting to a 27-group structure. The infinite media multiplication factors calculated by the 27- and 218-group cross-section sets were 1.279 and 1.261, respectively, or about 1-1/2% difference. Differences in the U-238 resonance region cross sections accounted for ~91% of the difference between the 27- and 218-group calculations. It was observed that the NITAWL treatment normally accounts for two admixed moderators, whereas, for these experiments, three admixed moderators were present, namely, H, F, and C. The control module was modified to input the second moderator to NITAWL as an effective moderator which approximated the effects of all of the moderating elements. This modification decreased the difference in calculated k_{eff} between the 27-group and 218-group to about 0.6% with values of 1.260 and 1.252, respectively. All of the calculations from ref. 18 were rerun with this modification. A comparison of the results using the standard and modified control modules are given in Table 8. Based on these results, it is recommended that this modification or a comparable one be incorporated into the Y12CSG cross-section processing routines. This would change the random number sequence and would therefore necessitate a subsequent revalidation.

2.2.2 Cross-Section Irregularities in the 27- and 218-Group Cross-Section Sets

During the study of the 3% enriched green block experiments, a RADE[45] calculation was performed for several elements in the 27- and 218-group cross-section sets. The thermal cross sections for hydrogen were flagged because the absorption cross section (MT-27) did not equal the sum of the neutron disappearance (MT-101) and total fission (MT-18) as it should. The difference was about 1/4% for the entire thermal range. It was determined that this was caused by a systematic error in XLACS2, which failed to account for the presence of oxygen when the thermal data for H_2O was used for the generation of the 218 hydrogen cross-section set from ENDF/B-IV data. The exact impact on the hydrogen data has not as yet been determined. There is good agreement between the calculated k_{eff} for hydrogen-moderated experiments. Therefore, it is not recommended that hydrogen (and all other elements which used thermal kernels based on compounds) be regenerated at this time. However, this should be considered as a potential source of bias in future validations.

The collapsing spectrum used to generate the 27-group cross-section set from the 218 set was also studied. The carbon collapsing function appeared highly irregular with large peaks in the energy ranges of 5 and 500 eV. These peaks should not have occurred considering the Fission-1/E*SIGT-Maxwellian flux spectrum which was used to generate the data, as described in ref. 10. The irregular shape does not affect the total scatter or total absorption cross sections because of carbon's flat cross section, but instead affects the transfer matrix, and, in particular, the within-group scatter. It is not known if the unusual weighting function was caused by a systematic error in XLACS2, or if it was caused by incorrect input data for XLACS2 when the 218 carbon set was generated. A special 218 carbon set was generated using XLACS3 and ENDF/B-IV data, and did not exhibit these irregularities. There is some indication that the existing carbon cross-section set may not be adequate for systems where carbon is the major moderator.

Table 8. Comparison of standard NITAWL treatment vs treating all moderators

	Case	k_{eff} Standard treatment		k_{eff} New treatment	
	CAS11	1.0023		0.9965	
	12	1.0096		0.9960	
	13	1.0054		0.9957	
	14	1.0028		0.9929	
2%	15	0.9967		0.9921	
	16	1.0000		0.9972	
	17	0.9982		0.9951	
	18	0.9975		0.9915	
	19	0.9885		0.9835	
	20	0.9846		0.9874	
			Avg = 0.9986		Avg = 0.9928
	21	1.0145		1.0040	
	22	1.0228		1.0091	
	23	1.0169		1.0097	
	24	1.0129		1.0064	
	25	1.0201		1.0066	
	26	1.0152		1.0043	
3%	27	1.0187		1.0106	
	28	1.0180		1.0120	
	29	1.0131		1.0040	
	30	1.0173		1.0137	
	31	1.0131		1.0041	
	32	1.0124		1.0064	
			Avg = 1.0163		Avg = 1.0076
Avg of 2% and 3% experiments		1.0082		1.0008	

In general, it appears that the collapsing spectrum for generating the 27-group cross-section set from the 218 cross-section set is not adequate for certain classes of problems. This observation is based on the results of infinite media calculations where up to 7% difference in k_{eff} was observed between the 27- and 218-group calculations. The problem appears to occur for models of experiments which have fairly hard spectrums and contain moderators of intermediate mass. This includes intermediate and highly enriched UF_4-CF_2 systems and some low enriched U_3O_8−sterotex systems. It should be noted that these observations are based on a study of a very few experiments (which were not included in the validation). The systems studied may not be adequate for inclusion in a validation report. It is recommended that the available experimental information for this class of systems be studied and included in future validations. If these observations are confirmed, there may be a need to incorporate a modification into the Y12CSG sequence to allow a problem-dependent collapse of the fine-group cross sections to a 27-group set.

2.2.3 Code Errors Encountered During Validation

Case CAB09 from Table 2 failed in execution after 42 minutes. It was determined that the cause of failure was due to a divide check in subroutine CROS in KENO V.a. The divide check was traced to a problem with round-off error when a neutron path terminates at the end of a cylinder. This problem is similar to problems which have been previously encountered.

In one study case, differential albedos were used. It was found that turning on the print option PAX in the KENO parameter card caused a change in the random sequence. This problem was traced to an incorrect resetting of a pointer when the print option was triggered.

The correction for both of these problems is straightforward. The proposed corrections should not affect the random sequence on any of the validation runs except for CAB09. It is recommended that these corrections be made to Y12CSG KENO V.a. These corrections would not require a revalidation of the code.

2.2.4 Bias in the 1F Experiments

The complete series of experiments at 415 g U/l, commonly referred to as the 1F arrays, from ref. 38, were included in the validation as cases CAS60-CAS91 in Table 5. Five of these experiments had been included in several previous validations,[5,6] whereas the complete set of experiments was first included in ref. 6. As a result, two different models of these five cases were included in this validation. Experiments which were included twice are listed in Table 9.

The primary modeling difference is that cases CAS13, CAS19, and CAS29 did not include the experimental room, whereas cases CAS91, CAS64, and CAS63 did. A best estimate of the room was included in the second modeling based on layout drawings of the experiment and descriptions of the experiments from personnel involved in the experiment. When room reflection was included in the model, a 1-1/2% bias for the unreflected cases was eliminated. The two reflected cases are models of the same experiment, except they were prepared by different analysts in a slightly different manner. It is recommended that cases CAS13, CAS16, CAS17, CAS18, and CAS29 be dropped from future validations since they are duplicates and are less accurately modeled.

The balance of the 1F array experiments shows a strong 1-1/2% bias for the reflected cases. These experiments were studied in detail.[46] The experimental logbook was available, and a comparison of the reported experiments versus the logbook description was done on a case-by-case basis. A number of details had been omitted from the experimental description in ref. 38. The most important of the details seem to be as follows.

Table 9. Duplicate 1F array calculations

Case	k	Corresponding Case	k	Reflection
CAS13	0.9854	CAS91	1.0052	U[a]
CAS16	0.9879	CAS64	0.9963	U
CAS17	1.0250	CAS74	1.0172	R[b]
CAS18	1.0010	CAS72	1.0016	R
CAS29	0.9872	CAS63	1.0050	U

[a]U - unreflected
[b]R - reflected

1. The reported critical arrays are interpolations or extrapolations of the actual experiments. In some cases, a single experiment was used and then extrapolated to an ideal array (an array of identical units equally spaced in three dimensions).
2. Details of the reflector were omitted and only nominal compositions and thicknesses were reported for the experimental materials. In many instances the reflector contained streaming paths (holes) for which no description was given.

Based on the best information available, the experiments were remodeled. Only documentable information was incorporated into these refined models. The results of the calculations for the original and refined models are given in Table 10.

The average of the calculated k_{eff} of the 28 experiments which were remodeled was 1/2% lower for the refined models when compared against the original models. This is considered significant with respect to the statistics of the calculations. The remaining bias is still unexplained.

In the logbook review, it was found that the experiment described in CAS74 was not run. For this experiment, five faces of the array were paraffin-reflected and one was Plexiglas-reflected. (There was insufficient paraffin available to fully reflect the 3x3x3 array with a 15.24-cm reflector.) It is recommended that CAS74 be dropped from future validations, since it is not a model of a critical experiment.

During this sequence of calculations several observations were made.

1. The automatic solution generator in the Y12CSG package caused a small (but noticeable) change in the uranium density and H/U ratio in the nitrate solution. For some cases this caused as much as 1/2% change in the infinite media multiplication factor from XSDRN calculations when compared to results using hand-calculated atomic number densities. It is recommended that the automatic solution generation option not be used if precise detail is available.
2. A comparison was made of the calculated k_{eff} for models in which a default weighting function of 0.5 was used in the reflector versus the use of reflector biasing. For these problems it was found that reflector biasing saved an average of 38% on the CPU time. No irregularities were observed between the full tracking versus "reflector biased" calculations except when paraffin weighting functions were used for thick Plexiglas reflectors. Based on an inspection of adjoint calculations for Plexiglas (as a reflector), it was found that the weighting function for Plexiglas is more like water than paraffin. It is recommended that the paraffin reflector bias not be routinely used for Plexiglas. Plexiglas reflector bias weights may need to be incorporated into the Y12CSG package.
3. It appears that these arrays may be susceptible to undersampling because a different starting random number seed changed the results of several calculations by more than three standard deviations. There was no other apparent indication of undersampling. A neutron batch size of 600 may not be sufficient to hold a good neutron starting distribution for these arrays.
4. A definite trend in k_{eff} in the refined models was observed as the reflector thickness increased. This may be an indication that some important parameter was omitted from the experimental description and/or model. The possibility of poor cross sections or a problem in code physics exists also. At present, the calculated k_{eff} for this series of experiments is considered biased an average of 1 to 1-1/2% high.

2.2.5 Bias in the Slab Experiments from Ref. 43

Cases CAS39-CAS50 of Table 5 are experiments involving 3- and 6-in.-thick slabs of UO_2F_2 solution at 81.8 g U/l. Six of these experiments appeared in Table 5 of ref. 6 and showed no bias. The balance appeared in Table 6 of ref. 6 and showed a strong 2% negative bias but were flagged as "neglecting external scatter that may be significant." A model of a large tank (Big Sid) had been

Table 10. Comparison of calculated k_{eff} for the 1F arrays

Reflection conditions	Number of units	Original model	Refined model
Unreflected	(8)	1.0081	1.0039
	(27)	1.0050	0.9940
	(64)	0.9963	0.9969
	(125)	0.9934	0.9983
		1.0007	0.9983
1.27 paraffin reflected	(27)	1.0134	1.0000
	(8)	1.0165	1.0084
		1.0149	1.0042
1.27 plex reflected	(27)	1.0016	1.0048
	(8)	1.0175	1.0048
		1.0095	1.0048
3.81 paraffin reflected	(27)	1.0300	1.0249
	(8)	1.0177	1.0187
		1.0239	1.0218
7.62 paraffin reflected	(27)	1.0302	1.0311
	(8)	1.0169	1.0186
		1.0236	1.0249
15.24 paraffin reflected	(8)	1.0177	1.0110
	(27)	1.0117	1.0160
		1.0202	1.0135
15.24-cm bottom reflector, 5 remaining sides uniform reflector			
1.27 paraffin reflected	(27)	1.0170	1.0020
	(8)	1.0195	1.0024
		1.0183	1.0022
1.28 plex reflected	(8)	1.0046	1.0023
	(27)	1.0020	1.0159
		1.0033	1.0091
2.54 plex reflected	(8)	1.0137	1.0030
	(27)	1.0217	1.0166
		1.0177	1.0098
3.81 paraffin reflected	(27)	1.0205	1.0202
	(8)	1.0225	1.0178
		1.0215	1.019
4.45 plex reflected	(8)	1.0223	1.0146
6.35 plex reflected	(8)	1.0197	1.0167
7.62 paraffin reflected	(8)	1.0247	1.0147
	(27)	1.0302	1.0286
		1.0275	1.0217
11.43 plex reflected	(8)	1.0225	1.0179
15.26 plex reflected	(8)	1.0237	1.0220

included in the experimental model for the cases reported in Table 5 of ref. 6. Reference 43 was carefully reviewed, and a model of the experimental room and tank were incorporated as appropriate into all of the models. The room was based on a layout drawing of the experimental facility with a "best estimate" of the actual location of the slabs in the room.

The new models substantially improved the calculations for the experiments done inside Big Sid; however, the experiments done outside of Big Sid still showed a 1-1/2% bias. The experimental logbooks were available and reviewed against the reported experiments. Two items of potential significance were observed:

1. There was no detailed description of the tank support structures including how far from the floor the tanks were positioned during the experiments. There was also no description of a control blade structure which was suspended above at least one of the tanks during all of the experiments.
2. There were fragmented notes made at the time of the experiment, and on two later dates, expressing a concern with the accuracy of the uranium concentration analysis and the possibility that evaporation may have increased the concentration. The experiments were reported as being run at an H/X=337; notes in the logbook indicated that the solution concentration was between H/X=333 and H/X=335 at the end of the experiments.

Table 11 shows a comparison of the original model versus the refined model for these calculations. In the refined models the tanks were 12 in. above the floor (a best estimate based on discussion with personnel involved in the experiments). All calculations included a room model and were at an H/X=337. The experiments are reported in the order in which they were performed. All of the experiments done inside Big Sid calculate well. However, all of the experiments done outside of Big Sid still show a bias. Based on the results in Table 11, it appears that the bias in the calculations was either a function of the time at which the experiments were performed or the location at which they were done. The first case could indicate a potential problem with solution concentration; the second would indicate inadequacies in the experimental model. One of the personnel involved in these experiments was questioned as to the possibility of evaporation and an incorrectly reported H/X ratio. It was commented that at the time the experiments were performed, the accuracy of a concentration analysis was usually no better than 1% and that the experiments were reported as "preliminary" because the experimentalists had problems with some of the results. It was suggested that the eta experiments performed some years later be modeled and calculated.

Several infinite media calculations were done using the XSDRN code to study the impact of an incorrect H/X ratio for this solution. The results indicate that the 1-1/2% to 2% bias observed in the experiments done outside Big Sid could have been caused because of an incorrect concentration used in the calculations; however, insufficient evidence is available to discount the possibility of modeling bias.

2.2.6 Bias Caused by the Analyst's Model

When modeling critical experiments, the analyst must decide how much detail to incorporate into his/her model, and, in some cases, how to approximate the various details of the experiment which cannot be modeled explicitly. The amount of detail which is modeled is usually a function of the cost, either time or money, required to include the detail. Many times an analyst calls on past experience in determining what is important and what may be omitted from a model without significantly affecting the results. It was found that cases CAS20 and CAS21 from Table 5 were repeats of Cases CAA30 and CAA38 from Table 4. The calculated k_{eff} for these cases was 1.03654, 1.0239, 0.9961, and 1.0061, respectively. The discrepancies were briefly reviewed. It was found that the cases had been set up by two different analysts at different times. Each experimental model was imprecise in that certain details of the experiment were omitted. It was observed that the major difference between CAS20 and

Table 11. Comparison of calculated k_{eff} for the slab experiments

		k_{eff}	
Case	Comments	Original model	Refined model
CAS30	The first 15 experiments	0.9978	0.9950
CAS52	were performed inside	0.9852	0.9901
CAS49	Big Sid and took ten	0.9831	0.9980
CAS50	days from start to	0.9814	0.9941
CAS51	completion	0.9791	0.9919
CAS40		0.9824	0.9868
CAS34		0.9803	0.9878
CAS35		0.9906	0.9906
CAS36		0.9933	0.9918
CAS37		1.0030	1.0030
CAS38		0.9881	0.9913
CAS39		0.9952	0.9952
CAS32		0.9805	0.9921
CAS33		0.9995	0.9995
CAS31		0.9949	0.9949
	21 days of related experimenting with same solution		
CAS53	The last 15 experiments	0.9884	0.9834
CAS41	were performed outside of	0.9767	0.9821
CAS55	Big Sid and took ten days	0.9876	0.9923
CAS56	from start to completion	0.9869	0.9847
CAS43		0.9835	0.9803
CAS57		0.9864	0.9954
CAS44		0.9757	0.9803
CAS58		0.9824	0.9793
CAS42		0.9916	0.9825
CAS54		0.9831	0.9859
CAS59		0.9836	0.9852
CAS47		0.9819	0.9875
CAS46		0.9832	0.9729
CAS45		0.9871	0.9946
CAS48		0.9813	0.9858

Logbook indicates estimated concentration at H/X=333 due to evaporation.

CAA30 was that the analyst who set up CAA30 included fire-retardent Plexiglas in the modeling of the upper and lower reflector, whereas the analyst who set up CAS20 used regular Plexiglas for the entire reflector. The result was a 3-1/2% positive bias for CAS20. In CAS21, the analyst chose to ignore a 1.25-cm gap at the junction of the upper and lower reflectors. This omission accounted for approximately 70% of the difference between cases CAS21 and CAA30. Based on these observations, it is recommended that CAS20 and CAS21 be dropped from future validations, and that cases CAA12-CAA43 be reviewed to ensure that sufficient detail has been incorporated into the models. These two cases highlight the importance of accurately modeling reflector compositons and streaming paths in the reflector.

Case CAS14 from Table 5 calculated a k_{eff} of 1.0585. Reference 39 was reviewed, and it was found that several details of the experiment had been omitted from the model. These included the omission of two steel lateral support plates and a detailed model of the stainless-steel slab tank. The model was refined, and the calculated k_{eff} dropped to 1.03. The 3% positive bias has not been accounted for. Reference 39 documents more than 100 critical experiments. Many of the experiments are similar to the 1F array experiments which show a positive bias. Based on this, it is recommended that several more experiments from ref. 39 be included in future validations in order to better establish the bias for these experiments. If possible, additional information beyond what was reported in ref. 39 (such as the experimental logbook and experimentalists' notes) should be reviewed. There is an indication from this experiment (and several others which contain Plexiglas) that the chemical and/or impurity composition of Plexiglas has not been adequately reported. Trace impurities in paraffin or Plexiglas seem to have a strong effect on the calculated k_{eff}. (There is some evidence that high leakage systems, such as arrays, which are reflected by thin reflectors, are biased. This may indicate code or cross-section problems.)

Evidence of analyst bias was also observed in cases CAA08, CAA10, and CAA11 from Table 4. The analyst used a fissile isotope density which was tabulated at 25°C in ref. 27, whereas the experiments were actually done at different temperatures and had different fissile isotope densities. Instead of simply remodeling only the four incorrect experiments, all of the experiments documented in ref. 27 were modeled and run. For these cases, the radius of the "effective" sphere was calculated based on the reported critical volume (since there appeared to be only slight variation due to temperature). The fissile isotope density was based on the reported critical mass and volume. (It was noted that all of the reported masses for experiments performed in the 32-cm-diam tank were flagged as being 2% high; however, the reported masses used.) The concentration and masses were high because a layer of plastic paint used to protect the inside of the tank was not taken into account in the volume measurements. This plastic was not modeled in these calculations. The calculations were done using the modified control module which treats all of the admixed moderators. The results are listed in Table 12.

The results indicate that the U-233 experiments are biased ~2-1/2% high. The U-235 experiments in the 26.4-cm-diam sphere appear to be unbiased, but the experiments in the 32-cm-diam sphere appear to be biased 1-1/2 to 2% high.

Based on these results, it is recommended that cases CAA08-CAA11 be refined or be omitted from future validations. The cause of the bias in the results in Table 12 is not known at this time. If the plastic paint used on the interior surface contained impurities such as chlorine or boron, then omission from the model could explain the results.

2.2.6.1 Bias in CAS19, Table 5

Case CAS19 from Table 5 showed a 3.29% positive bias. The experimental model for the case was compared against the reference document. It was found that the model contained more information than was reported in ref. 41. These arrays have been calculated many times with earlier versions of KENO and the 16-group cross-section set.[47,48] The input for the earlier calculations was compared. It was found that the automatic solution generator option had been used for the Y12CSG validation, whereas the atomic number densities had been hand calculated and input for previous validations. The

Table 12. UO_2F_2 solution spheres

H/X	Temp. °C	gm X/l	Calculated k	Original calculation
U-233/26.4-cm diam/H_2O reflected				
418.3	36.0	61.14	1.0149	
414.6	39.5	61.63	1.0287	
400.5	65.5	62.96	1.0250	
389.6	83.2	64.07	1.0088	
378.1	96.5	65.52	1.0231	
U-233/32.0-cm diam/H_2O reflected				
663.1	26.3	38.72	1.0268	
643.1	56.0	39.49	1.0261	
602.8	99.5	41.17	1.0411	
U-233/32-cm diam/unreflected				
381.0	27.0	67.33	1.0251	
U-235/26.4-cm diam/H_2O reflected				
268.8	27.5	95.05	1.0028	
253.3	39.5	96.67	0.9999	
245.4	74.0	101.90	1.0191	
239.3	85.5	103.86	1.0055	CAA10, k = 1.0164
U-235/32.0-cm diam/H_2O reflected				
515.1	27.0	50.28	1.0045	CAA08, k = 1.0212
502.6	43.0	51.20	1.0173	
503.4	43.0	51.13	1.0094	
496.5	54.0	51.59	1.0131	
487.6	64.5	52.22	1.0218	
476.8	87.5	52.72	1.0190	(averaged) CAA11, k = 1.0351
459.6	87.5	54.61	1.0220	
U-235/32.0-cm diam/unreflected				
203.5	27.0	125.08	1.0078	CAA09, k = 0.9991

difference was an 0.6% increase in the uranium density and an 8% increase in the H/X ratio for the number densities calculated by the automatic solution generator. It was also found that the composition for stainless steel 304 differed from what the code uses in standard composition SS304.

The KENO output indicated a potential source convergence and/or undersampling problem in that the average value of k_{eff} was 1.0198, where the calculated k with the lowest standard deviation was 1.0329. The plot of k_{eff} by generation skipped showed an unusual trend. The plot of average k_{eff} indicated that the source distribution had not converged after more than 40 generations, and convergence was from low k_{eff} toward the final value. It appears that calculations which approach the final value from below tend to have more difficulty converging the source than those which approach the final value from above. The calculation was rerun using the atomic number densities used in previous validations. In addition, a cosine starting distribution was used over a section at the central portion of the column. The calculated k was 1.0201. Several of the pipe intersection experiments should be included in future validations in order to establish the bias for this type of system.

3. GENERAL COMMENTS ON THE EXPERIMENTS REVIEWED

Based on the study of the experiments which showed some evidence of bias, several observations may be made. The most significant is that a large proportion of the experiments which have been included in this validation and in previous validations should be scrutinized to determine their adequacy for use in validating codes. There is a surprising lack of detail in the descriptions of the experiments,including estimates of the accuracy of concentration in the fissile mixture, the actual dimensions and composition of the materials involved in the experiment and the experimental layout itself. Details such as the description of the experimental room and the location of the experiment in the room have been omitted from most reports. For some systems, these details are extremely important; and their inclusion or omission may bias the calculated results. In some of the experiments studied, the uncertainty in the experimental parameters could easily bias calculated results 2% high or low, but the uncertainties were not reported. This deficiency indicates a need for a set of experiments which has been carefully evaluated specifically for validation purposes such that reporting bias is eliminated (or at least is well known).

In some instances, the modeling of the critical experiment was found to be poor and biased the results by more than 2%. This again shows a lack of attention to detail. In other cases, the models which were set up were incorrect. These deficiencies indicate a need to verify the accuracy of the models used for validation. Reporting bias and/or modeling bias tend to mask potential problems with the code or cross sections being used. Since these forms of bias are not systematic, the inclusion of these results in any trend analysis should be avoided in order to eliminate the possibility of artificial trends. Extrapolation and/or interpolation of critical experiment information based on artificial trends may not be correct.

In order for the codes and cross sections used for criticality safety to be improved, validation efforts should continue. The cause of the bias in the calculations should be determined and eliminated if possible.

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Appendix A

Y12CSG INPUT DATA USED FOR VALIDATION CASES

Input data for the validation appears in the same order as listed in Tables 1-6 of Sect. 1 of this report.

Table A.1. Table 1 input data

```
CAA01
=CSAS25
LIBBY EXP. 4.89% RODS 30 CM LONG, .762 CM DIAM, 1.3 CM PITCH
27GROUPNDF4 LATTICECELL
URANIUM    1 .9995 293 92235 4.89 92238 95.11 END
H2O         2 1 END
PLEXIGLASS  3 1 END
END COMP
SQUAREPITCH  1.3 .762 1 2 END
LIBBY EXP. 4.89% RODS 30 CM LONG, .762CM DIAM, 1.3CM PITCH
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 .381 5.08 0
CUBOID    2 1 4P.65 5.08 0
UNIT 2
CYLINDER  1 1 .381 1.27 0
CUBOID    3 1 4P.65 1.27 0
UNIT 3
CYLINDER  1 1 .381 17.935 0
CUBOID    2 1 4P.65 17.935 0
UNIT 4
CYLINDER  1 1 .381 .635 0
CUBOID    3 1 4P.65 .635 0
UNIT 5
CUBOID    2 1 4P.65 5.08 0
UNIT 6
CYLINDER  2 1 .381 1.27 0
CUBOID    3 1 4P.65 1.27 0
UNIT 7
CUBOID    2 1 4P.65 17.935 0
UNIT 8
CYLINDER  2 1 .381 .635 0
CUBOID    3 1 4P.65 .635 0
CORE      0 1 3R0
REFLECTOR  3 1 5R0 3.81 1
REFLECTOR  2 2 5R3 0 1
REFLECTOR  2 3 5R3 2.19 1
REFLECTOR  2 4 4R3 3.2 3 1
REFLECTOR  2 5 4R3 0 3   2
END GEOM
READ ARRAY NUX=20 NUY=21 NUZ=5 FILL
19R5 401R1  19R6 401R2  19R7 401R3 19R8 401R4 19R5 401R1
END FILL END ARRAY
READ BIAS ID=500 2 6 END BIAS
END DATA
END
```

```
CAA02
=CSAS25
LIBBY EXP. 4.89% RODS 30 CM LONG, .762 CM DIAM, 1.3CM PITCH
27GROUPNDF4  LATTICECELL
URANIUM    1 .995 293 92235 4.89 92238 95.11 END
H2O         2 1 END
PLEXIGLASS  3 1 END
END COMP
SQUAREPITCH  1.3 .762 1 2 END
LIBBY H2O REFL. CASE 4B_
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 .381 30 0
CUBOID    2 1 4P.65 30 0
UNIT 2
CUBOID    2 1 4P.65 30 0
CORE      0 1 3R0
REFLECTOR  2 2 6R3 1
REFLECTOR  2 3 4R3 1 3 1
REFLECTOR  2 4 4R3 0 3 3
END GEOM
READ ARRAY NUX=22 NUY=22 NUZ=1 FILL
10R1 2R2 10R1 9Q22 44R2 10R1 2R2 10R1 9Q22
END FILL END ARRAY
READ BIAS ID=500 2 6 END BIAS
END DATA
END
```

```
CAA03
=CSAS25
LIBBY EXP. 4.89% RODS 30 CM LONG, .762 CM DIAM, 1.3 CM PITCH
27GROUPNDF4  LATTICECELL
URANIUM    1 .9995 293 92235 4.89 92238 95.11 END
H2O         2 1 END
PLEXIGLASS  3 1 END
END COMP
SQUAREPITCH  1.3 .762 1 2 END
LIBBY H2O REFL. CASE 11A
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 .381 30 0
CUBOID    2 1 4P.65 30 0
UNIT 2
CUBOID    2 1 4P.65 30 0
CORE      0 1 3R0
REFLECTOR  2 2 6R3 2
REFLECTOR  2 4 4R3 1.9    3 1
REFLECTOR  2 5 4R3 0 3 2
END GEOM
READ ARRAY NUX=23 NUY=23 NUZ=1 FILL
12R2 2R1 2 2Q3 2R1  Q23  23R2  2R1 2 6Q3 2R1  N46  5Q69
2R1 2 6Q3 2R1  Q23
END FILL END ARRAY
READ BIAS ID=500 2 6 END BIAS
END DATA
END
```

Table A.1 (continued)

```
CAA04
=CSAS25
LIBBY EXP. 4.89 RODS 30 CM LONG, .762 CM DIAM, 2.05 CM PITCH
27GROUPNDF4  LATTICECELL
URANIUM    1 .9995 293 92235 4.89 92238 95.11 END
H2O         2 1 END
PLEXIGLASS  3 1 END
END COMP
SQUAREPITCH  2.05 .762 1 2 END
LIBBY H2O REFL. CASE 6A
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 .381 30 0
CUBOID    2 1 4P1.025 30 0
UNIT 2
CUBOID    2 1 4P1.025 30 0
CORE      0 1 3R0
REFLECTOR  2 2 6R3 3
REFLECTOR  2 5 4R3 .3 3 1
REFLECTOR  2 6 4R3 0 3 1
END GEOM
READ ARRAY NUX=14 NUY=15 NUZ=1 FILL
7R1 7R2 F1
END FILL END ARRAY
READ BIAS ID=500 2 6 END BIAS
END DATA
END
```

```
CAA05
=CSAS25
LIBBY EXP. 4.89% RODS 30 CM LONG, .762 CM DIAM, 2.05 CM PITCH
27GROUPNDF4  LATTICECELL
URANIUM    1 .9995 293 92235 4.89 92238 95.11 END
H2O         2 1 END
PLEXIGLASS  3 1 END
END COMP
SQUAREPITCH  2.05 .762 1 2 END
LIBBY H2O REFL. CASE 8C
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 .381 30 0
CUBOID    2 1 4P1.025 30 0
UNIT 2
CUBOID    2 1 4P1.025 30 0
CORE      0 1 3R0
REFLECTOR  2 2 6R3 1
REFLECTOR  2 3 4R3 .35 3 1
REFLECTOR  2 4 4R3 0 3 3
END GEOM
READ ARRAY NUX=22 NUY=22 NUZ=1 FILL
10R1 2R2 10R1 9Q22 22R2 N242
END FILL END ARRAY
READ BIAS ID=500 2 6 END BIAS
END DATA
END
```

```
CAA06
=CSAS25
LIBBY EXP. 4.89% RODS 30 CM LONG, .762 CM DIAM, 1.3 CM PITCH
27GROUPNDF4  LATTICECELL
URANIUM    1 .9995 293 92235 4.89 92238 95.11 END
H2O         2 1 END
PLEXIGLASS  3 1 END
PB    4 1 END
END COMP
SQUAREPITCH  1.3 .762 1 2 END
LIBBY H2O REFL. CASE 14A PB 1 FACE
READ PARAM NPG=600  NUB=YES PLT=NO FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 .381 30 0
CUBOID    2 1 4P.65 30 0
UNIT 2
CUBOID    2 1 4P.65 30 0
UNIT 3
ARRAY 1 3R0
REFLECTOR  2 2 2R3 0 3 2R0 2
REFLECTOR  2 4 2R1.32 0 1.32 2R0 1
UNIT 4
CUBOID  4 1 2P20.32 2P10.16 25.4 0
REFLECTOR  2 2 4R0 1.425 0 1
REFLECTOR  3 2 5R0 3.175 1
ARRAY 2 3R0
REFLECTOR  2 4 2R1.68 0 1.68 2R0 1
REFLECTOR  2 5 2R3 0 3 2R0 2
REFLECTOR  2 2 4R0 3 0 1
REFLECTOR  2 3 4R0 2.1 0 1
REFLECTOR  3 2 5R0 3 4
REFLECTOR  3 6 5R0 1.97 1
END GEOM
READ ARRAY ARA=1 NUX=20 NUY=20 NUZ=1 FILL
18R1 2R2 F1
END FILL
ARA=2 NUX=1 NUY=2 NUZ=1 FILL 3 4
END FILL END ARRAY
READ BIAS ID=500 2 6 END BIAS
READ PLOT TTL='14A X-Y' PIC=MIX
XUL=-7.8 YUL=53.8 ZUL=15  XLR=48.8 YLR=-7.8 ZLR=15
UAX=1 VDN=-1 NAX=125 END
TTL='14A X-Y' PIC=WTS END
TTL='14A Y-Z' PIC=MIX
XUL=20 YUL=-7.8 ZUL=35.5  XLR=20 YLR=53.8 ZLR=-14.1
VAX=1 WDN=-1 UAX=0 VDN=0 NAX=125 END
TTL='14A Y-Z' PIC=WTS END
END PLOT
END DATA
END
```

Table A.1 (continued)

```
CAA07
=CSAS25
LIBBY EXP. 4.89% RODS 30 CM LONG, .762 CM DIAM, 1.3 CM PITCH
27GROUPNDF4  LATTICECELL
URANIUM    1 .9995 293 92235 4.89 92238 95.11 END
H2O        2 1 END
PLEXIGLASS  3 1 END
PB   4 1 END
END COMP
SQUAREPITCH  1.3 .762 1 2 END
LIBBY H2O REFL. CASE 23B PB 4 FACES
READ PARAM NPG=600  NUB=YES PLT=NO FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 .381 27 0
CUBOID    2 1 4P.65 27 0
UNIT 2
CUBOID    2 1 4P.65 27 0
UNIT 7
CYLINDER  1 1 .381 3 0
CUBOID    0 1 4P.65 3 0
UNIT 8
CUBOID    0 1 4P.65 3 0
UNIT 3
ARRAY 1 3R0
REFLECTOR  2 1 4R3.221 2R0 1
UNIT 9
ARRAY 4 3R0
REFLECTOR  0 1 4R3.221 2R0 1
UNIT 10
ARRAY 5 3R0
UNIT 4
CUBOID  4 1 2P10.16 2P16.871 25.4 0
REFLECTOR  0 1 4R0 1.425 0 1
REFLECTOR  3 2 5R0 3.175 1
UNIT 5
ARRAY 2 3R0
UNIT 6
CUBOID  4 1 2P37.191 2P10.16 25.4 0
REFLECTOR  0 1 4R0 1.425 0 1
REFLECTOR  3 2 5R0 3.175 1
ARRAY 3 3R0
REFLECTOR 3 2 5R0 3 4
REFLECTOR 3 6 5R0 1.97 1
END GEOM
READ ARRAY ARA=1 NUX=21 NUY=21 NUZ=1 FILL
10R1 2 10R1 9Q21 21R2 10R1 2 10R1 9Q21
END FILL
ARA=4 NUX=21 NUY=21 NUZ=1 FILL
10R7 8 10R7 9Q21 21R8 10R7 8 10R7 9Q21
END FILL
ARA=2 NUX=3 NUY=1 NUZ=1 FILL 4 10 4 END FILL
ARA=3 NUX=1 NUY=3 NUZ=1 FILL 6 5 6
END FILL
ARA=5 NUX=1 NUY=1 NUZ=2 FILL 3 9
END FILL END ARRAY
READ BIAS ID=500 2 6 END BIAS
READ PLOT TTL=' X-Y' PIC=MIX
XUL=0 YUL=75 ZUL=15  XLR=75 YLR=0 ZLR=15
UAX=1 VDN=-1 NAX=125 END
TTL=' X-Y' PIC=WTS END
TTL=' Y-Z' PIC=MIX
XUL=33 YUL=0 ZUL=31  XLR=33 YLR=75 ZLR=-14.1
VAX=1 WDN=-1 UAX=0 VDN=0 NAX=125 END
TTL=' Y-Z' PIC=WTS END
END PLOT
END DATA
END
```

```
CAA08
=CSAS25
LIBBY EXP. 4.89% RODS 30 CM LONG, .762 CM DIAM, 1.3 CM PITCH
27GROUPNDF4  LATTICECELL
URANIUM    1 .9995 293 92235 4.89 92238 95.11 END
H2O        2 1 END
PLEXIGLASS  3 1 END
PB   4 1 END
END COMP
SQUAREPITCH  1.3 .762 1 2 END
LIBBY H2O REFL. CASE 26A PB 4 FACES
READ PARAM NPG=600  NUB=YES PLT=NO FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 .381 30 0
CUBOID    2 1 4P.65 30 0
UNIT 2
CUBOID    2 1 4P.65 30 0
UNIT 3
ARRAY 1 3R0
REFLECTOR  2 1 .62 .62 .62 4.52 2R0 1
UNIT 4
CUBOID  4 1 2P10.16 2P15.57 25.4 0
REFLECTOR  2 2 4R0 1.425 0 1
REFLECTOR  3 2 5R0 3.175 1
UNIT 5
ARRAY 2 3R0
UNIT 6
CUBOID  4 1 2P35.89 2P10.16 25.4 0
REFLECTOR  2 2 4R0 1.425 0 1
REFLECTOR  3 2 5R0 3.175 1
ARRAY 3 3R0
REFLECTOR 2 2 4R0 3 0 2
REFLECTOR 2 4 4R0 1.95 0 1
REFLECTOR 3 2 5R0 3 4
REFLECTOR 3 6 5R0 1.97 1
END GEOM
READ ARRAY ARA=1 NUX=23 NUY=20 NUZ=1 FILL
3R2 2R1 2 5Q3 2R1  Q23  23R2  Q69  2 1 2 2R1 2 5Q3 2R1
2R1 2 6Q3 2R1  23R2  2R1 2 6Q3 2R1  Q23  23R2  2Q69
2R1 2 6Q3 2R1  Q23
END FILL
ARA=2 NUX=3 NUY=1 NUZ=1 FILL 4 3 4 END FILL
ARA=3 NUX=1 NUY=3 NUZ=1 FILL 6 5 6
END FILL END ARRAY
READ BIAS ID=500 2 6 END BIAS
READ PLOT TTL=' X-Y' PIC=MIX
XUL=0 YUL=72 ZUL=15  XLR=72 YLR=0 ZLR=15
UAX=1 VDN=-1 NAX=125 END
TTL=' X-Y' PIC=WTS END
TTL=' Y-Z' PIC=MIX
XUL=33 YUL=0 ZUL=40  XLR=33 YLR=72 ZLR=-14.1
VAX=1 WDN=-1 UAX=0 VDN=0 NAX=125 END
TTL=' Y-Z' PIC=WTS END
END PLOT
END DATA
END
```

Table A.1 (continued)

```
CAA09
=CSAS25
LIBBY EXP. 4.89% RODS 30 CM LONG, .762 CM DIAM, 1.3 CM PITCH
27GROUPNDF4  LATTICECELL
URANIUM    1 .9995 293 92235 4.89 92238 95.11 END
H2O        2 1 END
PLEXIGLASS  3 1 END
PB   4 1 END
SS304  5 1 END
END COMP
SQUAREPITCH  1.3 .762 1 2 END
LIBBY H2O REFL. CASE 28A PB 4 FACES, SS PLATE IN CENTER
READ PARAM NPG=600  NUB=YES PLT=NO FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 .381 30 0
CUBOID    2 1 4P.65 30 0
UNIT 2
CUBOID    2 1 4P.65 30 0
UNIT 3
ARRAY 1 3R0
REFLECTOR  2 1 0 3R.62 2R0 1
UNIT 7
ARRAY 4 3R0
REFLECTOR  2 1 .62 0 2R.62 2R0 1
UNIT 8
CUBOID  5 1 2P.3175 2P15.57 25.4 0
REFLECTOR  2 1 2R.3325 2R0 1.425 3.175 1
UNIT 4
CUBOID  4 1 2P10.16 2P15.57 25.4 0
REFLECTOR  2 2 4R0 1.425 0 1
REFLECTOR  3 2 5R0 3.175 1
UNIT 5
ARRAY 2 3R0
UNIT 6
CUBOID  4 1 2P35.89 2P10.16 25.4 0
REFLECTOR  2 2 4R0 1.425 0 1
REFLECTOR  3 2 5R0 3.175 1
ARRAY 3 3R0
REFLECTOR  2 2 4R0 3 0 5
REFLECTOR  2 6 4R0 1 0 1
REFLECTOR  3 2 5R0 3 4
REFLECTOR  3 6 5R0 1.97 1
END GEOM
READ ARRAY ARA=1 NUX=11 NUY=23 NUZ=1 FILL
2 1 2 2R1 2Q3  2R1 2 2R1 2Q3  11R2  2R1 2 2R1 2Q3  Q11  6Q33
END FILL
ARA=4 NUX=11 NUY=23 NUZ=1 FILL
2R1 2 2R1 2Q3  Q11  11R2  2R1 2 2R1 2Q3  Q11  6Q33
END FILL
ARA=2 NUX=5 NUY=1 NUZ=1 FILL 4 3 8 7 4 END FILL
ARA=3 NUX=1 NUY=3 NUZ=1 FILL 6 5 6
END FILL END ARRAY
READ BIAS ID=500 2 6 END BIAS
READ PLOT TTL=' X-Y' PIC=MIX
XUL=0 YUL=72 ZUL=15  XLR=72 YLR=0 ZLR=15
UAX=1 VDN=-1 NAX=125 END
TTL=' X-Y' PIC=WTS END
TTL=' Y-Z' PIC=MIX
XUL=33 YUL=0 ZUL=40  XLR=33 YLR=72 ZLR=-14.1
VAX=1 WDN=-1 UAX=0 VDN=0 NAX=125 END
TTL=' Y-Z' PIC=WTS END
END PLOT
END DATA
END
```

```
CAA10
=CSAS25
LIBBY EXP. 4.89% RODS 30 CM LONG, .762 CM DIAM, 1.3 CM PITCH
27GROUPNDF4  LATTICECELL
URANIUM    1 .9995 293 92235 4.89 92238 95.11 END
H2O        2 1 END
PLEXIGLASS  3 1 END
PB   4 1 END
B-10  5 0 4.617-3 END
B-11  5 0 1.872-2 END
C     5 0 5.750-3 END
AL    5 0 4.765-2 END
END COMP
SQUAREPITCH  1.3 .762 1 2 END
LIBBY H2O REFL. CASE 30C PB 4 FACES, BORAL PLATE 6TH ROW
READ PARAM NPG=600  NUB=YES PLT=NO FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 .381 30 0
CUBOID    2 1 4P.65 30 0
UNIT 2
CUBOID    2 1 4P.65 30 0
UNIT 3
ARRAY 1 3R0
REFLECTOR  2 1 2R.62 0 .62 2R0 1
UNIT 7
ARRAY 4 3R0
REFLECTOR  2 1 3R.62 0 2R0 1
UNIT 8
CUBOID  5 1 2P15.57 2P.3175 25.4 0
REFLECTOR  2 1 2R0 2R.3325 1.425 3.175 1
UNIT 4
CUBOID  4 1 2P10.16 2P15.57 25.4 0
REFLECTOR  2 2 4R0 1.425 0 1
REFLECTOR  3 2 5R0 3.175 1
UNIT 9
ARRAY 5 3R0
UNIT 5
ARRAY 2 3R0
UNIT 6
CUBOID  4 1 2P35.89 2P10.16 25.4 0
REFLECTOR  2 2 4R0 1.425 0 1
REFLECTOR  3 2 5R0 3.175 1
ARRAY 3 3R0
REFLECTOR  2 2 4R0 3 0 1
REFLECTOR  2 3 4R0 1.8 0 1
REFLECTOR  3 2 5R0 3 4
REFLECTOR  3 6 5R0 1.97 1
END GEOM
READ ARRAY ARA=1 NUX=23 NUY=17 NUZ=1 FILL
2R2 19R1 2R2  2 21R1 2  F1
END FILL
ARA=4 NUX=23 NUY=5 NUZ=1 FILL
69R1 2 21R1 2  2R2 19R1 2R2
END FILL
ARA=5 NUX=1 NUY=3 NUZ=1 FILL 3 8 7 END FILL
ARA=2 NUX=3 NUY=1 NUZ=1 FILL 4 9 4 END FILL
ARA=3 NUX=1 NUY=3 NUZ=1 FILL 6 5 6
END FILL END ARRAY
READ BIAS ID=500 2 6 END BIAS
READ PLOT TTL=' X-Y' PIC=MIX
XUL=0 YUL=72 ZUL=15  XLR=72 YLR=0 ZLR=15
UAX=1 VDN=-1 NAX=125 END
TTL=' X-Y' PIC=WTS END
TTL=' Y-Z' PIC=MIX
```

Table A.1 (continued)

```
XUL=33 YUL=0 ZUL=40  XLR=33 YLR=72 ZLR=-14.1
TTL=' Y-Z' PIC=WTS END
END PLOT
END DATA
END


CAA11
=CSAS25
LIBBY EXP. 4.89% RODS 30 CM LONG, .762 CM DIAM, 1.3 CM PITCH
27GROUPNDF4  LATTICECELL
URANIUM    1 .9995 293 92235 4.89 92238 95.11 END
H2O         2 1 END
PLEXIGLASS  3 1 END
PB    4 1 END
CD   5 1 END
END COMP
SQUAREPITCH  1.3 .762 1 2 END
LIBBY H2O REFL. CASE 31C PB 4 FACES, CD PLATE 6TH ROW
READ PARAM NPG=600  NUB=YES PLT=NO FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 .381 30 0
CUBOID    2 1 4P.65 30 0
UNIT 2
CUBOID    2 1 4P.65 30 0
UNIT 3
ARRAY 1 3R0
REFLECTOR  2 1 2R.62 0 .62 2R0 1
UNIT 7
ARRAY 4 3R0
REFLECTOR  2 1 3R.62 0 2R0 1
UNIT 8
CUBOID  5 1 2P15.57 2P.04445 25.4 0
REFLECTOR  2 1 2R0 2R.60555 1.425 3.175 1
UNIT 4
CUBOID  4 1 2P10.16 2P15.57 25.4 0
REFLECTOR  2 2 4R0 1.425 0 1
REFLECTOR  3 2 5R0 3.175 1
UNIT 9
ARRAY 5 3R0
UNIT 5
ARRAY 2 3R0
UNIT 6
CUBOID  4 1 2P35.89 2P10.16 25.4 0
REFLECTOR  2 2 4R0 1.425 0 1
REFLECTOR  3 2 5R0 3.175 1
ARRAY 3 3R0
REFLECTOR  2 2 4R0 .5 0 1
REFLECTOR  3 2 5R0 3 4
REFLECTOR  3 6 5R0 1.97 1
END GEOM
READ ARRAY ARA=1 NUX=23 NUY=17 NUZ=1 FILL
11R1 12R2   F1
END FILL
ARA=4 NUX=23 NUY=5 NUZ=1 FILL
F1
END FILL
ARA=5 NUX=1 NUY=3 NUZ=1 FILL 3 8 7 END FILL
ARA=2 NUX=3 NUY=1 NUZ=1 FILL 4 9 4 END FILL
ARA=3 NUX=1 NUY=3 NUZ=1 FILL 6 5 6
END FILL END ARRAY
READ BIAS ID=500 2 6 END BIAS
READ PLOT TTL=' X-Y' PIC=MIX
XUL=0 YUL=72 ZUL=15  XLR=72 YLR=0 ZLR=15
UAX=1 VDN=-1 NAX=125 END
TTL=' X-Y' PIC=WTS END
TTL=' Y-Z' PIC=MIX
XUL=33 YUL=0 ZUL=40  XLR=33 YLR=72 ZLR=-14.1
VAX=1 WDN=-1 UAX=0 VDN=0 NAX=125 END
TTL=' Y-Z' PIC=WTS END
END PLOT
END DATA
END
L


CAA12
=CSAS25
LIBBY EXP. 4.89% RODS 30 CM LONG, .762 CM DIAM, 2.05 CM PITCH IN UO2F2 SOLN
27GROUPNDF4  LATTICECELL
URANIUM    1 .9995 293 92235 4.89 92238 95.11 END
SOLNUO2F2  2 295.54 0 1 293 92235 4.89 92238 95.11 END
PLEXIGLASS  3 1 END
AL  4 1 END
SOLNUO2F2  5 295.54 0 1 293 92235 4.89 92238 95.11 END
END COMP
SQUAREPITCH  2.05 .762 1 2 END
LIBBY RODS IN UO2F2 SOLN CASE 32S
READ PARAM NPG=600   NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 .381 5.08 0
CUBOID    5 1 4P1.025 5.08 0
UNIT 2
CYLINDER  1 1 .381 1.27 0
CUBOID    3 1 4P1.025 1.27 0
UNIT 3
CYLINDER  1 1 .381 17.935 0
CUBOID    5 1 4P1.025 17.935 0
UNIT 4
CYLINDER  1 1 .381 .635 0
CUBOID    3 1 4P1.025 .635 0
UNIT 5
CUBOID    2 1 4P1.025 5.08 0
UNIT 6
CYLINDER  2 1 .381 1.27 0
CUBOID    3 1 4P1.025 1.27 0
UNIT 7
CUBOID    2 1 4P1.025 17.935 0
UNIT 8
CYLINDER  2 1 .381 .635 0
CUBOID    3 1 4P1.025 .635 0
CORE      0 1 -11.275 -12.3 0
REFLECTOR  3 1 5R0 3.81 1
CYLINDER  5 1 47.94 30.1 -7.4
CYLINDER  4 1 48.26 30.1 -7.72
END GEOM
READ ARRAY NUX=11 NUY=12 NUZ=5 FILL
132R1 132R2 132R3 132R4 132R1
END FILL END ARRAY
END DATA
END
```

Table A.1 (continued)

```
CAA13
=CSAS25
LIBBY EXP. 4.89% RODS 30 CM LONG, .762 CM DIAM, 2.05 CM PITCH IN UO2F2 SOLN
27GROUPNDF4  LATTICECELL
URANIUM    1 .9995 293 92235 4.89 92238 95.11 END
SOLNUO2F2  2 295.54 0 1 293 92235 4.89 92238 95.11 END
PLEXIGLASS  3 1 END
AL  4 1 END
SOLNUO2F2  5 295.54 0 1 293 92235 4.89 92238 95.11 END
END COMP
SQUAREPITCH  2.05 .762 1 2 END
LIBBY RODS IN UO2F2 SOLN CASE 33S
READ PARAM NPG=600  FAR=YES  NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 .381 5.08 0
CUBOID    5 1 4P1.025 5.08 0
UNIT 2
CYLINDER  1 1 .381 1.27 0
CUBOID    3 1 4P1.025 1.27 0
UNIT 3
CYLINDER  1 1 .381 17.935 0
CUBOID    5 1 4P1.025 17.935 0
UNIT 4
CYLINDER  1 1 .381 .635 0
CUBOID    3 1 4P1.025 .635 0
UNIT 5
CUBOID    2 1 4P1.025 5.08 0
UNIT 6
CYLINDER  2 1 .381 1.27 0
CUBOID    3 1 4P1.025 1.27 0
UNIT 7
CUBOID    2 1 4P1.025 17.935 0
UNIT 8
CYLINDER  2 1 .381 .635 0
CUBOID    3 1 4P1.025 .635 0
CORE      0 1 -9.225 -10.25 0
REFLECTOR  3 1 5R0 3.81 1
CYLINDER  5 1 47.94 48.65 -7.4
CYLINDER  4 1 48.26 48.65 -7.72
END GEOM
READ ARRAY NUX=9 NUY=10 NUZ=5 FILL
90R1 90R2 90R3 90R4 90R1
END FILL END ARRAY
END DATA
END
```

```
CAA14
=CSAS25
LIBBY EXP. 4.89% RODS 30 CM LONG, .762 CM DIAM, 3.25 CM PITCH IN UO2F2 SOLN
27GROUPNDF4  LATTICECELL
URANIUM    1 .9995 293 92235 4.89 92238 95.11 END
SOLNUO2F2  2 301.16 0 1 293 92235 4.89 92238 95.11 END
PLEXIGLASS  3 1 END
AL  4 1 END
SOLNUO2F2  5 301.16 0 1 293 92235 4.89 92238 95.11 END
END COMP
SQUAREPITCH  3.25 .762 1 2 END
LIBBY RODS IN UO2F2 SOLN CASE 36S
READ PARAM NPG=600  FAR=YES  NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 .381 5.08 0
CUBOID    5 1 4P1.625 5.08 0
UNIT 2
CYLINDER  1 1 .381 1.27 0
CUBOID    3 1 4P1.625 1.27 0
UNIT 3
CYLINDER  1 1 .381 17.935 0
CUBOID    5 1 4P1.625 17.935 0
UNIT 4
CYLINDER  1 1 .381 .635 0
CUBOID    3 1 4P1.625 .635 0
UNIT 5
CUBOID    2 1 4P1.625 5.08 0
UNIT 6
CYLINDER  2 1 .381 1.27 0
CUBOID    3 1 4P1.625 1.27 0
UNIT 7
CUBOID    2 1 4P1.625 17.935 0
UNIT 8
CYLINDER  2 1 .381 .635 0
CUBOID    3 1 4P1.625 .635 0
CORE      0 1 -14.625 -16.25 0
REFLECTOR  3 1 5R0 3.81 1
CYLINDER  5 1 47.94 38.52 -10.16
CYLINDER  4 1 48.26 38.52 -10.48
END GEOM
READ ARRAY NUX=9 NUY=10 NUZ=5 FILL
90R1 90R2 90R3 90R4 90R1
END FILL END ARRAY
END DATA
END
```

```
CAA15
=CSAS25
LIBBY EXP. 4.89% RODS 30 CM LONG, 1.31 CM DIAM, 2.99 CM PITCH IN UO2F2 SOLN
27GROUPNDF4  LATTICECELL
URANIUM    1 .9995 293 92235 4.89 92238 95.11 END
SOLNUO2F2  2 300.24 0 1 293 92235 4.89 92238 95.11 END
PLEXIGLASS  3 1 END
AL  4 1 END
SOLNUO2F2  5 300.24 0 1 293 92235 4.89 92238 95.11 END
END COMP
SQUAREPITCH  2.99 1.31 1 2 END
LIBBY RODS IN UO2F2 SOLN CASE 40S
READ PARAM NPG=600  FAR=YES  NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 .655 5.08 0
CUBOID    5 1 4P1.495 5.08 0
UNIT 2
CYLINDER  1 1 .655 1.27 0
CUBOID    3 1 4P1.495 1.27 0
UNIT 3
CYLINDER  1 1 .655 17.935 0
CUBOID    5 1 4P1.495 17.935 0
UNIT 4
CYLINDER  1 1 .655 .635 0
CUBOID    3 1 4P1.495 .635 0
UNIT 5
CUBOID    2 1 4P1.495 5.08 0
```

Table A.1 (continued)

```
UNIT 6
CYLINDER  2 1 .655 1.27 0
CUBOID    3 1 4P1.495 1.27 0
UNIT 7
CUBOID    2 1 4P1.495 17.935 0
UNIT 8
CYLINDER  2 1 .655 .635 0
CUBOID    3 1 4P1.495 .635 0
CORE      0 1 -8.97 -10.465 0
REFLECTOR  3 1 5R0 3.81 1
CYLINDER  5 1 47.94 43.95 -10.16
CYLINDER  4 1 48.26 43.95 -10.48
END GEOM
READ ARRAY NUX=6 NUY=7 NUZ=5 FILL
42R1 42R2 42R3 42R4 42R1
END FILL END ARRAY
END DATA
END

CAA16
=CSAS25
LIBBY EXP. 4.89% RODS 30 CM LONG, 1.31 CM DIAM, 3.40 CM PITCH IN UO2F2 SOLN
27GROUPNDF4  LATTICECELL
URANIUM    1 .9995 293 92235 4.89 92238 95.11 END
SOLNUO2F2  2 300.24 0 1 293 92235 4.89 92238 95.11 END
PLEXIGLASS  3 1 END
AL  4 1 END
SOLNUO2F2  5 300.24 0 1 293 92235 4.89 92238 95.11 END
END COMP
SQUAREPITCH  3.40 1.31 1 2 END
LIBBY RODS IN UO2F2 SOLN CASE 42S
READ PARAM NPG=600  FAR=YES  NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 .655 5.08 0
CUBOID    5 1 4P1.70 5.08 0
UNIT 2
CYLINDER  1 1 .655 1.27 0
CUBOID    3 1 4P1.70 1.27 0
UNIT 3
CYLINDER  1 1 .655 17.935 0
CUBOID    5 1 4P1.70 17.935 0
UNIT 4
CYLINDER  1 1 .655 .635 0
CUBOID    3 1 4P1.70 .635 0
UNIT 5
CUBOID    2 1 4P1.70 5.08 0
UNIT 6
CYLINDER  2 1 .655 1.27 0
CUBOID    3 1 4P1.70 1.27 0
UNIT 7
CUBOID    2 1 4P1.70 17.935 0
UNIT 8
CYLINDER  2 1 .655 .635 0
CUBOID    3 1 4P1.70 .635 0
CORE      0 1 -10.2 -11.9 0
REFLECTOR  3 1 5R0 3.81 1
CYLINDER  5 1 47.94 39.1 -10.16
CYLINDER  4 1 48.26 39.1 -10.48
END GEOM
READ ARRAY NUX=6 NUY=7 NUZ=5 FILL
42R1 42R2 42R3 42R4 42R1
END FILL END ARRAY
END DATA
END

CAA17
=CSAS25
LIBBY EXP. 4.89% RODS 30 CM LONG, 1.31 CM DIAM, 3.940 CM PITCH IN UO2F2 SOLN
27GROUPNDF4  LATTICECELL
URANIUM    1 .9995 293 92235 4.89 92238 95.11 END
SOLNUO2F2  2 300.24 0 1 293 92235 4.89 92238 95.11 END
PLEXIGLASS  3 1 END
AL  4 1 END
SOLNUO2F2  5 300.24 0 1 293 92235 4.89 92238 95.11 END
END COMP
SQUAREPITCH  3.94 1.31 1 2 END
LIBBY RODS IN UO2F2 SOLN CASE 44S
READ PARAM NPG=600  FAR=YES  NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 .655 5.08 0
CUBOID    5 1 4P1.97 5.08 0
UNIT 2
CYLINDER  1 1 .655 1.27 0
CUBOID    3 1 4P1.97 1.27 0
UNIT 3
CYLINDER  1 1 .655 17.935 0
CUBOID    5 1 4P1.97 17.935 0
UNIT 4
CYLINDER  1 1 .655 .635 0
CUBOID    3 1 4P1.97 .635 0
UNIT 5
CUBOID    2 1 4P1.97 5.08 0
UNIT 6
CYLINDER  2 1 .655 1.27 0
CUBOID    3 1 4P1.97 1.27 0
UNIT 7
CUBOID    2 1 4P1.97 17.935 0
UNIT 8
CYLINDER  2 1 .655 .635 0
CUBOID    3 1 4P1.97 .635 0
CORE      0 1 -11.82 -13.79 0
REFLECTOR  3 1 5R0 3.81 1
CYLINDER  5 1 47.94 39.25 -10.16
CYLINDER  4 1 48.26 39.25 -10.48
END GEOM
READ ARRAY NUX=6 NUY=7 NUZ=5 FILL
42R1 42R2 42R3 42R4 42R1
END FILL END ARRAY
END DATA
END
```

```
CAA18
=CSAS25
LIBBY EXP. 4.89% RODS 30 CM LONG, 1.31 CM DIAM, 4.40 CM PITCH IN UO2F2 SOLN
27GROUPNDF4  LATTICECELL
URANIUM     1 .9995 293 92235 4.89 92238 95.11 END
SOLNUO2F2  2 301.14 0 1 293 92235 4.89 92238 95.11 END
PLEXIGLASS  3 1 END
AL  4 1 END
SOLNUO2F2  5 301.14 0 1 293 92235 4.89 92238 95.11 END
END COMP
SQUAREPITCH  4.40 1.31 1 2 END
LIBBY RODS IN UO2F2 SOLN CASE 45S
READ PARAM NPG=600  FAR=YES  NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 .655 5.08 0
CUBOID    5 1 4P2.20 5.08 0
UNIT 2
CYLINDER  1 1 .655 1.27 0
CUBOID    3 1 4P2.20 1.27 0
UNIT 3
CYLINDER  1 1 .655 17.935 0
CUBOID    5 1 4P2.20 17.935 0
UNIT 4
CYLINDER  1 1 .655 .635 0
CUBOID    3 1 4P2.20 .635 0
UNIT 5
CUBOID    2 1 4P2.20 5.08 0
UNIT 6
CYLINDER  2 1 .655 1.27 0
CUBOID    3 1 4P2.20 1.27 0
UNIT 7
CUBOID    2 1 4P2.20 17.935 0
UNIT 8
CYLINDER  2 1 .655 .635 0
CUBOID    3 1 4P2.20 .635 0
CORE      0 1 -13.2 -15.4 0
REFLECTOR  3 1 5R0 3.81 1
CYLINDER  5 1 47.94 41.45 -10.16
CYLINDER  4 1 48.26 41.45 -10.48
END GEOM
READ ARRAY NUX=6 NUY=7 NUZ=5 FILL
42R1 42R2 42R3 42R4 42R1
END FILL END ARRAY
END DATA
END

CAA19
=CSAS25
4.89% GREEN BLOCKS H/U-235=244.6 55.5G U-235/L
27GROUPNDF4  MULTIREGION
U-234  1 0 5.8000-7 END
U-235  1 0 1.4220-4 END
U-238  1 0 2.7302-3 END
H      1 0 3.4782-2 END
C      1 0 1.8023-2 END
O      1 0 9.5585-3 END
AL     2 1 END
END COMP
SPHERICAL  END
1 28 NOEXTERMOD  END ZONE
4.89% GREEN BLOCKS UNREFLECTED CASE 1
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CUBE  1 1 2P10.16
UNIT 2
CUBOID  1 1 4P10.16  2P6.604
END GEOM
READ ARRAY NUX=3 NUY=3 NUZ=3 FILL 18R1 9R2 END FILL END ARRAY
END DATA
END

CAA20
=CSAS25
4.89% GREEN BLOCKS H/U-235=395.0 40.6 G U-235/L
27GROUPNDF4  MULTIREGION
U-234  1 0 4.3000-7 END
U-235  1 0 1.0402-4 END
U-238  1 0 1.9972-3 END
H      1 0 4.1088-2 END
C      1 0 2.1291-2 END
O      1 0 7.8456-3 END
AL     2 1 END
END COMP
SPHERICAL  END
1 28 NOEXTERMOD  END ZONE
4.89% GREEN BLOCKS UNREFLECTED CASE 2
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CUBOID  1 1 50.8 0 60.96 0 60.452 0
END GEOM
END DATA
END

CAA21
=CSAS25
4.89% GREEN BLOCKS H/U-235=757.0 22.1 G U-235/L
27GROUPNDF4  MULTIREGION
U-234  1 0 2.3000-7 END
U-235  1 0 5.6624-5 END
U-238  1 0 1.0872-3 END
H      1 0 4.2864-2 END
C      1 0 2.2212-2 END
O      1 0 5.3889-3 END
AL     2 1 END
END COMP
SPHERICAL  END
1 28 NOEXTERMOD  END ZONE
4.89% GREEN BLOCKS UNREFLECTED CASE 3
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CUBOID  1 1 71.12 0 71.12 0 70.358 0
END GEOM
END DATA
END
```

Table A.1 (continued)

```
CAA22
=CSAS25
4.89% GREEN BLOCKS H/U-235=503.5 33.3 G U-235/L
27GROUPNDF4  MULTIREGION
U-234   1 0 3.5000-7 END
U-235   1 0 8.5320-5 END
U-238   1 0 1.6381-3 END
H       1 0 4.2959-2 END
C       1 0 2.2261-2 END
O       1 0 6.9399-3 END
AL      2 1 END
END COMP
SPHERICAL  END
1 36 NOEXTERMOD  END ZONE
4.89% GREEN BLOCKS UNREFLECTED CASE 4
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CUBOID  1 1 60.96 0 60.96 0 52.832 0
END GEOM
END DATA
END
```

```
CAA23
=CSAS25
4.89% GREEN BLOCKS H/U-235=199.3 64.9 G U-235/L
27GROUPNDF4  MULTIREGION
U-234   1 0 6.8000-7 END
U-235   1 0 1.6628-4 END
U-238   1 0 3.1926-3 END
H       1 0 3.3140-2 END
C       1 0 1.7173-2 END
O       1 0 1.0766-2 END
AL      2 1 END
H2O     3 1 END
PARAFFIN  4 1 END
END COMP
SPHERICAL  END
1 22 ONEXTERMOD 3 40 NOEXTERMOD  END ZONE
4.89% GREEN BLOCKS REFLECTED CASE 1
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CUBE  1 1 2P10.16
UNIT 2
CUBOID  1 1 4P10.16  2P8.763
CORE    0 1 3R0.
REFLECTOR  4 8 4R0 3.048 0 5
REFLECTOR  3 2 4R3 0 3 6
END GEOM
READ ARRAY NUX=2 NUY=2 NUZ=3 FILL 8R1 4R2 END FILL END ARRAY
READ BIAS ID=500 2 7 ID=400 8 12 END BIAS
END DATA
END
```

```
CAA24
=CSAS25
4.89% GREEN BLOCKS H/U-235=244.8 56.2 G U-235/L
27GROUPNDF4  MULTIREGION
U-234   1 0 5.9000-7 END
U-235   1 0 1.4399-4 END
U-238   1 0 2.7647-3 END
H       1 0 3.5249-2 END
C       1 0 1.8265-2 END
O       1 0 9.6807-3 END
AL      2 1 END
H2O     3 1 END
PARAFFIN  4 1 END
END COMP
SPHERICAL  END
1 22 ONEXTERMOD 3 40 NOEXTERMOD  END ZONE
4.89% GREEN BLOCKS REFLECTED CASE 2
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CUBOID  1 1 40.64 0 40.64 0 57.912 0
REFLECTOR  4 8 4R0 3.048 0 5
REFLECTOR  3 2 4R3 0 3 6
END GEOM
READ BIAS ID=500 2 7 ID=400 8 12 END BIAS
END DATA
END
```

```
CAA25
=CSAS25
4.89 GREEN BLOCKS H/U-235=396.7 40.6 G U-235/L
27GROUPNDF4  MULTIREGION
U-234   1 0 4.3000-7 END
U-235   1 0 1.0402-4 END
U-238   1 0 1.9972-3 END
H       1 0 4.1265-2 END
C       1 0 2.1383-2 END
O       1 0 7.8552-3 END
AL      2 1 END
H2O     3 1 END
PARAFFIN  4 1 END
END COMP
SPHERICAL  END
1 20 ONEXTERMOD 3 38 NOEXTERMOD  END ZONE
4.89% GREEN BLOCKS REFLECTED CASE 3
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CUBOID  1 1 40.64 0 40.64 0 57.658 0
REFLECTOR  4 8 4R0 3.048 0 5
REFLECTOR  3 2 4R3 0 3 6
END GEOM
READ BIAS ID=500 2 7 ID=400 8 12 END BIAS
END DATA
END
```

Table A.1 (continued)

```
CAA27
=CSAS25
4.89% GREEN BLOCKS H/U-235=146.8 81.1 G U-235/L
27GROUPNDF4  MULTIREGION
U-234   1 0 8.5000-7 END
U-235   1 0 2.0779-4 END
U-238   1 0 3.9896-3 END
H       1 0 3.0504-2 END
C       1 0 1.5807-2 END
O       1 0 1.2859-2 END
AL      2 1 END
H2O     3 1 END
PARAFFIN  4 1 END
END COMP
SPHERICAL  END
1 22 ONEXTERMOD 3 40 NOEXTERMOD  END ZONE
4.89% GREEN BLOCKS REFLECTED CASE 5
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CUBOID  1 1 50.8 0 50.8 0 42.164 0
REFLECTOR  4 8 4R0 3.048 0 5
REFLECTOR  3 2 4R3 0 3 6
END GEOM
READ BIAS ID=500 2 7 ID=400 8 12 END BIAS
END DATA
END
```

```
CAA28
=CSAS25
4.89% GREEN BLOCKS H/U-235=82.7 107. G U-235/L
27GROUPNDF4  MULTIREGION
U-234   1 0 1.1300-6 END
U-235   1 0 2.7415-4 END
U-238   1 0 5.2637-3 END
H       1 0 2.2672-2 END
C       1 0 1.1748-2 END
O       1 0 1.6007-2 END
AL      2 1 END
H2O     3 1 END
PARAFFIN  4 1 END
END COMP
SPHERICAL  END
1 26 ONEXTERMOD 3 44 NOEXTERMOD  END ZONE
4.89% GREEN BLOCKS REFLECTED CASE 6
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CUBOID  1 1 50.8 0 60.96 0 56.134 0
REFLECTOR  4 8 4R0 3.048 0 5
REFLECTOR  3 2 4R3 0 3 6
END GEOM
READ BIAS ID=500 2 7 ID=400 8 12 END BIAS
END DATA
END
```

```
CAA26
=CSAS25
4.89% GREEN BLOCKS H/U-235=756.6 22.2 G U-235/L
27GROUPNDF4  MULTIREGION
U-234   1 0 2.3000-7 END
U-235   1 0 5.6880-5 END
U-238   1 0 1.0921-3 END
H       1 0 4.3035-2 END
C       1 0 2.2300-2 END
O       1 0 5.4119-3 END
AL      2 1 END
H2O     3 1 END
PARAFFIN  4 1 END
END COMP
SPHERICAL  END
1 28 ONEXTERMOD 3 46 NOEXTERMOD  END ZONE
4.89% GREEN BLOCKS REFLECTED CASE 4
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CUBOID  1 1 71.12 0 60.96 0 51.562 0
REFLECTOR  4 8 4R0 3.048 0 5
REFLECTOR  3 2 4R3 0 3 6
END GEOM
READ BIAS ID=500 2 7 ID=400 8 12 END BIAS
END DATA
END
```

```
CAA29
=CSAS25
4.89% GREEN BLOCKS H/U-235=504.1 33.3 G U-235/L
27GROUPNDF4  MULTIREGION
U-234   1 0 3.5000-7 END
U-235   1 0 8.5320-5 END
U-238   1 0 1.6381-3 END
H       1 0 4.3010-2 END
C       1 0 2.2287-2 END
O       1 0 6.9427-3 END
AL      2 1 END
H2O     3 1 END
PARAFFIN  4 1 END
END COMP
SPHERICAL  END
1 29 ONEXTERMOD 3 47 NOEXTERMOD  END ZONE
4.89% GREEN BLOCKS REFLECTED CASE 7
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CUBOID  1 1 50.8 0 50.8 0 41.148 0
REFLECTOR  4 8 4R0 3.048 0 5
REFLECTOR  3 2 4R3 0 3 6
END GEOM
READ BIAS ID=500 2 7 ID=400 8 12 END BIAS
END DATA
END
```

Table A.1 (continued)

```
CAA30
=CSAS25
4.89% UO2F2 H/U-235=524
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 869.9 0 1 293 92234 .02 92235 4.89
92238 95.09 END
SS304      2 1 END
END COMP
CYLINDRICAL END
1 25.4 NOEXTERMOD  2 25.56 NOEXTERMOD END ZONE
4.89% UO2F2 20 IN DIAM SS CYL BARE 1
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 25.4 38.66 0
CYLINDER  2 1 25.559 38.66 -.159
END GEOM
END DATA
END
```

```
CAA31
=CSAS25
4.89% UO2F2 H/U-235=524
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 869.9 0 1 293 92234 .02 92235 4.89
92238 95.09 END
AL         2 1 END
END COMP
CYLINDRICAL END
1 25.4 NOEXTERMOD  2 25.56 NOEXTERMOD END ZONE
4.89% UO2F2 20X20 IN AL BOX BARE 2
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CUBOID  1 1 4P25.25 35.9 0
CUBOID  2 1 4P25.409 35.9 -.159
END GEOM
END DATA
END
```

```
CAA32
=CSAS25
4.89% UO2F2 H/U-235=735
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 650.1 0 1 293 92234 .02 92235 4.89
92238 95.09 END
SS304      2 1 END
END COMP
CYLINDRICAL END
1 25.4 NOEXTERMOD  2 25.56 NOEXTERMOD END ZONE
4.89% UO2F2 20 IN DIAM SS CYL BARE 3
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 25.4 54.35 0
CYLINDER  2 1 25.559 54.35 -.159
END GEOM
END DATA
END
```

```
CAA33
=CSAS25
4.89% UO2F2 H/U-235=1002
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 491.6 0 1 293 92234 .02 92235 4.89
92238 95.09 END
AL         2 1 END
END COMP
SPHERICAL END
1 34.6 NOEXTERMOD  2 34.76 NOEXTERMOD END ZONE
4.89% UO2F2 27.3 IN DIAM AL SPHERE BARE 4
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
HEMISPHE-Z  1 1 34.6   CHORD 30.
SPHERE      0 1 34.6
SPHERE      2 1 34.759
END GEOM
END DATA
END
```

```
CAA34
=CSAS25
4.89% UO2F2 H/U-235=991
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 496.5 0 1 293 92234 .02 92235 4.89
92238 95.09 END
AL         2 1 END
PLEXIGLASS  3 1 END
END COMP
CYLINDRICAL END
1 38.1 NOEXTERMOD  2 38.26 NOEXTERMOD END ZONE
4.89% UO2F2 30 IN DIAM SS CYL BARE 5
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 38.1 44.75 0
CYLINDER  2 1 38.259 44.75 -.159
CUBOID    0 1 4P60.96 44.75 -.159
REFLECTOR 3 1 5R0 2.54 1
END GEOM
END DATA
END
```

Table A.1 (continued)

```
CAA35
=CSAS25
4.89% UO2F2 H/U-235=524
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 869.9 0 1 293 92234 .02 92235 4.89
92238 95.09 END
SS304      2 1 END
H2O        3 1 END
END COMP
CYLINDRICAL END
1 19 ONEXTERMOD 2 19.2 NOEXTERMOD 3 37.2 NOEXTERMOD END ZONE
4.89% UO2F2 15 IN DIAM SS CYL REFL 1
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 19.05 50.37 0
CYLINDER  2 1 19.209 50.529 -.159
REFLECTOR 3 2 3R3 6
END GEOM
READ BIAS ID=500 2 7 END BIAS
END DATA
END

CAA36
=CSAS25
4.89% UO2F2 H/U-235=524
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 869.9 0 1 293 92234 .02 92235 4.89
92238 95.09 END
AL         2 1 END
H2O        3 1 END
END COMP
CYLINDRICAL END
1 25.4 ONEXTERMOD 2 25.56 NOEXTERMOD 3 43.56 NOEXTERMOD END ZONE
4.89% UO2F2 20X20 IN AL BOX REFL 2
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CUBOID  1 1 4P25.25 25.4 0
CUBOID  2 1 4P25.409 25.559 -.159
REFLECTOR 3 2 6R3 6
END GEOM
READ BIAS ID=500 2 7 END BIAS
END DATA
END

CAA37
=CSAS25
4.89% UO2F2 H/U-235=735
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 650.1 0 1 293 92234 .02 92235 4.89
92238 95.09 END
SS304      2 1 END
H2O        3 1 END
END COMP
CYLINDRICAL END
1 19 ONEXTERMOD 2 19.2 NOEXTERMOD 3 37.2 NOEXTERMOD END ZONE
4.89% UO2F2 15 IN DIAM SS CYL REFL 3
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 19.05 153.01 0
CYLINDER  2 1 19.209 153.169 -.159
REFLECTOR 3 2 3R3 6
END GEOM
READ BIAS ID=500 2 7 END BIAS
END DATA
END

CAA38
=CSAS25
4.89% UO2F2 H/U-235=1099
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 452.1 0 1 293 92234 .02 92235 4.89
92238 95.09 END
AL         2 1 END
H2O        3 1 END
END COMP
SPHERICAL END
1 34.6 ONEXTERMOD  2 34.76 NOEXTERMOD  3 52.76 NOEXTERMOD END ZONE
4.89% UO2F2 27.3 IN DIAM AL SPHERE REFL 4
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
HEMISPHE-Z  1 1 34.6   CHORD 27.9
SPHERE      0 1 34.6
SPHERE      2 1 34.759
REFLECTOR   3 2 3. 6
END GEOM
READ BIAS ID=500 2 7 END BIAS
END DATA
END

CAA39
=CSAS25
4.89% UO2F2 H/U-235=994
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 495.3 0 1 293 92234 .02 92235 4.89
92238 95.09 END
SS304      2 1 END
H2O        3 1 END
END COMP
CYLINDRICAL END
1 25.4 ONEXTERMOD 2 25.56 NOEXTERMOD 3 43.56 NOEXTERMOD END ZONE
4.89% UO2F2 20 IN DIAM SS CYL REFL 5
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 25.4 85.72 0
CYLINDER  2 1 25.559 85.879 -.159
REFLECTOR 3 2 3R3 6
END GEOM
READ BIAS ID=500 2 7 END BIAS
END DATA
END
```

Table A.2. Table 2 input data

```
CAB01
=CSAS25
CASE EBJ.1 U(3.85) 15 @ 7.2"/0"/0"/77.8CM, SQUARE
27GROUPNDF4 INFHOMMEDIUM

' U(3.85) METAL
U-235          1 0.  1.8643E-3 END
U-238          1 0.  4.5971E-2 END

' FULL DENSITY WATER MODERATOR/REFLECTOR
H2O            2 1.0           END

' FIR TIMBER MODEL
C              3 0.  1.06802E-2 END
H              3 0.  2.21713E-2 END
O              3 0.  1.10850E-2 END

' STEEL FOR GRATING, TANK WALLS AND FLOOR
CARBONSTEEL  4 1.0             END

' STAINLESS STEEL LINING FOR TANK
SS304          5 1.0           END

END COMP
CASE EBJ.1 U(3.85) 15 @ 7.2"/0"/0"/77.8CM, SQUARE
READ PARM
NPG=600  PLT=NO FDN=YES NUB=YES TME=90 TBA=2
END PARM
READ GEOM

UNIT 1
COM=* FIR TIMBER 7.25" X 72" X 7.25" *
CUBOID 3 1 182.88 0. 18.415 0. 18.415 0.

UNIT 2
COM=* WATER GAP 3.5" X 72" X 7.25" BETWEEN TIMBERS *
CUBOID 2 1 182.88 0. 8.89 0. 18.415 0.

UNIT 3
COM=* ARRAY OF TIMBERS 72" X 72" X 7.25" *
ARRAY 1 3*0.0
REPLICATE 2 1 2R0. 2R0.3175 2R0. 1

UNIT 4
COM=* SECTION OF STEEL GRATING *
CUBOID 4 1 2.778125 .238125 .396875 -.396875 3.175 2.38125
CUBOID 2 1 2.778125 .238125 4.524375 -4.524375 3.175 0.
CUBOID 4 1 3.01625 0. 4.524375 -4.524375 3.175 0.

UNIT 5
COM=* ARRAY OF STEEL GRATING *
ARRAY 2 3*0.0
REPLICATE 2 1 4R0.9525 2R0.0 1

UNIT 6
COM=* U(3.85) ANNULUS WITH INSERT *
CYLINDER 1 1 3.175 76.2 0.
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P9.144 76.2 0.

UNIT 7
COM=* WATER CUBOID TO COMPLETE ANNULI ARRAY *
CUBOID 2 1 4P9.144 76.2 0.

UNIT 8
COM=* ARRAY OF 15 ANNULI WITH U(3.85) INSERTS *
ARRAY 3 3*0.0
REPLICATE 2 1 4R54.864 1.6 0. 1

CORE 4 1 -91.44 -91.44 0.
REPLICATE 2 1 4R30.48 2R0. 1
REPLICATE 5 1 5R0.0 0.1905 1
REPLICATE 4 1 5R0.0 2.54 1
END GEOM
READ ARRAY
ARA=1 NUX=1 NUY=13 NUZ=1
FILL 1 2 5Q2 1 END FILL
ARA=2 NUX=60 NUY=20 NUZ=1
FILL F4 END FILL
ARA=3 NUX=4 NUY=4 NUZ=1
LOOP 6  1 4 1  1 4 1  1 1 1
     7  4 4 1  1 1 1  1 1 1 END LOOP
GBL=4
ARA=4 NUX=1 NUY=1 NUZ=3
FILL 3 5 8 END FILL
END ARRAY
READ START
XSM=-36.576 XSP=36.576 YSM=-36.576 YSP=36.576 ZSM=21.59 ZSP=97.79
END START
READ PLOT

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF ANNULI/INSERTS"
XUL=-91.44 YUL=91.44 ZUL=59.69
XLR=91.44 YLR=-91.44 ZLR=59.69
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF GRATING"
XUL=-91.44 YUL=91.44 ZUL=20.0025
XLR=91.44 YLR=-91.44 ZLR=20.0025
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF FIR TIMBERS"
XUL=-91.44 YUL=91.44 ZUL=9.2075
XLR=91.44 YLR=-91.44 ZLR=9.2075
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="PLAN VIEW 1/10 SCALE OF MOCKUP, Z=MIDLEVEL OF U UNITS"
XUL=-121.92 YUL=121.92 ZUL=59.69
XLR=121.92 YLR=-121.92 ZLR=59.69
UAX=1. VDN=-1. DLX=2.54 NCH=* U.WGSC* END

TTL="PLAN VIEW 2X SCALE OF SINGLE U UNIT, Z=MIDLEVEL OF UNIT"
XUL=0. YUL=18.288 ZUL=59.69
XLR=18.288 YLR=0. ZLR=59.69
UAX=1. VDN=-1. DLX=0.127 NCH=* U.WGSC* END

TTL="CROSS SECTION OF CORE 1/6 SCALE,Y=9.144"
XUL=-91.44 YUL=9.144 ZUL=102.
XLR=91.44 YLR=9.144 ZLR=0.
UAX=1. WDN=-1. DLX=1.524 NCH=* U.WGSC* END
```

Table A.2 (continued)

```
TTL="CROSS SECTION OF MOCKUP 1/10 SCALE,Y=9.144"
XUL=-121.92 YUL=9.144 ZUL=105.
XLR=121.92 YLR=9.144 ZLR=-65.
UAX=1. WDN=-1. DLX=2.54 NCH=* U.WGSC* END

TTL="CROSS SECTION OF GRATING/FIR TIMBERS, FULL SCALE"
XUL=0. YUL=0. ZUL=24.13
XLR=25.4 YLR=0. ZLR=-3.0
UAX=1. WDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="PLAN VIEW OF GRATING THRU TIEBARS, FULL SCALE"
XUL=0. YUL=25.4 ZUL=21.193
XLR=25.4 YLR=0. ZLR=21.193
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="PLAN VIEW OF GRATING @ GRATING MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=20.0025
XLR=25.4 YLR=0. ZLR=20.0025
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="PLAN VIEW OF TIMBERS @ TIMBER MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=9.2075
XLR=25.4 YLR=-25.4 ZLR=9.2075
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGSC* END
END PLOT
END DATA
END
```

```
CAB02
=CSAS25
CASE EBJ.2X  ( U(3.85) 11 @ 7.2"/0"/0.75"/72.4CM, SQUARE)
27GROUPNDF4 INFHOMMEDIUM

' U(3.85) METAL
U-235         1 0.  1.8643E-3 END
U-238         1 0.  4.5971E-2 END

' FULL DENSITY WATER MODERATOR/REFLECTOR
H2O           2 1.0           END

' FIR TIMBER MODEL
C             3 0.  1.06802E-2 END
H             3 0.  2.21713E-2 END
O             3 0.  1.10850E-2 END

' STEEL FOR GRATING, TANK WALLS AND FLOOR
CARBONSTEEL   4 1.0           END

' STAINLESS STEEL LINING FOR TANK
SS304         5 1.0           END

END COMP
CASE EBJ.2X  RESTART EBJ.2 @ GENERATION # 11
READ PARM
NPG=600  PLT=NO NUB=YES FDN=YES TME=90 TBA=2
END PARM
READ GEOM
```

```
UNIT 1
COM=* FIR TIMBER 7.25" X 72" X 7.25" *
CUBOID 3 1 182.88 0. 18.415 0. 18.415 0.

UNIT 2
COM=* WATER GAP 3.5" X 72" X 7.25" BETWEEN TIMBERS *
CUBOID 2 1 182.88 0. 8.89 0. 18.415 0.

UNIT 3
COM=* ARRAY OF TIMBERS 72" X 72" X 7.25" PLUS 12" H20 *
ARRAY 1 3*0.0
REPLICATE 2 1 2R0. 2R0.3175 2R0. 1
REPLICATE 2 1 4R30.48 2R0. 1

UNIT 4
COM=* SECTION OF STEEL GRATING *
CUBOID 4 1 2.778125 .238125 .396875 -.396875 3.175 2.38125
CUBOID 2 1 2.778125 .238125 4.524375 -4.524375 3.175 0.
CUBOID 4 1 3.01625 0. 4.524375 -4.524375 3.175 0.

UNIT 5
COM=* ARRAY OF STEEL GRATING PLUS 12" H2O *
ARRAY 2 3*0.0
REPLICATE 2 1 4R0.9525 2R0.0 1
REPLICATE 2 1 4R30.48 2R0.0 1

UNIT 6
COM=* U(3.85) ANNULUS WITH INSERT (72.4 CM H) *
CYLINDER 1 1 3.175 72.4 0.
CYLINDER 2 1 3.302 72.4 0.
CYLINDER 1 1 9.144 72.4 0.
CUBOID 2 1 4P10.0965 72.4 0.

UNIT 7
COM=* WATER CUBOID TO COMPLETE ANNULI ARRAY (72.4 CM H) *
CUBOID 2 1 4P10.0965 72.4 0.

UNIT 8
COM=* ARRAY OF 11 ANNULI WITH U(3.85) INSERTS (72.4 CM H) *
ARRAY 3 3*0.0
REPLICATE 2 1 4R51.054 2R0. 1
REPLICATE 2 1 4R30.48 2R0.0 1

UNIT 9
COM=* U(3.85) ANNULUS WITH INSERT (3.8 CM H) *
CYLINDER 1 1 3.175 3.8 0.
CYLINDER 0 1 3.302 3.8 0.
CYLINDER 1 1 9.144 3.8 0.
CUBOID 0 1 4P10.0965 3.8 0.

UNIT 10
COM=* VOID CUBOID TO COMPLETE ANNULI ARRAY (3.8 CM H) *
CUBOID 0 1 4P10.0965 3.8 0.

UNIT 11
COM=* ARRAY OF 11 ANNULI WITH U(3.85) INSERTS (3.8 CM H) *
ARRAY 4 3*0.0
REPLICATE 0 1 4R51.054 2R0.0 1
REPLICATE 0 1 4R30.48 2R0.0 1
```

Table A.2 (continued)

```
CORE 5 1 -121.92 -121.92 0.
REPLICATE 5 1 5R0.0 0.1905 1
REPLICATE 4 1 5R0.0 2.54 1
END GEOM
READ ARRAY
ARA=1 NUX=1 NUY=13 NUZ=1
FILL 1 2 5Q2 1 END FILL
ARA=2 NUX=60 NUY=20 NUZ=1
FILL F4 END FILL
ARA=3 NUX=4 NUY=4 NUZ=1
LOOP 6  1 4 1  1 4 1  1 1 1
     7  1 4 1  1 1 1  1 1 1
     7  4 4 1  2 2 1  1 1 1 END LOOP
ARA=4 NUX=4 NUY=4 NUZ=1
LOOP  9  1 4 1  1 4 1  1 1 1
     10  1 4 1  1 1 1  1 1 1
     10  4 4 1  2 2 1  1 1 1 END LOOP
GBL=5
ARA=5 NUX=1 NUY=1 NUZ=4
FILL 3 5 8 11 END FILL
END ARRAY
READ START
NST=6
LNU=200  TFX= 10.0965 TFY= 10.0965 TFZ=59.69
LNU=400  TFX=-10.0965 TFY= 10.0965 TFZ=59.69
LNU=470  TFX= 10.0965 TFY=-10.0965 TFZ=59.69
LNU=540  TFX=-10.0965 TFY=-10.0965 TFZ=59.59
LNU=610  TFX=-40.3856 TFY=-10.0965 TFZ=59.69
LNU=680  TFX=-40.3856 TFY= 10.0965 TFZ=59.69
LNU=750  TFX=-40.3856 TFY= 40.3856 TFZ=59.69
LNU=820  TFX=-10.0965 TFY= 40.3856 TFZ=59.69
LNU=890  TFX= 10.0965 TFY= 40.3856 TFZ=59.69
LNU=960  TFX= 40.3856 TFY= 40.3856 TFZ=59.69
LNU=1000 TFX= 40.3856 TFY= 10.0965 TFZ=59.69
END START
READ PLOT

TTL="PLAN VIEW 1/6 SCALE OF PALLET, Z=MIDLEVEL OF ANNULI/INSERTS"
XUL=-91.44 YUL=91.44 ZUL=59.69
XLR=91.44 YLR=-91.44 ZLR=59.69
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="PLAN VIEW 1/6 SCALE OF PALLET, Z=MIDLEVEL OF GRATING"
XUL=-91.44 YUL=91.44 ZUL=20.0025
XLR=91.44 YLR=-91.44 ZLR=20.0025
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="PLAN VIEW 1/6 SCALE OF PALLET, Z=MIDLEVEL OF FIR TIMBERS"
XUL=-91.44 YUL=91.44 ZUL=9.2075
XLR=91.44 YLR=-91.44 ZLR=9.2075
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="PLAN VIEW 1/10 SCALE OF MOCKUP, Z=MIDLEVEL OF U UNITS"
XUL=-137. YUL=137. ZUL=59.69
XLR=137. YLR=-137. ZLR=59.69
UAX=1. VDN=-1. DLX=2.54 NCH=* U.WGSC* END

TTL="PLAN VIEW 2X SCALE OF SINGLE U UNIT, Z=MIDLEVEL OF UNIT"
XUL=0. YUL=20.193 ZUL=59.69
XLR=20.193 YLR=0. ZLR=59.69
UAX=1. VDN=-1. DLX=0.127 NCH=* U.WGSC* END

TTL="CROSS SECTION OF PALLET 1/6 SCALE,Y=10.0965"
XUL=-91.44 YUL=10.0965 ZUL=113.
XLR=91.44 YLR=10.0965 ZLR=-18.
UAX=1. WDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="CROSS SECTION OF MOCKUP 1/10 SCALE,Y=10.0965"
XUL=-137. YUL=10.0965 ZUL=113.
XLR=137. YLR=10.0965 ZLR=-18.
UAX=1. WDN=-1. DLX=2.54 NCH=* U.WGSC* END

TTL="CROSS SECTION OF FLOOR/GRATING/FIR TIMBERS, FULL SCALE"
XUL=0. YUL=0. ZUL=24.13
XLR=25.4 YLR=0. ZLR=-5.4
UAX=1. WDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="PLAN VIEW OF GRATING THRU TIEBARS, FULL SCALE"
XUL=0. YUL=25.4 ZUL=21.193
XLR=25.4 YLR=0. ZLR=21.193
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="PLAN VIEW OF GRATING @ GRATING MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=20.0025
XLR=25.4 YLR=0. ZLR=20.0025
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="PLAN VIEW OF TIMBERS @ TIMBER MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=9.2075
XLR=25.4 YLR=-25.4 ZLR=9.2075
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="CROSS SECTION AT TOP OF UNITS, 2X SCALE"
XUL=0. YUL=10.0965 ZUL=105.
XLR=12.7 YLR=10.0965 ZLR=90.
UAX=1. WDN=-1. DLX=.127 NCH=* U.WGSC* END
END PLOT
END DATA
END
```

Table A.2 (continued)

```
CAB03
=CSAS25
CASE EBJ.3X  ( U(3.85) 24 @ 7.2"/0"/1.5"/75.0CM, SQUARE)
27GROUPNDF4 INFHOMMEDIUM

' U(3.85) METAL
U-235         1 0.  1.8643E-3 END
U-238         1 0.  4.5971E-2 END

' FULL DENSITY WATER MODERATOR/REFLECTOR
H2O           2 1.0           END

' FIR TIMBER MODEL
C             3 0.  1.06802E-2 END
H             3 0.  2.21713E-2 END
O             3 0.  1.10850E-2 END

' STEEL FOR GRATING, TANK WALLS AND FLOOR
CARBONSTEEL  4 1.0            END

' STAINLESS STEEL LINING FOR TANK
SS304         5 1.0           END

END COMP
CASE EBJ.3X
READ PARM
NPG=600  NUB=YES PLT=NO FDN=YES TME=90 TBA=2
END PARM
READ GEOM

UNIT 1
COM=* FIR TIMBER 7.25" X 72" X 7.25" *
CUBOID 3 1 182.88 0. 18.415 0. 18.415 0.

UNIT 2
COM=* WATER GAP 3.5" X 72" X 7.25" BETWEEN TIMBERS *
CUBOID 2 1 182.88 0. 8.89 0. 18.415 0.

UNIT 3
COM=* ARRAY OF TIMBERS 72" X 72" X 7.25" PLUS 12" H20 *
ARRAY 1 3*0.0
REPLICATE 2 1 2R0. 2R0.3175 2R0. 1
REPLICATE 2 1 4R30.48 2R0. 1

UNIT 4
COM=* SECTION OF STEEL GRATING *
CUBOID 4 1 2.778125 .238125 .396875 -.396875 3.175 2.38125
CUBOID 2 1 2.778125 .238125 4.524375 -4.524375 3.175 0.
CUBOID 4 1 3.01625 0. 4.524375 -4.524375 3.175 0.

UNIT 5
COM=* ARRAY OF STEEL GRATING PLUS 12" H20 *
ARRAY 2 3*0.0
REPLICATE 2 1 4R0.9525 2R0.0 1
REPLICATE 2 1 4R30.48 2R0.0 1

UNIT 6
COM=* U(3.85) ANNULUS WITH INSERT (75.0 CM H) *
CYLINDER 1 1 3.175 75.0 0.
CYLINDER 2 1 3.302 75.0 0.
CYLINDER 1 1 9.144 75.0 0.
CUBOID 2 1 4P11.049 75.0 0.

UNIT 7
COM=* WATER CUBOID TO COMPLETE ANNULI ARRAY (75.0 CM H) *
CUBOID 2 1 4P11.049 75.0 0.

UNIT 8
COM=* ARRAY OF 24 ANNULI WITH U(3.85) INSERTS (75.0 CM H) *
ARRAY 3 3*0.0
REPLICATE 2 1 4R36.195 2R0. 1
REPLICATE 2 1 4R30.48 2R0.0 1

UNIT 9
COM=* U(3.85) ANNULUS WITH INSERT (1.2 CM H) *
CYLINDER 1 1 3.175 1.2 0.
CYLINDER 0 1 3.302 1.2 0.
CYLINDER 1 1 9.144 1.2 0.
CUBOID 0 1 4P11.049 1.2 0.

UNIT 10
COM=* VOID CUBOID TO COMPLETE ANNULI ARRAY (1.2 CM H) *
CUBOID 0 1 4P11.049 1.2 0.

UNIT 11
COM=* ARRAY OF 24 ANNULI WITH U(3.85) INSERTS (1.2 CM H) *
ARRAY 4 3*0.0
REPLICATE 0 1 4R36.195 2R0.0 1
REPLICATE 0 1 4R30.48 2R0.0 1

CORE 5 1 -121.92 -121.92 0.
REPLICATE 5 1 5R0.0 0.1905 1
REPLICATE 4 1 5R0.0 2.54 1
END GEOM
READ ARRAY
ARA=1 NUX=1 NUY=13 NUZ=1
FILL 1 2 5Q2 1 END FILL
ARA=2 NUX=60 NUY=20 NUZ=1
FILL F4 END FILL
ARA=3 NUX=5 NUY=5 NUZ=1
LOOP  6   1 5 1   1 5 1   1 1 1
      7   5 5 1   1 1 1   1 1 1 END LOOP
ARA=4 NUX=5 NUY=5 NUZ=1
LOOP  9   1 5 1   1 5 1   1 1 1
     10   5 5 1   1 1 1   1 1 1 END LOOP
GBL=5
ARA=5 NUX=1 NUY=1 NUZ=4
FILL 3 5 8 11 END FILL
END ARRAY
READ START
NST=1
XSM=-55.245 XSP=55.245 YSM=-55.245 YSP=55.245 ZSM=21.59 ZSP=97.79
END START
READ PLOT

TTL="PLAN VIEW 1/6 SCALE OF PALLET, Z=MIDLEVEL OF ANNULI/INSERTS"
XUL=-91.44 YUL=91.44 ZUL=59.69
XLR=91.44 YLR=-91.44 ZLR=59.69
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="PLAN VIEW 1/6 SCALE OF PALLET, Z=MIDLEVEL OF GRATING"
XUL=-91.44 YUL=91.44 ZUL=20.0025
XLR=91.44 YLR=-91.44 ZLR=20.0025
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGSC* END
```

Table A.2 (continued)

```
TTL="PLAN VIEW 1/6 SCALE OF PALLET, Z=MIDLEVEL OF FIR TIMBERS"
XUL=-91.44 YUL=91.44 ZUL=9.2075
XLR=91.44 YLR=-91.44 ZLR=9.2075
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="PLAN VIEW 1/10 SCALE OF MOCKUP, Z=MIDLEVEL OF U UNITS"
XUL=-137. YUL=137. ZUL=59.69
XLR=137. YLR=-137. ZLR=59.69
UAX=1. VDN=-1. DLX=2.54 NCH=* U.WGSC* END

TTL="PLAN VIEW 2X SCALE OF SINGLE U UNIT, Z=MIDLEVEL OF UNIT"
XUL=-11.049 YUL=11.049 ZUL=59.69
XLR=11.049 YLR=-11.049 ZLR=59.69
UAX=1. VDN=-1. DLX=0.127 NCH=* U.WGSC* END

TTL="CROSS SECTION OF PALLET 1/6 SCALE,Y=0.0"
XUL=-91.44 YUL=0.0 ZUL=113.
XLR=91.44 YLR=0.0 ZLR=-18.
UAX=1. WDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="CROSS SECTION OF MOCKUP 1/10 SCALE,Y=0.0"
XUL=-137. YUL=0.0 ZUL=113.
XLR=137. YLR=0.0 ZLR=-18.
UAX=1. WDN=-1. DLX=2.54 NCH=* U.WGSC* END

TTL="CROSS SECTION OF FLOOR/GRATING/FIR TIMBERS, FULL SCALE"
XUL=0. YUL=0. ZUL=24.13
XLR=25.4 YLR=0. ZLR=-5.4
UAX=1. WDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="PLAN VIEW OF GRATING THRU TIEBARS, FULL SCALE"
XUL=0. YUL=25.4 ZUL=21.193
XLR=25.4 YLR=0. ZLR=21.193
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="PLAN VIEW OF GRATING @ GRATING MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=20.0025
XLR=25.4 YLR=0. ZLR=20.0025
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="PLAN VIEW OF TIMBERS @ TIMBER MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=9.2075
XLR=25.4 YLR=-25.4 ZLR=9.2075
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="CROSS SECTION AT TOP OF UNITS, 2X SCALE"
XUL=-11.049 YUL=0. ZUL=105.
XLR=11.049 YLR=0. ZLR=90.
UAX=1. WDN=-1. DLX=.127 NCH=* U.WGSC* END
END PLOT
END DATA
END
```

```
CAB07
=CSAS25
CASE EBJ.4 U(3.85) 16 @ 7.2"/0"/0.25"/79.3CM, TRIANGULAR
27GROUPNDF4 INFHOMMEDIUM

' U(3.85) METAL
U-235          1 0.   1.8643E-3 END
U-238          1 0.   4.5971E-2 END

' FULL DENSITY WATER MODERATOR/REFLECTOR
H2O            2 1.0            END

' FIR TIMBER MODEL
C              3 0.   1.06802E-2 END
H              3 0.   2.21713E-2 END
O              3 0.   1.10850E-2 END

' STEEL FOR GRATING, TANK WALLS AND FLOOR
CARBONSTEEL  4 1.0              END

' STAINLESS STEEL LINING FOR TANK
SS304          5 1.0            END

END COMP
CASE EBJ.4 U(3.85) 16 @ 7.2"/0"/0.25"/79.3CM, TRIANGULAR
READ PARM
TBA=3 NPG=600  NUB=YES PLT=NO FDN=YES TME=90
END PARM
READ GEOM

UNIT 1
COM=* FIR TIMBER 7.25" X 72" X 7.25" *
CUBOID 3 1 182.88 0. 18.415 0. 18.415 0.

UNIT 2
COM=* WATER GAP 3.5" X 72" X 7.25" BETWEEN TIMBERS *
CUBOID 2 1 182.88 0. 8.89 0. 18.415 0.

UNIT 3
COM=* ARRAY OF TIMBERS 72" X 72" X 7.25" *
ARRAY 1 3*0.0
REPLICATE 2 1 2R0. 2R0.3175 2R0. 1

UNIT 4
COM=* SECTION OF STEEL GRATING *
CUBOID 4 1 2.778125 .238125 .396875 -.396875 3.175 2.38125
CUBOID 2 1 2.778125 .238125 4.524375 -4.524375 3.175 0.
CUBOID 4 1 3.01625 0. 4.524375 -4.524375 3.175 0.

UNIT 5
COM=* ARRAY OF STEEL GRATING *
ARRAY 2 3*0.0
REPLICATE 2 1 4R0.9525 2R0.0 1

UNIT 6
COM=* U(3.85) ANNULUS WITH INSERT *
CYLINDER 1 1 3.175 76.2 0.
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
```

Table A.2 (continued)

```
UNIT 7
COM=* ARRAY OF 16 ANNULI WITH U(3.85) INSERTS *
CUBOID 2 1 4P91.44 79.3 0.
HOLE 6   0.0        0.0     0.0
HOLE 6 -18.923      0.0     0.0
HOLE 6  -9.4615  16.3878 0.0
HOLE 6   9.4615  16.3878 0.0
HOLE 6  18.923      0.0     0.0
HOLE 6   9.4615 -16.3878 0.0
HOLE 6  -9.4615 -16.3878 0.0
HOLE 6 -28.3845  16.3878 0.0
HOLE 6 -18.923   32.7756 0.0
HOLE 6   0.0     32.7756 0.0
HOLE 6  28.3845  16.3878 0.0
HOLE 6  37.846      0.0     0.0
HOLE 6  28.3845 -16.3878 0.0
HOLE 6   0.0    -32.7756 0.0
HOLE 6 -18.923  -32.7756 0.0
HOLE 6 -28.3845 -16.3878 0.0

CORE 3 1 -91.44 -91.44 0.
REPLICATE 2 1 4R30.48 2R0. 1
REPLICATE 5 1 5R0.0 0.1905 1
REPLICATE 4 1 5R0.0 2.54 1
END GEOM
READ ARRAY
ARA=1 NUX=1 NUY=13 NUZ=1
FILL 1 2 5Q2 1 END FILL
ARA=2 NUX=60 NUY=20 NUZ=1
FILL F4 END FILL
GBL=3
ARA=3 NUX=1 NUY=1 NUZ=3
FILL 3 5 7 END FILL
END ARRAY
READ START
NST=1
XSM=-37.5285 XSP=46.99
YSM=-41.9196 YSP=41.9196
ZSM= 21.59   ZSP=97.79
END START
READ PLOT

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF ANNULI/INSERTS"
XUL=-91.44 YUL=91.44 ZUL=59.69
XLR=91.44 YLR=-91.44 ZLR=59.69
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF GRATING"
XUL=-91.44 YUL=91.44 ZUL=20.0025
XLR=91.44 YLR=-91.44 ZLR=20.0025
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF FIR TIMBERS"
XUL=-91.44 YUL=91.44 ZUL=9.2075
XLR=91.44 YLR=-91.44 ZLR=9.2075
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="PLAN VIEW 1/10 SCALE OF MOCKUP, Z=MIDLEVEL OF U UNITS"
XUL=-121.92 YUL=121.92 ZUL=59.69
XLR=121.92 YLR=-121.92 ZLR=59.69
UAX=1. VDN=-1. DLX=2.54 NCH=* U.WGSC* END

TTL="PLAN VIEW FULL SCALE OF SINGLE U UNIT, Z=MIDLEVEL OF UNIT"
XUL=-16.75 YUL=16.75 ZUL=59.69
XLR=16.75 YLR=-16.75 ZLR=59.69
UAX=1. VDN=-1. DLX=0.254 NCH=* U.WGSC* END

TTL="CROSS SECTION OF CORE 1/6 SCALE,Y=0.0"
XUL=-91.44 YUL=0.0 ZUL=102.
XLR=91.44 YLR=0.0 ZLR=0.
UAX=1. WDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="CROSS SECTION OF MOCKUP 1/10 SCALE,Y=0.0"
XUL=-121.92 YUL=0.0 ZUL=105.
XLR=121.92 YLR=0.0 ZLR=-65.
UAX=1. WDN=-1. DLX=2.54 NCH=* U.WGSC* END

TTL="CROSS SECTION OF GRATING/FIR TIMBERS, FULL SCALE"
XUL=0. YUL=0. ZUL=24.13
XLR=25.4 YLR=0. ZLR=-3.0
UAX=1. WDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="PLAN VIEW OF GRATING THRU TIEBARS, FULL SCALE"
XUL=0. YUL=25.4 ZUL=21.193
XLR=25.4 YLR=0. ZLR=21.193
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="PLAN VIEW OF GRATING @ GRATING MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=20.0025
XLR=25.4 YLR=0. ZLR=20.0025
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="PLAN VIEW OF TIMBERS @ TIMBER MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=9.2075
XLR=25.4 YLR=-25.4 ZLR=9.2075
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGSC* END
END PLOT
END DATA
END
```

Table A.2 (continued)

```
CAB08
=CSAS25
CASE EBJ.5X  ( U(3.85) 7 @ 7.2"/0"/1.0"/53.1CM, TRIANGULAR)
27GROUPNDF4 INFHOMMEDIUM

' U(3.85) METAL
U-235          1 0.  1.8643E-3 END
U-238          1 0.  4.5971E-2 END

' FULL DENSITY WATER MODERATOR/REFLECTOR
H2O            2 1.0           END

' FIR TIMBER MODEL
C              3 0.  1.06802E-2 END
H              3 0.  2.21713E-2 END
O              3 0.  1.10850E-2 END

' STEEL FOR GRATING, TANK WALLS AND FLOOR
CARBONSTEEL  4 1.0             END

' STAINLESS STEEL LINING FOR TANK
SS304          5 1.0           END

END COMP
CASE EBJ.5X
READ PARM
TBA=3 NPG=600  NUB=YES PLT=NO FDN=YES TME=90
END PARM
READ GEOM

UNIT 1
COM=* FIR TIMBER 7.25" X 72" X 7.25" *
CUBOID 3 1 182.88 0. 18.415 0. 18.415 0.

UNIT 2
COM=* WATER GAP 3.5" X 72" X 7.25" BETWEEN TIMBERS *
CUBOID 2 1 182.88 0. 8.89 0. 18.415 0.

UNIT 3
COM=* ARRAY OF TIMBERS 72" X 72" X 7.25" *
ARRAY 1 3*0.0
REPLICATE 2 1 2R0. 2R0.3175 2R0. 1
REPLICATE 2 1 4R30.48 2R0.0 1

UNIT 4
COM=* SECTION OF STEEL GRATING *
CUBOID 4 1 2.778125 .238125 .396875 -.396875 3.175 2.38125
CUBOID 2 1 2.778125 .238125 4.524375 -4.524375 3.175 0.
CUBOID 4 1 3.01625 0. 4.524375 -4.524375 3.175 0.

UNIT 5
COM=* ARRAY OF STEEL GRATING *
ARRAY 2 3*0.0
REPLICATE 2 1 4R0.9525 2R0.0 1
REPLICATE 2 1 4R30.48 2R0.0 1

UNIT 6
COM=* U(3.85) UNIT, FLOODED, H=1.905, LEVELS 1 AND 3 *
CYLINDER 1 1 3.175 1.905 0.
CYLINDER 2 1 3.302 1.905 0.
CYLINDER 1 1 9.144 1.905 0.

UNIT 7
COM=* ARRAY OF 7 UNITS, FLOODED, H=1.905, LEVELS 1 AND 3 *
CUBOID 3 1 4P91.44 1.905 0.
HOLE 6   0.0       0.0       0.0
HOLE 6 -20.828     0.0       0.0
HOLE 6 -10.414  18.037577 0.0
HOLE 6  10.414  18.037577 0.0
HOLE 6  20.828     0.0       0.0
HOLE 6  10.414 -18.037577 0.0
HOLE 6 -10.414 -18.037577 0.0
REPLICATE 2 1 4R30.48 2R0.0 1

UNIT 8
COM=* U(3.85) UNIT, FLOODED, H=35.2425, LEVEL 2 *
CYLINDER 1 1 3.175 35.2425 0.
CYLINDER 2 1 3.302 35.2425 0.
CYLINDER 1 1 9.144 35.2425 0.

UNIT 9
COM=* ARRAY OF 7 UNITS, FLOODED, H=35.2425, LEVEL 2 *
CUBOID 2 1 4P91.44 35.2425 0.
HOLE 8   0.0       0.0       0.0
HOLE 8 -20.828     0.0       0.0
HOLE 8 -10.414  18.037577 0.0
HOLE 8  10.414  18.037577 0.0
HOLE 8  20.828     0.0       0.0
HOLE 8  10.414 -18.037577 0.0
HOLE 8 -10.414 -18.037577 0.0
REPLICATE 2 1 4R30.48 2R0.0  1

UNIT 10
COM=* U(3.85) UNIT, FLOODED, H=14.0475, LEVEL 4 *
CYLINDER 1 1 3.175 14.0475 0.
CYLINDER 2 1 3.302 14.0475 0.
CYLINDER 1 1 9.144 14.0475 0.

UNIT 11
COM=* ARRAY OF 7 UNITS, FLOODED, H=14.0475, LEVEL 4 *
CUBOID 2 1 4P91.44 14.0475 0.
HOLE 10   0.0       0.0       0.0
HOLE 10 -20.828     0.0       0.0
HOLE 10 -10.414  18.037577 0.0
HOLE 10  10.414  18.037577 0.0
HOLE 10  20.828     0.0       0.0
HOLE 10  10.414 -18.037577 0.0
HOLE 10 -10.414 -18.037577 0.0
REPLICATE 2 1 4R30.48 2R0.0 1

UNIT 12
COM=* U(3.85) UNIT, DRY, H=11.9875, LEVEL 5 *
CYLINDER 1 1 3.175 11.9875 0.
CYLINDER 0 1 3.302 11.9875 0.
CYLINDER 1 1 9.144 11.9875 0.
```

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UNIT 13
COM=* ARRAY OF 7 UNITS, DRY, H=11.9875, LEVEL 5 *
CUBOID 0 1 4P91.44 11.9875 0.
HOLE 12   0.0       0.0       0.0
HOLE 12 -20.828     0.0       0.0
HOLE 12 -10.414   18.037577 0.0
HOLE 12  10.414   18.037577 0.0
HOLE 12  20.828     0.0       0.0
HOLE 12  10.414  -18.037577 0.0
HOLE 12 -10.414  -18.037577 0.0
REPLICATE 0 1 4R30.48 2R0.0 1

UNIT 14
COM=* U(3.85) UNIT, DRY, H=1.905, LEVEL 6 *
CYLINDER 1 1 3.175 1.905 0.
CYLINDER 0 1 3.302 1.905 0.
CYLINDER 1 1 9.144 1.905 0.

UNIT 15
COM=* ARRAY OF 7 UNITS, DRY, H=1.905, LEVEL 6 *
CUBOID 3 1 4P91.44 1.905 0.
HOLE 14   0.0       0.0       0.0
HOLE 14 -20.828     0.0       0.0
HOLE 14 -10.414   18.037577 0.0
HOLE 14  10.414   18.037577 0.0
HOLE 14  20.828     0.0       0.0
HOLE 14  10.414  -18.037577 0.0
HOLE 14 -10.414  -18.037577 0.0
REPLICATE 0 1 4R30.48 2R0.0 1

UNIT 16
COM=* U(3.85) UNIT, DRY, H=9.2075, LEVEL 7 *
CYLINDER 1 1 3.175 9.2075 0.
CYLINDER 0 1 3.302 9.2075 0.
CYLINDER 1 1 9.144 9.2075 0.

UNIT 17
COM=* ARRAY OF 7 UNITS, DRY, H=9.2075, LEVEL 7 *
CUBOID 0 1 4P91.44 9.2075 0.
HOLE 16   0.0       0.0       0.0
HOLE 16 -20.828     0.0       0.0
HOLE 16 -10.414   18.037577 0.0
HOLE 16  10.414   18.037577 0.0
HOLE 16  20.828     0.0       0.0
HOLE 16  10.414  -18.037577 0.0
HOLE 16 -10.414  -18.037577 0.0
REPLICATE 0 1 4R30.48 2R0.0 1

CORE 3 1 -121.92 -121.92 0.
REPLICATE 5 1 5R0.0 0.1905 1
REPLICATE 4 1 5R0.0 2.54 1
END GEOM
READ ARRAY
ARA=1 NUX=1 NUY=13 NUZ=1
FILL 1 2 5Q2 1 END FILL
ARA=2 NUX=60 NUY=20 NUZ=1
FILL F4 END FILL
GBL=3
ARA=3 NUX=1 NUY=1 NUZ=9
FILL 3 5 7 9 7 11 13 15 17 END FILL
END ARRAY
```

```
READ START
NST=1
XSM=-20.828 XSP=20.828
YSM=-20.828 YSP=20.828
ZSM= 21.59   ZSP=74.69
END START
READ PLOT

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF ANNULI/INSERTS"
XUL=-100. YUL=100. ZUL=59.69
XLR=100. YLR=-100. ZLR=59.69
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF GRATING"
XUL=-100. YUL=100. ZUL=20.0025
XLR=100. YLR=-100. ZLR=20.0025
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF FIR TIMBERS"
XUL=-100. YUL=100. ZUL=9.2075
XLR=100. YLR=-100. ZLR=9.2075
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="PLAN VIEW 1/10 SCALE OF MOCKUP, Z=MIDLEVEL OF U UNITS"
XUL=-130. YUL=130. ZUL=59.69
XLR=130. YLR=-130. ZLR=59.69
UAX=1. VDN=-1. DLX=2.54 NCH=* U.WGSC* END

TTL="PLAN VIEW, FULL SCALE AT CENTER OF ARRAY, Z=MIDLEVEL "
XUL=-16.75 YUL=16.75 ZUL=59.69
XLR=16.75 YLR=-16.75 ZLR=59.69
UAX=1. VDN=-1. DLX=0.254 NCH=* U.WGSC* END

TTL="CROSS SECTION OF CORE 1/6 SCALE,Y=0.0"
XUL=-100. YUL=0.0 ZUL=102.
XLR=100. YLR=0.0 ZLR=0.
UAX=1. WDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="CROSS SECTION OF MOCKUP 1/10 SCALE,Y=0.0"
XUL=-130. YUL=0.0 ZUL=105.
XLR=130. YLR=0.0 ZLR=-65.
UAX=1. WDN=-1. DLX=2.54 NCH=* U.WGSC* END

TTL="CROSS SECTION OF GRATING/FIR TIMBERS, FULL SCALE"
XUL=0. YUL=0. ZUL=24.13
XLR=25.4 YLR=0. ZLR=-5.0
UAX=1. WDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="PLAN VIEW OF GRATING THRU TIEBARS, FULL SCALE"
XUL=0. YUL=25.4 ZUL=21.193
XLR=25.4 YLR=0. ZLR=21.193
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="PLAN VIEW OF GRATING @ GRATING MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=20.0025
XLR=25.4 YLR=0. ZLR=20.0025
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="PLAN VIEW OF TIMBERS @ TIMBER MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=9.2075
XLR=25.4 YLR=-25.4 ZLR=9.2075
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGSC* END
```

Table A.2 (continued)

```
TTL="CROSS SECTION OF CENTRAL UNIT, 2X SCALE"
XUL=0.0 YUL=0.0 ZUL=102.
XLR=15.24 YLR=0.0 ZLR=-5.
UAX=1. WDN=-1. DLX=0.127 NCH=* U.WGSC* END

END PLOT
END DATA
END



CAB09
=CSAS25
CASE EBJ.6X   ( U((3.85) 22 @ 7.2"/0"/2.35"/77.2CM, TRIANGULAR)
27GROUPNDF4 INFHOMMEDIUM

' U(3.85) METAL
U-235           1 0.   1.8643E-3 END
U-238           1 0.   4.5971E-2 END

' FULL DENSITY WATER MODERATOR/REFLECTOR
H2O             2 1.0            END

' FIR TIMBER MODEL
C               3 0.   1.06802E-2 END
H               3 0.   2.21713E-2 END
O               3 0.   1.10850E-2 END

' STEEL FOR GRATING, TANK WALLS AND FLOOR
CARBONSTEEL   4 1.0              END

' STAINLESS STEEL LINING FOR TANK
SS304           5 1.0            END

END COMP
CASE EBJ.6X
READ PARM
TBA=3 NPG=600  NUB=YES PLT=NO FDN=YES TME=90
END PARM
READ GEOM

UNIT 1
COM=* FIR TIMBER 7.25" X 72" X 7.25" *
CUBOID 3 1 182.88 0. 18.415 0. 18.415 0.

UNIT 2
COM=* WATER GAP 3.5" X 72" X 7.25" BETWEEN TIMBERS *
CUBOID 2 1 182.88 0. 8.89 0. 18.415 0.

UNIT 3
COM=* ARRAY OF TIMBERS 72" X 72" X 7.25" *
ARRAY 1 3*0.0
REPLICATE 2 1 2R0. 2R0.3175 2R0. 1
REPLICATE 2 1 4R30.48 2R0.0 1

UNIT 4
COM=* SECTION OF STEEL GRATING *
CUBOID 4 1 2.778125 .238125 .396875 -.396875 3.175 2.38125
CUBOID 2 1 2.778125 .238125 4.524375 -4.524375 3.175 0.
CUBOID 4 1 3.01625 0. 4.524375 -4.524375 3.175 0.

UNIT 5
COM=* ARRAY OF STEEL GRATING *
ARRAY 2 3*0.0
REPLICATE 2 1 4R0.9525 2R0.0 1
REPLICATE 2 1 4R30.48 2R0.0 1

UNIT 6
COM=* U(3.85) UNIT, FLOODED, H=1.905, LEVELS 1, 3, AND 5 *
CYLINDER 1 1 3.175 1.905 0.
CYLINDER 2 1 3.302 1.905 0.
CYLINDER 1 1 9.144 1.905 0.

UNIT 7
COM=* ARRAY OF 22 UNITS, FLOODED, H=1.905, LEVELS 1, 3, AND 5 *
CUBOID 3 1 4P91.44 1.905 0.
HOLE 6   0.0        0.0        0.0
HOLE 6 -24.257      0.0        0.0
HOLE 6 -12.1285   21.007178  0.0
HOLE 6  12.1285   21.007178  0.0
HOLE 6  24.257      0.0        0.0
HOLE 6  12.1285  -21.007178  0.0
HOLE 6 -12.1285  -21.007178  0.0
HOLE 6 -36.3855  -21.007178  0.0
HOLE 6 -48.514      0.0        0.0
HOLE 6 -36.3855   21.007178  0.0
HOLE 6 -24.257    42.014356  0.0
HOLE 6   0.0      42.014356  0.0
HOLE 6  24.257    42.014356  0.0
HOLE 6  36.3855   21.007178  0.0
HOLE 6  48.514      0.0        0.0
HOLE 6  36.3855  -21.007178  0.0
HOLE 6  24.257   -42.014356  0.0
HOLE 6   0.0     -42.014356  0.0
HOLE 6 -24.257   -42.014356  0.0
HOLE 6 -48.514   -42.014356  0.0
HOLE 6 -12.1285   63.021534  0.0
HOLE 6  60.6425  -21.007178  0.0
REPLICATE 2 1 4R30.48 2R0.0 1

UNIT 8
COM=* U(3.85) UNIT, FLOODED, H=35.2425, LEVEL 2 *
CYLINDER 1 1 3.175 35.2425 0.
CYLINDER 2 1 3.302 35.2425 0.
CYLINDER 1 1 9.144 35.2425 0.

UNIT 9
COM=* ARRAY OF 22 UNITS, FLOODED, H=35.2425, LEVEL 2 *
CUBOID 2 1 4P91.44 35.2425 0.
HOLE 8   0.0        0.0        0.0
HOLE 8 -24.257      0.0        0.0
HOLE 8 -12.1285   21.007178  0.0
HOLE 8  12.1285   21.007178  0.0
HOLE 8  24.257      0.0        0.0
HOLE 8  12.1285  -21.007178  0.0
HOLE 8 -12.1285  -21.007178  0.0
HOLE 8 -36.3855  -21.007178  0.0
HOLE 8 -48.514      0.0        0.0
HOLE 8 -36.3855   21.007178  0.0
HOLE 8 -24.257    42.014356  0.0
HOLE 8   0.0      42.014356  0.0
HOLE 8  24.257    42.014356  0.0
HOLE 8  36.3855   21.007178  0.0
```

Table A.2 (continued)

```
HOLE 8  48.514     0.0       0.0
HOLE 8  36.3855 -21.007178 0.0
HOLE 8  24.257  -42.014356 0.0
HOLE 8   0.0    -42.014356 0.0
HOLE 8 -24.257  -42.014356 0.0
HOLE 8 -48.514  -42.014356 0.0
HOLE 8 -12.1285  63.021534 0.0
HOLE 8  60.6425 -21.007178 0.0
REPLICATE 2 1 4R30.48 2R0.0  1

UNIT 10
COM=* U(3.85) UNIT, FLOODED, H=26.035, LEVEL 4 *
CYLINDER 1 1 3.175 26.035 0.
CYLINDER 2 1 3.302 26.035 0.
CYLINDER 1 1 9.144 26.035 0.

UNIT 11
COM=* ARRAY OF 22 UNITS, FLOODED, H=26.035, LEVEL 4 *
CUBOID 2 1 4P91.44 26.035 0.
HOLE 10   0.0       0.0       0.0
HOLE 10 -24.257     0.0       0.0
HOLE 10 -12.1285  21.007178 0.0
HOLE 10  12.1285  21.007178 0.0
HOLE 10  24.257     0.0       0.0
HOLE 10  12.1285 -21.007178 0.0
HOLE 10 -12.1285 -21.007178 0.0
HOLE 10 -36.3855 -21.007178 0.0
HOLE 10 -48.514     0.0       0.0
HOLE 10 -36.3855  21.007178 0.0
HOLE 10 -24.257   42.014356 0.0
HOLE 10   0.0     42.014356 0.0
HOLE 10  24.257   42.014356 0.0
HOLE 10  36.3855  21.007178 0.0
HOLE 10  48.514     0.0       0.0
HOLE 10  36.3855 -21.007178 0.0
HOLE 10  24.257  -42.014356 0.0
HOLE 10   0.0    -42.014356 0.0
HOLE 10 -24.257  -42.014356 0.0
HOLE 10 -48.514  -42.014356 0.0
HOLE 10 -12.1285  63.021534 0.0
HOLE 10  60.6425 -21.007178 0.0
REPLICATE 2 1 4R30.48 2R0.0 1

UNIT 12
COM=* U(3.85) UNIT, FLOODED, H=9.2075, LEVEL 6 *
CYLINDER 1 1 3.175 9.2075 0.
CYLINDER 2 1 3.302 9.2075 0.
CYLINDER 1 1 9.144 9.2075 0.

UNIT 13
COM=* ARRAY OF 22 UNITS, FLOODED, H=9.2075, LEVEL 6 *
CUBOID 2 1 4P91.44 9.2075 0.
HOLE 12   0.0       0.0       0.0
HOLE 12 -24.257     0.0       0.0
HOLE 12 -12.1285  21.007178 0.0
HOLE 12  12.1285  21.007178 0.0
HOLE 12  24.257     0.0       0.0
HOLE 12  12.1285 -21.007178 0.0
HOLE 12 -12.1285 -21.007178 0.0
HOLE 12 -36.3855 -21.007178 0.0
HOLE 12 -48.514     0.0       0.0
HOLE 12 -36.3855  21.007178 0.0
HOLE 12 -24.257   42.014356 0.0
HOLE 12   0.0     42.014356 0.0
HOLE 12  24.257   42.014356 0.0
HOLE 12  36.3855  21.007178 0.0
HOLE 12  48.514     0.0       0.0
HOLE 12  36.3855 -21.007178 0.0
HOLE 12  24.257  -42.014356 0.0
HOLE 12   0.0    -42.014356 0.0
HOLE 12 -24.257  -42.014356 0.0
HOLE 12 -48.514  -42.014356 0.0
HOLE 12 -12.1285  63.021534 0.0
HOLE 12  60.6425 -21.007178 0.0
REPLICATE 2 1 4R30.48 2R0.0 1

CORE 3 1 -121.92 -121.92 0.
REPLICATE 2 1 4R0.0 1.0 0.0 1
REPLICATE 5 1 5R0.0 0.1905 1
REPLICATE 4 1 5R0.0 2.54 1
END GEOM
READ ARRAY
ARA=1 NUX=1 NUY=13 NUZ=1
FILL 1 2 5Q2 1 END FILL
ARA=2 NUX=60 NUY=20 NUZ=1
FILL F4 END FILL
GBL=3
ARA=3 NUX=1 NUY=1 NUZ=8
FILL 3 5 7 9 7 11 7 13 END FILL
END ARRAY
READ START
NST=1
XSM=-57.658 XSP=57.658
YSM=-51.158356 YSP=51.158356
ZSM= 21.59   ZSP=97.79
END START
READ PLOT

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF ANNULI/INSERTS"
XUL=-100. YUL=100. ZUL=59.69
XLR=100. YLR=-100. ZLR=59.69
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF GRATING"
XUL=-100. YUL=100. ZUL=20.0025
XLR=100. YLR=-100. ZLR=20.0025
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF FIR TIMBERS"
XUL=-100. YUL=100. ZUL=9.2075
XLR=100. YLR=-100. ZLR=9.2075
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="PLAN VIEW 1/10 SCALE OF MOCKUP, Z=MIDLEVEL OF U UNITS"
XUL=-130. YUL=130. ZUL=59.69
XLR=130. YLR=-130. ZLR=59.69
UAX=1. VDN=-1. DLX=2.54 NCH=* U.WGSC* END

TTL="PLAN VIEW, FULL SCALE AT CENTER OF ARRAY, Z=MIDLEVEL "
XUL=-16.75 YUL=16.75 ZUL=59.69
XLR=16.75 YLR=-16.75 ZLR=59.69
UAX=1. VDN=-1. DLX=0.254 NCH=* U.WGSC* END
```

Table A.2 (continued)

```
TTL="CROSS SECTION OF CORE 1/6 SCALE,Y=0.0"
XUL=-100. YUL=0.0 ZUL=102.
XLR=100. YLR=0.0 ZLR=0.
UAX=1. WDN=-1. DLX=1.524 NCH=* U.WGSC* END

TTL="CROSS SECTION OF MOCKUP 1/10 SCALE,Y=0.0"
XUL=-130. YUL=0.0 ZUL=105.
XLR=130. YLR=0.0 ZLR=-65.
UAX=1. WDN=-1. DLX=2.54 NCH=* U.WGSC* END

TTL="CROSS SECTION OF GRATING/FIR TIMBERS, FULL SCALE"
XUL=0. YUL=0. ZUL=24.13
XLR=25.4 YLR=0. ZLR=-5.0
UAX=1. WDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="PLAN VIEW OF GRATING THRU TIEBARS, FULL SCALE"
XUL=0. YUL=25.4 ZUL=21.193
XLR=25.4 YLR=0. ZLR=21.193
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="PLAN VIEW OF GRATING @ GRATING MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=20.0025
XLR=25.4 YLR=0. ZLR=20.0025
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="PLAN VIEW OF TIMBERS @ TIMBER MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=9.2075
XLR=25.4 YLR=-25.4 ZLR=9.2075
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGSC* END

TTL="CROSS SECTION OF CENTRAL UNIT, 2X SCALE"
XUL=0.0 YUL=0.0 ZUL=102.
XLR=15.24 YLR=0.0 ZLR=-5.
UAX=1. WDN=-1. DLX=0.127 NCH=* U.WGSC* END

END PLOT
END DATA
END
```

```
CAB10
=CSAS25
CASE EBJ.8 U(3.85) 6 @ 7.2"/2.6"/0.75"/91.4CM, SQUARE
27GROUPNDF4 INFHOMMEDIUM

' U(3.85) METAL
U-235          1 0.   1.8643E-3 END
U-238          1 0.   4.5971E-2 END

' FULL DENSITY WATER MODERATOR/REFLECTOR
H2O            2 1.0            END

' FIR TIMBER MODEL
C              3 0.   1.06802E-2 END
H              3 0.   2.21713E-2 END
O              3 0.   1.10850E-2 END

' STEEL FOR GRATING, TANK WALLS AND FLOOR
CARBONSTEEL   4 1.0            END

' STAINLESS STEEL LINING FOR TANK
SS304          5 1.0            END

END COMP
CASE EBJ.8 U(3.85) 6 @ 7.2"/2.6"/0.75"/91.4CM, SQUARE
READ PARM
NPG=600  NUB=YES PLT=NO FDN=YES TME=90 TBA=2
END PARM
READ GEOM

UNIT 1
COM=* FIR TIMBER 7.25" X 72" X 7.25" *
CUBOID 3 1 182.88 0. 18.415 0. 18.415 0.

UNIT 2
COM=* WATER GAP 3.5" X 72" X 7.25" BETWEEN TIMBERS *
CUBOID 2 1 182.88 0. 8.89 0. 18.415 0.

UNIT 3
COM=* ARRAY OF TIMBERS 72" X 72" X 7.25" *
ARRAY 1 3*0.0
REPLICATE 2 1 2R0. 2R0.3175 2R0. 1
REPLICATE 2 1 4R30.48 2R0. 1

UNIT 4
COM=* SECTION OF STEEL GRATING *
CUBOID 4 1 2.778125 .238125 .396875 -.396875 3.175 2.38125
CUBOID 2 1 2.778125 .238125 4.524375 -4.524375 3.175 0.
CUBOID 4 1 3.01625 0. 4.524375 -4.524375 3.175 0.

UNIT 5
COM=* ARRAY OF STEEL GRATING *
ARRAY 2 3*0.0
REPLICATE 2 1 4R0.9525 2R0.0 1
REPLICATE 2 1 4R30.48 2R0. 1
```

Table A.2 (continued)

```
UNIT 6
COM=* U(3.85) ANNULUS, H=76.2, SUBMERGED, ON CORNER *
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 4.614139 76.2 0.
CYLINDER 1 1 5.628264 76.2 0.
CYLINDER 1 1 6.485710 76.2 0.
CYLINDER 1 1 7.242341 76.2 0.
CYLINDER 1 1 7.927079 76.2 0.
CYLINDER 1 1 8.557199 76.2 0.
CYLINDER 1 1 9.144000 76.2 0.
CUBOID 2 1 4P10.0965 91.4 0.

UNIT 7
COM=* U(3.85) ANNULUS, H=76.2, SUBMERGED, ON SIDE *
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 4.614139 76.2 0.
CYLINDER 1 1 5.628264 76.2 0.
CYLINDER 1 1 6.485710 76.2 0.
CYLINDER 1 1 7.242341 76.2 0.
CYLINDER 1 1 7.927079 76.2 0.
CYLINDER 1 1 8.557199 76.2 0.
CYLINDER 1 1 9.144000 76.2 0.
CUBOID 2 1 4P10.0965 91.4 0.

UNIT 8
COM=* ARRAY OF 6 ANNULI, H=76.2, SUBMERGED *
ARRAY 3 3*0.0
REPLICATE 2 1 2R61.1505 2R71.247 2R0. 1
REPLICATE 2 1 4R30.48 2R0. 1

CORE 4 1 -121.92 -121.92 0.
REPLICATE 5 1 5R0.0 0.1905 1
REPLICATE 4 1 5R0.0 2.54 1
END GEOM
READ ARRAY
ARA=1 NUX=1 NUY=13 NUZ=1
FILL 1 2 5Q2 1 END FILL
ARA=2 NUX=60 NUY=20 NUZ=1
FILL F4 END FILL
ARA=3 NUX=3 NUY=2 NUZ=1
FILL 6 7 6 6 7 6 END FILL
GBL=4
ARA=4 NUX=1 NUY=1 NUZ=3
FILL 3 5 8 END FILL
END ARRAY
READ START
NST=1
XSM=-30.2895 XSP=30.2895
YSM=-20.193 YSP=20.193
ZSM=21.59 ZSP=97.79
END START
READ PLOT

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF ANNULI/INSERTS"
XUL=-91.44 YUL=91.44 ZUL=59.69
XLR=91.44 YLR=-91.44 ZLR=59.69
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF GRATING"
XUL=-91.44 YUL=91.44 ZUL=20.0025
XLR=91.44 YLR=-91.44 ZLR=20.0025
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF FIR TIMBERS"
XUL=-91.44 YUL=91.44 ZUL=9.2075
XLR=91.44 YLR=-91.44 ZLR=9.2075
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW 1/10 SCALE OF MOCKUP, Z=MIDLEVEL OF U UNITS"
XUL=-135. YUL=135. ZUL=59.69
XLR=135. YLR=-135. ZLR=59.69
UAX=1. VDN=-1. DLX=2.54 NCH=* U.WGS* END

TTL="PLAN VIEW 2X SCALE OF SINGLE U UNIT, Z=MIDLEVEL OF UNIT"
XUL=0.0 YUL=20.193 ZUL=59.69
XLR=20.193 YLR=0.0 ZLR=59.69
UAX=1. VDN=-1. DLX=0.127 NCH=* U.WGS* END

TTL="CROSS SECTION OF CORE 1/6 SCALE,Y=10.0965"
XUL=-91.44 YUL=10.0965 ZUL=125.
XLR=91.44 YLR=10.0965 ZLR=-10.
UAX=1. WDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="CROSS SECTION OF MOCKUP 1/10 SCALE,Y=10.0965"
XUL=-135. YUL=10.0965 ZUL=125.
XLR=135. YLR=10.0965 ZLR=-10.
UAX=1. WDN=-1. DLX=2.54 NCH=* U.WGS* END

TTL="CROSS SECTION OF GRATING/FIR TIMBERS, FULL SCALE"
XUL=0. YUL=0. ZUL=24.13
XLR=25.4 YLR=0. ZLR=-3.0
UAX=1. WDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW OF GRATING THRU TIEBARS, FULL SCALE"
XUL=0. YUL=25.4 ZUL=21.193
XLR=25.4 YLR=0. ZLR=21.193
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW OF GRATING @ GRATING MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=20.0025
XLR=25.4 YLR=0. ZLR=20.0025
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW OF TIMBERS @ TIMBER MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=9.2075
XLR=25.4 YLR=-25.4 ZLR=9.2075
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="CROSS SECTION OF CENTRAL UNIT, FULL SCALE,Y=10.0965"
XUL=-10.0965 YUL=10.0965 ZUL=125.
XLR=10.0965 YLR=10.0965 ZLR=-10.
UAX=1. WDN=-1. DLX=.254 NCH=* U.WGS* END

END PLOT
END DATA
END
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Table A.2 (continued)

```
CAB11
=CSAS25
CASE EBJ.9 U(3.85) 16 @ 7.2"/2.6"/1.50"/49.2CM, SQUARE
27GROUPNDF4 INFHOMMEDIUM

' U(3.85) METAL
U-235          1 0.  1.8643E-3 END
U-238          1 0.  4.5971E-2 END

' FULL DENSITY WATER MODERATOR/REFLECTOR
H2O            2 1.0           END

' FIR TIMBER MODEL
C              3 0.  1.06802E-2 END
H              3 0.  2.21713E-2 END
O              3 0.  1.10850E-2 END

' STEEL FOR GRATING, TANK WALLS AND FLOOR
CARBONSTEEL  4 1.0           END

' STAINLESS STEEL LINING FOR TANK
SS304          5 1.0           END

END COMP
CASE EBJ.9 U(3.85) 16 @ 7.2"/2.6"/1.50"/49.2CM, SQUARE
READ PARM
NPG=600  NUB=YES PLT=NO FDN=YES TME=90 TBA=2
END PARM
READ GEOM

UNIT 1
COM=* FIR TIMBER 7.25" X 72" X 7.25" *
CUBOID 3 1 182.88 0. 18.415 0. 18.415 0.

UNIT 2
COM=* WATER GAP 3.5" X 72" X 7.25" BETWEEN TIMBERS *
CUBOID 2 1 182.88 0. 8.89 0. 18.415 0.

UNIT 3
COM=* ARRAY OF TIMBERS 72" X 72" X 7.25" *
ARRAY 1 3*0.0
REPLICATE 2 1 2R0. 2R0.3175 2R0. 1
REPLICATE 2 1 4R30.48 2R0. 1

UNIT 4
COM=* SECTION OF STEEL GRATING *
CUBOID 4 1 2.778125 .238125 .396875 -.396875 3.175 2.38125
CUBOID 2 1 2.778125 .238125 4.524375 -4.524375 3.175 0.
CUBOID 4 1 3.01625 0. 4.524375 -4.524375 3.175 0.

UNIT 5
COM=* ARRAY OF STEEL GRATING *
ARRAY 2 3*0.0
REPLICATE 2 1 4R0.9525 2R0.0 1
REPLICATE 2 1 4R30.48 2R0. 1

UNIT 6
COM=* U(3.85) ANNULUS, H=49.2, SUBMERGED, ON CORNER *
CYLINDER 2 1 3.302 49.2 0.
CYLINDER 1 1 4.614139 49.2 0.
CYLINDER 1 1 5.628264 49.2 0.
CYLINDER 1 1 6.485710 49.2 0.
CYLINDER 1 1 7.242341 49.2 0.
CYLINDER 1 1 7.927079 49.2 0.
CYLINDER 1 1 8.557199 49.2 0.
CYLINDER 1 1 9.144000 49.2 0.
CUBOID 2 1 4P11.049 49.2 0.

UNIT 7
COM=* U(3.85) ANNULUS, H=49.2, SUBMERGED, ON SIDE *
CYLINDER 2 1 3.302 49.2 0.
CYLINDER 1 1 4.614139 49.2 0.
CYLINDER 1 1 5.628264 49.2 0.
CYLINDER 1 1 6.485710 49.2 0.
CYLINDER 1 1 7.242341 49.2 0.
CYLINDER 1 1 7.927079 49.2 0.
CYLINDER 1 1 8.557199 49.2 0.
CYLINDER 1 1 9.144000 49.2 0.
CUBOID 2 1 4P11.049 49.2 0.

UNIT 8
COM=* U(3.85) ANNULUS, H=49.2, SUBMERGED, IN MIDDLE *
CYLINDER 2 1 3.302 49.2 0.
CYLINDER 1 1 4.614139 49.2 0.
CYLINDER 1 1 5.628264 49.2 0.
CYLINDER 1 1 6.485710 49.2 0.
CYLINDER 1 1 7.242341 49.2 0.
CYLINDER 1 1 7.927079 49.2 0.
CYLINDER 1 1 8.557199 49.2 0.
CYLINDER 1 1 9.144000 49.2 0.
CUBOID 2 1 4P11.049 49.2 0.

UNIT 9
COM=* U(3.85) ANNULUS, H=27.0, DRY, ON CORNER *
CYLINDER 0 1 3.302 27.0 0.
CYLINDER 1 1 4.614139 27.0 0.
CYLINDER 1 1 5.628264 27.0 0.
CYLINDER 1 1 6.485710 27.0 0.
CYLINDER 1 1 7.242341 27.0 0.
CYLINDER 1 1 7.927079 27.0 0.
CYLINDER 1 1 8.557199 27.0 0.
CYLINDER 1 1 9.144000 27.0 0.
CUBOID 0 1 4P11.049 27.0 0.

UNIT 10
COM=* U(3.85) ANNULUS, H=27.0, DRY, ON SIDE *
CYLINDER 0 1 3.302 27.0 0.
CYLINDER 1 1 4.614139 27.0 0.
CYLINDER 1 1 5.628264 27.0 0.
CYLINDER 1 1 6.485710 27.0 0.
CYLINDER 1 1 7.242341 27.0 0.
CYLINDER 1 1 7.927079 27.0 0.
CYLINDER 1 1 8.557199 27.0 0.
CYLINDER 1 1 9.144000 27.0 0.
CUBOID 0 1 4P11.049 27.0 0.
```

Table A.2 (continued)

```
UNIT 11
COM=* U(3.85) ANNULUS, H=27.0, DRY, IN MIDDLE *
CYLINDER 0 1 3.302 27.0 0.
CYLINDER 1 1 4.614139 27.0 0.
CYLINDER 1 1 5.628264 27.0 0.
CYLINDER 1 1 6.485710 27.0 0.
CYLINDER 1 1 7.242341 27.0 0.
CYLINDER 1 1 7.927079 27.0 0.
CYLINDER 1 1 8.557199 27.0 0.
CYLINDER 1 1 9.144000 27.0 0.
CUBOID 0 1 4P11.049 27.0 0.

UNIT 12
COM=* ARRAY OF 16 ANNULI, H=49.2, SUBMERGED *
ARRAY 3 3*0.0
REPLICATE 2 1 4R47.244 2R0. 1
REPLICATE 2 1 4R30.48 2R0. 1

UNIT 13
COM=* ARRAY OF 16 ANNULI, H=27.0, DRY *
ARRAY 4 3*0.0
REPLICATE 0 1 4R47.244 2R0. 1
REPLICATE 0 1 4R30.48 2R0. 1

CORE 5 1 -121.92 -121.92 0.
REPLICATE 5 1 5R0.0 0.1905 1
REPLICATE 4 1 5R0.0 2.54 1
END GEOM
READ ARRAY
ARA=1 NUX=1 NUY=13 NUZ=1
FILL 1 2 5Q2 1 END FILL
ARA=2 NUX=60 NUY=20 NUZ=1
FILL F4 END FILL
ARA=3 NUX=4 NUY=4 NUZ=1
FILL 6 7 7 6 7 8 8 7 7 8 8 7 6 7 7 6 END FILL
ARA=4 NUX=4 NUY=4 NUZ=1
FILL 9 10 10 9 10 11 11 10 10 11 11 10 9 10 10 9 END FILL
GBL=5
ARA=5 NUX=1 NUY=1 NUZ=4
FILL 3 5 12 13 END FILL
END ARRAY
READ START
NST=1
XSM=-44.196 XSP=44.196
YSM=-44.196 YSP=44.196
ZSM=21.59 ZSP=70.79
END START
READ PLOT

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF ANNULI/INSERTS"
XUL=-91.44 YUL=91.44 ZUL=59.69
XLR=91.44 YLR=-91.44 ZLR=59.69
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF GRATING"
XUL=-91.44 YUL=91.44 ZUL=20.0025
XLR=91.44 YLR=-91.44 ZLR=20.0025
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF FIR TIMBERS"
XUL=-91.44 YUL=91.44 ZUL=9.2075
XLR=91.44 YLR=-91.44 ZLR=9.2075
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW 1/10 SCALE OF MOCKUP, Z=MIDLEVEL OF U UNITS"
XUL=-135. YUL=135. ZUL=59.69
XLR=135. YLR=-135. ZLR=59.69
UAX=1. VDN=-1. DLX=2.54 NCH=* U.WGS* END

TTL="PLAN VIEW 2X SCALE OF SINGLE U UNIT, Z=MIDLEVEL OF UNIT"
XUL=0.0 YUL=22.098 ZUL=59.69
XLR=22.098 YLR=0. ZLR=59.69
UAX=1. VDN=-1. DLX=0.127 NCH=* U.WGS* END

TTL="CROSS SECTION OF CORE 1/6 SCALE,Y=11.049"
XUL=-91.44 YUL=11.049 ZUL=110.
XLR=91.44 YLR=11.049 ZLR=-10.
UAX=1. WDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="CROSS SECTION OF MOCKUP 1/10 SCALE,Y=11.049"
XUL=-135. YUL=11.049 ZUL=125.
XLR=135. YLR=11.049 ZLR=-10.
UAX=1. WDN=-1. DLX=2.54 NCH=* U.WGS* END

TTL="CROSS SECTION OF GRATING/FIR TIMBERS, FULL SCALE"
XUL=0. YUL=0. ZUL=24.13
XLR=25.4 YLR=0. ZLR=-3.0
UAX=1. WDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW OF GRATING THRU TIEBARS, FULL SCALE"
XUL=0. YUL=25.4 ZUL=21.193
XLR=25.4 YLR=0. ZLR=21.193
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW OF GRATING @ GRATING MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=20.0025
XLR=25.4 YLR=0. ZLR=20.0025
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW OF TIMBERS @ TIMBER MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=9.2075
XLR=25.4 YLR=-25.4 ZLR=9.2075
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="CROSS SECTION OF CENTRAL UNIT, FULL SCALE,Y=11.049"
XUL=0.0 YUL=22.098 ZUL=110.
XLR=22.098 YLR=0.0 ZLR=-10.
UAX=1. WDN=-1. DLX=.254 NCH=* U.WGS* END

END PLOT
END DATA
END
```

Table A.2 (continued)

```
CAB12
=CSAS25
CASE EBJ.10 U(3.85) 20 @ 7.2"/2.6"/1.87"/79.0CM, SQUARE
27GROUPNDF4 INFHOMMEDIUM

' U(3.85) METAL
U-235          1 0.  1.8643E-3 END
U-238          1 0.  4.5971E-2 END

' FULL DENSITY WATER MODERATOR/REFLECTOR
H2O            2 1.0           END

' FIR TIMBER MODEL
C              3 0.  1.06802E-2 END
H              3 0.  2.21713E-2 END
O              3 0.  1.10850E-2 END

' STEEL FOR GRATING, TANK WALLS AND FLOOR
CARBONSTEEL  4 1.0             END

' STAINLESS STEEL LINING FOR TANK
SS304          5 1.0           END

END COMP
CASE EBJ.10 U(3.85) 20 @ 7.2"/2.6"/1.87"/79.0CM, SQUARE
READ PARM
NPG=600  NUB=YES PLT=NO FDN=YES TME=90 TBA=2
END PARM
READ GEOM

UNIT 1
COM=* FIR TIMBER 7.25" X 72" X 7.25" *
CUBOID 3 1 182.88 0. 18.415 0. 18.415 0.

UNIT 2
COM=* WATER GAP 3.5" X 72" X 7.25" BETWEEN TIMBERS *
CUBOID 2 1 182.88 0. 8.89 0. 18.415 0.

UNIT 3
COM=* ARRAY OF TIMBERS 72" X 72" X 7.25" *
ARRAY 1 3*0.0
REPLICATE 2 1 2R0. 2R0.3175 2R0. 1
REPLICATE 2 1 4R30.48 2R0. 1

UNIT 4
COM=* SECTION OF STEEL GRATING *
CUBOID 4 1 2.778125 .238125 .396875 -.396875 3.175 2.38125
CUBOID 2 1 2.778125 .238125 4.524375 -4.524375 3.175 0.
CUBOID 4 1 3.01625 0. 4.524375 -4.524375 3.175 0.

UNIT 5
COM=* ARRAY OF STEEL GRATING *
ARRAY 2 3*0.0
REPLICATE 2 1 4R0.9525 2R0.0 1
REPLICATE 2 1 4R30.48 2R0. 1

UNIT 6
COM=* U(3.85) ANNULUS, H=76.2, SUBMERGED *
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P11.5189 79.0 0.

UNIT 7
COM=* U(3.85) ANNULUS, H=76.2, SUBMERGED *
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P11.5189 79.0 0.

UNIT 8
COM=* U(3.85) ANNULUS, H=76.2, SUBMERGED *
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P11.5189 79.0 0.

UNIT 9
COM=* U(3.85) ANNULUS, H=76.2, SUBMERGED *
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P11.5189 79.0 0.

UNIT 10
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P11.5189 79.0 0.

UNIT 11
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P11.5189 79.0 0.

UNIT 12
COM=* U(3.85) ANNULUS, H=76.2, SUBMERGED *
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P11.5189 79.0 0.

UNIT 13
COM=* U(3.85) ANNULUS, H=76.2, SUBMERGED *
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P11.5189 79.0 0.

UNIT 14
COM=* U(3.85) ANNULUS, H=76.2, SUBMERGED *
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P11.5189 79.0 0.

UNIT 15
COM=* U(3.85) ANNULUS, H=76.2, SUBMERGED *
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P11.5189 79.0 0.

UNIT 16
COM=* U(3.85) ANNULUS, H=76.2, SUBMERGED *
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P11.5189 79.0 0.

UNIT 17
COM=* U(3.85) ANNULUS, H=76.2, SUBMERGED *
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P11.5189 79.0 0.
```

Table A.2 (continued)

```
UNIT 18
COM=* U(3.85) ANNULUS, H=76.2, SUBMERGED *
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P11.5189 79.0 0.

UNIT 19
COM=* U(3.85) ANNULUS, H=76.2, SUBMERGED *
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P11.5189 79.0 0.

UNIT 20
COM=* U(3.85) ANNULUS, H=76.2, SUBMERGED *
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P11.5189 79.0 0.

UNIT 21
COM=* U(3.85) ANNULUS, H=76.2, SUBMERGED *
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P11.5189 79.0 0.

UNIT 22
COM=* U(3.85) ANNULUS, H=76.2, SUBMERGED *
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P11.5189 79.0 0.

UNIT 23
COM=* U(3.85) ANNULUS, H=76.2, SUBMERGED *
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P11.5189 79.0 0.

UNIT 24
COM=* U(3.85) ANNULUS, H=76.2, SUBMERGED *
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P11.5189 79.0 0.

UNIT 25
COM=* U(3.85) ANNULUS, H=76.2, SUBMERGED *
CYLINDER 2 1 3.302 76.2 0.
CYLINDER 1 1 9.144 76.2 0.
CUBOID 2 1 4P11.5189 79.0 0.

UNIT 26
COM=* WATER CUBOID TO COMPLETE ARRAY *
CUBOID 2 1 4P11.5189 79.0 0.

UNIT 27
COM=* ARRAY OF 20 ANNULI, H=76.2, SUBMERGED *
ARRAY 3 3*0.0
REPLICATE 2 1 4R33.8455 2R0. 1
REPLICATE 2 1 4R30.48 2R0. 1

CORE 4 1 -121.92 -121.92 0.
REPLICATE 5 1 5R0.0 0.1905 1
REPLICATE 4 1 5R0.0 2.54 1
END GEOM
```

```
READ ARRAY
ARA=1 NUX=1 NUY=13 NUZ=1
FILL 1 2 5Q2 1 END FILL
ARA=2 NUX=60 NUY=20 NUZ=1
FILL F4 END FILL
ARA=3 NUX=5 NUY=5 NUZ=1
FILL 26 26 6 7 26 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
26 23 24 25 26 END FILL
GBL=4
ARA=4 NUX=1 NUY=1 NUZ=3
FILL 3 5 27 END FILL
END ARRAY
READ START
NST=1
XSM=-57.5945 XSP=57.5945
YSM=-57.5945 YSP=57.5945
ZSM=21.59 ZSP=97.79
END START
READ PLOT

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF ANNULI/INSERTS"
XUL=-91.44 YUL=91.44 ZUL=59.69
XLR=91.44 YLR=-91.44 ZLR=59.69
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF GRATING"
XUL=-91.44 YUL=91.44 ZUL=20.0025
XLR=91.44 YLR=-91.44 ZLR=20.0025
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF FIR TIMBERS"
XUL=-91.44 YUL=91.44 ZUL=9.2075
XLR=91.44 YLR=-91.44 ZLR=9.2075
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW 1/10 SCALE OF MOCKUP, Z=MIDLEVEL OF U UNITS"
XUL=-135. YUL=135. ZUL=59.69
XLR=135. YLR=-135. ZLR=59.69
UAX=1. VDN=-1. DLX=2.54 NCH=* U.WGS* END

TTL="PLAN VIEW 2X SCALE OF SINGLE U UNIT, Z=MIDLEVEL OF UNIT"
XUL=-11.5189 YUL=11.5189 ZUL=59.69
XLR=11.5189 YLR=-11.5189 ZLR=59.69
UAX=1. VDN=-1. DLX=0.127 NCH=* U.WGS* END

TTL="CROSS SECTION OF CORE 1/6 SCALE,Y=0.0"
XUL=-91.44 YUL=0.0 ZUL=110.
XLR=91.44 YLR=0.0 ZLR=-10.
UAX=1. WDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="CROSS SECTION OF MOCKUP 1/10 SCALE,Y=0.0"
XUL=-135. YUL=0.0 ZUL=125.
XLR=135. YLR=0.0 ZLR=-10.
UAX=1. WDN=-1. DLX=2.54 NCH=* U.WGS* END

TTL="CROSS SECTION OF GRATING/FIR TIMBERS, FULL SCALE"
XUL=0. YUL=0. ZUL=24.13
XLR=25.4 YLR=0. ZLR=-3.0
UAX=1. WDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW OF GRATING THRU TIEBARS, FULL SCALE"
XUL=0. YUL=25.4 ZUL=21.193
XLR=25.4 YLR=0. ZLR=21.193
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END
```

Table A.2 (continued)

```
TTL="PLAN VIEW OF GRATING @ GRATING MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=20.0025
XLR=25.4 YLR=0. ZLR=20.0025
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW OF TIMBERS @ TIMBER MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=9.2075
XLR=25.4 YLR=-25.4 ZLR=9.2075
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="CROSS SECTION OF CENTRAL UNIT, FULL SCALE,Y=0.0"
XUL=-11.5189 YUL=0.0 ZUL=110.
XLR=11.5189 YLR=0.0 ZLR=-10.
UAX=1. WDN=-1. DLX=.254 NCH=* U.WGS* END

END PLOT
END DATA
END



CAB13
=CSAS25
CASE EBJ.11 U(3.85) 8 @ 7.2"/2.6"/0.0"/72.5CM, SQUARE
27GROUPNDF4 INFHOMMEDIUM

' U(3.85) METAL
U-235          1 0.  1.8643E-3 END
U-238          1 0.  4.5971E-2 END

' FULL DENSITY WATER MODERATOR/REFLECTOR
H2O            2 1.0           END

' FIR TIMBER MODEL
C              3 0.  1.06802E-2 END
H              3 0.  2.21713E-2 END
O              3 0.  1.10850E-2 END

' STEEL FOR GRATING, TANK WALLS AND FLOOR
CARBONSTEEL  4 1.0             END

' STAINLESS STEEL LINING FOR TANK
SS304          5 1.0           END

END COMP
CASE EBJ.11 U(3.85) 8 @ 7.2"/2.6"/0.0"/72.5CM, SQUARE
READ PARM
NPG=600  NUB=YES PLT=NO FDN=YES TME=90 TBA=2
END PARM
READ GEOM

UNIT 1
COM=* FIR TIMBER 7.25" X 72" X 7.25" *
CUBOID 3 1 182.88 0. 18.415 0. 18.415 0.

UNIT 2
COM=* WATER GAP 3.5" X 72" X 7.25" BETWEEN TIMBERS *
CUBOID 2 1 182.88 0. 8.89 0. 18.415 0.

UNIT 3
COM=* ARRAY OF TIMBERS 72" X 72" X 7.25" *
ARRAY 1 3*0.0
REPLICATE 2 1 2R0. 2R0.3175 2R0. 1
REPLICATE 2 1 4R30.48 2R0. 1

UNIT 4
COM=* SECTION OF STEEL GRATING *
CUBOID 4 1 2.778125 .238125 .396875 -.396875 3.175 2.38125
CUBOID 2 1 2.778125 .238125 4.524375 -4.524375 3.175 0.
CUBOID 4 1 3.01625 0. 4.524375 -4.524375 3.175 0.

UNIT 5
COM=* ARRAY OF STEEL GRATING *
ARRAY 2 3*0.0
REPLICATE 2 1 4R0.9525 2R0.0 1
REPLICATE 2 1 4R30.48 2R0. 1

UNIT 6
COM=* U(3.85) ANNULUS, H=72.5, SUBMERGED, ON CORNER *
CYLINDER 2 1 3.302 72.5 0.
CYLINDER 1 1 4.614139 72.5 0.
CYLINDER 1 1 5.628264 72.5 0.
CYLINDER 1 1 6.485710 72.5 0.
CYLINDER 1 1 7.242341 72.5 0.
CYLINDER 1 1 7.927079 72.5 0.
CYLINDER 1 1 8.557199 72.5 0.
CYLINDER 1 1 9.144000 72.5 0.
CUBOID 2 1 4P9.144 72.5 0.

UNIT 7
COM=* U(3.85) ANNULUS, H=72.5, SUBMERGED, ON SIDE *
CYLINDER 2 1 3.302 72.5 0.
CYLINDER 1 1 4.614139 72.5 0.
CYLINDER 1 1 5.628264 72.5 0.
CYLINDER 1 1 6.485710 72.5 0.
CYLINDER 1 1 7.242341 72.5 0.
CYLINDER 1 1 7.927079 72.5 0.
CYLINDER 1 1 8.557199 72.5 0.
CYLINDER 1 1 9.144000 72.5 0.
CUBOID 2 1 4P9.144 72.5 0.

UNIT 8
COM=* U(3.85) ANNULUS, H=3.7, DRY, ON CORNER *
CYLINDER 0 1 3.302 3.7 0.
CYLINDER 1 1 4.614139 3.7 0.
CYLINDER 1 1 5.628264 3.7 0.
CYLINDER 1 1 6.485710 3.7 0.
CYLINDER 1 1 7.242341 3.7 0.
CYLINDER 1 1 7.927079 3.7 0.
CYLINDER 1 1 8.557199 3.7 0.
CYLINDER 1 1 9.144000 3.7 0.
CUBOID 0 1 4P9.144 3.7 0.

UNIT 9
COM=* U(3.85) ANNULUS, H=3.7, DRY, ON SIDE *
CYLINDER 0 1 3.302 3.7 0.
CYLINDER 1 1 4.614139 3.7 0.
CYLINDER 1 1 5.628264 3.7 0.
CYLINDER 1 1 6.485710 3.7 0.
CYLINDER 1 1 7.242341 3.7 0.
CYLINDER 1 1 7.927079 3.7 0.
CYLINDER 1 1 8.557199 3.7 0.
CYLINDER 1 1 9.144000 3.7 0.
CUBOID 0 1 4P9.144 3.7 0.
```

Table A.2 (continued)

```
UNIT 10
COM=* ARRAY OF 8 ANNULI, H=72.5, SUBMERGED *
ARRAY 3 3*0.0
REPLICATE 2 1 2R54.864 2R73.152 2R0. 1
REPLICATE 2 1 4R30.48 2R0. 1

UNIT 11
COM=* ARRAY OF 8 ANNULI, H=3.7, DRY *
ARRAY 4 3*0.0
REPLICATE 0 1 2R54.864 2R73.152 2R0. 1
REPLICATE 0 1 4R30.48 2R0. 1

CORE 5 1 -121.92 -121.92 0.
REPLICATE 5 1 5R0.0 0.1905 1
REPLICATE 4 1 5R0.0 2.54 1
END GEOM
READ ARRAY
ARA=1 NUX=1 NUY=13 NUZ=1
FILL 1 2 5Q2 1 END FILL
ARA=2 NUX=60 NUY=20 NUZ=1
FILL F4 END FILL
ARA=3 NUX=4 NUY=2 NUZ=1
FILL 6 7 7 6 6 7 7 6 END FILL
ARA=4 NUX=4 NUY=2 NUZ=1
FILL 8 9 9 8 8 9 9 8 END FILL
GBL=5
ARA=5 NUX=1 NUY=1 NUZ=4
FILL 3 5 10 11 END FILL
END ARRAY
READ START
NST=1
XSM=-36.576 XSP=36.576
YSM=-18.288 YSP=18.288
ZSM=21.59 ZSP=94.09
END START
READ PLOT

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF ANNULI/INSERTS"
XUL=-91.44 YUL=91.44 ZUL=59.69
XLR=91.44 YLR=-91.44 ZLR=59.69
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF GRATING"
XUL=-91.44 YUL=91.44 ZUL=20.0025
XLR=91.44 YLR=-91.44 ZLR=20.0025
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF FIR TIMBERS"
XUL=-91.44 YUL=91.44 ZUL=9.2075
XLR=91.44 YLR=-91.44 ZLR=9.2075
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW 1/10 SCALE OF MOCKUP, Z=MIDLEVEL OF U UNITS"
XUL=-135. YUL=135. ZUL=59.69
XLR=135. YLR=-135. ZLR=59.69
UAX=1. VDN=-1. DLX=2.54 NCH=* U.WGS* END

TTL="PLAN VIEW 2X SCALE OF SINGLE U UNIT, Z=MIDLEVEL OF UNIT"
XUL=0.0 YUL=18.288 ZUL=59.69
XLR=18.288 YLR=0. ZLR=59.69
UAX=1. VDN=-1. DLX=0.127 NCH=* U.WGS* END

TTL="CROSS SECTION OF CORE 1/6 SCALE,Y=9.144"
XUL=-91.44 YUL=9.144 ZUL=110.
XLR=91.44 YLR=9.144 ZLR=-10.
UAX=1. WDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="CROSS SECTION OF MOCKUP 1/10 SCALE,Y=9.144"
XUL=-135. YUL=9.144 ZUL=125.
XLR=135. YLR=9.144 ZLR=-10.
UAX=1. WDN=-1. DLX=2.54 NCH=* U.WGS* END

TTL="CROSS SECTION OF GRATING/FIR TIMBERS, FULL SCALE"
XUL=0. YUL=0. ZUL=24.13
XLR=25.4 YLR=0. ZLR=-3.0
UAX=1. WDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW OF GRATING THRU TIEBARS, FULL SCALE"
XUL=0. YUL=25.4 ZUL=21.193
XLR=25.4 YLR=0. ZLR=21.193
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW OF GRATING @ GRATING MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=20.0025
XLR=25.4 YLR=0. ZLR=20.0025
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW OF TIMBERS @ TIMBER MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=9.2075
XLR=25.4 YLR=-25.4 ZLR=9.2075
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="CROSS SECTION OF CENTRAL UNIT, FULL SCALE,Y=9.144"
XUL=0.0 YUL=9.144 ZUL=110.
XLR=18.288 YLR=9.144 ZLR=-10.
UAX=1. WDN=-1. DLX=.254 NCH=* U.WGS* END

END PLOT
END DATA
END


CAB14
=CSAS25
CASE EBJ.12 U(3.85) 22 @ 2.5"/0.0"/0.35"/72.3CM, SQUARE
27GROUPNDF4 INFHOMMEDIUM

' U(3.85) METAL
U-235          1 0.   1.8643E-3 END
U-238          1 0.   4.5971E-2 END

' FULL DENSITY WATER MODERATOR/REFLECTOR
H2O            2 1.0            END

' FIR TIMBER MODEL
C              3 0.   1.06802E-2 END
H              3 0.   2.21713E-2 END
O              3 0.   1.10850E-2 END

' STEEL FOR GRATING, TANK WALLS AND FLOOR
CARBONSTEEL    4 1.0            END

' STAINLESS STEEL LINING FOR TANK
SS304          5 1.0            END
```

Table A.2 (continued)

```
END COMP
CASE EBJ.12 U(3.85) 22 @ 2.5"/0.0"/0.35"/72.3CM, SQUARE
READ PARM
NPG=600  NUB=YES PLT=NO FDN=YES TME=90 TBA=2
END PARM
READ GEOM

UNIT 1
COM=* FIR TIMBER 7.25" X 72" X 7.25" *
CUBOID 3 1 182.88 0. 18.415 0. 18.415 0.

UNIT 2
COM=* WATER GAP 3.5" X 72" X 7.25" BETWEEN TIMBERS *
CUBOID 2 1 182.88 0. 8.89 0. 18.415 0.

UNIT 3
COM=* ARRAY OF TIMBERS 72" X 72" X 7.25" *
ARRAY 1 3*0.0
REPLICATE 2 1 2R0. 2R0.3175 2R0. 1
REPLICATE 2 1 4R30.48 2R0. 1

UNIT 4
COM=* SECTION OF STEEL GRATING *
CUBOID 4 1 2.778125 .238125 .396875 -.396875 3.175 2.38125
CUBOID 2 1 2.778125 .238125 4.524375 -4.524375 3.175 0.
CUBOID 4 1 3.01625 0. 4.524375 -4.524375 3.175 0.

UNIT 5
COM=* ARRAY OF STEEL GRATING *
ARRAY 2 3*0.0
REPLICATE 2 1 4R0.9525 2R0.0 1
REPLICATE 2 1 4R30.48 2R0. 1

UNIT 6
COM=* U(3.85) ROD, H=72.3, SUBMERGED *
CYLINDER 1 1 1.419903 72.3 0.
CYLINDER 1 1 2.008046 72.3 0.
CYLINDER 1 1 2.459344 72.3 0.
CYLINDER 1 1 2.839806 72.3 0.
CYLINDER 1 1 3.175000 72.3 0.
CUBOID 2 1 4P3.6195 72.3 0.

UNIT 7
COM=* WATER CUBOID TO COMPLETE ARRAY 3 *
CUBOID 2 1 4P3.6195 72.3 0.

UNIT 8
COM=* U(3.85) ROD, H=3.9, DRY *
CYLINDER 1 1 1.419903 3.9 0.
CYLINDER 1 1 2.008046 3.9 0.
CYLINDER 1 1 2.459344 3.9 0.
CYLINDER 1 1 2.839806 3.9 0.
CYLINDER 1 1 3.175000 3.9 0.
CUBOID 0 1 4P3.6195 3.9 0.

UNIT 9
COM=* VOID CUBOID TO COMPLETE ARRAY 4 *
CUBOID 0 1 4P3.6195 3.9 0.

UNIT 10
COM=* U(3.85) ROD ARRAY, H=72.3, SUBMERGED *
ARRAY 3 3*0.0
REPLICATE 2 1 4R73.3425 2R0. 1
REPLICATE 2 1 4R30.48 2R0. 1

UNIT 11
COM=* ARRAY OF 22 U(3.85) RODS, H=3.9, DRY *
ARRAY 4 3*0.0
REPLICATE 0 1 4R73.3425 2R0. 1
REPLICATE 0 1 4R30.48 2R0. 1

CORE 5 1 -121.92 -121.92 0.
REPLICATE 5 1 5R0.0 0.1905 1
REPLICATE 4 1 5R0.0 2.54 1
END GEOM
READ ARRAY
ARA=1 NUX=1 NUY=13 NUZ=1
FILL 1 2 5Q2 1 END FILL
ARA=2 NUX=60 NUY=20 NUZ=1
FILL F4 END FILL
ARA=3 NUX=5 NUY=5 NUZ=1
FILL 2R6 3R7 20R6 END FILL
ARA=4 NUX=5 NUY=5 NUZ=1
FILL 2R8 3R9 20R8 END FILL
GBL=5
ARA=5 NUX=1 NUY=1 NUZ=4
FILL 3 5 10 11 END FILL
END ARRAY
READ START
NST=1
XSM=-18.0975 XSP=18.0975
YSM=-18.0975 YSP=18.0975
ZSM=21.59 ZSP=93.89
END START
READ PLOT

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF ANNULI/INSERTS"
XUL=-91.44 YUL=91.44 ZUL=59.69
XLR=91.44 YLR=-91.44 ZLR=59.69
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW OF ARRAY, FULL SCALE"
XUL=-18.0975 YUL=18.0975 ZUL=59.69
XLR=18.0975 YLR=-18.0975 ZLR=59.69
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF GRATING"
XUL=-91.44 YUL=91.44 ZUL=20.0025
XLR=91.44 YLR=-91.44 ZLR=20.0025
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF FIR TIMBERS"
XUL=-91.44 YUL=91.44 ZUL=9.2075
XLR=91.44 YLR=-91.44 ZLR=9.2075
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW 1/10 SCALE OF MOCKUP, Z=MIDLEVEL OF U UNITS"
XUL=-135. YUL=135. ZUL=59.69
XLR=135. YLR=-135. ZLR=59.69
UAX=1. VDN=-1. DLX=2.54 NCH=* U.WGS* END

TTL="PLAN VIEW 2X SCALE OF SINGLE U UNIT, Z=MIDLEVEL OF UNIT"
XUL=-3.6195 YUL=3.6195 ZUL=59.69
XLR=3.6195 YLR=-3.6195 ZLR=59.69
UAX=1. VDN=-1. DLX=0.127 NCH=* U.WGS* END
```

Table A.2 (continued)

```
TTL="CROSS SECTION OF CORE 1/6 SCALE,Y=0.0"
XUL=-91.44 YUL=0.0 ZUL=110.
XLR=91.44 YLR=0.0 ZLR=-10.
UAX=1. WDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="CROSS SECTION OF MOCKUP 1/10 SCALE,Y=0.0"
XUL=-135. YUL=0.0 ZUL=125.
XLR=135. YLR=0.0 ZLR=-10.
UAX=1. WDN=-1. DLX=2.54 NCH=* U.WGS* END

TTL="CROSS SECTION OF GRATING/FIR TIMBERS, FULL SCALE"
XUL=0. YUL=0. ZUL=24.13
XLR=25.4 YLR=0. ZLR=-3.0
UAX=1. WDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW OF GRATING THRU TIEBARS, FULL SCALE"
XUL=0. YUL=25.4 ZUL=21.193
XLR=25.4 YLR=0. ZLR=21.193
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW OF GRATING @ GRATING MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=20.0025
XLR=25.4 YLR=0. ZLR=20.0025
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW OF TIMBERS @ TIMBER MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=9.2075
XLR=25.4 YLR=-25.4 ZLR=9.2075
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="CROSS SECTION OF CENTRAL UNIT, 2XL SCALE,Y=0.0"
XUL=-3.6195 YUL=0.0 ZUL=110.
XLR=3.6195 YLR=0.0 ZLR=-10.
UAX=1. WDN=-1. DLX=.127 NCH=* U.WGS* END

END PLOT
END DATA
END
```

```
CAB15
=CSAS25
CASE EBJ.13 U(3.85) 15 @ 2.5"/0.0"/0.75"/64.8CM, SQUARE
27GROUPNDF4 INFHOMMEDIUM

' U(3.85) METAL
U-235          1 0.  1.8643E-3 END
U-238          1 0.  4.5971E-2 END

' FULL DENSITY WATER MODERATOR/REFLECTOR
H2O            2 1.0           END

' FIR TIMBER MODEL
C              3 0.  1.06802E-2 END
H              3 0.  2.21713E-2 END
O              3 0.  1.10850E-2 END

' STEEL FOR GRATING, TANK WALLS AND FLOOR
CARBONSTEEL  4 1.0             END

' STAINLESS STEEL LINING FOR TANK
SS304          5 1.0           END

END COMP
CASE EBJ.13 U(3.85) 15 @ 2.5"/0.0"/0.75"/64.8CM, SQUARE
READ PARM
NPG=600  NUB=YES PLT=NO FDN=YES TME=90 TBA=2
END PARM
READ GEOM

UNIT 1
COM=* FIR TIMBER 7.25" X 72" X 7.25" *
CUBOID 3 1 182.88 0. 18.415 0. 18.415 0.

UNIT 2
COM=* WATER GAP 3.5" X 72" X 7.25" BETWEEN TIMBERS *
CUBOID 2 1 182.88 0. 8.89 0. 18.415 0.

UNIT 3
COM=* ARRAY OF TIMBERS 72" X 72" X 7.25" *
ARRAY 1 3*0.0
REPLICATE 2 1 2R0. 2R0.3175 2R0. 1
REPLICATE 2 1 4R30.48 2R0. 1

UNIT 4
COM=* SECTION OF STEEL GRATING *
CUBOID 4 1 2.778125 .238125 .396875 -.396875 3.175 2.38125
CUBOID 2 1 2.778125 .238125 4.524375 -4.524375 3.175 0.
CUBOID 4 1 3.01625 0. 4.524375 -4.524375 3.175 0.

UNIT 5
COM=* ARRAY OF STEEL GRATING *
ARRAY 2 3*0.0
REPLICATE 2 1 4R0.9525 2R0.0 1
REPLICATE 2 1 4R30.48 2R0. 1

UNIT 6
COM=* U(3.85) ROD, H=64.8, SUBMERGED *
CYLINDER 1 1 1.419903 64.8 0.
CYLINDER 1 1 2.008046 64.8 0.
CYLINDER 1 1 2.459344 64.8 0.
CYLINDER 1 1 2.839806 64.8 0.
CYLINDER 1 1 3.175000 64.8 0.
CUBOID 2 1 4P4.1275 64.8 0.
```

Table A.2 (continued)

```
UNIT 7
COM=* WATER CUBOID TO COMPLETE ARRAY 3 *
CUBOID 2 1 4P4.1275 64.8 0.

UNIT 8
COM=* U(3.85) ROD, H=11.4, DRY *
CYLINDER 1 1 1.419903 11.4 0.
CYLINDER 1 1 2.008046 11.4 0.
CYLINDER 1 1 2.459344 11.4 0.
CYLINDER 1 1 2.839806 11.4 0.
CYLINDER 1 1 3.175000 11.4 0.
CUBOID 0 1 4P4.1275 11.4 0.

UNIT 9
COM=* VOID CUBOID TO COMPLETE ARRAY 4 *
CUBOID 0 1 4P4.1275 11.4 0.

UNIT 10
COM=* U(3.85) ROD ARRAY, H=64.8, SUBMERGED *
ARRAY 3 3*0.0
REPLICATE 2 1 4R74.93 2R0. 1
REPLICATE 2 1 4R30.48 2R0. 1

UNIT 11
COM=* ARRAY OF 15 RODS, H=11.4, DRY *
ARRAY 4 3*0.0
REPLICATE 0 1 4R74.93 2R0. 1
REPLICATE 0 1 4R30.48 2R0. 1

CORE 5 1 -121.92 -121.92 0.
REPLICATE 5 1 5R0.0 0.1905 1
REPLICATE 4 1 5R0.0 2.54 1
END GEOM
READ ARRAY
ARA=1 NUX=1 NUY=13 NUZ=1
FILL 1 2 5Q2 1 END FILL
ARA=2 NUX=60 NUY=20 NUZ=1
FILL F4 END FILL
ARA=3 NUX=4 NUY=4 NUZ=1
FILL 3R6 7 12R6 END FILL
ARA=4 NUX=4 NUY=4 NUZ=1
FILL 3R8 9 12R8 END FILL
GBL=5
ARA=5 NUX=1 NUY=1 NUZ=4
FILL 3 5 10 11 END FILL
END ARRAY
READ START
NST=1
XSM=-16.51 XSP=16.51
YSM=-16.51 YSP=16.51
ZSM=21.59 ZSP=86.39
END START
READ PLOT

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF ANNULI/INSERTS"
XUL=-91.44 YUL=91.44 ZUL=59.69
XLR=91.44 YLR=-91.44 ZLR=59.69
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW FULL SCALE OF ARRAY, Z=MIDLEVEL OF UNITS"
XUL=-16.51 YUL=16.51 ZUL=59.69
XLR=16.51 YLR=-16.51 ZLR=59.69
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF GRATING"
XUL=-91.44 YUL=91.44 ZUL=20.0025
XLR=91.44 YLR=-91.44 ZLR=20.0025
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF FIR TIMBERS"
XUL=-91.44 YUL=91.44 ZUL=9.2075
XLR=91.44 YLR=-91.44 ZLR=9.2075
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW 1/10 SCALE OF MOCKUP, Z=MIDLEVEL OF U UNITS"
XUL=-135. YUL=135. ZUL=59.69
XLR=135. YLR=-135. ZLR=59.69
UAX=1. VDN=-1. DLX=2.54 NCH=* U.WGS* END

TTL="PLAN VIEW 2X SCALE OF SINGLE U UNIT, Z=MIDLEVEL OF UNIT"
XUL=0.0 YUL=8.255 ZUL=59.69
XLR=8.255 YLR=0.0 ZLR=59.69
UAX=1. VDN=-1. DLX=0.127 NCH=* U.WGS* END

TTL="CROSS SECTION OF CORE 1/6 SCALE,Y=4.1275"
XUL=-91.44 YUL=4.1275 ZUL=110.
XLR=91.44 YLR=4.1275 ZLR=-10.
UAX=1. WDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="CROSS SECTION OF MOCKUP 1/10 SCALE,Y=4.1275"
XUL=-135. YUL=4.1275 ZUL=125.
XLR=135. YLR=4.1275 ZLR=-10.
UAX=1. WDN=-1. DLX=2.54 NCH=* U.WGS* END

TTL="CROSS SECTION OF GRATING/FIR TIMBERS, FULL SCALE"
XUL=0. YUL=0. ZUL=24.13
XLR=25.4 YLR=0. ZLR=-3.0
UAX=1. WDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW OF GRATING THRU TIEBARS, FULL SCALE"
XUL=0. YUL=25.4 ZUL=21.193
XLR=25.4 YLR=0. ZLR=21.193
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW OF GRATING @ GRATING MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=20.0025
XLR=25.4 YLR=0. ZLR=20.0025
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW OF TIMBERS @ TIMBER MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=9.2075
XLR=25.4 YLR=-25.4 ZLR=9.2075
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="CROSS SECTION OF CENTRAL UNIT, 2X SCALE,Y=4.1275"
XUL=0.0 YUL=4.1275 ZUL=110.
XLR=8.255 YLR=4.1275 ZLR=-10.
UAX=1. WDN=-1. DLX=.127 NCH=* U.WGS* END

END PLOT
END DATA
END
```

Table A.2 (continued)

```
CAB16
=CSAS25
CASE EBJ.14 U(3.85) 23 @ 2.5"/0.0"/1.50"/68.9CM, SQUARE
27GROUPNDF4 INFHOMMEDIUM

' U(3.85) METAL
U-235          1 0.  1.8643E-3 END
U-238          1 0.  4.5971E-2 END

' FULL DENSITY WATER MODERATOR/REFLECTOR
H2O            2 1.0           END

' FIR TIMBER MODEL
C              3 0.  1.06802E-2 END
H              3 0.  2.21713E-2 END
O              3 0.  1.10850E-2 END

' STEEL FOR GRATING, TANK WALLS AND FLOOR
CARBONSTEEL  4 1.0             END

' STAINLESS STEEL LINING FOR TANK
SS304          5 1.0           END

END COMP
CASE EBJ.14 U(3.85) 23 @ 2.5"/0.0"/1.50"/68.9CM, SQUARE
READ PARM
NPG=600  NUB=YES PLT=NO FDN=YES TME=90 TBA=2
END PARM
READ GEOM

UNIT 1
COM=* FIR TIMBER 7.25" X 72" X 7.25" *
CUBOID 3 1 182.88 0. 18.415 0. 18.415 0.

UNIT 2
COM=* WATER GAP 3.5" X 72" X 7.25" BETWEEN TIMBERS *
CUBOID 2 1 182.88 0. 8.89 0. 18.415 0.

UNIT 3
COM=* ARRAY OF TIMBERS 72" X 72" X 7.25" *
ARRAY 1 3*0.0
REPLICATE 2 1 2R0. 2R0.3175 2R0. 1
REPLICATE 2 1 4R30.48 2R0. 1

UNIT 4
COM=* SECTION OF STEEL GRATING *
CUBOID 4 1 2.778125 .238125 .396875 -.396875 3.175 2.38125
CUBOID 2 1 2.778125 .238125 4.524375 -4.524375 3.175 0.
CUBOID 4 1 3.01625 0. 4.524375 -4.524375 3.175 0.

UNIT 5
COM=* ARRAY OF STEEL GRATING *
ARRAY 2 3*0.0
REPLICATE 2 1 4R0.9525 2R0.0 1
REPLICATE 2 1 4R30.48 2R0. 1

UNIT 6
COM=* U(3.85) ROD, H=68.9, SUBMERGED *
CYLINDER 1 1 1.419903 68.9 0.
CYLINDER 1 1 2.008046 68.9 0.
CYLINDER 1 1 2.459344 68.9 0.
CYLINDER 1 1 2.839806 68.9 0.
CYLINDER 1 1 3.175000 68.9 0.
CUBOID 2 1 4P5.08 68.9 0.

UNIT 7
COM=* WATER CUBOID TO COMPLETE ARRAY 3 *
CUBOID 2 1 4P5.08 68.9 0.

UNIT 8
COM=* U(3.85) ROD, H=7.3, DRY *
CYLINDER 1 1 1.419903 7.3 0.
CYLINDER 1 1 2.008046 7.3 0.
CYLINDER 1 1 2.459344 7.3 0.
CYLINDER 1 1 2.839806 7.3 0.
CYLINDER 1 1 3.175000 7.3 0.
CUBOID 0 1 4P5.08 7.3 0.

UNIT 9
COM=* VOID CUBOID TO COMPLETE ARRAY 4 *
CUBOID 0 1 4P5.08 7.3 0.

UNIT 10
COM=* U(3.85) ROD ARRAY, H=68.9, SUBMERGED *
ARRAY 3 3*0.0
REPLICATE 2 1 4R66.04 2R0. 1
REPLICATE 2 1 4R30.48 2R0. 1

UNIT 11
COM=* ARRAY OF 22 U(3.85) RODS, H=7.3, DRY *
ARRAY 4 3*0.0
REPLICATE 0 1 4R66.04 2R0. 1
REPLICATE 0 1 4R30.48 2R0. 1

CORE 5 1 -121.92 -121.92 0.
REPLICATE 5 1 5R0.0 0.1905 1
REPLICATE 4 1 5R0.0 2.54 1
END GEOM
READ ARRAY
ARA=1 NUX=1 NUY=13 NUZ=1
FILL 1 2 5Q2 1 END FILL
ARA=2 NUX=60 NUY=20 NUZ=1
FILL F4 END FILL
ARA=3 NUX=5 NUY=5 NUZ=1
FILL 3R6 2R7 20R6 END FILL
ARA=4 NUX=5 NUY=5 NUZ=1
FILL 3R8 2R9 20R8 END FILL
GBL=5
ARA=5 NUX=1 NUY=1 NUZ=4
FILL 3 5 10 11 END FILL
END ARRAY
READ START
NST=1
XSM=-25.4 XSP=25.4
YSM=-25.4 YSP=25.4
ZSM=21.59 ZSP=90.49
END START
READ PLOT

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF ANNULI/INSERTS"
XUL=-91.44 YUL=91.44 ZUL=59.69
XLR=91.44 YLR=-91.44 ZLR=59.69
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW OF ARRAY, FULL SCALE"
XUL=-25.4 YUL=25.4 ZUL=59.69
XLR=25.4 YLR=-25.4 ZLR=59.69
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END
```

Table A.2 (continued)

```
TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF GRATING"
XUL=-91.44 YUL=91.44 ZUL=20.0025
XLR=91.44 YLR=-91.44 ZLR=20.0025
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW 1/6 SCALE OF CORE, Z=MIDLEVEL OF FIR TIMBERS"
XUL=-91.44 YUL=91.44 ZUL=9.2075
XLR=91.44 YLR=-91.44 ZLR=9.2075
UAX=1. VDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="PLAN VIEW 1/10 SCALE OF MOCKUP, Z=MIDLEVEL OF U UNITS"
XUL=-135. YUL=135. ZUL=59.69
XLR=135. YLR=-135. ZLR=59.69
UAX=1. VDN=-1. DLX=2.54 NCH=* U.WGS* END

TTL="PLAN VIEW 2X SCALE OF SINGLE U UNIT, Z=MIDLEVEL OF UNIT"
XUL=-5.08 YUL=5.08 ZUL=59.69
XLR=5.08 YLR=-5.08 ZLR=59.69
UAX=1. VDN=-1. DLX=0.127 NCH=* U.WGS* END

TTL="CROSS SECTION OF CORE 1/6 SCALE,Y=0.0"
XUL=-91.44 YUL=0.0 ZUL=110.
XLR=91.44 YLR=0.0 ZLR=-10.
UAX=1. WDN=-1. DLX=1.524 NCH=* U.WGS* END

TTL="CROSS SECTION OF MOCKUP 1/10 SCALE,Y=0.0"
XUL=-135. YUL=0.0 ZUL=125.
XLR=135. YLR=0.0 ZLR=-10.
UAX=1. WDN=-1. DLX=2.54 NCH=* U.WGS* END

TTL="CROSS SECTION OF GRATING/FIR TIMBERS, FULL SCALE"
XUL=0. YUL=0. ZUL=24.13
XLR=25.4 YLR=0. ZLR=-3.0
UAX=1. WDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW OF GRATING THRU TIEBARS, FULL SCALE"
XUL=0. YUL=25.4 ZUL=21.193
XLR=25.4 YLR=0. ZLR=21.193
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW OF GRATING @ GRATING MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=20.0025
XLR=25.4 YLR=0. ZLR=20.0025
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="PLAN VIEW OF TIMBERS @ TIMBER MIDLEVEL, FULL SCALE"
XUL=0. YUL=25.4 ZUL=9.2075
XLR=25.4 YLR=-25.4 ZLR=9.2075
UAX=1. VDN=-1. DLX=.254 NCH=* U.WGS* END

TTL="CROSS SECTION OF CENTRAL UNIT, 2X SCALE,Y=0.0"
XUL=-5.08 YUL=0.0 ZUL=110.
XLR=5.08 YLR=0.0 ZLR=-10.
UAX=1. WDN=-1. DLX=.127 NCH=* U.WGS* END

END PLOT
END DATA
END
```

Table A.3. Table 3 input data

```
CAS04
=CSAS25
BRITISH HANDBOOK OF CRITICALITY SAFETY U(1.42)F4 & PARAFFIN (CASE 04)
27GROUPNDF4  INFHOMMEDIUM
UF4       1 0.4903 293 92235 1.4023 92238 98.5977 END
' NOTE: THE ENRICHMENT GIVEN IN THE REFRENCE IS NOT WEIGHT PERCENT
PARAFFIN 1 0.4572 END
END COMP
BRITISH HANDBOOK OF CRITICALITY SAFETY U(1.42)F4 & PARAFFIN (CASE 04)
READ PARM   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 2P46.55 2P46.50 2P61.9
END GEOM
END DATA
END


CAS05
=CSAS25
BRITISH HANDBOOK OF CRITICALITY SAFETY U(1.42)F4 & PARAFFIN (CASE 05)
27GROUPNDF4  INFHOMMEDIUM
UF4       1 0.4903 293 92235 1.4023 92238 98.5977 END
' NOTE: THE ENRICHMENT GIVEN IN THE REFRENCE IS NOT WEIGHT PERCENT
PARAFFIN 1 0.4572 END
END COMP
BRITISH HANDBOOK OF CRITICALITY SAFETY U(1.42)F4 & PARAFFIN (CASE 05)
READ PARM   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 2P50.00 2P49.95 2P51.55
END GEOM
END DATA
END


CAS06
=CSAS25
BRITISH HANDBOOK OF CRITICALITY SAFETY U(1.42)F4 & PARAFFIN (CASE 06)
27GROUPNDF4  INFHOMMEDIUM
UF4       1 0.4903 293 92235 1.4023 92238 98.5977 END
' NOTE: THE ENRICHMENT GIVEN IN THE REFRENCE IS NOT WEIGHT PERCENT
PARAFFIN 1 0.4572 END
END COMP
BRITISH HANDBOOK OF CRITICALITY SAFETY U(1.42)F4 & PARAFFIN (CASE 06)
READ PARM   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 2P65.35 2P65.3 2P37.1
END GEOM
END DATA
END
=CSAS25
BRITISH HANDBOOK OF CRITICALITY SAFETY U(1.42)F4 & PARAFFIN (CASE 06)
HANSEN-ROACH  INFHOMMEDIUM
UF4       1 0.4903 293 92235 1.4023 92238 98.5977 END
' NOTE: THE ENRICHMENT GIVEN IN THE REFRENCE IS NOT WEIGHT PERCENT
PARAFFIN 1 0.4572 END
END COMP
BRITISH HANDBOOK OF CRITICALITY SAFETY U(1.42)F4 & PARAFFIN (CASE 06)
READ PARM  NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 2P65.35 2P65.3 2P37.1
END GEOM
END DATA
END
```

```
CAS11
=CSAS25
RAFFETY AND MILHALCZO U(2)F4-1 REFLECTED (CASE 11)
27GROUPNDF4  INFHOMMEDIUM
U-235   1 0 1.5811E-4 END
U-238   1 0 7.6467E-3 END
H       1 0 3.0864E-2 END
C       1 0 1.4839E-2 END
F       1 0 3.1219E-2 END
PARAFFIN  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(2)F4-1 REFLECTED (CASE 11)
READ PARM  RUN=YES    NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 4P28.110 2P56.44
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 4P28.110 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
READ BIAS ID=400  2 6 END BIAS
END DATA
END
=CSAS25
RAFFETY AND MILHALCZO U(2)F4-1 REFLECTED (CASE 11)
HANSEN-ROACH  INFHOMMEDIUM
U-235   1 0 1.5811E-4 END
U-238   1 0 7.6467E-3 END
H       1 0 3.0864E-2 END
C       1 0 1.4839E-2 END
F       1 0 3.1219E-2 END
PARAFFIN  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(2)F4-1 REFLECTED (CASE 11)
READ PARM  RUN=YES PLT=NO NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 4P28.110 2P56.44
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 4P28.110 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
READ BIAS ID=400  2 6 END BIAS
READ PLOT TTL='XZ SLICE OF CASE 11 SHOWING BIASING REGIONS'
XUL=-1  YUL=20  ZUL=146
XLR=88  YLR=20  ZLR=-3
UAX=1  WDN=-1 NAX=130  NCH='0123456'
PIC=WTS
END PLOT
END DATA
END
```

Table A.3 (continued)

```
CAS12
=CSAS25
RAFFETY AND MILHALCZO U(2)F4-1 UNREFLECTED (CASE 12)
27GROUPNDF4  INFHOMMEDIUM
U-235   1 0 1.5811E-4 END
U-238   1 0 7.6467E-3 END
H       1 0 3.0864E-2 END
C       1 0 1.4839E-2 END
F       1 0 3.1219E-2 END
END COMP
RAFFETY AND MALHALCZO U(2)F4-1 UNREFLECTED (CASE12)
READ PARM   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 35.735 -35.735 35.735 -35.735 47.07 -47.07
END GEOM
END DATA
END
=CSAS25
RAFFETY AND MILHALCZO U(2)F4-1 UNREFLECTED (CASE 12)
HANSEN-ROACH  INFHOMMEDIUM
U-235   1 0 1.5811E-4 END
U-238   1 0 7.6467E-3 END
H       1 0 3.0864E-2 END
C       1 0 1.4839E-2 END
F       1 0 3.1219E-2 END
END COMP
RAFFETY AND MALHALCZO U(2)F4-1 UNREFLECTED (CASE12)
READ PARM  NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 35.735 -35.735 35.735 -35.735 47.07 -47.07
END GEOM
END DATA
END


CAS13
=CSAS25
RAFFETY AND MILHALCZO U(2)F4-2 REFLECTED (CASE 13) NO BIASING
27GROUPNDF4  INFHOMMEDIUM
U-235   1 0 1.3303E-4 END
U-238   1 0 6.4370E-3 END
H       1 0 3.9097E-2 END
C       1 0 1.8797E-2 END
F       1 0 2.6280E-2 END
PARAFFIN  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(2)F4-2 REFLECTED (CASE 13) NO BIASING
READ PARM  RUN=YES   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 4P25.555 2P36.935
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 4P25.555 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
' READ BIAS ID=400  2 6 END BIAS
END DATA
END
```

```
=CSAS25
RAFFETY AND MILHALCZO U(2)F4-2 REFLECTED (CASE 13) NO BIASING
HANSEN-ROACH  INFHOMMEDIUM
U-235   1 0 1.3303E-4 END
U-238   1 0 6.4370E-3 END
H       1 0 3.9097E-2 END
C       1 0 1.8797E-2 END
F       1 0 2.6280E-2 END
PARAFFIN  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(2)F4-2 REFLECTED (CASE 13) NO BIASING
READ PARM  RUN=YES PLT=NO NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 4P25.555 2P36.935
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 4P25.555 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
' READ BIAS ID=400  2 6 END BIAS
READ PLOT TTL='XZ SLICE OF CASE 13 SHOWING BIASING REGIONS'
XUL=-1  YUL=20  ZUL=106
XLR=83  YLR=20  ZLR=-3
UAX=1  WDN=-1 NAX=130  NCH='0123456'
PIC=WTS
END PLOT
END DATA
END
```

```
CAS14
=CSAS25
RAFFETY AND MILHALCZO U(2)F4-2 UNREFLECTED (CASE 14)
27GROUPNDF4  INFHOMMEDIUM
U-235  1 0 1.3303E-4 END
U-238  1 0 6.4370E-3 END
H      1 0 3.9097E-2 END
C      1 0 1.8797E-2 END
F      1 0 2.6280E-2 END
END COMP
RAFFETY AND MALHALCZO U(2)F4-2 UNREFLECTED (CASE 14)
READ PARM   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 28.11 -28.11 28.11 -28.11 61.235 -61.235
END GEOM
END DATA
END
=CSAS25
RAFFETY AND MILHALCZO U(2)F4-2 UNREFLECTED (CASE 14)
HANSEN-ROACH  INFHOMMEDIUM
U-235  1 0 1.3303E-4 END
U-238  1 0 6.4370E-3 END
H      1 0 3.9097E-2 END
C      1 0 1.8797E-2 END
F      1 0 2.6280E-2 END
END COMP
RAFFETY AND MALHALCZO U(2)F4-2 UNREFLECTED (CASE 14)
READ PARM  NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 28.11 -28.11 28.11 -28.11 61.235 -61.235
END GEOM
END DATA
END


CAS15
=CSAS25
RAFFETY AND MALHALCZO U(2)F4-3 REFLECTED (CASE 15)
27GROUPNDF4  INFHOMMEDIUM
U-235  1 0 1.1191E-4 END
U-238  1 0 5.4152E-3 END
H      1 0 4.5472E-2 END
C      1 0 2.1861E-2 END
F      1 0 2.2109E-2 END
PARAFFIN  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(2)F4-3 REFLECTED (CASE 15)
READ PARM  RUN=YES    NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 4P26.835 2P27.145
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 4P26.835 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
READ BIAS ID=400  2 6 END BIAS
END DATA
END
=CSAS25
RAFFETY AND MILHALCZO U(2)F4-3 REFLECTED (CASE 15)
HANSEN-ROACH  INFHOMMEDIUM
U-235  1 0 1.1191E-4 END
U-238  1 0 5.4152E-3 END
H      1 0 4.5472E-2 END
C      1 0 2.1861E-2 END
F      1 0 2.2109E-2 END
PARAFFIN  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(2)F4-3 REFLECTED (CASE 15)
READ PARM  RUN=YES PLT=NO NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 4P26.835 2P27.145
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 4P26.835 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
READ BIAS ID=400  2 6 END BIAS
READ PLOT TTL='XZ SLICE OF CASE 15 SHOWING BIASING REGIONS'
XUL=-1  YUL=20  ZUL=86
XLR=86  YLR=20  ZLR=-3
UAX=1  WDN=-1 NAX=130  NCH='0123456'
PIC=WTS
END PLOT
END DATA
END
```

Table A.3 (continued)

```
CAS16
=CSAS25
RAFFETY AND MILHALCZO U(2)F4-4 REFLECTED (CASE 16)
27GROUPNDF4  INFHOMMEDIUM
U-235   1 0 0.9924E-4 END
U-238   1 0 4.7998E-3 END
H       1 0 4.9212E-2 END
C       1 0 2.3660E-2 END
F       1 0 1.9596E-2 END
PARAFFIN  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(2)F4-4 REFLECTED (CASE 16)
READ PARM  RUN=YES  NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 4P23.000 2P48.285
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 4P23.000 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
READ BIAS ID=400  2 6 END BIAS
END DATA
END
=CSAS25
RAFFETY AND MILHALCZO U(2)F4-4 REFLECTED (CASE 16)
HANSEN-ROACH  INFHOMMEDIUM
U-235   1 0 0.9924E-4 END
U-238   1 0 4.7998E-3 END
H       1 0 4.9212E-2 END
C       1 0 2.3660E-2 END
F       1 0 1.9596E-2 END
PARAFFIN  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(2)F4-4 REFLECTED (CASE 16)
READ PARM  RUN=YES PLT=NO NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 4P23.000 2P48.285
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 4P23.000 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
READ BIAS ID=400  2 6 END BIAS
READ PLOT TTL='XZ SLICE OF CASE 16 SHOWING BIASING REGIONS'
XUL=-1  YUL=20  ZUL=129
XLR=79  YLR=20  ZLR=-3
UAX=1  WDN=-1 NAX=130  NCH='0123456'
PIC=WTS
END PLOT
END DATA
END
```

```
CAS17
=CSAS25
RAFFETY AND MILHALCZO U(2)F4-5 REFLECTED (CASE 17)
27GROUPNDF4  INFHOMMEDIUM
U-235   1 0 0.8667E-4 END
U-238   1 0 4.1941E-3 END
H       1 0 5.3187E-2 END
C       1 0 2.5570E-2 END
F       1 0 1.7123E-2 END
POLYETHYLENE  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(2)F4-5 REFLECTED (CASE 17)
READ PARM  RUN=YES   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 2P28.160 2P30.645 2P27.040
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 2P28.160 2P30.645 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
READ BIAS ID=400  2 6 END BIAS
END DATA
END
=CSAS25
RAFFETY AND MILHALCZO U(2)F4-5 REFLECTED (CASE 17)
HANSEN-ROACH  INFHOMMEDIUM
U-235   1 0 0.8667E-4 END
U-238   1 0 4.1941E-3 END
H       1 0 5.3187E-2 END
C       1 0 2.5570E-2 END
F       1 0 1.7123E-2 END
POLYETHYLENE 2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(2)F4-5 REFLECTED (CASE 17)
READ PARM  RUN=YES PLT=NO NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 2P28.160 2P30.645 2P27.040
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 2P28.160 2P30.645 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
READ BIAS ID=400  2 6 END BIAS
READ PLOT TTL='XZ SLICE OF CASE 17 SHOWING BIASING REGIONS'
XUL=-1  YUL=20  ZUL=86
XLR=89  YLR=20  ZLR=-3
UAX=1  WDN=-1 NAX=130  NCH='0123456'
PIC=WTS
END PLOT
END DATA
END
```

Table A.3 (continued)

```
CAS18
=CSAS25
RAFFETY AND MILHALCZO U(2)F4-5 UNREFLECTED (CASE 18)
27GROUPNDF4  INFHOMMEDIUM
U-235  1 0 0.8667E-4 END
U-238  1 0 4.1941E-3 END
H      1 0 5.3187E-2 END
C      1 0 2.5570E-2 END
F      1 0 1.7123E-2 END
END COMP
RAFFETY AND MALHALCZO U(2)F4-5 UNREFLECTED (CASE18)
READ PARM   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 30.65 -30.65 33.27 -33.27 33.26 -33.26
END GEOM
END DATA
END
=CSAS25
RAFFETY AND MILHALCZO U(2)F4-5 UNREFLECTED (CASE 18)
HANSEN-ROACH  INFHOMMEDIUM
U-235  1 0 0.8667E-4 END
U-238  1 0 4.1941E-3 END
H      1 0 5.3187E-2 END
C      1 0 2.5570E-2 END
F      1 0 1.7123E-2 END
END COMP
RAFFETY AND MALHALCZO U(2)F4-5 UNREFLECTED (CASE18)
READ PARM  NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 30.65 -30.65 33.27 -33.27 33.26 -33.26
END GEOM
END DATA
END


CAS19
=CSAS25
RAFFETY AND MILHALCZO U(2)F4-6 REFLECTED (CASE 19)
27GROUPNDF4  INFHOMMEDIUM
U-235  1 0 0.6232E-4 END
U-238  1 0 3.0100E-3 END
H      1 0 6.0557E-2 END
C      1 0 2.9114E-2 END
F      1 0 1.2309E-2 END
POLYETHYLENE  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(2)F4-6 REFLECTED (CASE 19)
READ PARM  RUN=YES    NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 2P38.255 2P38.220 2P41.210
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 2P38.255 2P38.220 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
READ BIAS ID=400  2 6 END BIAS
END DATA
END
=CSAS25
RAFFETY AND MILHALCZO U(2)F4-6 REFLECTED (CASE 19)
HANSEN-ROACH  INFHOMMEDIUM
U-235  1 0 0.6232E-4 END
U-238  1 0 3.0100E-3 END
H      1 0 6.0557E-2 END
C      1 0 2.9114E-2 END
F      1 0 1.2309E-2 END
POLYETHYLENE  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(2)F4-6 REFLECTED (CASE 19)
READ PARM  RUN=YES PLT=NO NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 2P38.255 2P38.220 2P41.210
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 2P38.255 2P38.220 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
READ BIAS ID=400  2 6 END BIAS
READ PLOT TTL='XZ SLICE OF CASE 19 SHOWING BIASING REGIONS'
XUL=-1  YUL=20  ZUL=115
XLR=108  YLR=20  ZLR=-3
UAX=1  WDN=-1 NAX=130  NCH='0123456'
PIC=WTS
END PLOT
END DATA
END
```

Table A.3 (continued)

```
CAS20
=CSAS25
RAFFETY AND MILHALCZO U(2)F4-6 UNREFLECTED (CASE 20)
27GROUPNDF4  INFHOMMEDIUM
U-235   1 0 0.6232E-4 END
U-238   1 0 3.0100E-3 END
H       1 0 6.0557E-2 END
C       1 0 2.9114E-2 END
F       1 0 1.2309E-2 END
END COMP
RAFFETY AND MALHALCZO U(2)F4-6 UNREFLECTED (CASE20)
READ PARM   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 40.725 -40.725 43.35 -43.35 44.110 -44.110
END GEOM
END DATA
END
=CSAS25
RAFFETY AND MILHALCZO U(2)F4-6 UNREFLECTED (CASE 20)
HANSEN-ROACH  INFHOMMEDIUM
U-235   1 0 0.6232E-4 END
U-238   1 0 3.0100E-3 END
H       1 0 6.0557E-2 END
C       1 0 2.9114E-2 END
F       1 0 1.2309E-2 END
END COMP
RAFFETY AND MALHALCZO U(2)F4-6 UNREFLECTED (CASE20)
READ PARM  NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 40.725 -40.725 43.35 -43.35 44.110 -44.110
END GEOM
END DATA
END


CAS21
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-1 REFLECTED (CASE 21) NO BIAS
27GROUPNDF4  INFHOMMEDIUM
U-235   1 0 2.3494E-4 END
U-238   1 0 7.4999E-3 END
H       1 0 3.1341E-2 END
C       1 0 1.5067E-2 END
F       1 0 3.0939E-2 END
PARAFFIN  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MILHALCZO U(3)F4-1 REFLECTED (CASE 21) NO BIAS
READ PARM  RUN=YES   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 2P25.57 2P25.57 2P25.635
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 2P25.57 2P25.57 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
' READ BIAS ID=400  2 6 END BIAS
END DATA
END
```

```
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-1 REFLECTED (CASE 21) NO BIAS
HANSEN-ROACH  INFHOMMEDIUM
U-235   1 0 2.3494E-4 END
U-238   1 0 7.4999E-3 END
H       1 0 3.1341E-2 END
C       1 0 1.5067E-2 END
F       1 0 3.0939E-2 END
PARAFFIN  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MILHALCZO U(3)F4-1 REFLECTED (CASE 21) NO BIAS
READ PARM  RUN=YES PLT=NO NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 2P25.57 2P25.57 2P25.635
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 2P25.57 2P25.57 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
' READ BIAS ID=400  2 6 END BIAS
READ PLOT TTL='XZ SLICE OF CASE 21 SHOWING BIASING REGIONS'
XUL=-1  YUL=20  ZUL=83
XLR=83  YLR=20  ZLR=-3
UAX=1  WDN=-1 NAX=130  NCH='0123456'
PIC=WTS
END PLOT
END DATA
END
```

Table A.3 (continued)

```
CAS23
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-1 REFLECTED (CASE 23)
27GROUPNDF4  INFHOMMEDIUM
U-235   1 0 2.3494E-4 END
U-238   1 0 7.4999E-3 END
H       1 0 3.1341E-2 END
C       1 0 1.5067E-2 END
F       1 0 3.0939E-2 END
PARAFFIN  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-1 REFLECTED (CASE 23)
READ PARM  RUN=YES   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 2P23.010 2P23.010 2P33.785
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 2P23.010 2P23.010 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
READ BIAS ID=400  2 6 END BIAS
END DATA
END
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-1 REFLECTED (CASE 23)
HANSEN-ROACH  INFHOMMEDIUM
U-235   1 0 2.3494E-4 END
U-238   1 0 7.4999E-3 END
H       1 0 3.1341E-2 END
C       1 0 1.5067E-2 END
F       1 0 3.0939E-2 END
PARAFFIN  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-1 REFLECTED (CASE 23)
READ PARM  RUN=YES PLT=NO NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 2P23.010 2P23.010 2P33.785
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 2P23.010 2P23.010 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
READ BIAS ID=400  2 6 END BIAS
READ PLOT TTL='XZ SLICE OF CASE 23 SHOWING BIASING REGIONS'
XUL=-1  YUL=20  ZUL=99
XLR=79  YLR=20  ZLR=-3
UAX=1  WDN=-1 NAX=130  NCH='0123456'
PIC=WTS
END PLOT
END DATA
END
```

```
CAS22
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-1 REFLECTED (CASE 22)
27GROUPNDF4  INFHOMMEDIUM
U-235   1 0 2.3494E-4 END
U-238   1 0 7.4999E-3 END
H       1 0 3.1341E-2 END
C       1 0 1.5067E-2 END
F       1 0 3.0939E-2 END
PARAFFIN  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-1 REFLECTED (CASE 22)
READ PARM  RUN=YES   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 2P21.735 2P21.735 2P43.1950
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 2P21.735 2P21.735 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
READ BIAS ID=400  2 6 END BIAS
END DATA
END
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-1 REFLECTED (CASE 22)
HANSEN-ROACH  INFHOMMEDIUM
U-235   1 0 2.3494E-4 END
U-238   1 0 7.4999E-3 END
H       1 0 3.1341E-2 END
C       1 0 1.5067E-2 END
F       1 0 3.0939E-2 END
PARAFFIN  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-1 REFLECTED (CASE 22)
READ PARM  RUN=YES PLT=NO NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 2P21.735 2P21.735 2P43.1950
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 2P21.735 2P21.735 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
READ BIAS ID=400  2 6 END BIAS
READ PLOT TTL='XZ SLICE OF CASE 22 SHOWING BIASING REGIONS'
XUL=-1  YUL=20  ZUL=129
XLR=79  YLR=20  ZLR=-3
UAX=1  WDN=-1 NAX=130  NCH='0123456'
PIC=WTS
END PLOT
END DATA
END
```

Table A.3 (continued)

```
CAS24
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-1 REFLECTED (CASE 24) NO BIASING
27GROUPNDF4  INFHOMMEDIUM
U-235   1 0 2.3494E-4 END
U-238   1 0 7.4999E-3 END
H       1 0 3.1341E-2 END
C       1 0 1.5067E-2 END
F       1 0 3.0939E-2 END
PARAFFIN  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-1 REFLECTED (CASE 24) NO BIASING
READ PARM  RUN=YES   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 2P28.125 2P28.125 2P21.705
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 2P28.125 2P28.125 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
' READ BIAS ID=400  2 6 END BIAS
END DATA
END
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-1 REFLECTED (CASE 24) NO BIASING
HANSEN-ROACH  INFHOMMEDIUM
U-235   1 0 2.3494E-4 END
U-238   1 0 7.4999E-3 END
H       1 0 3.1341E-2 END
C       1 0 1.5067E-2 END
F       1 0 3.0939E-2 END
PARAFFIN  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-1 REFLECTED (CASE 24) NO BIASING
READ PARM  RUN=YES PLT=NO NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 2P28.125 2P28.125 2P21.705
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 2P28.125 2P28.125 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
' READ BIAS ID=400  2 6 END BIAS
READ PLOT TTL='XZ SLICE OF CASE 24 SHOWING BIASING REGIONS'
XUL=-1  YUL=20  ZUL=75
XLR=88  YLR=20  ZLR=-3
UAX=1  WDN=-1 NAX=130  NCH='0123456'
PIC=WTS
END PLOT
END DATA
END
```

```
CAS25
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-1 REFLECTED (CASE 25)
27GROUPNDF4  INFHOMMEDIUM
U-235   1 0 2.3494E-4 END
U-238   1 0 7.4999E-3 END
H       1 0 3.1341E-2 END
C       1 0 1.5067E-2 END
F       1 0 3.0939E-2 END
PARAFFIN  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-1 REFLECTED (CASE 25)
READ PARM  RUN=YES   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 2P30.680 2P30.680 2P19.335
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 2P30.680 2P30.680 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
READ BIAS ID=400  2 6 END BIAS
END DATA
END
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-1 REFLECTED (CASE 25)
HANSEN-ROACH  INFHOMMEDIUM
U-235   1 0 2.3494E-4 END
U-238   1 0 7.4999E-3 END
H       1 0 3.1341E-2 END
C       1 0 1.5067E-2 END
F       1 0 3.0939E-2 END
PARAFFIN  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-1 REFLECTED (CASE 25)
READ PARM  RUN=YES PLT=NO NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 2P30.680 2P30.680 2P19.335
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 2P30.680 2P30.680 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
READ BIAS ID=400  2 6 END BIAS
READ PLOT TTL='XZ SLICE OF CASE 25 SHOWING BIASING REGIONS'
XUL=-1  YUL=20  ZUL=71
XLR=93  YLR=20  ZLR=-3
UAX=1  WDN=-1 NAX=130  NCH='0123456'
PIC=WTS
END PLOT
END DATA
END
```

Table A.3 (continued)

```
CAS26
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-1 UNREFLECTED (CASE 26)
27GROUPNDF4  INFHOMMEDIUM
U-235   1 0 2.3494E-4 END
U-238   1 0 7.4999E-3 END
H       1 0 3.1341E-2 END
C       1 0 1.5067E-2 END
F       1 0 3.0939E-2 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-1 UNREFLECTED (CASE 26)
READ PARM   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 28.235 -28.235 28.235 -28.235 43.32 -43.32
END GEOM
END DATA
END
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-1 UNREFLECTED (CASE 26)
HANSEN-ROACH  INFHOMMEDIUM
U-235   1 0 2.3494E-4 END
U-238   1 0 7.4999E-3 END
H       1 0 3.1341E-2 END
C       1 0 1.5067E-2 END
F       1 0 3.0939E-2 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-1 UNREFLECTED (CASE 26)
READ PARM  NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 28.235 -28.235 28.235 -28.235 43.32 -43.32
END GEOM
END DATA
END
```

```
CAS27
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-1 UNREFLECTED (CASE 27)
27GROUPNDF4  INFHOMMEDIUM
U-235   1 0 2.3494E-4 END
U-238   1 0 7.4999E-3 END
H       1 0 3.1341E-2 END
C       1 0 1.5067E-2 END
F       1 0 3.0939E-2 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-1 UNREFLECTED (CASE 27)
READ PARM   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 28.125 -28.125 30.68 -30.68 37.19 -37.19
END GEOM
END DATA
END
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-1 UNREFLECTED (CASE 27)
HANSEN-ROACH  INFHOMMEDIUM
U-235   1 0 2.3494E-4 END
U-238   1 0 7.4999E-3 END
H       1 0 3.1341E-2 END
C       1 0 1.5067E-2 END
F       1 0 3.0939E-2 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-1 UNREFLECTED (CASE 27)
READ PARM  NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 28.125 -28.125 30.68 -30.68 37.19 -37.19
END GEOM
END DATA
END
```

```
CAS28
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-1 UNREFLECTED (CASE 28)
27GROUPNDF4  INFHOMMEDIUM
U-235   1 0 2.3494E-4 END
U-238   1 0 7.4999E-3 END
H       1 0 3.1341E-2 END
C       1 0 1.5067E-2 END
F       1 0 3.0939E-2 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-1 UNREFLECTED (CASE 28)
READ PARM   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 30.7 -30.7 30.7 -30.7 33.00 -33.00
END GEOM
END DATA
END
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-1 UNREFLECTED (CASE 28)
HANSEN-ROACH  INFHOMMEDIUM
U-235   1 0 2.3494E-4 END
U-238   1 0 7.4999E-3 END
H       1 0 3.1341E-2 END
C       1 0 1.5067E-2 END
F       1 0 3.0939E-2 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-1 UNREFLECTED (CASE 28)
READ PARM  NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 30.7 -30.7 30.7 -30.7 33.00 -33.00
END GEOM
END DATA
END
```

Table A.3 (continued)

```
CAS29
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-2 REFLECTED (CAS29)
27GROUPNDF4  INFHOMMEDIUM
U-235  1 0 1.6709E-4 END
U-238  1 0 5.3355E-3 END
H      1 0 4.6262E-2 END
C      1 0 2.2241E-2 END
F      1 0 2.2011E-2 END
POLYETHYLENE  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-2 REFLECTED (CAS29)
READ PARM  RUN=YES   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 2P20.405 2P20.400 2P19.745
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 2P20.405 2P20.400 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
READ BIAS ID=400  2 6 END BIAS
END DATA
END
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-2 REFLECTED (CAS29)
HANSEN-ROACH  INFHOMMEDIUM
U-235  1 0 1.6709E-4 END
U-238  1 0 5.3355E-3 END
H      1 0 4.6262E-2 END
C      1 0 2.2241E-2 END
F      1 0 2.2011E-2 END
POLYETHYLENE  2 1.0 END
PLEXIGLASS  3 0.918 END
AL          3 0.062 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-2 REFLECTED (CAS29)
READ PARM  RUN=YES PLT=NO NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CUBOID  1 1 2P20.405 2P20.400 2P19.745
REPLICATE  2 2 5*3.048 0.0 5
UNIT  2
CUBOID  3 1 2P20.405 2P20.400 2*0.0
REPLICATE 3 2 4*3.048 0.0 3.048 5
END GEOM
READ ARRAY
NUX=1  NUY=1  NUZ=2
FILL  2 1 END FILL
END ARRAY
READ BIAS ID=400  2 6 END BIAS
READ PLOT TTL='XZ SLICE OF CAS29 SHOWING BIASING REGIONS'
XUL=-1  YUL=20  ZUL=71
XLR=73  YLR=20  ZLR=-3
UAX=1  WDN=-1 NAX=130  NCH='0123456'
PIC=WTS
END PLOT
END DATA
END
```

```
CAS30
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-2 UNREFLECTED (CASE 30)
27GROUPNDF4  INFHOMMEDIUM
U-235  1 0 1.6709E-4 END
U-238  1 0 5.3355E-3 END
H      1 0 4.6262E-2 END
C      1 0 2.2241E-2 END
F      1 0 2.2011E-2 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-2 UNREFLECTED (CASE 30)
READ PARM  RUN=YES   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 2P20.450 2P20.465 2P58.400
END GEOM
END DATA
END
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-2 UNREFLECTED (CASE 30)
HANSEN-ROACH  INFHOMMEDIUM
U-235  1 0 1.6709E-4 END
U-238  1 0 5.3355E-3 END
H      1 0 4.6262E-2 END
C      1 0 2.2241E-2 END
F      1 0 2.2011E-2 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-2 UNREFLECTED (CASE 30)
READ PARM  RUN=YES  NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 2P20.450 2P20.465 2P58.400
END GEOM
END DATA
END
```

```
CAS31
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-2 UNREFLECTEL (CASE 31)
27GROUPNDF4  INFHOMMEDIUM
U-235  1 0 1.6709E-4 END
U-238  1 0 5.3355E-3 END
H      1 0 4.6262E-2 END
C      1 0 2.2241E-2 END
F      1 0 2.2011E-2 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-2 UNREFLECTED (CASE 31)
READ PARM  RUN=YES   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 2P24.295 2P25.570 2P24.265
END GEOM
END DATA
END
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-2 UNREFLECTED (CASE 31)
HANSEN-ROACH  INFHOMMEDIUM
U-235  1 0 1.6709E-4 END
U-238  1 0 5.3355E-3 END
H      1 0 4.6262E-2 END
C      1 0 2.2241E-2 END
F      1 0 2.2011E-2 END
END COMP
```

Table A.3 (continued)

```
RAFFETY AND MALHALCZO U(3)F4-2 UNREFLECTED (CASE 31)
READ PARM  RUN=YES  NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 2P24.295 2P25.570 2P24.265
END GEOM
END DATA
END


CAS32
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-2 UNREFLECTED (CASE 32)
27GROUPNDF4  INFHOMMEDIUM
U-235  1 0 1.6709E-4 END
U-238  1 0 5.3355E-3 END
H      1 0 4.6262E-2 END
C      1 0 2.2241E-2 END
F      1 0 2.2011E-2 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-2 UNREFLECTED (CASE 32)
READ PARM  RUN=YES   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 2P40.855 2P40.830 2P15.670
END GEOM
END DATA
END
=CSAS25
RAFFETY AND MILHALCZO U(3)F4-2 UNREFLECTED (CASE 32)
HANSEN-ROACH  INFHOMMEDIUM
U-235  1 0 1.6709E-4 END
U-238  1 0 5.3355E-3 END
H      1 0 4.6262E-2 END
C      1 0 2.2241E-2 END
F      1 0 2.2011E-2 END
END COMP
RAFFETY AND MALHALCZO U(3)F4-2 UNREFLECTED (CASE 32)
READ PARM  RUN=YES  NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
CUBOID  1 1 2P40.855 2P40.830 2P15.670
END GEOM
END DATA
END
```

```
CAS33
=CSAS25
CRITICAL REFLECTED CYLINDER OF AQUEOUS U(4.98)O2F2 (CASE 33)
27GROUPNDF4  INFHOMMEDIUM
SOLNUO2F2  1 910.36 0.0 1 298 92235 4.98 92238 95.02 END
SS304  2 1.0 END
H2O    3 1.0 END
CD     4 1.0 END
END COMP
CRITICAL REFLECTED CYLINDER OF AQUEOUS U(4.98)O2F2 (CASE 33)
READ PARM  RUN=YES    NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CYLINDER  1 1 19.545 2P27.225
CYLINDER  0 1 19.545 78.975 -27.225
CYLINDER  2 1 19.624 79.054 -27.304
CYLINDER  4 1 19.705 79.054 -27.304
CYLINDER  2 1 22.245 79.054 -27.304
CYLINDER  3 1 45.000 79.054 -27.304
CUBOID    0 1 4P45.000 79.054 -27.304
END GEOM
END DATA
END
=CSAS25
CRITICAL REFLECTED CYLINDER OF AQUEOUS U(4.98)O2F2 (CASE 33)
HANSEN-ROACH  INFHOMMEDIUM
SOLNUO2F2  1 910.36 0.0 1 298 92235 4.98 92238 95.02 END
SS304  2 1.0 END
H2O    3 1.0 END
CD     4 1.0 END
END COMP
CRITICAL REFLECTED CYLINDER OF AQUEOUS U(4.98)O2F2 (CASE 33)
READ PARM  RUN=YES   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CYLINDER  1 1 19.545 2P27.225
CYLINDER  0 1 19.545 78.975 -27.225
CYLINDER  2 1 19.624 79.054 -27.304
CYLINDER  4 1 19.705 79.054 -27.304
CYLINDER  2 1 22.245 79.054 -27.304
CYLINDER  3 1 45.000 79.054 -27.304
CUBOID    0 1 4P45.000 79.054 -27.304
END GEOM
READ PLOT TTL='XZ SLICE OF CYLINDER CASE 33'
XUL=-45 YUL=0.0 ZUL=81
XLR=45  YLR=0.0 ZLR=-29
UAX=1  WDN=-1  NAX=130  NCH='01234'END
TTL='ENLARGEMENT OF LOWER RIGHT HAND CORNER OF CYLINDER'
XUL=18  YUL=0.0 ZUL=-25
XLR=23  YLR=0.0 ZLR=-28
UAX=1  WDN=-1  NAX=130  NCH='01234'
END PLOT
END DATA
END
```

Table A.3 (continued)

```
CAS34
=CSAS25
CRITICAL REFLECTED CYLINDER OF AQUEOUS U(4.98)O2F2 (CASE 34)
27GROUPNDF4  INFHOMMEDIUM
' SOLNUO2F2  1 910.36 0.0 1 298 92235 4.98 92238 95.02 END
U-235  1 0 1.1599E-4 END
U-238  1 0 2.1852E-3 END
F      1 0 4.6024E-3 END
H      1 0 5.6605E-2 END
O      1 0 3.2904E-2 END
SS304  2 1.0 END
H2O    3 1.0 END
END COMP
CRITICAL REFLECTED CYLINDER OF AQUEOUS U(4.98)O2F2 (CASE 34)
READ PARM  RUN=YES   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CYLINDER  1 1 16.510 2P71.500
CYLINDER  0 1 16.510 172.400 -71.500
CYLINDER  2 1 16.589 172.479 -71.579
CYLINDER  2 1 19.129 172.479 -71.579
CYLINDER  3 1 45.000 172.479 -71.579
CUBOID    0 1 4P45.000 172.479 -71.579
END GEOM
END DATA
END
=CSAS25
CRITICAL REFLECTED CYLINDER OF AQUEOUS U(4.98)O2F2 (CASE 34)
HANSEN-ROACH  INFHOMMEDIUM
' SOLNUO2F2  1 910.36 0.0 1 298 92235 4.98 92238 95.02 END
U-235  1 0 1.1599E-4 END
U-238  1 0 2.1852E-3 END
F      1 0 4.6024E-3 END
H      1 0 5.6605E-2 END
O      1 0 3.2904E-2 END
SS304  2 1.0 END
H2O    3 1.0 END
END COMP
CRITICAL REFLECTED CYLINDER OF AQUEOUS U(4.98)O2F2 (CASE 34)
READ PARM  RUN=YES  NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CYLINDER  1 1 16.510 2P71.500
CYLINDER  0 1 16.510 172.400 -71.500
CYLINDER  2 1 16.589 172.479 -71.579
CYLINDER  2 1 19.129 172.479 -71.579
CYLINDER  3 1 45.000 172.479 -71.579
CUBOID    0 1 4P45.000 172.479 -71.579
END GEOM
READ PLOT TTL='XZ SLICE OF CYLINDER CASE 34'
XUL=-45  YUL=0.0 ZUL=174
XLR=45   YLR=0.0 ZLR=-73
UAX=1  WDN=-1  NAX=130  NCH='0123'END
TTL='ENLARGEMENT OF LOWER RIGHT CORNER OF CYLINDER'
XUL=15  YUL=0.0 ZUL=-69
XLR=20   YLR=0.0 ZLR=-73
UAX=1  WDN=-1  NAX=130  NCH='0123'
END PLOT
END DATA
END
```

```
CAS35
=CSAS25
CRITICAL SPHERE OF AQUEOUS U(4.98)O2F2 (CASE 35)
27GROUPNDF4  INFHOMMEDIUM
' SOLNUO2F2  1 910.18 0.0 1 292 92235 4.98 92238 95.02 END
U-235  1 0 1.1613E-4 END
U-238  1 0 2.1878E-3 END
H      1 0 5.6947E-2 END
O      1 0 3.3081E-2 END
F      1 0 4.6080E-3 END
SS304  2 1.0 END
END COMP
CRITICAL SPHERE OF AQUEOUS U(4.98)O2F2 (CASE 35)
READ PARM  RUN=YES   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
SPHERE  1 1 25.3873
SPHERE  2 1 25.4127
CUBOID    0 1 6P25.4127
END GEOM
END DATA
END
=CSAS25
CRITICAL SPHERE OF AQUEOUS U(4.98)O2F2 (CASE 35)
HANSEN-ROACH  INFHOMMEDIUM
' SOLNUO2F2  1 910.18 0.0 1 292 92235 4.98 92238 95.02 END
U-235  1 0 1.1613E-4 END
U-238  1 0 2.1878E-3 END
H      1 0 5.6947E-2 END
O      1 0 3.3081E-2 END
F      1 0 4.6080E-3 END
SS304  2 1.0 END
END COMP
CRITICAL SPHERE OF AQUEOUS U(4.98)O2F2 (CASE 35)
READ PARM  RUN=YES  NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
SPHERE  1 1 25.3873
SPHERE  2 1 25.4127
CUBOID    0 1 6P25.4127
END GEOM
READ PLOT TTL='XZ SLICE OF SPHERE CASE 35'
XUL=-26  YUL=0.0 ZUL=26
XLR=26   YLR=0.0 ZLR=-26
UAX=1  WDN=-1  NAX=130  NCH='012'
TTL='ENLARGEMENT OF SPHERE WALL'
XUL=24  YUL=0.0 ZUL=2
XLR=26  YLR=0.0 ZLR=-2
UAX=1  WDN=-1  NAX=130  NCH='012'
END PLOT
END DATA
END
```

Table A.3 (continued)

```
CAS36
=CSAS25
CRITICAL CYLINDER OF AQUEOUS U(4.98)O2F2 (CASE 36)
27GROUPNDF4  INFHOMMEDIUM
SOLNUO2F2  1 910.36 0.0 1 298 92235 4.98 92238 95.02 END
SS304  2 1.0 END
END COMP
CRITICAL CYLINDER OF AQUEOUS U(4.98)O2F2 (CASE 36)
READ PARM  RUN=YES   NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CYLINDER  1 1 19.5500 2P50.85
CYLINDER  0 1 19.5500 74.16 -50.85
CYLINDER  2 1 19.6287 74.16 -50.9287
CUBOID    0 1 4P19.6287 74.16 -50.9287
END GEOM
END DATA
END
=CSAS25
CRITICAL CYLINDER OF AQUEOUS U(4.98)O2F2 (CASE 36)
HANSEN-ROACH  INFHOMMEDIUM
SOLNUO2F2  1 910.36 0.0 1 298 92235 4.98 92238 95.02 END
SS304  2 1.0 END
END COMP
CRITICAL CYLINDER OF AQUEOUS U(4.98)O2F2 (CASE 36)
READ PARM  RUN=YES  NPG=600 NUB=YES FDN=YES END PARM
READ GEOM
UNIT  1
CYLINDER  1 1 19.5500 2P50.85
CYLINDER  0 1 19.5500 74.16 -50.85
CYLINDER  2 1 19.6287 74.16 -50.9287
CUBOID    0 1 4P19.6287 74.16 -50.9287
END GEOM
READ PLOT TTL='XZ SLICE OF CYLINDER CASE 36'
XUL=-21  YUL=0.0 ZUL=76
XLR=21   YLR=0.0 ZLR=-52
UAX=1  WDN=-1  NAX=130  NCH='012'END
TTL='ENLARGEMENT OF LOWER RIGHT CORNER OF CYLINDER'
XUL=18  YUL=0.0 ZUL=-49
XLR=21  YLR=0.0 ZLR=-52
UAX=1  WDN=-1  NAX=130  NCH='012'
END PLOT
END DATA
END
```

```
CAR01
=CSAS25
ROCKY FLATS CRITICALS NUREG/CR-1071 EXPERIMENT NUMBER 1 (27 GROUP)
' 48 FUEL CANS 2.44 CM MODERATOR GEE.HU77.DATA(OPT1)
27GROUPNDF4  LATTICECELL
U3O8   1 5.4078E-1 293.0 92234 0.03 92235 4.46 92236 0.08 92238 95.43 END
H2O    1 8.9514E-2 END
ARBM-BAGGIE  1.0 3 0 0 0 1001 14.01 6012 84.9 8016 1.20 1 1.9134E-2
   END
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 2 9.5390E-1
   END
ARBM-TAPE(VINYL)  1.0 7 0 0 0 1001 5.92 6012 45.91 8016 10.82 17000
   25.73 20040 6.9 22000 1.6 82000 1.1 2 1.1115E-2 END
ARBM-TAPE(MYLAR)  1.0 3 0 0 0 1001 6.83 6012 65.50 8016 27.02 2
   1.7491E-2 END
ARBM-MODERATOR  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 3 END
ARBM-PLEX(REG)  1.0 3 0 0 0 1001 7.84 6012 59.59 8016 32.23 4
   1.1773 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 4
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 4
   1.1648E-3 END
ARBM-PLEX(TRIS)  1.0 8 0 0 1 1001 7.16 6012 52.03 7014 0.16 8016 29.82
   15031 1.02 17000 1.81 35079 4.260 35081 2.840 5 1.2757 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 5
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 5
   1.1648E-3 END
ARBM-FILLER  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 6 .88 END
' THIS MATERIAL IS ACTUALLY MODERATOR ADJUSTED FOR THE VOLUME
' FRACTION OF THE VOID FILLED BETWEEN CORE AND REFLECTOR.
END COMP
SPHTRIANGP  19.9462 18.5857 1 3 18.9579 2 END
ROCKY FLATS CRITICALS NUREG/CR-1071 EXPERIMENT NUMBER 1 (27 GROUP)
' 48 FUEL CANS 2.44 CM MODERATOR GEE.HU77.DATA(OPT1)
READ PARM  RUN=YES NPG=600
NUB=YES FDN=YES PLT=NO
END PARM
READ GEOM
UNIT  1
COM='FUEL BOX 15.28 CM ON A SIDE WITH .15 CM WALLS .05CM STACKING VOID'
CUBOID  1 1 6P7.49
CUBOID  2 1 6P7.64
CUBOID  0 1 6P7.6650
UNIT  2
COM='X-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 2P1.2200 4P7.665
UNIT  3
COM='Y-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 2P7.665 2P1.2200 2P7.665
UNIT  4
COM='Z-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 4P7.665 2P1.2200
UNIT  5
COM='MORE X-FACE MODERATOR'
CUBOID  3 1 4P1.2200 2P7.665
UNIT  6
COM='MORE Y-FACE MODERATOR'
CUBOID  3 1 2P7.665 4P1.2200
UNIT  7
COM='MORE Z-FACE MODERATOR'
CUBOID  3 1 2P1.2200 2P7.665 2P1.2200
```

Table A.3 (continued)

```
UNIT  8
COM='LAST OF INTERSTITIAL MODERATOR'
CUBOID  3 1 6P1.2200
UNIT  9
COM='NORTH SPLIT TABLE CORE'
ARRAY 1 3*0.0
UNIT  10
COM='SOUTH SPLIT TABLE CORE'
ARRAY 2 3*0.0
UNIT  11
COM='PLEXIGLASS REFLECTOR SHEET WITHOUT TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  4 1 2P16.5500 2P38.7500 2P0.6150
UNIT  12
COM='PLEXIGLASS REFLECTOR SHEET WITH TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  5 1 2P16.5500 2P38.7500 2P0.6150
UNIT  13
COM='UPPER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P16.550 2P38.75 2P8.24
UNIT  14
COM='LOWER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P16.550 2P38.75 2P3.69
UNIT  15
COM='NORTH BOTTOM REFLECTOR INCLUDES REGULAR AND TRIS'
ARRAY 3 3*0.0
UNIT  16
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITHOUT TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P0.615
CUBOID  4 1 44.3 -5.1 2P38.75  2P0.615
UNIT  17
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P0.615
CUBOID  5 1 44.3 -5.1 2P38.75 2P0.6150
UNIT  18
COM='LOWER PORTION SOUTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P8.855
CUBOID  5 1 44.3 -5.1 2P38.75 2P8.855
UNIT  19
COM='SOUTH BOTTOM REFLECTOR WITH REGULAR AND TRIS'
ARRAY 4 3*0.0
UNIT  20
COM='EAST AND WEST REFLECTORS FOR NORTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P16.550 2P12.65 2P54.2825
UNIT  21
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR NORTH REFLECTOR'
ARRAY 5 3*0.0
UNIT  22
COM='EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P24.700 2P12.65 2P54.2825
UNIT  23
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR'
ARRAY 6 3*0.0
UNIT  24
COM='NORTH TOP REFLECTOR WITH TRIS'
CUBOID  5 1 2P29.100 2P64.05 2P12.15
UNIT  25
COM='ARRAY FOR NORTH TOP REFLECTOR'
ARRAY 7 3*0.0
UNIT  26
COM='SOUTH TOP REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P12.15
CUBOID  5 1 69.4 -5.1 2P64.05 2P12.15
UNIT  27
COM='ARRAY FOR SOUTH TOP REFLECTOR'
ARRAY 8 3*0.0
UNIT  28
COM='NORTH END REFLECTOR 9.8CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P4.9000 2P64.0500 2P54.2825
UNIT  29
COM='NORTH END RELFECTOR 5.2 CM PORTION WITH TRIS'
CUBOID  5 1 2P2.6 2P64.0500 2P54.2825
UNIT  30
COM='NORTH END RELFECTOR 10.1 CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P5.05 2P64.05 2P54.2825
UNIT  31
COM='ARRAY FOR NORTH END REFLECTOR'
ARRAY 9 3*0.0
UNIT  32
COM='SOUTH END REFLECTOR'
CUBOID  5 1 2P12.55 2P64.05 2P54.2825
UNIT  33
COM='ARRAY FOR SOUTH END REFLECTOR'
ARRAY 10 3*0.0
UNIT  34
COM='BOTTOM MODERATING PLASTIC NORTH CORE'
CUBOID  6 1 2P16.550 2P38.7500 2P13.0500
UNIT  35
COM='TOP MODERATING PLASTIC NORTH CORE'
CUBOID  6 1 2P16.550 2P38.7500 2P3.2525
UNIT  36
ARRAY 11 3*0.0
UNIT  37
ARRAY 12 3*0.0
UNIT  38
COM='NORTH CORE WITH BOTTOM REFLECTOR'
ARRAY 13 3* 0.0
UNIT  39
COM='NORTH CORE WITH EAST AND WEST REFLECTOR'
ARRAY 14 3*0.0
UNIT  40
COM='NORTH CORE WITH END REFLECTOR'
ARRAY 15 3*0.0
UNIT  41
COM='NORTH SPLIT TABLE FACEPLATE'
CUBOID  3 1 2P0.6150 2P64.0500 2P66.4325
UNIT  42
COM='NORTH CORE WITH TOP REFLECTOR'
ARRAY 16 3*0.0
UNIT  43
COM='NORTH CORE WITH FACEPLATE'
ARRAY 17 3*0.0
UNIT  44
COM='12.95 CM THICK MODERATOR SOUTH CORE'
CUBOID  6 1 2P23.924 2P6.475 2P40.183
UNIT  45
COM='2.95 THICK MODERATOR SOUTH CORE'
CUBOID  6 1 2P23.924 2P38.5285 2P1.475
UNIT  46
COM='COMBINATION OF CORE WITH 12.95 THICK MODERATOR'
ARRAY 18 3*0.0
UNIT  47
COM='COMBINATION OF CORE WITH 2.95 THICK MODERATOR'
ARRAY 19 3*0.0
UNIT  48
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 20 3*0.0
```

Table A.3 (continued)

```
UNIT  49
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 21 3*0.0
UNIT  50
COM='SOUTH CORE END REFLECTOR'
ARRAY 22 3*0.0
UNIT  51
COM='FACEPLATE FOR SOUTH SPLIT TABLE'
CUBOID  3 1 2P0.4620  2P64.0500 2P66.4325
UNIT  52
COM='SOUTH CORE WITH TOP REFLECTOR'
ARRAY 23 3*0.0
UNIT  53
COM='SOUTH CORE WITH FACEPLATE'
ARRAY 24 3*0.0
UNIT  54
COM='AIR GAP'
CUBOID  0 1 2P0.1550 2P64.0500 2P66.4325
GLOBAL
UNIT  55
COM='TOTAL'
ARRAY 25 3*0.0
UNIT  56
COM='EMPTY FUEL LOCATION'
CUBOID  0 1 6P7.6650
UNIT  57
COM='SIDE MODERATOR'
CUBOID  6 1 2P16.550 2P4.4300 2P25.4350
UNIT  58
COM='END MODERATOR'
CUBOID  6 1 2P8.1500 2P38.7500 2P25.4350
UNIT  59
COM='SOUTH CORE BOTTOM MODERATING PLASTIC'
CUBOID  6 1 2P24.7000 2P38.7500 2P13.0500
UNIT  60
COM='SOUTH CORE TOP MODERATING PLASTIC'
CUBOID  6 1 2P24.7000 2P38.7500 2P3.2525
UNIT  61
COM='Y-FACE MODERATOR VOID'
CUBOID  0 1 2P7.665 2P1.2200 2P7.665
END GEOMETRY
READ ARRAY
ARA=1  NUX=3 NUY=7 NUZ=5
COM='NORTH SPLIT TABLE CORE'
FILL   1 2 1 3 5 3 2Q6 1 2 1
       4 7 4 6 8 6 2Q6 4 7 4
       1Q42
       56 2 1 3 5 3 1 2 1 3 5 3 1Q6 56 2 1   END FILL
ARA=2  NUX=3 NUY=7 NUZ=5
COM='SOUTH SPLIT TABLE CORE'
FILL   1 2 1 3 5 3 2Q6 1 2 1
       4 7 4 6 8 6 2Q6 4 7 4
       1Q42
       1 2 56 3 5 61 2Q6 1 2 56 END FILL
ARA=3  NUX=1 NUY=1 NUZ=3
COM='NORTH BOTTOM REFLECTOR'
FILL  14 11 13  END FILL
ARA=4  NUX=1 NUY=1 NUZ=7
COM='SOUTH BOTTOM REFLECTOR'
FILL  18 16 17 16 16 17 17  END FILL
ARA=5  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF NORTH REFLECTOR'
FILL  20 END FILL
ARA=6  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF SOUTH REFLECTOR'
FILL  22  END FILL
ARA=7  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR NORTH TOP REFLECTOR'
FILL  24  END FILL
ARA=8  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH TOP REFLECTOR'
FILL  26 END FILL
ARA=9  NUX=3 NUY=1 NUZ=1
COM='ARRAY FOR NORTH END REFLECTOR'
FILL  28 29 30  END FILL
ARA=10  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH END REFLECTOR'
FILL  32  END FILL
ARA=11  NUX=1 NUY=2 NUZ=1
COM='COMBINARION OF CORE WITH SIDE MODERATOR'
FILL  9 57  END FILL
ARA=12 NUX=1 NUY=1 NUZ=3
COM='COMBINATION OF PREVIOUS ARRAY WITH TOP AND BOTTOM MODERATOR'
FILL  34 36 35  END FILL
ARA=13  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF NORTH CORE WITH BOTTOM REFLECTOR'
FILL  15 37  END FILL
ARA=14  NUX=1 NUY=3 NUZ=1
COM='NORTH CORE WITH SIDE REFLECTORS'
FILL  21 38 21  END FILL
ARA=15  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH END REFLECTOR'
FILL  31 39  END FILL
ARA=16  NUX=1 NUY=1 NUZ=2
COM='NORTH CORE WITH TOP REFLECTOR'
FILL  40 25  END FILL
ARA=17  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH FACEPLATE'
FILL  42 41  END FILL
ARA=18  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF S. CORE WITH SIDE MODERATOR'
FILL  10 57  END FILL
ARA=19  NUX=2 NUY=1 NUZ=1
COM='COMBINATION OF CORE WITH END MODERATOR'
FILL  46 58  END FILL
ARA=20  NUX=1 NUY=1 NUZ=4
COM='SOUTH CORE WITH BOTTOM MODERATOR AND REFLECTOR'
FILL  19 59 47 60  END FILL
ARA=21 NUX=1 NUY=3 NUZ=1
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
FILL  23 48 23  END FILL
ARA=22 NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH END REFLECTOR'
FILL  49 33  END FILL
ARA=23  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH TOP REFLECTOR'
FILL  50 27  END FILL
ARA=24  NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH FACEPLATE'
FILL  51 52  END FILL
ARA=25  NUX=3 NUY=1 NUZ=1
COM='TOTAL'
FILL  43 54 53  END FILL
END ARRAY
READ PLOT TTL='XZ SLICE OF RFP1 SHOWING MATERIAL REGIONS'
XUL=-2  YUL=64.05 ZUL=136
XLR=137 YLR=64.05 ZLR=-2
UAX=1  WDN=-1 NAX=130  NCH='0123456'END
```

Table A.3 (continued)

```
TTL='YZ SLICE OF NORTH CORE SECOND ROW'
XUL=28  YUL=-2   ZUL=136
XLR=28  YLR=136 ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF SOUTH CORE SECOND ROW'
XUL=80 YUL=-2   ZUL=136
XLR=80 YLR=136  ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'
END PLOT
END DATA
END

CAR02
=CSAS25
ROCKY FLATS CRITICALS NUREG/CR-1071 EXPERIMENT NUMBER 2 (27 GROUP)
' 43 FUEL CANS 2.44 CM MODERATOR GEE.HU77.DATA(OPT2)
27GROUPNDF4  LATTICECELL
U3O8   1 5.4078E-1 293.0 92234 0.03 92235 4.46 92236 0.08 92238 95.43 END
H2O    1 8.9514E-2 END
ARBM-BAGGIE  1.0 3 0 0 0 1001 14.01 6012 84.9 8016 1.20 1 1.9134E-2
    END
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 2 9.5390E-1
    END
ARBM-TAPE(VINYL)  1.0 7 0 0 0 1001 5.92 6012 45.91 8016 10.82 17000
    25.73 20040 6.9 22000 1.6 82000 1.1 2 1.1115E-2 END
ARBM-TAPE(MYLAR)  1.0 3 0 0 0 1001 6.83 6012 65.50 8016 27.02 2
    1.7491E-2 END
ARBM-MODERATOR  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 3 END
ARBM-PLEX(REG)  1.0 3 0 0 0 1001 7.84 6012 59.59 8016 32.23 4
    1.1773 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 4
    3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 4
    1.1648E-3 END
ARBM-PLEX(TRIS)  1.0 8 0 0 1 1001 7.16 6012 52.03 7014 0.16 8016 29.82
    15031 1.02 17000 1.81 35079 4.260 35081 2.840 5 1.2757 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 5
    3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 5
    1.1648E-3 END
ARBM-MODERATOR  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 6 .89 END
' THIS MATERIAL IS ACTUALLY MODERATOR ADJUSTED FOR THE VOLUME
' FRACTION OF THE VOID FILLED BETWEEN CORE AND REFLECTOR.
END COMP
SPHTRIANGP  19.9462 18.5857 1 3 18.9579 2 END
ROCKY FLATS CRITICALS NUREG/CR-1071 EXPERIMENT NUMBER 2 (27 GROUP)
' 43 FUEL CANS 2.44 CM MODERATOR GEE.HU77.DATA(OPT2)
READ PARM  RUN=YES NPG=600
NUB=YES FDN=YES PLT=NO
END PARM
READ GEOM
UNIT  1
COM='FUEL BOX 15.28 CM ON A SIDE WITH .15 CM WALLS .05CM STACKING VOID'
CUBOID  1 1 6P7.49
CUBOID  2 1 6P7.64
CUBOID  0 1 6P7.6650
UNIT  2
COM='X-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 2P1.2200 4P7.665
UNIT  3
COM='Y-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 2P7.665 2P1.2200 2P7.665
UNIT  4
COM='Z-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 4P7.665 2P1.2200
UNIT  5
COM='MORE X-FACE MODERATOR'
CUBOID  3 1 4P1.2200 2P7.665
UNIT  6
COM='MORE Y-FACE MODERATOR'
CUBOID  3 1 2P7.665 4P1.2200
UNIT  7
COM='MORE Z-FACE MODERATOR'
CUBOID  3 1 2P1.2200 2P7.665 2P1.2200
UNIT  8
COM='LAST OF INTERSTITIAL MODERATOR'
CUBOID  3 1 6P1.2200
UNIT  9
COM='NORTH SPLIT TABLE CORE'
ARRAY 1 3*0.0
UNIT  10
COM='SOUTH SPLIT TABLE CORE'
ARRAY 2 3*0.0
UNIT  11
COM='PLEXIGLASS REFLECTOR SHEET WITHOUT TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  4 1 2P16.5500 2P38.7500 2P0.6150
UNIT  12
COM='PLEXIGLASS REFLECTOR SHEET WITH TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  5 1 2P16.5500 2P38.7500 2P0.6150
UNIT  13
COM='UPPER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P16.550 2P38.75 2P8.24
UNIT  14
COM='LOWER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P16.550 2P38.75 2P3.69
UNIT  15
COM='NORTH BOTTOM REFLECTOR INCLUDES REGULAR AND TRIS'
ARRAY 3 3*0.0
UNIT  16
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITHOUT TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P0.6150
CUBOID  4 1 44.3 -5.1 2P38.75  2P0.615
UNIT  17
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P0.6150
CUBOID  5 1 44.3 -5.1 2P38.75 2P0.6150
UNIT  18
COM='LOWER PORTION SOUTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P8.855
CUBOID  5 1 44.3 -5.1 2P38.75 2P8.855
UNIT  19
COM='SOUTH BOTTOM REFLECTOR WITH REGULAR AND TRIS'
ARRAY 4 3*0.0
UNIT  20
COM='EAST AND WEST REFLECTORS FOR NORTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P16.550 2P12.65 2P54.2825
UNIT  21
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR NORTH REFLECTOR'
ARRAY 5 3*0.0
UNIT  22
COM='EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P24.700 2P12.65 2P54.2825
UNIT  23
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR'
ARRAY 6 3*0.0
```

Table A.3 (continued)

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UNIT  24
COM='NORTH TOP REFLECTOR WITH TRIS'
CUBOID  5 1 2P29.100 2P64.05 2P12.15
UNIT  25
COM='ARRAY FOR NORTH TOP REFLECTOR'
ARRAY 7 3*0.0
UNIT  26
COM='SOUTH TOP REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P12.15
CUBOID  5 1 69.4 -5.1 2P64.05 2P12.15
UNIT  27
COM='ARRAY FOR SOUTH TOP REFLECTOR'
ARRAY 8 3*0.0
UNIT  28
COM='NORTH END REFLECTOR 9.8CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P4.9000 2P64.0500 2P54.2825
UNIT  29
COM='NORTH END RELFECTOR 5.2 CM PORTION WITH TRIS'
CUBOID  5 1 2P2.6 2P64.0500 2P54.2825
UNIT  30
COM='NORTH END RELFECTOR 10.1 CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P5.05 2P64.05 2P54.2825
UNIT  31
COM='ARRAY FOR NORTH END REFLECTOR'
ARRAY 9 3*0.0
UNIT  32
COM='SOUTH END REFLECTOR'
CUBOID  5 1 2P12.55 2P64.05 2P54.2825
UNIT  33
COM='ARRAY FOR SOUTH END REFLECTOR'
ARRAY 10 3*0.0
UNIT  34
COM='BOTTOM MODERATING PLASTIC NORTH CORE'
CUBOID  6 1 2P16.550 2P38.7500 2P13.0500
UNIT  35
COM='TOP MODERATING PLASTIC NORTH CORE'
CUBOID  6 1 2P16.550 2P38.7500 2P3.2525
UNIT  36
ARRAY 11 3*0.0
UNIT  37
ARRAY 12 3*0.0
UNIT  38
COM='NORTH CORE WITH BOTTOM REFLECTOR'
ARRAY 13 3* 0.0
UNIT  39
COM='NORTH CORE WITH EAST AND WEST REFLECTOR'
ARRAY 14 3*0.0
UNIT  40
COM='NORTH CORE WITH END REFLECTOR'
ARRAY 15 3*0.0
UNIT  41
COM='NORTH SPLIT TABLE FACEPLATE'
CUBOID  3 1 2P0.6150 2P64.0500 2P66.4325
UNIT  42
COM='NORTH CORE WITH TOP REFLECTOR'
ARRAY 16 3*0.0
UNIT  43
COM='NORTH CORE WITH FACEPLATE'
ARRAY 17 3*0.0
UNIT  44
COM='12.95 CM THICK MODERATOR SOUTH CORE'
CUBOID  6 1 2P23.924 2P6.475 2P40.183
UNIT  45
COM='2.95 THICK MODERATOR SOUTH CORE'
CUBOID  6 1 2P23.924 2P38.5285 2P1.475
UNIT  46
COM='COMBINATION OF CORE WITH 12.95 THICK MODERATOR'
ARRAY 18 3*0.0
UNIT  47
COM='COMBINATION OF CORE WITH 2.95 THICK MODERATOR'
ARRAY 19 3*0.0
UNIT  48
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 20 3*0.0
UNIT  49
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 21 3*0.0
UNIT  50
COM='SOUTH CORE END REFLECTOR'
ARRAY 22 3*0.0
UNIT  51
COM='FACEPLATE FOR SOUTH SPLIT TABLE'
CUBOID  3 1 2P0.4620  2P64.0500 2P66.4325
UNIT  52
COM='SOUTH CORE WITH TOP REFLECTOR'
ARRAY 23 3*0.0
UNIT  53
COM='SOUTH CORE WITH FACEPLATE'
ARRAY 24 3*0.0
UNIT  54
COM='AIR GAP'
CUBOID  0 1 2P0.7600 2P64.0500 2P66.4325
GLOBAL
UNIT  55
COM='TOTAL'
ARRAY 25 3*0.0
UNIT  56
COM='EMPTY FUEL LOCATION'
CUBOID  0 1 6P7.6650
UNIT  57
COM='SIDE MODERATOR'
CUBOID  6 1 2P16.550 2P4.4300 2P25.4350
UNIT  58
COM='END MODERATOR'
CUBOID  6 1 2P8.1500 2P38.7500 2P25.4350
UNIT  59
COM='SOUTH CORE BOTTOM MODERATING PLASTIC'
CUBOID  6 1 2P24.7000 2P38.7500 2P13.0500
UNIT  60
COM='SOUTH CORE TOP MODERATING PLASTIC'
CUBOID  6 1 2P24.7000 2P38.7500 2P3.2525
UNIT  61
COM='Y-FACE MODERATOR VOID'
CUBOID  0 1 2P7.665 2P1.2200 2P7.665
END GEOMETRY
READ ARRAY
ARA=1  NUX=3 NUY=7 NUZ=5
COM='NORTH SPLIT TABLE CORE'
FILL  1 2 1 3 5 3 2Q6 1 2 1
      4 7 4 6 8 6 2Q6 4 7 4
      1Q42
      56 2 1 3 5 3 1 2 1 3 5 3 1Q6 56 2 1  END FILL
ARA=2  NUX=3 NUY=7 NUZ=5
COM='SOUTH SPLIT TABLE CORE'
```

Table A.3 (continued)

```
FILL  1 2 1 3 5 3 2Q6 1 2 1
      4 7 4 6 8 6 2Q6 4 7 4
      1Q42
      1 2 56 3 5 3 1 2 1 3 5 3 1 2 56 3 5 61 1 2 56  END FILL
ARA=3  NUX=1 NUY=1 NUZ=3
COM='NORTH BOTTOM REFLECTOR'
FILL  14 11 13  END FILL
ARA=4  NUX=1 NUY=1 NUZ=7
COM='SOUTH BOTTOM REFLECTOR'
FILL  18 16 17 16 16 17 17  END FILL
ARA=5  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF NORTH REFLECTOR'
FILL  20 END FILL
ARA=6  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF SOUTH REFLECTOR'
FILL  22  END FILL
ARA=7  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR NORTH TOP REFLECTOR'
FILL  24  END FILL
ARA=8  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH TOP REFLECTOR'
FILL  26 END FILL
ARA=9  NUX=3 NUY=1 NUZ=1
COM='ARRAY FOR NORTH END REFLECTOR'
FILL  28 29 30  END FILL
ARA=10  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH END REFLECTOR'
FILL  32  END FILL
ARA=11  NUX=1 NUY=2 NUZ=1
COM='COMBINARION OF CORE WITH SIDE MODERATOR'
FILL  9 57  END FILL
ARA=12 NUX=1 NUY=1 NUZ=3
COM='COMBINATION OF PREVIOUS ARRAY WITH TOP AND BOTTOM MODERATOR'
FILL  34 36 35  END FILL
ARA=13  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF NORTH CORE WITH BOTTOM REFLECTOR'
FILL  15 37  END FILL
ARA=14  NUX=1 NUY=3 NUZ=1
COM='NORTH CORE WITH SIDE REFLECTORS'
FILL  21 38 21  END FILL
ARA=15  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH END REFLECTOR'
FILL  31 39  END FILL
ARA=16  NUX=1 NUY=1 NUZ=2
COM='NORTH CORE WITH TOP REFLECTOR'
FILL  40 25  END FILL
ARA=17  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH FACEPLATE'
FILL  42 41  END FILL
ARA=18  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF S. CORE WITH SIDE MODERATOR'
FILL  10 57  END FILL
ARA=19  NUX=2 NUY=1 NUZ=1
COM='COMBINATION OF CORE WITH END MODERATOR'
FILL  46 58  END FILL
ARA=20  NUX=1 NUY=1 NUZ=4
COM='SOUTH CORE WITH BOTTOM MODERATOR AND REFLECTOR'
FILL  19 59 47 60  END FILL
ARA=21 NUX=1 NUY=3 NUZ=1
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
FILL  23 48 23  END FILL
ARA=22 NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH END REFLECTOR'
FILL  49 33  END FILL
ARA=23  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH TOP REFLECTOR'
FILL  50 27  END FILL
ARA=24  NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH FACEPLATE'
FILL  51 52  END FILL
ARA=25  NUX=3 NUY=1 NUZ=1
COM='TOTAL'
FILL  43 54 53  END FILL
END ARRAY
READ PLOT TTL='XZ SLICE OF RFP2 SHOWING MATERIAL REGIONS'
XUL=-2  YUL=64.05 ZUL=136
XLR=137 YLR=64.05 ZLR=-2
UAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF NORTH CORE SECOND ROW'
XUL=28  YUL=-2   ZUL=136
XLR=28  YLR=136 ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF SOUTH CORE SECOND ROW'
XUL=80 YUL=-2   ZUL=136
XLR=80 YLR=136  ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'
END PLOT
END DATA
END
```

```
CAR03
=CSAS25
ROCKY FLATS CRITICALS NUREG/CR-1071 EXPERIMENT NUMBER 3 (27 GROUP)
' 100 FUEL CANS 0.929 CM MODERATOR GEE.HU77.DATA(UND)
27GROUPNDF4  LATTICECELL
U3O8  1 5.4078E-1 293.0 92234 0.03 92235 4.46 92236 0.08 92238 95.43 END
H2O   1 8.9514E-2 END
ARBM-BAGGIE  1.0 3 0 0 0 1001 14.01 6012 84.9 8016 1.20 1 1.9134E-2
   END
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 2 9.5390E-1
   END
ARBM-TAPE(VINYL)  1.0 7 0 0 0 1001 5.92 6012 45.91 8016 10.82 17000
   25.73 20040 6.9 22000 1.6 82000 1.1 2 1.1115E-2 END
ARBM-TAPE(MYLAR)  1.0 3 0 0 0 1001 6.83 6012 65.50 8016 27.02 2
   1.7491E-2 END
ARBM-MODERATOR  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 3 END
ARBM-PLEX(REG)  1.0 3 0 0 0 1001 7.84 6012 59.59 8016 32.23 4
   1.1773 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 4
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 4
   1.1648E-3 END
ARBM-PLEX(TRIS)  1.0 8 0 0 1 1001 7.16 6012 52.03 7014 0.16 8016 29.82
   15031 1.02 17000 1.81 35079 4.260 35081 2.840 5 1.2757 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 5
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 5
   1.1648E-3 END
ARBM-FILLER  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 6 0.7 END
' THIS MATERIAL IS ACTUALLY MODERATOR ADJUSTED FOR THE VOLUME
' FRACTION OF THE VOID FILLED BETWEEN CORE AND REFLECTOR.
END COMP
SPHTRIANGP  19.00 18.5857 1 3 18.9579 2 END
ROCKY FLATS CRITICALS NUREG/CR-1071 EXPERIMENT NUMBER 3 (27 GROUP)
' 100 FUEL CANS 0.929 CM MODERATOR GEE.HU77.DATA(UND)
READ PARM  RUN=YES NPG=600
NUB=YES FDN=YES PLT=NO
END PARM
```

Table A.3 (continued)

```
READ GEOM
UNIT  1
COM='FUEL BOX 15.28 CM ON A SIDE WITH .15 CM WALLS .05CM STACKING VOID'
CUBOID  1 1 6P7.49
CUBOID  2 1 6P7.64
CUBOID  0 1 6P7.6650
UNIT  2
COM='X-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 2P0.4645 4P7.665
UNIT  3
COM='Y-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 2P7.665 2P0.4645 2P7.665
UNIT  4
COM='Z-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 4P7.665 2P0.4645
UNIT  5
COM='MORE X-FACE MODERATOR'
CUBOID  3 1 4P0.4645 2P7.665
UNIT  6
COM='MORE Y-FACE MODERATOR'
CUBOID  3 1 2P7.665 4P0.4645
UNIT  7
COM='MORE Z-FACE MODERATOR'
CUBOID  3 1 2P0.4645 2P7.665 2P0.4645
UNIT  8
COM='LAST OF INTERSTITIAL MODERATOR'
CUBOID  3 1 6P0.4645
UNIT  9
COM='NORTH SPLIT TABLE CORE'
ARRAY 1 3*0.0
UNIT  10
COM='SOUTH SPLIT TABLE CORE'
ARRAY 2 3*0.0
UNIT  11
COM='PLEXIGLASS REFLECTOR SHEET WITHOUT TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  4 1 2P15.8000 2P38.7500 2P0.6150
UNIT  12
COM='PLEXIGLASS REFLECTOR SHEET WITH TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  5 1 2P15.8000 2P38.7500 2P0.6150
UNIT  13
COM='UPPER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P8.24
UNIT  14
COM='LOWER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P3.69
UNIT  15
COM='NORTH BOTTOM REFLECTOR INCLUDES REGULAR AND TRIS'
ARRAY 3 3*0.0
UNIT  16
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITHOUT TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P0.6150
CUBOID  4 1 44.3 -5.1 2P38.75  2P0.615
UNIT  17
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P0.6150
CUBOID  5 1 44.3 -5.1 2P38.75 2P0.6150
UNIT  18
COM='LOWER PORTION SOUTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P8.855
CUBOID  5 1 44.3 -5.1 2P38.75 2P8.855
UNIT  19
COM='SOUTH BOTTOM REFLECTOR WITH REGULAR AND TRIS'
ARRAY 4 3*0.0
UNIT  20
COM='EAST AND WEST REFLECTORS FOR NORTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P12.65 2P54.2825
UNIT  21
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR NORTH REFLECTOR'
ARRAY 5 3*0.0
UNIT  22
COM='EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P24.700 2P12.65 2P54.2825
UNIT  23
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR'
ARRAY 6 3*0.0
UNIT  24
COM='NORTH TOP REFLECTOR WITH TRIS'
CUBOID  5 1 2P28.35 2P64.05 2P12.15
UNIT  25
COM='ARRAY FOR NORTH TOP REFLECTOR'
ARRAY 7 3*0.0
UNIT  26
COM='SOUTH TOP REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P12.15
CUBOID  5 1 69.4 -5.1 2P64.05 2P12.15
UNIT  27
COM='ARRAY FOR SOUTH TOP REFLECTOR'
ARRAY 8 3*0.0
UNIT  28
COM='NORTH END REFLECTOR 9.8CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P4.9000 2P64.0500 2P54.2825
UNIT  29
COM='NORTH END RELFECTOR 5.2 CM PORTION WITH TRIS'
CUBOID  5 1 2P2.6 2P64.0500 2P54.2825
UNIT  30
COM='NORTH END RELFECTOR 10.1 CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P5.05 2P64.05 2P54.2825
UNIT  31
COM='ARRAY FOR NORTH END REFLECTOR'
ARRAY 9 3*0.0
UNIT  32
COM='SOUTH END REFLECTOR'
CUBOID  5 1 2P12.55 2P64.05 2P54.2825
UNIT  33
COM='ARRAY FOR SOUTH END REFLECTOR'
ARRAY 10 3*0.0
UNIT  34
COM='12.95 THICK MODERATING PLASTIC NORTH CORE'
CUBOID  6 1 2P15.7945 2P6.4750 2P40.1830
UNIT  35
COM='2.95 THICK MODERATING PLASTIC NORTH CORE'
CUBOID  6 1 2P15.7945 2P38.5285 2P1.475
UNIT  36
ARRAY 11 3*0.0
UNIT  37
ARRAY 12 3*0.0
REPLICATE  0 1 0.0 0.011 0.443 0.0 0.1590 0.0 1
UNIT  38
COM='NORTH CORE WITH BOTTOM REFLECTOR'
ARRAY 13 3* 0.0
UNIT  39
COM='NORTH CORE WITH EAST AND WEST REFLECTOR'
ARRAY 14 3*0.0
UNIT  40
COM='NORTH CORE WITH END REFLECTOR'
ARRAY 15 3*0.0
UNIT  41
COM='NORTH SPLIT TABLE FACEPLATE'
CUBOID  3 1 2P0.6150 2P64.0500 2P66.4325
```

Table A.3 (continued)

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UNIT  42
COM='NORTH CORE WITH TOP REFLECTOR'
ARRAY 16 3*0.0
UNIT  43
COM='NORTH CORE WITH FACEPLATE'
ARRAY 17 3*0.0
UNIT  44
COM='12.95 CM THICK MODERATOR SOUTH CORE'
CUBOID  6 1 2P23.924 2P6.475 2P40.183
UNIT  45
COM='2.95 THICK MODERATOR SOUTH CORE'
CUBOID  6 1 2P23.924 2P38.5285 2P1.475
UNIT  46
COM='COMBINATION OF CORE WITH 12.95 THICK MODERATOR'
ARRAY 18 3*0.0
UNIT  47
COM='COMBINATION OF CORE WITH 2.95 THICK MODERATOR'
ARRAY 19 3*0.0
REPLICATE  0 1 1.552 0.0 0.4430 0.0 0.159 0.0 1
UNIT  48
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 20 3*0.0
UNIT  49
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 21 3*0.0
UNIT  50
COM='SOUTH CORE END REFLECTOR'
ARRAY 22 3*0.0
UNIT  51
COM='FACEPLATE FOR SOUTH SPLIT TABLE'
CUBOID  3 1 2P0.4620  2P64.0500 2P66.4325
UNIT  52
COM='SOUTH CORE WITH TOP REFLECTOR'
ARRAY 23 3*0.0
UNIT  53
COM='SOUTH CORE WITH FACEPLATE'
ARRAY 24 3*0.0
UNIT  54
COM='AIR GAP'
CUBOID  0 1 2P0.5250 2P64.0500 2P66.4325
GLOBAL
UNIT  55
COM='TOTAL'
ARRAY 25 3*0.0
END GEOMETRY
READ ARRAY
ARA=1  NUX=3 NUY=7 NUZ=9
COM='NORTH SPLIT TABLE CORE'
FILL   1 2 1 3 5 3 2Q6 1 2 1
       4 7 4 6 8 6 2Q6 4 7 4
       3Q42
       1 2 1 3 5 3 2Q6 1 2 1  END FILL
ARA=2  NUX=5 NUY=7 NUZ=9
COM='SOUTH SPLIT TABLE CORE'
FILL   1 2 1 2 1 3 5 3 5 3 2Q10 1 2 1 2 1
       4 7 4 7 4 6 8 6 8 6 2Q10 4 7 4 7 4
       3Q70
       1 2 1 2 1 3 5 3 5 3 2Q10 1 2 1 2 1   END FILL
ARA=3  NUX=1 NUY=1 NUZ=3
COM='NORTH BOTTOM REFLECTOR'
FILL   14 11 13  END FILL
ARA=4  NUX=1 NUY=1 NUZ=7
COM='SOUTH BOTTOM REFLECTOR'
FILL   18 16 17 16 16 17 17  END FILL
ARA=5  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF NORTH REFLECTOR'
FILL  20 END FILL
ARA=6  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF SOUTH REFLECTOR'
FILL  22  END FILL
ARA=7  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR NORTH TOP REFLECTOR'
FILL  24  END FILL
ARA=8  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH TOP REFLECTOR'
FILL  26 END FILL
ARA=9  NUX=3 NUY=1 NUZ=1
COM='ARRAY FOR NORTH END REFLECTOR'
FILL  28 29 30  END FILL
ARA=10  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH END REFLECTOR'
FILL  32  END FILL
ARA=11  NUX=1 NUY=2 NUZ=1
COM='COMBINARION OF CORE WITH 12.95CM THICK MODERATOR'
FILL  9 34  END FILL
ARA=12 NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF PREVIOUS ARRAY WITH 2.95CM THICK MODERATOR'
FILL  36 35  END FILL
ARA=13  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF NORTH CORE WITH BOTTOM REFLECTOR'
FILL  15 37  END FILL
ARA=14  NUX=1 NUY=3 NUZ=1
COM='NORTH CORE WITH SIDE REFLECTORS'
FILL  21 38 21  END FILL
ARA=15  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH END REFLECTOR'
FILL  31 39  END FILL
ARA=16  NUX=1 NUY=1 NUZ=2
COM='NORTH CORE WITH TOP REFLECTOR'
FILL  40 25  END FILL
ARA=17  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH FACEPLATE'
FILL  42 41  END FILL
ARA=18  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF S. CORE WITH 12.95 CM THICK MODERATOR'
FILL  10 44  END FILL
ARA=19  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH 2.95 CM THICK MODERATOR'
FILL  46 45  END FILL
ARA=20  NUX=1 NUY=1 NUZ=2
COM='SOUTH CORE WITH BOTTOM REFLECTOR'
FILL  19 47  END FILL
ARA=21 NUX=1 NUY=3 NUZ=1
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
FILL  23 48 23  END FILL
ARA=22 NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH END REFLECTOR'
FILL  49 33  END FILL
ARA=23  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH TOP REFLECTOR'
FILL  50 27  END FILL
ARA=24  NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH FACEPLATE'
FILL  51 52  END FILL
ARA=25  NUX=3 NUY=1 NUZ=1
COM='TOTAL'
FILL  43 54 53  END FILL
```

```
END ARRAY
READ PLOT TTL='XZ SLICE OF RFP3 SHOWING MATERIAL REGIONS'
XUL=-1  YUL=64.05 ZUL=135
XLR=136 YLR=64.05 ZLR=-2
UAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF NORTH CORE SECOND ROW'
XUL=28  YUL=-2   ZUL=136
XLR=28  YLR=136 ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF SOUTH CORE SECOND ROW'
XUL=90 YUL=-2   ZUL=136
XLR=90 YLR=136  ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'
END PLOT
END DATA
END



CAR04
=CSAS25
ROCKY FLATS CRITICALS NUREG/CR-1071 EXPERIMENT NUMBER 13 (27 GROUP)
27GROUPNDF4  LATTICECELL
U3O8   1 5.4078E-1 293.0 92234 0.03 92235 4.46 92236 0.08 92238 95.43 END
H2O   1 8.9514E-2 END
ARBM-BAGGIE  1.0 3 0 0 0 1001 14.01 6012 84.9 8016 1.20 1 1.9134E-2
   END
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 2 9.5390E-1
   END
ARBM-TAPE(VINYL)  1.0 7 0 0 0 1001 5.92 6012 45.91 8016 10.82 17000
   25.73 20040 6.9 22000 1.6 82000 1.1 2 1.1115E-2 END
ARBM-TAPE(MYLAR)  1.0 3 0 0 0 1001 6.83 6012 65.50 8016 27.02 2
   1.7491E-2 END
ARBM-MODERATOR  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 3 END
RFCONCRETE   5  1.0 END
END COMP
SPHTRIANGP  19.9462 18.5857 1 3 18.9579 2 END
ROCKY FLATS CRITICALS NUREG/CR-1071 EXPERIMENT NUMBER 13 (27 GROUP)
READ PARM  RUN=YES NPG=600
PLT=NO FDN=YES NUB=YES
END PARM
READ GEOM
UNIT  1
COM='FUEL BOX 15.28 CM ON A SIDE WITH .15 CM WALLS .05CM STACKING VOID'
CUBOID  1 1 6P7.49
CUBOID  2 1 6P7.64
CUBOID  0 1 6P7.6650
UNIT  2
COM='X-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 2P1.2200 4P7.665
UNIT  3
COM='Y-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 2P7.665 2P1.2200 2P7.665
UNIT  4
COM='Z-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 4P7.665 2P1.2200
UNIT  5
COM='MORE X-FACE MODERATOR'
CUBOID  3 1 4P1.2200 2P7.665
UNIT  6
COM='MORE Y-FACE MODERATOR'
CUBOID  3 1 2P7.665 4P1.2200
UNIT  7
COM='MORE Z-FACE MODERATOR'
CUBOID  3 1 2P1.2200 2P7.665 2P1.2200
UNIT  8
COM='LAST OF INTERSTITIAL MODERATOR'
CUBOID  3 1 6P1.2200
UNIT  9
COM='NORTH SPLIT TABLE CORE'
ARRAY 1 -33.1 2*0.0
CUBOID  5 1 0.0 -33.6 76.2 0.0 50.87 -30.5
CUBOID  0 1 0.0 -33.6 77.5 0.0 52.70 -30.5
CUBOID  5 1 0.0 -33.6 103.0 -25.5 78.2 -56.0
CUBOID  0 1 0.0 -34.3 103.0 -25.5 78.2 -56.0
CUBOID  5 1 0.0 -59.9 103.0 -25.5 78.2 -56.0
UNIT  10
COM='SOUTH SPLIT TABLE CORE'
ARRAY 2 3*0.0
CUBOID  5 1 44.4 0.0 76.2 0.0 50.87 -30.5
CUBOID  0 1 47.5 0.0 77.5 0.0 52.70 -30.5
CUBOID  5 1 73.0 0.0 103.0 -25.5 78.2 -56.0
HOLE   11 0.0 38.75 -56.0
HOLE   11 0.0 38.75 52.7
UNIT  11
CUBOID  0 1 10.2 0.0 2P2.55 25.5 0.0
UNIT  12
COM='NORTH SPLIT TABLE FACEPLATE'
CUBOID  3 1 2P0.6150 2P64.2500 2P67.1
UNIT  13
COM='FACEPLATE FOR SOUTH SPLIT TABLE'
CUBOID  3 1 2P0.6150  2P64.2500 2P67.1
UNIT  14
COM='AIR GAP'
CUBOID  0 1 2P0.2850 2P64.2500 2P67.1
GLOBAL
UNIT  15
COM='TOTAL'
ARRAY 3 3*0.0
UNIT  56
COM='EMPTY FUEL LOCATION'
CUBOID  0 1 6P7.6650
UNIT  61
COM='Y-FACE MODERATOR VOID'
CUBOID  0 1 2P7.665 2P1.2200 2P7.665
END GEOMETRY
READ ARRAY
ARA=1  NUX=3 NUY=7 NUZ=5
COM='NORTH SPLIT TABLE CORE'
FILL  1 2 1 3 5 3 2Q6 1 2 1
      4 7 4 6 8 6 2Q6 4 7 4
      1Q42
      56 2 1 61 5 3 2Q6 56 2 1  END FILL
ARA=2  NUX=3 NUY=7 NUZ=5
COM='SOUTH SPLIT TABLE CORE'
FILL  1 2 1 3 5 3 2Q6 1 2 1
      4 7 4 6 8 6 2Q6 4 7 4
      1Q42
      1 2 56 3 5 61 2Q6 1 2 56  END FILL
ARA=3  NUX=5 NUY=1 NUZ=1
COM='TOTAL'
FILL  9 12 14 13 10  END FILL
END ARRAY
```

Table A.3 (continued)

```
READ PLOT TTL='XZ SLICE OF RFP1 SHOWING MATERIAL REGIONS'
XUL=-2  YUL=64.05 ZUL=136
XLR=137 YLR=64.05 ZLR=-2
UAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF NORTH CORE SECOND ROW'
XUL=28  YUL=-2   ZUL=136
XLR=28  YLR=136 ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF SOUTH CORE SECOND ROW'
XUL=80 YUL=-2   ZUL=136
XLR=80 YLR=136  ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'
END PLOT
READ START  NST=1
XSM=15 XSP=122 YSM=15 YSP=122 ZSM=30 ZSP=122  END START
END DATA
END
```

```
CAR05
=CSAS25
ROCKY FLATS CRITICALS NUREG/CR-1071 EXPERIMENT NUMBER 15 (27 GROUP)
27GROUPNDF4  LATTICECELL
U3O8  1 5.4078E-1 293.0 92234 0.03 92235 4.46 92236 0.08 92238 95.43 END
H2O   1 8.9514E-2 END
ARBM-BAGGIE  1.0 3 0 0 0 1001 14.01 6012 84.9 8016 1.20 1 1.9134E-2
    END
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 2 9.5390E-1
    END
ARBM-TAPE(VINYL)  1.0 7 0 0 0 1001 5.92 6012 45.91 8016 10.82 17000
    25.73 20040 6.9 22000 1.6 82000 1.1 2 1.1115E-2 END
ARBM-TAPE(MYLAR)  1.0 3 0 0 0 1001 6.83 6012 65.50 8016 27.02 2
    1.7491E-2 END
ARBM-MODERATOR  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 3 END
RFCONCRETE   5  1.0 END
END COMP
SPHTRIANGP  19.0000 18.5857 1 3 18.9579 2 END
ROCKY FLATS CRITICALS NUREG/CR-1071 EXPERIMENT NUMBER 15 (27 GROUP)
READ PARM  RUN=YES NPG=600 PLT=NO
FDN=YES NUB=YES
END PARM
READ GEOM
UNIT  1
COM='FUEL BOX 15.28 CM ON A SIDE WITH .15 CM WALLS .05CM STACKING VOID'
CUBOID  1 1 6P7.49
CUBOID  2 1 6P7.64
CUBOID  0 1 6P7.6650
UNIT  2
COM='X-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 2P0.4645 4P7.665
UNIT  3
COM='Y-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 2P7.665 2P0.4645 2P7.665
UNIT  4
COM='Z-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 4P7.665 2P0.4645
UNIT  5
COM='MORE X-FACE MODERATOR'
CUBOID  3 1 4P0.4645 2P7.665
UNIT  6
COM='MORE Y-FACE MODERATOR'
CUBOID  3 1 2P7.665 4P0.4645
UNIT  7
COM='MORE Z-FACE MODERATOR'
CUBOID  3 1 2P0.4645 2P7.665 2P0.4645
UNIT  8
COM='LAST OF INTERSTITIAL MODERATOR'
CUBOID  3 1 6P0.4645
UNIT  9
COM='NORTH SPLIT TABLE CORE'
ARRAY 1 -31.589 2*0.0
CUBOID  5 1 0.0 -31.589 76.207 0.0  80.366 -25.5
CUBOID  0 1 0.0 -32.3   77.5   0.0  83.2   -25.5
CUBOID  5 1 0.0 -57.8  103.0 -25.5 108.7   -25.5
UNIT  10
COM='SOUTH SPLIT TABLE CORE'
ARRAY 2 3*0.0
CUBOID  5 1 47.848 0.0  76.207 0.0  80.366 -25.5
HOLE   11 0.0 38.75 -25.5
CUBOID  0 1 47.848 0.0  77.5   0.0  83.2   -25.5
CUBOID  5 1 47.848 0.0 103.0 -25.5 108.7   -25.5
HOLE   11 0.0 38.75  83.2
CUBOID  0 1 48.848 0.0 103.0 -25.5 108.7   -25.5
CUBOID  5 1 74.348 0.0 103.0 -25.5 108.7   -25.5
UNIT  11
CUBOID  0 1 10.2 0.0 2P2.55 25.5 0.0
UNIT  12
COM='NORTH SPLIT TABLE FACEPLATE'
CUBOID  3 1 2P0.0 2P64.2500 2P67.1
UNIT  13
COM='FACEPLATE FOR SOUTH SPLIT TABLE'
CUBOID  3 1 2P0.4620  2P64.2500 2P67.1
UNIT  14
COM='AIR GAP'
CUBOID  0 1 2P0.2850 2P64.2500 2P67.1
GLOBAL
UNIT  15
COM='TOTAL'
ARRAY 3 3*0.0
UNIT  56
COM='EMPTY FUEL LOCATION'
CUBOID  0 1 6P7.6650
UNIT  61
COM='Y-FACE MODERATOR VOID'
CUBOID  0 1 2P7.665 2P0.4645 2P7.665
END GEOMETRY
READ ARRAY
ARA=1  NUX=3 NUY=7 NUZ=9
COM='NORTH SPLIT TABLE CORE'
FILL  1 2 1 3 5 3 2Q6 1 2 1
      4 7 4 6 8 6 2Q6 4 7 4
      3Q42
      1 2 1 3 5 3 2Q6 1 2 1   END FILL
ARA=2  NUX=5 NUY=7 NUZ=9
COM='SOUTH SPLIT TABLE CORE'
FILL  1 2 1 2 1 3 5 3 5 3 2Q10 1 2 1 2 1
      4 7 4 7 4 6 8 6 8 6 2Q10 4 7 4 7 4
      3Q70
      1 2 1 2 1 3 5 3 5 3
      56 2 1 2 1 61 5 3 5 3
      56 2 1 2 1 3 5 3 5 3
      1 2 1 2 1               END FILL
ARA=3  NUX=5 NUY=1 NUZ=1
COM='TOTAL'
FILL  9 12 14 13 10  END FILL
```

Table A.3 (continued)

```
END ARRAY
READ PLOT TTL='XZ SLICE OF RFP1 SHOWING MATERIAL REGIONS'
XUL=-2  YUL=64.05 ZUL=136
XLR=137 YLR=64.05 ZLR=-2
UAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF NORTH CORE SECOND ROW'
XUL=28  YUL=-2   ZUL=136
XLR=28  YLR=136 ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF SOUTH CORE SECOND ROW'
XUL=80 YUL=-2   ZUL=136
XLR=80 YLR=136  ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'
END PLOT
READ START  NST=1
XSM=15 XSP=122 YSM=15 YSP=122 ZSM=30 ZSP=122  END START
END DATA
END
```

```
CAR06
=CSAS25
ROCKY FLATS CRITICALS NUREG/CR-0674 EXPERIMENT NUMBER ? (27 GROUP MODEL)
' FUEL CUBE 15.28 CM, U(4.46)308 @ H/U=0.77, HI ENRICHED SPHERE DRIVEN
27GROUPNDF4  INFHOMMEDIUM
U308  1 5.4078E-1 293.0 92234 0.03 92235 4.46 92236 0.08 92238 95.43 END
H2O   1 8.9514E-2 END
ARBM-BAGGIE  1.0 3 0 0 0 1001 14.01 6012 84.9 8016 1.20 1 1.9134E-2
   END
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 2 9.5390E-1
   END
ARBM-TAPE(VINYL)  1.0 7 0 0 0 1001 5.92 6012 45.91 8016 10.82 17000
   25.73 20040 6.9 22000 1.6 82000 1.1 2 1.1115E-2 END
ARBM-TAPE(MYLAR)  1.0 3 0 0 0 1001 6.83 6012 65.50 8016 27.02 2
   1.7491E-2 END
ARBM-MODERATOR  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 3 END
ARBM-PLEX(REG)  1.0 3 0 0 0 1001 7.84 6012 59.59 8016 32.23 4
   1.1773 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 4
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 4
   1.1648E-3 END
ARBM-PLEX(TRIS)  1.0 8 0 0 1 1001 7.16 6012 52.03 7014 0.16 8016 29.82
   15031 1.02 17000 1.81 35079 4.260 35081 2.840 5 1.2757 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 5
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 5
   1.1648E-3 END
ARBM-FILLER  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 6 0.7 END
' THIS MATERIAL IS ACTUALLY MODERATOR ADJUSTED FOR THE VOLUME
' FRACTION OF THE VOID FILLED BETWEEN CORE AND REFLECTOR.
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 7 2.715  END
URANIUM  8 0.9516 293.0 92234 1.0 92235 93.19 92236 0.4 92238  5.41 END
ARBM-PJ  0.816 2 0 0 0 1001 85.1 6012 14.9 8 0.0041  END
SS304  9 1.0 END
END COMP
ROCKY FLATS CRITICALS NUREG/CR-0674 EXPERIMENT NUMBER ? (27 GROUP MODEL)
' FUEL CUBE 15.28 CM, U(4.46)308 @ H/U=0.77, HI ENRICHED SPHERE DRIVEN
READ PARM  NPG=600 NUB=YES FDN=YES PLT=NO  END PARM
READ GEOM
```

```
UNIT  1
COM='FUEL BOX WITH VOID AND PART OF AL BOX'
CUBOID  0 1 9.80  0.0 3.75   0.0   14.98 0.0
CUBOID  2 1 9.95  0.0 3.90  -0.15  14.98 0.0
CUBOID  1 1 14.98 0.0 9.365 -5.615 14.98 0.0
UNIT  2
COM='FRONT OF FUEL BOX'
CUBOID  2 1 0.15 0.0  5.615 0.0 14.98 0.0
CUBOID  0 1 0.15 0.0  9.365 0.0 14.98 0.0
CUBOID  2 1 0.15 0.0 14.98  0.0 14.98 0.0
UNIT  3
COM='REAR OF FUEL BOX'
CUBOID  2 1 0.15 0.0 14.98  0.0 14.98 0.0
UNIT  4
COM='ARRAY TO ASSEMBLE PART OF BOX'
ARRAY 26 3*0
UNIT  5
COM='TOP AND BOTTOM OF BOX'
CUBOID  0 1  9.80 0.0 3.750  0.0   0.15 0.0
CUBOID  2 1 15.28 0.0 9.365 -5.615 0.15 0.0
GLOBAL
UNIT  6
COM='ARRAY TO ASSEMBLE TOP AND BOTTOM'
ARRAY 27 3*0
CUBOID  2 1 15.28   0.0    15.13  -0.15   15.28   0.0
CUBOID  0 1 15.305 -0.025 15.155 -0.175 15.305 -0.025
UNIT  7
COM='FUEL BOX 15.28 CM ON A SIDE WITH .15 CM WALLS .05CM STACKING VOID'
CUBOID  1 1 6P7.49
CUBOID  2 1 6P7.64
CUBOID  0 1 6P7.6650
UNIT  8
COM='BOX FOR DRIVER'
CYLINDER  9 1 0.3175 2P7.32
HEMISPHE+X  8 1 7.334  CHORD 6.818
CUBOID  0 1 8.512 -6.818 2P7.665 2P7.665
HOLE  37 0.0 0.0 -7.665
UNIT  34
COM='ALUMINUM WEIGHT DISTRIBUTION PLATE FOR SPECIAL BOX'
CUBOID  0 1  9.80 0.0 3.750  0.0  0.16 0.0
CUBOID  7 1 15.33 0.0 9.54 -5.79 0.16 0.0
UNIT  35
COM='ALUMINUM WEIGHT DISTRIBUTION PLATE FOR BOXES'
CUBOID  7 1  4P7.665 0.16 0.0
UNIT  37
COM='DRIVER MOUNT'
CYLINDER  9 1 1.56 0.331 0.0
UNIT  9
COM='NORTH SPLIT TABLE CORE'
ARRAY 1 3*0.0
CUBOID  0 1 30.66 -0.94 77.5 0.0 83.475 0.0
UNIT  10
COM='SOUTH SPLIT TABLE CORE'
ARRAY 2 3*0.0
CUBOID  0 1 49.4 0.0 77.5 0.0 83.475 0.0
UNIT  11
COM='PLEXIGLASS REFLECTOR SHEET WITHOUT TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  4 1 2P15.8000 2P38.7500 2P0.6150
UNIT  12
COM='PLEXIGLASS REFLECTOR SHEET WITH TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  5 1 2P15.8000 2P38.7500 2P0.6150
UNIT  13
COM='UPPER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P8.24
```

Table A.3 (continued)

```
UNIT  14
COM='LOWER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P3.69
UNIT  15
COM='NORTH BOTTOM REFLECTOR INCLUDES REGULAR AND TRIS'
ARRAY 3 3*0.0
UNIT  16
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITHOUT TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P0.6150
CUBOID  4 1 44.3 -5.1 2P38.75  2P0.615
UNIT  17
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P0.6150
CUBOID  5 1 44.3 -5.1 2P38.75 2P0.6150
UNIT  18
COM='LOWER PORTION SOUTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P8.855
CUBOID  5 1 44.3 -5.1 2P38.75 2P8.855
UNIT  19
COM='SOUTH BOTTOM REFLECTOR WITH REGULAR AND TRIS'
ARRAY 4 3*0.0
UNIT  20
COM='EAST AND WEST REFLECTORS FOR NORTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P12.65 2P54.2825
UNIT  21
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR NORTH REFLECTOR'
ARRAY 5 3*0.0
UNIT  22
COM='EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P24.700 2P12.65 2P54.2825
UNIT  23
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR'
ARRAY 6 3*0.0
UNIT  24
COM='NORTH TOP REFLECTOR WITH TRIS'
CUBOID  5 1 2P28.35 2P64.05 2P12.15
UNIT  25
COM='ARRAY FOR NORTH TOP REFLECTOR'
ARRAY 7 3*0.0
UNIT  26
COM='SOUTH TOP REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P12.15
CUBOID  5 1 69.4 -5.1 2P64.05 2P12.15
UNIT  27
COM='ARRAY FOR SOUTH TOP REFLECTOR'
ARRAY 8 3*0.0
UNIT  28
COM='NORTH END REFLECTOR 9.8CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P4.9000 2P64.0500 2P54.2825
UNIT  29
COM='NORTH END RELFECTOR 5.2 CM PORTION WITH TRIS'
CUBOID  5 1 2P2.6 2P64.0500 2P54.2825
UNIT  30
COM='NORTH END RELFECTOR 10.1 CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P5.05 2P64.05 2P54.2825
UNIT  31
COM='ARRAY FOR NORTH END REFLECTOR'
ARRAY 9 3*0.0
UNIT  32
COM='SOUTH END REFLECTOR'
CUBOID  5 1 2P12.55 2P64.05 2P54.2825
UNIT  33
COM='ARRAY FOR SOUTH END REFLECTOR'
ARRAY 10 3*0.0
UNIT  38
COM='NORTH CORE WITH BOTTOM REFLECTOR'
ARRAY 13 3* 0.0
UNIT  39
COM='NORTH CORE WITH EAST AND WEST REFLECTOR'
ARRAY 14 3*0.0
UNIT  40
COM='NORTH CORE WITH END REFLECTOR'
ARRAY 15 3*0.0
UNIT  42
COM='NORTH CORE WITH TOP REFLECTOR'
ARRAY 16 3*0.0
UNIT  48
COM='SOUTH CORE WITH BOTTOM REFLECTORS'
ARRAY 20 3*0.0
UNIT  49
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 21 3*0.0
UNIT  50
COM='SOUTH CORE END REFLECTOR'
ARRAY 22 3*0.0
UNIT  52
COM='SOUTH CORE WITH TOP REFLECTOR'
ARRAY 23 3*0.0
UNIT  54
COM='AIR GAP'
HEMISPHE-X  8 1 7.334  CHORD -6.818
CUBOID  0 1 -6.818 -7.619 64.475 -63.625 69.13 -63.735
GLOBAL
UNIT  55
COM='TOTAL'
ARRAY 25 3*0.0
END GEOMETRY
READ ARRAY
ARA=1  NUX=2 NUY=5 NUZ=9
COM='NORTH SPLIT TABLE CORE'
FILL  10R7
      10R35
      10R7
      10R35
      10R7
      10R35
      10R7
      10R35
      10R7   END FILL
ARA=2  NUX=3 NUY=5 NUZ=9
COM='SOUTH SPLIT TABLE CORE'
FILL  6R7 6 8R7
      6R35 34 8R35
      6R7 6 8R7
      6R35 34 8R35
      6R7 8 8R7
      6R35 34 8R35
      6R7 6 8R7
      6R35 34 8R35
      6R7 6 8R7  END FILL
ARA=3  NUX=1 NUY=1 NUZ=3
COM='NORTH BOTTOM REFLECTOR'
FILL  14 11 13  END FILL
ARA=4  NUX=1 NUY=1 NUZ=7
COM='SOUTH BOTTOM REFLECTOR'
FILL  18 16 17 16 16 17 17  END FILL
ARA=5  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF NORTH REFLECTOR'
FILL  20 END FILL
```

Table A.3 (continued)

```
ARA=6  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF SOUTH REFLECTOR'
FILL  22  END FILL
ARA=7  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR NORTH TOP REFLECTOR'
FILL  24  END FILL
ARA=8  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH TOP REFLECTOR'
FILL  26 END FILL
ARA=9  NUX=3 NUY=1 NUZ=1
COM='ARRAY FOR NORTH END REFLECTOR'
FILL  28 29 30  END FILL
ARA=10  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH END REFLECTOR'
FILL  32  END FILL
ARA=13  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF NORTH CORE WITH BOTTOM REFLECTOR'
FILL  15 9  END FILL
ARA=14  NUX=1 NUY=3 NUZ=1
COM='NORTH CORE WITH SIDE REFLECTORS'
FILL  21 38 21  END FILL
ARA=15  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH END REFLECTOR'
FILL  31 39  END FILL
ARA=16  NUX=1 NUY=1 NUZ=2
COM='NORTH CORE WITH TOP REFLECTOR'
FILL  40 25  END FILL
ARA=20  NUX=1 NUY=1 NUZ=2
COM='SOUTH CORE WITH BOTTOM REFLECTOR'
FILL  19 10  END FILL
ARA=21 NUX=1 NUY=3 NUZ=1
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
FILL  23 48 23  END FILL
ARA=22 NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH END REFLECTOR'
FILL  49 33  END FILL
ARA=23  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH TOP REFLECTOR'
FILL  50 27  END FILL
ARA=25  NUX=3 NUY=1 NUZ=1
COM='TOTAL'
FILL  42 54 52  END FILL
ARA=26  NUX=3 NUY=1 NUZ=1
COM='ASSEMBLY OF FUEL BOX FRONT AND REAR'
FILL  2 1 3  END FILL
ARA=27  NUX=1 NUY=1 NUZ=3
COM='ASSEMBLY OF FUEL BOX TOP AND BOTTOM'
FILL  5 4 5  END FILL
END ARRAY
READ PLOT TTL='YZ SLICE OF SOUTH CORE FIRST ROW'
XUL=64.319 YUL=55.625 ZUL=71.735
XLR=64.319 YLR=71.625 ZLR=55.735
VAX=1  WDN=-1 NAX=130  NCH='012345678'END
TTL='XZ SLICE OF SPHERE CUBOID'
XUL=56.0 YUL=63.625 ZUL=71.735
XLR=72.0 YLR=63.625 ZLR=55.735
UAX=1  WDN=-1 NAX=130  NCH='012345678'
END PLOT
' READ START  NST=6 TFX=65 TFY=63.625 TFZ=63.735 LNU=300  END START
READ START  NST=1 XSM=56.981 XSP=71.649 YSM=56.219 YSP=70.959
  ZSM=56.401 ZSP=71.069   END START
END DATA
END
```

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CAR07
=CSAS25
ROCKY FLATS CRITICALS NUREG/CR-0674 EXPERIMENT NUMBER ? (27 GROUP MODEL)
' FUEL CUBE 15.28 CM, U(4.46)308 @ H/U=0.77, HI CONC. SOLUTION DRIVEN
27GROUPNDF4  INFHOMMEDIUM
U3O8  1 5.4078E-1 293.0 92234 0.03 92235 4.46 92236 0.08 92238 95.43 END
H2O   1 8.9514E-2 END
ARBM-BAGGIE  1.0 3 0 0 0 1001 14.01 6012 84.9 8016 1.20 1 1.9134E-2
   END
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 2 9.5390E-1
   END
ARBM-TAPE(VINYL)  1.0 7 0 0 0 1001 5.92 6012 45.91 8016 10.82 17000
   25.73 20040 6.9 22000 1.6 82000 1.1 2 1.1115E-2 END
ARBM-TAPE(MYLAR)  1.0 3 0 0 0 1001 6.83 6012 65.50 8016 27.02 2
   1.7491E-2 END
ARBM-MODERATOR  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 3 END
ARBM-PLEX(REG)  1.0 3 0 0 0 1001 7.84 6012 59.59 8016 32.23 4
   1.1773 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 4
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 4
   1.1648E-3 END
ARBM-PLEX(TRIS)  1.0 8 0 0 1 1001 7.16 6012 52.03 7014 0.16 8016 29.82
   15031 1.02 17000 1.81 35079 4.260 35081 2.840 5 1.2757 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 5
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 5
   1.1648E-3 END
ARBM-FILLER  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 6 0.7 END
' THIS MATERIAL IS ACTUALLY MODERATOR ADJUSTED FOR THE VOLUME
' FRACTION OF THE VOID FILLED BETWEEN CORE AND REFLECTOR.
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 7 2.715  END
SOLNUO2(NO3)2  8 351.18 0.549 1.0 293.0 92234 1.022 92235 93.172
   92236 0.434 92238 5.372  END
SS304  9 1.0 END
END COMP
ROCKY FLATS CRITICALS NUREG/CR-0674 EXPERIMENT NUMBER ? (27 GROUP MODEL)
' FUEL CUBE 15.28 CM, U(4.46)308 @ H/U=0.77, HI CONC. SOLUTION DRIVEN
READ PARM  NPG=600 NUB=YES FDN=YES PLT=NO  END PARM
READ GEOM
UNIT  1
COM='FUEL BOX WITH VOID AND PART OF AL BOX'
CUBOID  0 1 9.80  0.0 3.75    0.0    14.98 0.0
CUBOID  2 1 9.95  0.0 3.90   -0.15   14.98 0.0
CUBOID  1 1 14.98 0.0 9.365 -5.615  14.98 0.0
UNIT  2
COM='FRONT OF FUEL BOX'
CUBOID  2 1 0.15 0.0   5.615 0.0 14.98 0.0
CUBOID  0 1 0.15 0.0   9.365 0.0 14.98 0.0
CUBOID  2 1 0.15 0.0 14.98  0.0 14.98 0.0
UNIT  3
COM='REAR OF FUEL BOX'
CUBOID  2 1 0.15 0.0 14.98  0.0 14.98 0.0
UNIT  4
COM='ARRAY TO ASSEMBLE PART OF BOX'
ARRAY 26 3*0
UNIT  5
COM='TOP AND BOTTOM OF BOX'
CUBOID  0 1  9.80 0.0 3.750  0.0   0.15 0.0
CUBOID  2 1 15.28 0.0 9.365 -5.615 0.15 0.0
GLOBAL
```

Table A.3 (continued)

```
UNIT  6
COM='ARRAY TO ASSEMBLE TOP AND BOTTOM'
ARRAY 27 3*0
CUBOID  2 1 15.28   0.0   15.13  -0.15  15.28   0.0
CUBOID  0 1 15.305 -0.025 15.155 -0.175 15.305 -0.025
UNIT  7
COM='FUEL BOX 15.28 CM ON A SIDE WITH .15 CM WALLS .05CM STACKING VOID'
CUBOID  1 1 6P7.49
CUBOID  2 1 6P7.64
CUBOID  0 1 6P7.6650
UNIT  34
COM='ALUMINUM WEIGHT DISTRIBUTION PLATE FOR SPECIAL BOX'
CUBOID  0 1  9.80 0.0 3.750  0.0   0.16 0.0
CUBOID  7 1 15.33 0.0 9.54 -5.79 0.16 0.0
UNIT  35
COM='ALUMINUM WEIGHT DISTRIBUTION PLATE FOR BOXES'
CUBOID  7 1  4P7.665 0.16 0.0
UNIT  9
COM='NORTH SPLIT TABLE CORE'
ARRAY 1 3*0.0
CUBOID  0 1 30.66 -0.94 77.5 0.0 83.475 0.0
UNIT  10
COM='SOUTH SPLIT TABLE CORE'
ARRAY 2 3*0.0
CUBOID  0 1 49.4 0.0 77.5 0.0 83.475 0.0
UNIT  11
COM='PLEXIGLASS REFLECTOR SHEET WITHOUT TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  4 1 2P15.8000 2P38.7500 2P0.6150
UNIT  12
COM='PLEXIGLASS REFLECTOR SHEET WITH TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  5 1 2P15.8000 2P38.7500 2P0.6150
UNIT  13
COM='UPPER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P8.24
UNIT  14
COM='LOWER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P3.69
UNIT  15
COM='NORTH BOTTOM REFLECTOR INCLUDES REGULAR AND TRIS'
ARRAY 3 3*0.0
UNIT  16
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITHOUT TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P0.6150
CUBOID  4 1 44.3 -5.1 2P38.75  2P0.615
UNIT  17
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P0.6150
CUBOID  5 1 44.3 -5.1 2P38.75 2P0.6150
UNIT  18
COM='LOWER PORTION SOUTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P8.855
CUBOID  5 1 44.3 -5.1 2P38.75 2P8.855
UNIT  19
COM='SOUTH BOTTOM REFLECTOR WITH REGULAR AND TRIS'
ARRAY 4 3*0.0
UNIT  20
COM='EAST AND WEST REFLECTORS FOR NORTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P12.65 2P54.2825
UNIT  21
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR NORTH REFLECTOR'
ARRAY 5 3*0.0
UNIT  22
COM='EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P24.700 2P12.65 2P54.2825
```

```
UNIT  23
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR'
ARRAY 6 3*0.0
UNIT  24
COM='NORTH TOP REFLECTOR WITH TRIS'
CUBOID  5 1 2P28.35 2P64.05 2P12.15
UNIT  25
COM='ARRAY FOR NORTH TOP REFLECTOR'
ARRAY 7 3*0.0
UNIT  26
COM='SOUTH TOP REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P12.15
CUBOID  5 1 69.4 -5.1 2P64.05 2P12.15
UNIT  27
COM='ARRAY FOR SOUTH TOP REFLECTOR'
ARRAY 8 3*0.0
UNIT  28
COM='NORTH END REFLECTOR 9.8CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P4.9000 2P64.0500 2P54.2825
UNIT  29
COM='NORTH END RELFECTOR 5.2 CM PORTION WITH TRIS'
CUBOID  5 1 2P2.6 2P64.0500 2P54.2825
UNIT  30
COM='NORTH END RELFECTOR 10.1 CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P5.05 2P64.05 2P54.2825
UNIT  31
COM='ARRAY FOR NORTH END REFLECTOR'
ARRAY 9 3*0.0
UNIT  32
COM='SOUTH END REFLECTOR'
CUBOID  5 1 2P12.55 2P64.05 2P54.2825
UNIT  33
COM='ARRAY FOR SOUTH END REFLECTOR'
ARRAY 10 3*0.0
UNIT  38
COM='NORTH CORE WITH BOTTOM REFLECTOR'
ARRAY 13 3* 0.0
UNIT  39
COM='NORTH CORE WITH EAST AND WEST REFLECTOR'
ARRAY 14 3*0.0
UNIT  40
COM='NORTH CORE WITH END REFLECTOR'
ARRAY 15 3*0.0
UNIT  42
COM='NORTH CORE WITH TOP REFLECTOR'
ARRAY 16 3*0.0
UNIT  48
COM='SOUTH CORE WITH BOTTOM REFLECTORS'
ARRAY 20 3*0.0
UNIT  49
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 21 3*0.0
UNIT  50
COM='SOUTH CORE END REFLECTOR'
ARRAY 22 3*0.0
UNIT  52
COM='SOUTH CORE WITH TOP REFLECTOR'
ARRAY 23 3*0.0
UNIT  54
COM='AIR GAP'
CUBOID  0 1 0.942 0.0 64.475 -63.625 69.13 -63.735
GLOBAL
UNIT  55
COM='TOTAL'
ARRAY 25 3*0.0
```

Table A.3 (continued)

```
UNIT  56
COM='COMBINATION OF TWO REGULAR FUEL BOXES'
ARRAY 28 3*0.0
UNIT  57
COM='COMBINATION OF REGULAR FUEL BOX AND SPECIAL FUEL BOX'
ARRAY 29 3*0.0
UNIT  58
COM='COMBINATION OF TWO REGULAR WEIGHT DISTRIBUTION PLATES'
ARRAY 30 3*0.0
UNIT  59
COM='COMBINATION OF REGULAR AND SPECIAL WEIGHT DISTRIBUTION PLATES'
ARRAY 31 3*0.0
UNIT  60
COM='NORTH CORE SOLUTION DRIVER'
CUBOID  8 1 2P7.5 2P14.9 3.710 -7.5
CUBOID  0 1 2P7.5 2P14.9 2P7.5
CUBOID  9 1 2P7.65 2P15.05 2P7.65
CUBOID  0 1 2P7.665 2P15.33 2P7.665
UNIT  61
COM='NORTH CORE SOLUTION DRIVER'
CUBOID  8 1 2P7.5 2P14.9 3.630 -7.5
CUBOID  0 1 2P7.5 2P14.9 2P7.5
CUBOID  9 1 2P7.65 2P15.05 2P7.65
CUBOID  0 1 2P7.665 2P15.33 2P7.665
END GEOMETRY
READ ARRAY
ARA=1  NUX=2 NUY=4 NUZ=9
COM='NORTH SPLIT TABLE CORE'
FILL    2R7  2R56  4R7
        2R35 2R58  4R35
        2R7  2R56  4R7
        2R35 2R58  4R35
        2R7  56 60 4R7
        2R35 2R58  4R35
        2R7  2R56  4R7
        2R35 2R58  4R35
        2R7  2R56  4R7
END FILL
ARA=2  NUX=3 NUY=4 NUZ=9
COM='SOUTH SPLIT TABLE CORE'
FILL    3R7  3R56      6R7
        3R35 3R58      6R35
        3R7  3R56      6R7
        3R35 3R58      6R35
        3R7  61 56 56  6R7
        3R35 3R58      6R35
        3R7  57 56 56  6R7
        3R35 59 58 58  6R35
        3R7  57 56 56  6R7
END FILL
ARA=3  NUX=1 NUY=1 NUZ=3
COM='NORTH BOTTOM REFLECTOR'
FILL  14 11 13  END FILL
ARA=4  NUX=1 NUY=1 NUZ=7
COM='SOUTH BOTTOM REFLECTOR'
FILL  18 16 17 16 16 17 17  END FILL
ARA=5  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF NORTH REFLECTOR'
FILL  20 END FILL
ARA=6  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF SOUTH REFLECTOR'
FILL  22  END FILL
ARA=7  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR NORTH TOP REFLECTOR'
FILL  24  END FILL
ARA=8  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH TOP REFLECTOR'
FILL  26 END FILL
ARA=9  NUX=3 NUY=1 NUZ=1
COM='ARRAY FOR NORTH END REFLECTOR'
FILL  28 29 30  END FILL
ARA=10  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH END REFLECTOR'
FILL  32  END FILL
ARA=13  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF NORTH CORE WITH BOTTOM REFLECTOR'
FILL  15 9  END FILL
ARA=14  NUX=1 NUY=3 NUZ=1
COM='NORTH CORE WITH SIDE REFLECTORS'
FILL  21 38 21  END FILL
ARA=15  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH END REFLECTOR'
FILL  31 39  END FILL
ARA=16  NUX=1 NUY=1 NUZ=2
COM='NORTH CORE WITH TOP REFLECTOR'
FILL  40 25  END FILL
ARA=20  NUX=1 NUY=1 NUZ=2
COM='SOUTH CORE WITH BOTTOM REFLECTOR'
FILL  19 10  END FILL
ARA=21 NUX=1 NUY=3 NUZ=1
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
FILL  23 48 23  END FILL
ARA=22 NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH END REFLECTOR'
FILL  49 33  END FILL
ARA=23  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH TOP REFLECTOR'
FILL  50 27  END FILL
ARA=25  NUX=3 NUY=1 NUZ=1
COM='TOTAL'
FILL  42 54 52  END FILL
ARA=26  NUX=3 NUY=1 NUZ=1
COM='ASSEMBLY OF FUEL BOX FRONT AND REAR'
FILL  2 1 3  END FILL
ARA=27  NUX=1 NUY=1 NUZ=3
COM='ASSEMBLY OF FUEL BOX TOP AND BOTTOM'
FILL  5 4 5  END FILL
ARA=28  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF TWO FUEL BOXES'
FILL  7 7  END FILL
ARA=29  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF SPECIAL AND REGULAR FUEL BOXES'
FILL  7 6  END FILL
ARA=30  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF TWO WEIGHT DISTRIBUTION PLATES'
FILL  35 35  END FILL
ARA=31  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF SPECIAL AND REGULAR WEIGHT DISTRIBUTION PLATES'
FILL  35 34  END FILL
END ARRAY
READ PLOT TTL='YZ SLICE OF SOUTH CORE FIRST ROW'
XUL=64.319 YUL=40.000 ZUL=72.000
XLR=64.319 YLR=72.000 ZLR=56.000
VAX=1  WDN=-1 NAX=130  NCH='012345678'END
TTL='XZ SLICE OF SPHERE CUBOID'
XUL=56.0 YUL=63.625 ZUL=71.735
XLR=72.0 YLR=63.625 ZLR=55.735
UAX=1  WDN=-1 NAX=130  NCH='012345678'
END PLOT
```

Table A.3 (continued)

```
READ START  NST=1 XSM=41.37 XSP=72.894 YSM=40.63 YSP=71.29
  ZSM=56.071 ZSP=71.4    END START
END DATA
END




CAR08
=CSAS25
ROCKY FLATS CRITICALS NUREG/CR-0674 EXPERIMENT NUMBER ? (27 GROUP MODEL)
' FUEL CUBE 15.28 CM, U(4.46)308 @ H/U=0.77, LOW CONC. SOLUTION DRIVEN
27GROUPNDF4  INFHOMMEDIUM
U308   1 5.4078E-1 293.0 92234 0.03 92235 4.46 92236 0.08 92238 95.43 END
H2O    1 8.9514E-2 END
ARBM-BAGGIE  1.0 3 0 0 0 1001 14.01 6012 84.9 8016 1.20 1 1.9134E-2
   END
ARBM-AL1100   1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 2 9.5390E-1
   END
ARBM-TAPE(VINYL)  1.0 7 0 0 0 1001 5.92 6012 45.91 8016 10.82 17000
   25.73 20040 6.9 22000 1.6 82000 1.1 2 1.1115E-2 END
ARBM-TAPE(MYLAR)  1.0 3 0 0 0 1001 6.83 6012 65.50 8016 27.02 2
   1.7491E-2 END
ARBM-MODERATOR  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 3 END
ARBM-PLEX(REG)  1.0 3 0 0 0 1001 7.84 6012 59.59 8016 32.23 4
   1.1773 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 4
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 4
   1.1648E-3 END
ARBM-PLEX(TRIS)  1.0 8 0 0 1 1001 7.16 6012 52.03 7014 0.16 8016 29.82
   15031 1.02 17000 1.81 35079 4.260 35081 2.840 5 1.2757 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 5
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 5
   1.1648E-3 END
ARBM-FILLER  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 6 0.7 END
' THIS MATERIAL IS ACTUALLY MODERATOR ADJUSTED FOR THE VOLUME
' FRACTION OF THE VOID FILLED BETWEEN CORE AND REFLECTOR.
ARBM-AL1100   1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 7 2.715   END
SOLNUO2(NO3)2  8 86.42 0.149 1.0 293.0 92234 1.022 92235 93.172
   92236 0.434 92238 5.372   END
SS304  9 1.0 END
END COMP
ROCKY FLATS CRITICALS NUREG/CR-0674 EXPERIMENT NUMBER ? (27 GROUP MODEL)
' FUEL CUBE 15.28 CM, U(4.46)308 @ H/U=0.77, LOW CONC. SOLUTION DRIVEN
READ PARM  NPG=600 NUB=YES FDN=YES PLT=NO  END PARM
READ GEOM
UNIT  1
COM='FUEL BOX WITH VOID AND PART OF AL BOX'
CUBOID  0 1 9.80  0.0 3.75   0.0   14.98 0.0
CUBOID  2 1 9.95  0.0 3.90  -0.15  14.98 0.0
CUBOID  1 1 14.98 0.0 9.365 -5.615 14.98 0.0
UNIT  2
COM='FRONT OF FUEL BOX'
CUBOID  2 1 0.15 0.0  5.615 0.0 14.98 0.0
CUBOID  0 1 0.15 0.0  9.365 0.0 14.98 0.0
CUBOID  2 1 0.15 0.0 14.98  0.0 14.98 0.0
UNIT  3
COM='REAR OF FUEL BOX'
CUBOID  2 1 0.15 0.0 14.98   0.0 14.98 0.0
UNIT  4
COM='ARRAY TO ASSEMBLE PART OF BOX'
ARRAY 26 3*0
UNIT  5
COM='TOP AND BOTTOM OF BOX'
CUBOID  0 1  9.80 0.0 3.750  0.0   0.15 0.0
CUBOID  2 1 15.28 0.0 9.365 -5.615 0.15 0.0
GLOBAL
UNIT  6
COM='ARRAY TO ASSEMBLE TOP AND BOTTOM'
ARRAY 27 3*0
CUBOID  2 1 15.28   0.0   15.13  -0.15  15.28   0.0
CUBOID  0 1 15.305 -0.025 15.155 -0.175 15.305 -0.025
UNIT  7
COM='FUEL BOX 15.28 CM ON A SIDE WITH .15 CM WALLS .05CM STACKING VOID'
CUBOID  1 1 6P7.49
CUBOID  2 1 6P7.64
CUBOID  0 1 6P7.6650
UNIT  34
COM='ALUMINUM WEIGHT DISTRIBUTION PLATE FOR SPECIAL BOX'
CUBOID  0 1  9.80 0.0 3.750  0.0   0.16 0.0
CUBOID  7 1 15.33 0.0 9.54 -5.79 0.16 0.0
UNIT  35
COM='ALUMINUM WEIGHT DISTRIBUTION PLATE FOR BOXES'
CUBOID  7 1  4P7.665 0.16 0.0
UNIT  9
COM='NORTH SPLIT TABLE CORE'
ARRAY 1 3*0.0
CUBOID  0 1 30.66 -0.94 77.5 0.0 83.475 0.0
UNIT  10
COM='SOUTH SPLIT TABLE CORE'
ARRAY 2 3*0.0
CUBOID  0 1 49.4 0.0 77.5 0.0 83.475 0.0
UNIT  11
COM='PLEXIGLASS REFLECTOR SHEET WITHOUT TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  4 1 2P15.8000 2P38.7500 2P0.6150
UNIT  12
COM='PLEXIGLASS REFLECTOR SHEET WITH TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  5 1 2P15.8000 2P38.7500 2P0.6150
UNIT  13
COM='UPPER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P8.24
UNIT  14
COM='LOWER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P3.69
UNIT  15
COM='NORTH BOTTOM REFLECTOR INCLUDES REGULAR AND TRIS'
ARRAY 3 3*0.0
UNIT  16
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITHOUT TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P0.6150
CUBOID  4 1 44.3 -5.1 2P38.75  2P0.615
UNIT  17
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P0.6150
CUBOID  5 1 44.3 -5.1 2P38.75 2P0.6150
UNIT  18
COM='LOWER PORTION SOUTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P8.855
CUBOID  5 1 44.3 -5.1 2P38.75 2P8.855
UNIT  19
COM='SOUTH BOTTOM REFLECTOR WITH REGULAR AND TRIS'
ARRAY 4 3*0.0
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UNIT  20
COM='EAST AND WEST REFLECTORS FOR NORTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P12.65 2P54.2825
UNIT  21
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR NORTH REFLECTOR'
ARRAY 5 3*0.0
UNIT  22
COM='EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P24.700 2P12.65 2P54.2825
UNIT  23
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR'
ARRAY 6 3*0.0
UNIT  24
COM='NORTH TOP REFLECTOR WITH TRIS'
CUBOID  5 1 2P28.35 2P64.05 2P12.15
UNIT  25
COM='ARRAY FOR NORTH TOP REFLECTOR'
ARRAY 7 3*0.0
UNIT  26
COM='SOUTH TOP REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P12.15
CUBOID  5 1 69.4 -5.1 2P64.05 2P12.15
UNIT  27
COM='ARRAY FOR SOUTH TOP REFLECTOR'
ARRAY 8 3*0.0
UNIT  28
COM='NORTH END REFLECTOR 9.8CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P4.9000 2P64.0500 2P54.2825
UNIT  29
COM='NORTH END RELFECTOR 5.2 CM PORTION WITH TRIS'
CUBOID  5 1 2P2.6 2P64.0500 2P54.2825
UNIT  30
COM='NORTH END RELFECTOR 10.1 CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P5.05 2P64.05 2P54.2825
UNIT  31
COM='ARRAY FOR NORTH END REFLECTOR'
ARRAY 9 3*0.0
UNIT  32
COM='SOUTH END REFLECTOR'
CUBOID  5 1 2P12.55 2P64.05 2P54.2825
UNIT  33
COM='ARRAY FOR SOUTH END REFLECTOR'
ARRAY 10 3*0.0
UNIT  38
COM='NORTH CORE WITH BOTTOM REFLECTOR'
ARRAY 13 3* 0.0
UNIT  39
COM='NORTH CORE WITH EAST AND WEST REFLECTOR'
ARRAY 14 3*0.0
UNIT  40
COM='NORTH CORE WITH END REFLECTOR'
ARRAY 15 3*0.0
UNIT  42
COM='NORTH CORE WITH TOP REFLECTOR'
ARRAY 16 3*0.0
UNIT  48
COM='SOUTH CORE WITH BOTTOM REFLECTORS'
ARRAY 20 3*0.0
UNIT  49
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 21 3*0.0
UNIT  50
COM='SOUTH CORE END REFLECTOR'
ARRAY 22 3*0.0
UNIT  52
COM='SOUTH CORE WITH TOP REFLECTOR'
ARRAY 23 3*0.0
UNIT  54
COM='AIR GAP'
CUBOID  0 1 0.912 0.0 64.475 -63.625 69.13 -63.735
GLOBAL
UNIT  55
COM='TOTAL'
ARRAY 25 3*0.0
UNIT  56
COM='COMBINATION OF TWO REGULAR FUEL BOXES'
ARRAY 28 3*0.0
UNIT  57
COM='COMBINATION OF REGULAR FUEL BOX AND SPECIAL FUEL BOX'
ARRAY 29 3*0.0
UNIT  58
COM='COMBINATION OF TWO REGULAR WEIGHT DISTRIBUTION PLATES'
ARRAY 30 3*0.0
UNIT  59
COM='COMBINATION OF REGULAR AND SPECIAL WEIGHT DISTRIBUTION PLATES'
ARRAY 31 3*0.0
UNIT  60
COM='NORTH CORE SOLUTION DRIVER'
CUBOID  8 1 2P7.5 2P14.9 5.374 -7.5
CUBOID  0 1 2P7.5 2P14.9 2P7.5
CUBOID  9 1 2P7.65 2P15.05 2P7.65
CUBOID  0 1 2P7.665 2P15.33 2P7.665
UNIT  61
COM='NORTH CORE SOLUTION DRIVER'
CUBOID  8 1 2P7.5 2P14.9 5.328 -7.5
CUBOID  0 1 2P7.5 2P14.9 2P7.5
CUBOID  9 1 2P7.65 2P15.05 2P7.65
CUBOID  0 1 2P7.665 2P15.33 2P7.665
END GEOMETRY
READ ARRAY
ARA=1  NUX=2 NUY=4 NUZ=9
COM='NORTH SPLIT TABLE CORE'
FILL    2R7  2R56  4R7
        2R35 2R58  4R35
        2R7  2R56  4R7
        2R35 2R58  4R35
        2R7  56 60 4R7
        2R35 2R58  4R35
        2R7  2R56  4R7
        2R35 2R58  4R35
        2R7  2R56  4R7
END FILL
ARA=2  NUX=3 NUY=4 NUZ=9
COM='SOUTH SPLIT TABLE CORE'
FILL    3R7  3R56      6R7
        3R35 3R58      6R35
        3R7  3R56      6R7
        3R35 3R58      6R35
        3R7  61 56 56  6R7
        3R35 3R58      6R35
        3R7  57 56 56  6R7
        3R35 59 58 58  6R35
        3R7  57 56 56  6R7
END FILL
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Table A.3 (continued)

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ARA=3  NUX=1 NUY=1 NUZ=3
COM='NORTH BOTTOM REFLECTOR'
FILL  14 11 13  END FILL
ARA=4  NUX=1 NUY=1 NUZ=7
COM='SOUTH BOTTOM REFLECTOR'
FILL  18 16 17 16 16 17 17  END FILL
ARA=5  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF NORTH REFLECTOR'
FILL  20 END FILL
ARA=6  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF SOUTH REFLECTOR'
FILL  22  END FILL
ARA=7  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR NORTH TOP REFLECTOR'
FILL  24  END FILL
ARA=8  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH TOP REFLECTOR'
FILL  26 END FILL
ARA=9  NUX=3 NUY=1 NUZ=1
COM='ARRAY FOR NORTH END REFLECTOR'
FILL  28 29 30  END FILL
ARA=10  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH END REFLECTOR'
FILL  32  END FILL
ARA=13  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF NORTH CORE WITH BOTTOM REFLECTOR'
FILL  15 9  END FILL
ARA=14  NUX=1 NUY=3 NUZ=1
COM='NORTH CORE WITH SIDE REFLECTORS'
FILL  21 38 21  END FILL
ARA=15  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH END REFLECTOR'
FILL  31 39  END FILL
ARA=16  NUX=1 NUY=1 NUZ=2
COM='NORTH CORE WITH TOP REFLECTOR'
FILL  40 25  END FILL
ARA=20  NUX=1 NUY=1 NUZ=2
COM='SOUTH CORE WITH BOTTOM REFLECTOR'
FILL  19 10  END FILL
ARA=21 NUX=1 NUY=3 NUZ=1
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
FILL  23 48 23  END FILL
ARA=22 NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH END REFLECTOR'
FILL  49 33  END FILL
ARA=23  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH TOP REFLECTOR'
FILL  50 27  END FILL
ARA=25  NUX=3 NUY=1 NUZ=1
COM='TOTAL'
FILL  42 54 52  END FILL
ARA=26  NUX=3 NUY=1 NUZ=1
COM='ASSEMBLY OF FUEL BOX FRONT AND REAR'
FILL  2 1 3  END FILL
ARA=27  NUX=1 NUY=1 NUZ=3
COM='ASSEMBLY OF FUEL BOX TOP AND BOTTOM'
FILL  5 4 5  END FILL
ARA=28  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF TWO FUEL BOXES'
FILL  7 7  END FILL
ARA=29  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF SPECIAL AND REGULAR FUEL BOXES'
FILL  7 6  END FILL
ARA=30  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF TWO WEIGHT DISTRIBUTION PLATES'
FILL  35 35  END FILL
ARA=31  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF SPECIAL AND REGULAR WEIGHT DISTRIBUTION PLATES'
FILL  35 34  END FILL
END ARRAY
READ PLOT TTL='YZ SLICE OF SOUTH CORE FIRST ROW'
XUL=64.319 YUL=40.000 ZUL=72.000
XLR=64.319 YLR=72.000 ZLR=56.000
VAX=1  WDN=-1 NAX=130  NCH='012345678'END
TTL='XZ SLICE OF SPHERE CUBOID'
XUL=56.0 YUL=63.625 ZUL=71.735
XLR=72.0 YLR=63.625 ZLR=55.735
UAX=1  WDN=-1 NAX=130  NCH='012345678'
END PLOT
READ START  NST=1 XSM=41.37 XSP=72.894 YSM=40.63 YSP=71.29
  ZSM=56.071 ZSP=71.4   END START
END DATA
END


CAR09
=CSAS25
ROCKY FLATS CRITICALS NUREG/CR-0674 EXPERIMENT NUMBER 2 (27 GROUP MODEL)
' FUEL CUBE 15.28 CM, U(4.46)308 @ H/U=0.77, LOW CONC. SOLUTION DRIVEN
27GROUPNDF4  INFHOMMEDIUM
U3O8  1 5.4078E-1 293.0 92234 0.03 92235 4.46 92236 0.08 92238 95.43 END
H2O   1 8.9514E-2 END
ARBM-BAGGIE  1.0 3 0 0 0 1001 14.01 6012 84.9 8016 1.20 1 1.9134E-2
   END
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 2 9.5390E-1
   END
ARBM-TAPE(VINYL)  1.0 7 0 0 0 1001 5.92 6012 45.91 8016 10.82 17000
   25.73 20040 6.9 22000 1.6 82000 1.1 2 1.1115E-2 END
ARBM-TAPE(MYLAR)  1.0 3 0 0 0 1001 6.83 6012 65.50 8016 27.02 2
   1.7491E-2 END
ARBM-MODERATOR  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 3 END
ARBM-PLEX(REG)  1.0 3 0 0 0 1001 7.84 6012 59.59 8016 32.23 4
   1.1773 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 4
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 4
   1.1648E-3 END
ARBM-PLEX(TRIS)  1.0 8 0 0 1 1001 7.16 6012 52.03 7014 0.16 8016 29.82
   15031 1.02 17000 1.81 35079 4.260 35081 2.840 5 1.2757 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 5
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 5
   1.1648E-3 END
ARBM-FILLER  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 6 0.7 END
' THIS MATERIAL IS ACTUALLY MODERATOR ADJUSTED FOR THE VOLUME
' FRACTION OF THE VOID FILLED BETWEEN CORE AND REFLECTOR.
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 7 2.715  END
SOLNUO2(NO3)2  8 86.42 0.149 1.0 293.0 92234 1.022 92235 93.172
   92236 0.434 92238 5.372  END
SS304  9 1.0 END
END COMP
ROCKY FLATS CRITICALS NUREG/CR-0674 EXPERIMENT NUMBER 2 (27 GROUP MODEL)
' FUEL CUBE 15.28 CM, U(4.46)308 @ H/U=0.77, LOW CONC. SOLUTION DRIVEN
READ PARM  NPG=600 NUB=YES FDN=YES PLT=NO  END PARM
READ GEOM
```

Table A.3 (continued)

```
UNIT  1
COM='FUEL BOX WITH VOID AND PART OF AL BOX'
CUBOID  0 1 9.80  0.0 3.75   0.0   14.98 0.0
CUBOID  2 1 9.95  0.0 3.90  -0.15  14.98 0.0
CUBOID  1 1 14.98 0.0 9.365 -5.615 14.98 0.0
UNIT  2
COM='FRONT OF FUEL BOX'
CUBOID  2 1 0.15 0.0  5.615 0.0 14.98 0.0
CUBOID  0 1 0.15 0.0  9.365 0.0 14.98 0.0
CUBOID  2 1 0.15 0.0 14.98  0.0 14.98 0.0
UNIT  3
COM='REAR OF FUEL BOX'
CUBOID  2 1 0.15 0.0 14.98  0.0 14.98 0.0
UNIT  4
COM='ARRAY TO ASSEMBLE PART OF BOX'
ARRAY 26 3*0
UNIT  5
COM='TOP AND BOTTOM OF BOX'
CUBOID  0 1  9.80 0.0 3.750  0.0   0.15 0.0
CUBOID  2 1 15.28 0.0 9.365 -5.615 0.15 0.0
GLOBAL
UNIT  6
COM='ARRAY TO ASSEMBLE TOP AND BOTTOM'
ARRAY 27 3*0
CUBOID  2 1 15.28   0.0   15.13  -0.15  15.28   0.0
CUBOID  0 1 15.305 -0.025 15.155 -0.175 15.305 -0.025
UNIT  7
COM='FUEL BOX 15.28 CM ON A SIDE WITH .15 CM WALLS .05CM STACKING VOID'
CUBOID  1 1 6P7.49
CUBOID  2 1 6P7.64
CUBOID  0 1 6P7.6650
UNIT  34
COM='ALUMINUM WEIGHT DISTRIBUTION PLATE FOR SPECIAL BOX'
CUBOID  0 1  9.80 0.0 3.750  0.0   0.16 0.0
CUBOID  7 1 15.33 0.0 9.54 -5.79 0.16 0.0
UNIT  35
COM='ALUMINUM WEIGHT DISTRIBUTION PLATE FOR BOXES'
CUBOID  7 1  4P7.665 0.16 0.0
UNIT  9
COM='NORTH SPLIT TABLE CORE'
ARRAY 1 3*0.0
CUBOID  0 1 30.66 -0.94 77.5 0.0 83.475 0.0
UNIT  10
COM='SOUTH SPLIT TABLE CORE'
ARRAY 2 3*0.0
CUBOID  0 1 49.4 0.0 77.5 0.0 83.475 0.0
UNIT  11
COM='PLEXIGLASS REFLECTOR SHEET WITHOUT TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  4 1 2P15.8000 2P38.7500 2P0.6150
UNIT  12
COM='PLEXIGLASS REFLECTOR SHEET WITH TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  5 1 2P15.8000 2P38.7500 2P0.6150
UNIT  13
COM='UPPER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P8.24
UNIT  14
COM='LOWER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P3.69
UNIT  15
COM='NORTH BOTTOM REFLECTOR INCLUDES REGULAR AND TRIS'
ARRAY 3 3*0.0
UNIT  16
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITHOUT TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P0.6150
CUBOID  4 1 44.3 -5.1 2P38.75  2P0.615
UNIT  17
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P0.6150
CUBOID  5 1 44.3 -5.1 2P38.75 2P0.6150
UNIT  18
COM='LOWER PORTION SOUTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P8.855
CUBOID  5 1 44.3 -5.1 2P38.75 2P8.855
UNIT  19
COM='SOUTH BOTTOM REFLECTOR WITH REGULAR AND TRIS'
ARRAY 4 3*0.0
UNIT  20
COM='EAST AND WEST REFLECTORS FOR NORTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P12.65 2P54.2825
UNIT  21
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR NORTH REFLECTOR'
ARRAY 5 3*0.0
UNIT  22
COM='EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P24.700 2P12.65 2P54.2825
UNIT  23
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR'
ARRAY 6 3*0.0
UNIT  24
COM='NORTH TOP REFLECTOR WITH TRIS'
CUBOID  5 1 2P28.35 2P64.05 2P12.15
UNIT  25
COM='ARRAY FOR NORTH TOP REFLECTOR'
ARRAY 7 3*0.0
UNIT  26
COM='SOUTH TOP REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P12.15
CUBOID  5 1 69.4 -5.1 2P64.05 2P12.15
UNIT  27
COM='ARRAY FOR SOUTH TOP REFLECTOR'
ARRAY 8 3*0.0
UNIT  28
COM='NORTH END REFLECTOR 9.8CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P4.9000 2P64.0500 2P54.2825
UNIT  29
COM='NORTH END RELFECTOR 5.2 CM PORTION WITH TRIS'
CUBOID  5 1 2P2.6 2P64.0500 2P54.2825
UNIT  30
COM='NORTH END RELFECTOR 10.1 CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P5.05 2P64.05 2P54.2825
UNIT  31
COM='ARRAY FOR NORTH END REFLECTOR'
ARRAY 9 3*0.0
UNIT  32
COM='SOUTH END REFLECTOR'
CUBOID  5 1 2P12.55 2P64.05 2P54.2825
UNIT  33
COM='ARRAY FOR SOUTH END REFLECTOR'
ARRAY 10 3*0.0
UNIT  38
COM='NORTH CORE WITH BOTTOM REFLECTOR'
ARRAY 13 3* 0.0
UNIT  39
COM='NORTH CORE WITH EAST AND WEST REFLECTOR'
ARRAY 14 3*0.0
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Table A.3 (continued)

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UNIT  40
COM='NORTH CORE WITH END REFLECTOR'
ARRAY 15 3*0.0
UNIT  42
COM='NORTH CORE WITH TOP REFLECTOR'
ARRAY 16 3*0.0
UNIT  48
COM='SOUTH CORE WITH BOTTOM REFLECTORS'
ARRAY 20 3*0.0
UNIT  49
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 21 3*0.0
UNIT  50
COM='SOUTH CORE END REFLECTOR'
ARRAY 22 3*0.0
UNIT  52
COM='SOUTH CORE WITH TOP REFLECTOR'
ARRAY 23 3*0.0
UNIT  54
COM='AIR GAP'
CUBOID  0 1 1.117 0.0 64.475 -63.625 69.13 -63.735
GLOBAL
UNIT  55
COM='TOTAL'
ARRAY 25 3*0.0
UNIT  56
COM='COMBINATION OF TWO REGULAR FUEL BOXES'
ARRAY 28 3*0.0
UNIT  57
COM='COMBINATION OF REGULAR FUEL BOX AND SPECIAL FUEL BOX'
ARRAY 29 3*0.0
UNIT  58
COM='COMBINATION OF TWO REGULAR WEIGHT DISTRIBUTION PLATES'
ARRAY 30 3*0.0
UNIT  59
COM='COMBINATION OF REGULAR AND SPECIAL WEIGHT DISTRIBUTION PLATES'
ARRAY 31 3*0.0
UNIT  60
COM='NORTH CORE SOLUTION DRIVER'
CUBOID  8 1 2P7.5 2P14.9 5.499 -7.5
CUBOID  0 1 2P7.5 2P14.9 2P7.5
CUBOID  9 1 2P7.65 2P15.05 2P7.65
CUBOID  0 1 2P7.665 2P15.33 2P7.665
UNIT  61
COM='NORTH CORE SOLUTION DRIVER'
CUBOID  8 1 2P7.5 2P14.9 5.445 -7.5
CUBOID  0 1 2P7.5 2P14.9 2P7.5
CUBOID  9 1 2P7.65 2P15.05 2P7.65
CUBOID  0 1 2P7.665 2P15.33 2P7.665
END GEOMETRY
READ ARRAY
ARA=1  NUX=2 NUY=4 NUZ=9
COM='NORTH SPLIT TABLE CORE'
FILL    2R7  2R56  4R7
        2R35 2R58  4R35
        2R7  2R56  4R7
        2R35 2R58  4R35
        2R7  56 60 4R7
        2R35 2R58  4R35
        2R7  2R56  4R7
        2R35 2R58  4R35
        2R7  2R56  4R7
END FILL
ARA=2  NUX=3 NUY=4 NUZ=9
COM='SOUTH SPLIT TABLE CORE'
FILL    3R7  3R56      6R7
        3R35 3R58      6R35
        3R7  3R56      6R7
        3R35 3R58      6R35
        3R7  61 56 56  6R7
        3R35 3R58      6R35
        3R7  57 56 56  6R7
        3R35 59 58 58  6R35
        3R7  57 56 56  6R7
END FILL
ARA=3  NUX=1 NUY=1 NUZ=3
COM='NORTH BOTTOM REFLECTOR'
FILL  14 11 13  END FILL
ARA=4  NUX=1 NUY=1 NUZ=7
COM='SOUTH BOTTOM REFLECTOR'
FILL  18 16 17 16 16 17 17  END FILL
ARA=5  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF NORTH REFLECTOR'
FILL  20 END FILL
ARA=6  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF SOUTH REFLECTOR'
FILL  22  END FILL
ARA=7  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR NORTH TOP REFLECTOR'
FILL  24  END FILL
ARA=8  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH TOP REFLECTOR'
FILL  26 END FILL
ARA=9  NUX=3 NUY=1 NUZ=1
COM='ARRAY FOR NORTH END REFLECTOR'
FILL  28 29 30  END FILL
ARA=10  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH END REFLECTOR'
FILL  32  END FILL
ARA=13  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF NORTH CORE WITH BOTTOM REFLECTOR'
FILL  15 9  END FILL
ARA=14  NUX=1 NUY=3 NUZ=1
COM='NORTH CORE WITH SIDE REFLECTORS'
FILL  21 38 21  END FILL
ARA=15  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH END REFLECTOR'
FILL  31 39  END FILL
ARA=16  NUX=1 NUY=1 NUZ=2
COM='NORTH CORE WITH TOP REFLECTOR'
FILL  40 25  END FILL
ARA=20  NUX=1 NUY=1 NUZ=2
COM='SOUTH CORE WITH BOTTOM REFLECTOR'
FILL  19 10  END FILL
ARA=21 NUX=1 NUY=3 NUZ=1
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
FILL  23 48 23  END FILL
ARA=22 NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH END REFLECTOR'
FILL  49 33  END FILL
ARA=23  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH TOP REFLECTOR'
FILL  50 27  END FILL
ARA=25  NUX=3 NUY=1 NUZ=1
COM='TOTAL'
FILL  42 54 52  END FILL
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ARA=26  NUX=3 NUY=1 NUZ=1
COM='ASSEMBLY OF FUEL BOX FRONT AND REAR'
FILL  2 1 3  END FILL
ARA=27  NUX=1 NUY=1 NUZ=3
COM='ASSEMBLY OF FUEL BOX TOP AND BOTTOM'
FILL  5 4 5  END FILL
ARA=28  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF TWO FUEL BOXES'
FILL  7 7  END FILL
ARA=29  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF SPECIAL AND REGULAR FUEL BOXES'
FILL  7 6  END FILL
ARA=30  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF TWO WEIGHT DISTRIBUTION PLATES'
FILL  35 35  END FILL
ARA=31  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF SPECIAL AND REGULAR WEIGHT DISTRIBUTION PLATES'
FILL  35 34  END FILL
END ARRAY
READ PLOT TTL='YZ SLICE OF SOUTH CORE FIRST ROW'
XUL=64.319 YUL=40.000 ZUL=72.000
XLR=64.319 YLR=72.000 ZLR=56.000
VAX=1  WDN=-1 NAX=130  NCH='012345678'END
TTL='XZ SLICE OF SPHERE CUBOID'
XUL=56.0 YUL=63.625 ZUL=71.735
XLR=72.0 YLR=63.625 ZLR=55.735
UAX=1  WDN=-1 NAX=130  NCH='012345678'
END PLOT
READ START  NST=1 XSM=41.37 XSP=72.894 YSM=40.63 YSP=71.29
  ZSM=56.071 ZSP=71.4   END START
END DATA
END


CAR10
=CSAS25
ROCKY FLATS CRITICALS NUREG/CR-0674 CONCRETE REFLECTED (27 GROUP MODEL)
' FUEL CUBE 15.28 CM, U(4.46)3O8 @ H/U=0.77, HI CONC. SOLUTION DRIVEN
27GROUPNDF4  INFHOMMEDIUM
U3O8  1 5.4078E-1 293.0 92234 0.03 92235 4.46 92236 0.08 92238 95.43 END
H2O   1 8.9514E-2 END
ARBM-BAGGIE  1.0 3 0 0 0 1001 14.01 6012 84.9 8016 1.20 1 1.9134E-2
   END
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 2 9.5390E-1
   END
ARBM-TAPE(VINYL)  1.0 7 0 0 0 1001 5.92 6012 45.91 8016 10.82 17000
   25.73 20040 6.9 22000 1.6 82000 1.1 2 1.1115E-2 END
ARBM-TAPE(MYLAR)  1.0 3 0 0 0 1001 6.83 6012 65.50 8016 27.02 2
   1.7491E-2 END
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 7 2.715  END
RFCONCRETE  5  1.0  END
SOLNUO2(NO3)2  8 351.18 0.549 1.0 293.0 92234 1.022 92235 93.172
   92236 0.434 92238 5.372  END
SS304  9 1.0 END
END COMP
ROCKY FLATS CRITICALS NUREG/CR-0674 CONCRETE REFLECTED (27 GROUP MODEL)
' FUEL CUBE 15.28 CM, U(4.46)3O8 @ H/U=0.77, HI CONC. SOLUTION DRIVEN
READ PARM  NPG=600 NUB=YES FDN=YES PLT=NO  END PARM
READ GEOM
UNIT  1
COM='FUEL BOX WITH VOID AND PART OF AL BOX'
CUBOID  0 1 9.80  0.0 3.75   0.0   14.98 0.0
CUBOID  2 1 9.95  0.0 3.90  -0.15  14.98 0.0
CUBOID  1 1 14.98 0.0 9.365 -5.615 14.98 0.0
UNIT  2
COM='FRONT OF FUEL BOX'
CUBOID  2 1 0.15 0.0  5.615 0.0 14.98 0.0
CUBOID  0 1 0.15 0.0  9.365 0.0 14.98 0.0
CUBOID  2 1 0.15 0.0 14.98  0.0 14.98 0.0
UNIT  3
COM='REAR OF FUEL BOX'
CUBOID  2 1 0.15 0.0 14.98  0.0 14.98 0.0
UNIT  4
COM='ARRAY TO ASSEMBLE PART OF BOX'
ARRAY 26 3*0
UNIT  5
COM='TOP AND BOTTOM OF BOX'
CUBOID  0 1  9.80 0.0 3.750  0.0   0.15 0.0
CUBOID  2 1 15.28 0.0 9.365 -5.615 0.15 0.0
GLOBAL
UNIT  6
COM='ARRAY TO ASSEMBLE TOP AND BOTTOM'
ARRAY 27 3*0
CUBOID  2 1 15.28   0.0   15.13  -0.15  15.28   0.0
CUBOID  0 1 15.305 -0.025 15.155 -0.175 15.305 -0.025
UNIT  7
COM='FUEL BOX 15.28 CM ON A SIDE WITH .15 CM WALLS .05CM STACKING VOID'
CUBOID  1 1 6P7.49
CUBOID  2 1 6P7.64
CUBOID  0 1 6P7.6650
UNIT  34
COM='ALUMINUM WEIGHT DISTRIBUTION PLATE FOR SPECIAL BOX'
CUBOID  0 1  9.80 0.0 3.750  0.0   0.16 0.0
CUBOID  7 1 15.33 0.0 9.54 -5.79 0.16 0.0
UNIT  35
COM='ALUMINUM WEIGHT DISTRIBUTION PLATE FOR BOXES'
CUBOID  7 1  4P7.665 0.16 0.0
UNIT  9
COM='NORTH SPLIT TABLE CORE AND REFLECTOR'
ARRAY 1 -30.66 0.0 0.0
CUBOID  0 1 0.0 -32.3 77.5 0.0 83.2 0.0
CUBOID  5 1 0.0 -57.8 103.0 -25.5 108.7 -25.5
UNIT  10
COM='SOUTH SPLIT TABLE CORE AND REFLECTOR'
ARRAY 2 3*0.0
CUBOID  0 1 47.5 0.0 77.5 0.0 83.2 0.0
CUBOID  5 1 73.0 0.0 103.0 -25.5 108.7 -25.5
HOLE    11 0.0 38.75 -25.5
HOLE    11 0.0 38.75  83.2
UNIT  11
CUBOID  0 1 10.2 0.0 2P2.55 25.5 0.0
UNIT  54
COM='AIR GAP'
CUBOID  0 1  2P.334 2P64.25 2P67.1
GLOBAL
UNIT  55
COM='TOTAL'
ARRAY 25 3*0.0
UNIT  56
COM='COMBINATION OF TWO REGULAR FUEL BOXES'
ARRAY 28 3*0.0
UNIT  57
COM='COMBINATION OF REGULAR FUEL BOX AND SPECIAL FUEL BOX'
ARRAY 29 3*0.0
UNIT  58
COM='COMBINATION OF TWO REGULAR WEIGHT DISTRIBUTION PLATES'
ARRAY 30 3*0.0
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Table A.3 (continued)

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UNIT  59
COM='COMBINATION OF REGULAR AND SPECIAL WEIGHT DISTRIBUTION PLATES'
ARRAY 31 3*0.0
UNIT  60
COM='NORTH CORE SOLUTION DRIVER'
CUBOID  8 1 2P7.5 2P14.9 3.122 -7.5
CUBOID  0 1 2P7.5 2P14.9 2P7.5
CUBOID  9 1 2P7.65 2P15.05 2P7.65
CUBOID  0 1 2P7.665 2P15.33 2P7.665
UNIT  61
COM='SOUTH CORE SOLUTION DRIVER'
CUBOID  8 1 2P7.5 2P14.9 3.047 -7.5
CUBOID  0 1 2P7.5 2P14.9 2P7.5
CUBOID  9 1 2P7.65 2P15.05 2P7.65
CUBOID  0 1 2P7.665 2P15.33 2P7.665
END GEOMETRY
READ ARRAY
ARA=1  NUX=2 NUY=4 NUZ=9
COM='NORTH SPLIT TABLE CORE'
FILL    2R7  2R56  4R7
        2R35 2R58  4R35
        2R7  2R56  4R7
        2R35 2R58  4R35
        2R7  56 60 4R7
        2R35 2R58  4R35
        2R7  2R56  4R7
        2R35 2R58  4R35
        2R7  2R56  4R7
END FILL
ARA=2  NUX=3 NUY=4 NUZ=9
COM='SOUTH SPLIT TABLE CORE'
FILL    3R7  3R56     6R7
        3R35 3R58     6R35
        3R7  3R56     6R7
        3R35 3R58     6R35
        3R7  61 56 56 6R7
        3R35 3R58     6R35
        3R7  57 56 56 6R7
        3R35 59 58 58 6R35
        3R7  57 56 56 6R7
END FILL
ARA=25  NUX=3 NUY=1 NUZ=1
COM='TOTAL'
FILL  9 54 10  END FILL
ARA=26  NUX=3 NUY=1 NUZ=1
COM='ASSEMBLY OF FUEL BOX FRONT AND REAR'
FILL  2 1 3  END FILL
ARA=27  NUX=1 NUY=1 NUZ=3
COM='ASSEMBLY OF FUEL BOX TOP AND BOTTOM'
FILL  5 4 5  END FILL
ARA=28  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF TWO FUEL BOXES'
FILL  7 7  END FILL
ARA=29  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF SPECIAL AND REGULAR FUEL BOXES'
FILL  7 6  END FILL
ARA=30  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF TWO WEIGHT DISTRIBUTION PLATES'
FILL  35 35  END FILL
ARA=31  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF SPECIAL AND REGULAR WEIGHT DISTRIBUTION PLATES'
FILL  35 34  END FILL
END ARRAY
READ PLOT TTL='YZ SLICE OF SOUTH CORE FIRST ROW'
XUL=64.319 YUL=40.000 ZUL=72.000
XLR=64.319 YLR=72.000 ZLR=56.000
VAX=1  WDN=-1 NAX=130  NCH='012345678'END
TTL='XZ SLICE OF SPHERE CUBOID'
XUL=56.0 YUL=63.625 ZUL=71.735
XLR=72.0 YLR=63.625 ZLR=55.735
UAX=1  WDN=-1 NAX=130  NCH='012345678'
END PLOT
READ START  NST=1 XSM=15.0 XSP=122.0 YSM=15.0 YSP=122.0
  ZSM=15.0 ZSP=122.0  END START
END DATA
END


CAR11
=CSAS25
ROCKY FLATS CRITICALS NUREG/CR-1653 EXPERIMENT A (27 GROUP)
' 48 FUEL CANS 2.44 CM MODERATOR GEE.HU125.DATA(OPT)
27GROUPNDF4  LATTICECELL
U3O8  1 5.4078E-1 293.0 92234 0.03 92235 4.46 92236 0.08 92238 95.43 END
H2O   1 1.5627E-1 END
ARBM-BAGGIE  1.0 3 0 0 0 1001 14.01 6012 84.9 8016 1.20 1 1.9134E-2
   END
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 2 9.5390E-1
   END
ARBM-TAPE(VINYL)  1.0 7 0 0 0 1001 5.92 6012 45.91 8016 10.82 17000
   25.73 20040 6.9 22000 1.6 82000 1.1 2 1.1115E-2 END
ARBM-T.PE(MYLAR)  1.0 3 0 0 0 1001 6.83 6012 65.50 8016 27.02 2
   1.7491E-2 END
ARBM-MODERATOR  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 3 END
ARBM-PLEX(REG)  1.0 3 0 0 0 1001 7.84 6012 59.59 8016 32.23 4
   1.1773 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 4
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 4
   1.1648E-3 END
ARBM-PLEX(TRIS)  1.0 8 0 0 1 1001 7.16 6012 52.03 7014 0.16 8016 29.82
   15031 1.02 17000 1.81 35079 4.260 35081 2.840 5 1.2757 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 5
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 5
   1.1648E-3 END
ARBM-FILLER  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 6 .888 END
' THIS MATERIAL IS ACTUALLY MODERATOR ADJUSTED FOR THE VOLUME
' FRACTION OF THE VOID FILLED BETWEEN CORE AND REFLECTOR.
END COMP
SPHTRIANGP  19.9462 18.5857 1 3 18.9579 2 END
ROCKY FLATS CRITICALS NUREG/CR-1653 EXPERIMENT A (27 GROUP)
' 48 FUEL CANS 2.44 CM MODERATOR GEE.HU125.DATA(OPT)
READ PARM  RUN=YES NPG=600 FDN=YES NUB=YES PLT=NO  END PARM
READ GEOM
UNIT  1
COM='FUEL BOX 15.28 CM ON A SIDE WITH .15 CM WALLS .05CM STACKING VOID'
CUBOID  1 1 6P7.49
CUBOID  2 1 6P7.64
CUBOID  0 1 6P7.6650
UNIT  2
COM='X-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 2P1.2200 4P7.665
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Table A.3 (continued)

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UNIT  3
COM='Y-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 2P7.665 2P1.2200 2P7.665
UNIT  4
COM='Z-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 4P7.665 2P1.2200
UNIT  5
COM='MORE X-FACE MODERATOR'
CUBOID  3 1 4P1.2200 2P7.665
UNIT  6
COM='MORE Y-FACE MODERATOR'
CUBOID  3 1 2P7.665 4P1.2200
UNIT  7
COM='MORE Z-FACE MODERATOR'
CUBOID  3 1 2P1.2200 2P7.665 2P1.2200
UNIT  8
COM='LAST OF INTERSTITIAL MODERATOR'
CUBOID  3 1 6P1.2200
UNIT  9
COM='NORTH SPLIT TABLE CORE'
ARRAY 1 3*0.0
UNIT  10
COM='SOUTH SPLIT TABLE CORE'
ARRAY 2 3*0.0
UNIT  11
COM='PLEXIGLASS REFLECTOR SHEET WITHOUT TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  4 1 2P16.5500 2P38.7500 2P0.6150
UNIT  12
COM='PLEXIGLASS REFLECTOR SHEET WITH TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  5 1 2P16.5500 2P38.7500 2P0.6150
UNIT  13
COM='UPPER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P16.550 2P38.75 2P8.24
UNIT  14
COM='LOWER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P16.550 2P38.75 2P3.69
UNIT  15
COM='NORTH BOTTOM REFLECTOR INCLUDES REGULAR AND TRIS'
ARRAY 3 3*0.0
UNIT  16
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITHOUT TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P0.615
CUBOID  4 1 44.3 -5.1 2P38.75  2P0.615
UNIT  17
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P0.615
CUBOID  5 1 44.3 -5.1 2P38.75 2P0.6150
UNIT  18
COM='LOWER PORTION SOUTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P8.855
CUBOID  5 1 44.3 -5.1 2P38.75 2P8.855
UNIT  19
COM='SOUTH BOTTOM REFLECTOR WITH REGULAR AND TRIS'
ARRAY 4 3*0.0
UNIT  20
COM='EAST AND WEST REFLECTORS FOR NORTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P16.550 2P12.65 2P54.2825
UNIT  21
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR NORTH REFLECTOR'
ARRAY 5 3*0.0
UNIT  22
COM='EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P24.700 2P12.65 2P54.2825
UNIT  23
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR'
ARRAY 6 3*0.0
UNIT  24
COM='NORTH TOP REFLECTOR WITH TRIS'
CUBOID  5 1 2P29.100 2P64.05 2P12.15
UNIT  25
COM='ARRAY FOR NORTH TOP REFLECTOR'
ARRAY 7 3*0.0
UNIT  26
COM='SOUTH TOP REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P12.15
CUBOID  5 1 69.4 -5.1 2P64.05 2P12.15
UNIT  27
COM='ARRAY FOR SOUTH TOP REFLECTOR'
ARRAY 8 3*0.0
UNIT  28
COM='NORTH END REFLECTOR 9.8CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P4.9000 2P64.0500 2P54.2825
UNIT  29
COM='NORTH END RELFECTOR 5.2 CM PORTION WITH TRIS'
CUBOID  5 1 2P2.6 2P64.0500 2P54.2825
UNIT  30
COM='NORTH END RELFECTOR 10.1 CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P5.05 2P64.05 2P54.2825
UNIT  31
COM='ARRAY FOR NORTH END REFLECTOR'
ARRAY 9 3*0.0
UNIT  32
COM='SOUTH END REFLECTOR'
CUBOID  5 1 2P12.55 2P64.05 2P54.2825
UNIT  33
COM='ARRAY FOR SOUTH END REFLECTOR'
ARRAY 10 3*0.0
UNIT  34
COM='BOTTOM MODERATING PLASTIC NORTH CORE'
CUBOID  6 1 2P16.550 2P38.7500 2P13.0500
UNIT  35
COM='TOP MODERATING PLASTIC NORTH CORE'
CUBOID  6 1 2P16.550 2P38.7500 2P3.2525
UNIT  36
ARRAY 11 3*0.0
UNIT  37
ARRAY 12 3*0.0
UNIT  38
COM='NORTH CORE WITH BOTTOM REFLECTOR'
ARRAY 13 3* 0.0
UNIT  39
COM='NORTH CORE WITH EAST AND WEST REFLECTOR'
ARRAY 14 3*0.0
UNIT  40
COM='NORTH CORE WITH END REFLECTOR'
ARRAY 15 3*0.0
UNIT  41
COM='NORTH SPLIT TABLE FACEPLATE'
CUBOID  3 1 2P0.6150 2P64.0500 2P66.4325
UNIT  42
COM='NORTH CORE WITH TOP REFLECTOR'
ARRAY 16 3*0.0
UNIT  43
COM='NORTH CORE WITH FACEPLATE'
ARRAY 17 3*0.0
```

Table A.3 (continued)

```
UNIT  44
COM='12.95 CM THICK MODERATOR SOUTH CORE'
CUBOID  6 1 2P23.924 2P6.475 2P40.183
UNIT  45
COM='2.95 THICK MODERATOR SOUTH CORE'
CUBOID  6 1 2P23.924 2P38.5285 2P1.475
UNIT  46
COM='COMBINATION OF CORE WITH 12.95 THICK MODERATOR'
ARRAY 18 3*0.0
UNIT  47
COM='COMBINATION OF CORE WITH 2.95 THICK MODERATOR'
ARRAY 19 3*0.0
UNIT  48
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 20 3*0.0
UNIT  49
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 21 3*0.0
UNIT  50
COM='SOUTH CORE END REFLECTOR'
ARRAY 22 3*0.0
UNIT  51
COM='FACEPLATE FOR SOUTH SPLIT TABLE'
CUBOID  3 1 2P0.4620  2P64.0500 2P66.4325
UNIT  52
COM='SOUTH CORE WITH TOP REFLECTOR'
ARRAY 23 3*0.0
UNIT  53
COM='SOUTH CORE WITH FACEPLATE'
ARRAY 24 3*0.0
UNIT  54
COM='AIR GAP'
CUBOID  0 1 2P0.1550 2P64.0500 2P66.4325
GLOBAL
UNIT  55
COM='TOTAL'
ARRAY 25 3*0.0
UNIT  56
COM='EMPTY FUEL LOCATION'
CUBOID  0 1 6P7.6650
UNIT  57
COM='SIDE MODERATOR'
CUBOID  5 1 2P16.550 2P4.4300 2P25.4350
UNIT  58
COM='END MODERATOR'
CUBOID  6 1 2P8.1500 2P38.7500 2P25.4350
UNIT  59
COM='SOUTH CORE BOTTOM MODERATING PLASTIC'
CUBOID  6 1 2P24.7000 2P38.7500 2P13.0500
UNIT  60
COM='SOUTH CORE TOP MODERATING PLASTIC'
CUBOID  6 1 2P24.7000 2P38.7500 2P3.2525
UNIT  61
COM='Y-FACE MODERATOR VOID'
CUBOID  0 1 2P7.665 2P1.2200 2P7.665
UNIT  62
COM='X-FACE MODERATOR VOID'
CUBOID  0 1 2P1.2200 4P7.665
END GEOMETRY
READ ARRAY
ARA=1  NUX=3 NUY=7 NUZ=5
COM='NORTH SPLIT TABLE CORE'
FILL   1 2 1 3 5 3 2Q6 1 2 1
       4 7 4 6 8 6 2Q6 4 7 4
       1Q42
       56 2 1 61 5 3 56 2 1 61 5 3 1Q6 56 62 56  END FILL
ARA=2  NUX=3 NUY=7 NUZ=5
COM='SOUTH SPLIT TABLE CORE'
FILL   1 2 1 3 5 3 2Q6 1 2 1
       4 7 4 6 8 6 2Q6 4 7 4
       1Q42
       1 2 56 3 5 61 2Q6 56 62 56  END FILL
ARA=3  NUX=1 NUY=1 NUZ=3
COM='NORTH BOTTOM REFLECTOR'
FILL  14 11 13  END FILL
ARA=4  NUX=1 NUY=1 NUZ=7
COM='SOUTH BOTTOM REFLECTOR'
FILL  18 16 17 16 16 17 17  END FILL
ARA=5  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF NORTH REFLECTOR'
FILL  20 END FILL
ARA=6  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF SOUTH REFLECTOR'
FILL  22  END FILL
ARA=7  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR NORTH TOP REFLECTOR'
FILL  24  END FILL
ARA=8  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH TOP REFLECTOR'
FILL  26 END FILL
ARA=9  NUX=3 NUY=1 NUZ=1
COM='ARRAY FOR NORTH END REFLECTOR'
FILL  28 29 30  END FILL
ARA=10  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH END REFLECTOR'
FILL  32  END FILL
ARA=11  NUX=1 NUY=2 NUZ=1
COM='COMBINARION OF CORE WITH SIDE MODERATOR'
FILL  9 57  END FILL
ARA=12 NUX=1 NUY=1 NUZ=3
COM='COMBINATION OF PREVIOUS ARRAY WITH TOP AND BOTTOM MODERATOR'
FILL  34 36 35  END FILL
ARA=13  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF NORTH CORE WITH BOTTOM REFLECTOR'
FILL  15 37  END FILL
ARA=14  NUX=1 NUY=3 NUZ=1
COM='NORTH CORE WITH SIDE REFLECTORS'
FILL  21 38 21  END FILL
ARA=15  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH END REFLECTOR'
FILL  31 39  END FILL
ARA=16  NUX=1 NUY=1 NUZ=2
COM='NORTH CORE WITH TOP REFLECTOR'
FILL  40 25  END FILL
ARA=17  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH FACEPLATE'
FILL  42 41  END FILL
ARA=18  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF S. CORE WITH SIDE MODERATOR'
FILL  10 57  END FILL
ARA=19  NUX=2 NUY=1 NUZ=1
COM='COMBINATION OF CORE WITH END MODERATOR'
FILL  46 58  END FILL
ARA=20  NUX=1 NUY=1 NUZ=4
COM='SOUTH CORE WITH BOTTOM MODERATOR AND REFLECTOR'
FILL  19 59 47 60  END FILL
```

Table A.3 (continued)

```
ARA=21 NUX=1 NUY=3 NUZ=1
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
FILL  23 48 23  END FILL
ARA=22 NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH END REFLECTOR'
FILL  49 33  END FILL
ARA=23  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH TOP REFLECTOR'
FILL  50 27  END FILL
ARA=24  NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH FACEPLATE'
FILL  51 52  END FILL
ARA=25  NUX=3 NUY=1 NUZ=1
COM='TOTAL'
FILL  43 54 53  END FILL
END ARRAY
READ PLOT TTL='XZ SLICE OF RFP1 SHOWING MATERIAL REGIONS'
XUL=-2  YUL=64.05 ZUL=136
XLR=137 YLR=64.05 ZLR=-2
UAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF NORTH CORE FIRST ROW'
XUL=48  YUL=-2  ZUL=136
XLR=48  YLR=136 ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF NORTH CORE SECOND ROW'
XUL=28  YUL=-2  ZUL=136
XLR=28  YLR=136 ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF SOUTH CORE FIRST ROW'
XUL=62 YUL=-2   ZUL=136
XLR=62 YLR=136  ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF SOUTH CORE SECOND ROW'
XUL=80 YUL=-2   ZUL=136
XLR=80 YLR=136  ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'END
END PLOT
END DATA
END
```

```
CAR12
=CSAS25
ROCKY FLATS CRITICALS NUREG/CR-1653 EXPERIMENT B (27 GROUP)
' 78 FUEL CANS 0.929 CM MODERATOR GEE.HU125.DATA(UND1)
27GROUPNDF4  LATTICECELL
U3O8  1 5.4078E-1 293.0 92234 0.03 92235 4.46 92236 0.08 92238 95.43 END
H2O   1 1.5627E-1 END
ARBM-BAGGIE  1.0 3 0 0 0 1001 14.01 6012 84.9 8016 1.20 1 1.9134E-2
   END
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 2 9.5390E-1
   END
ARBM-TAPE(VINYL)  1.0 7 0 0 0 1001 5.92 6012 45.91 8016 10.82 17000
   25.73 20040 6.9 22000 1.6 82000 1.1 2 1.1115E-2 END
ARBM-TAPE(MYLAR)  1.0 3 0 0 0 1001 6.83 6012 65.50 8016 27.02 2
   1.7491E-2 END
ARBM-MODERATOR  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 3 END
ARBM-PLEX(REG)  1.0 3 0 0 0 1001 7.84 6012 59.59 8016 32.23 4
   1.1773 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 4
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 4
   1.1648E-3 END
ARBM-PLEX(TRIS)  1.0 8 0 0 1 1001 7.16 6012 52.03 7014 0.16 8016 29.82
   15031 1.02 17000 1.81 35079 4.260 35081 2.840 5 1.2757 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 5
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 5
   1.1648E-3 END
ARBM-FILLER  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 6 .854 END
' THIS MATERIAL IS ACTUALLY MODERATOR ADJUSTED FOR THE VOLUME
' FRACTION OF THE VOID FILLED BETWEEN CORE AND REFLECTOR.
END COMP
SPHTRIANGP  19.00 18.5857 1 3 18.9579 2 END
ROCKY FLATS CRITICALS NUREG/CR-1653 EXPERIMENT B (27 GROUP)
' 78 FUEL CANS 0.929 CM MODERATOR GEE.HU125.DATA(UND1)
READ PARM  RUN=YES NPG=600 FDN=YES NUB=YES PLT=NO  END PARM
READ GEOM
UNIT  1
COM='FUEL BOX 15.28 CM ON A SIDE WITH .15 CM WALLS .05CM STACKING VOID'
CUBOID  1 1 6P7.49
CUBOID  2 1 6P7.64
CUBOID  0 1 6P7.6650
UNIT  2
COM='X-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 2P0.4645 4P7.665
UNIT  3
COM='Y-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 2P7.665 2P0.4645 2P7.665
UNIT  4
COM='Z-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 4P7.665 2P0.4645
UNIT  5
COM='MORE X-FACE MODERATOR'
CUBOID  3 1 4P0.4645 2P7.665
UNIT  6
COM='MORE Y-FACE MODERATOR'
CUBOID  3 1 2P7.665 4P0.4645
UNIT  7
COM='MORE Z-FACE MODERATOR'
CUBOID  3 1 2P0.4645 2P7.665 2P0.4645
UNIT  8
COM='LAST OF INTERSTITIAL MODERATOR'
CUBOID  3 1 6P0.4645
```

Table A.3 (continued)

```
UNIT  9
COM='NORTH SPLIT TABLE CORE'
ARRAY 1 3*0.0
UNIT  10
COM='SOUTH SPLIT TABLE CORE'
ARRAY 2 3*0.0
UNIT  11
COM='PLEXIGLASS REFLECTOR SHEET WITHOUT TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  4 1 2P15.8000 2P38.7500 2P0.6150
UNIT  12
COM='PLEXIGLASS REFLECTOR SHEET WITH TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  5 1 2P15.8000 2P38.7500 2P0.6150
UNIT  13
COM='UPPER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P8.24
UNIT  14
COM='LOWER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P3.69
UNIT  15
COM='NORTH BOTTOM REFLECTOR INCLUDES REGULAR AND TRIS'
ARRAY 3 3*0.0
UNIT  16
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITHOUT TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P0.615
CUBOID  4 1 44.3 -5.1 2P38.75  2P0.615
UNIT  17
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P0.615
CUBOID  5 1 44.3 -5.1 2P38.75 2P0.6150
UNIT  18
COM='LOWER PORTION SOUTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P8.855
CUBOID  5 1 44.3 -5.1 2P38.75 2P8.855
UNIT  19
COM='SOUTH BOTTOM REFLECTOR WITH REGULAR AND TRIS'
ARRAY 4 3*0.0
UNIT  20
COM='EAST AND WEST REFLECTORS FOR NORTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P12.65 2P54.2825
UNIT  21
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR NORTH REFLECTOR'
ARRAY 5 3*0.0
UNIT  22
COM='EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P24.700 2P12.65 2P54.2825
UNIT  23
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR'
ARRAY 6 3*0.0
UNIT  24
COM='NORTH TOP REFLECTOR WITH TRIS'
CUBOID  5 1 2P28.35 2P64.05 2P12.15
UNIT  25
COM='ARRAY FOR NORTH TOP REFLECTOR'
ARRAY 7 3*0.0
UNIT  26
COM='SOUTH TOP REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P12.15
CUBOID  5 1 69.4 -5.1 2P64.05 2P12.15
UNIT  27
COM='ARRAY FOR SOUTH TOP REFLECTOR'
ARRAY 8 3*0.0
UNIT  28
COM='NORTH END REFLECTOR 9.8CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P4.9000 2P64.0500 2P54.2825
UNIT  29
COM='NORTH END RELFECTOR 5.2 CM PORTION WITH TRIS'
CUBOID  5 1 2P2.6 2P64.0500 2P54.2825
UNIT  30
COM='NORTH END RELFECTOR 10.1 CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P5.05 2P64.05 2P54.2825
UNIT  31
COM='ARRAY FOR NORTH END REFLECTOR'
ARRAY 9 3*0.0
UNIT  32
COM='SOUTH END REFLECTOR'
CUBOID  5 1 2P12.55 2P64.05 2P54.2825
UNIT  33
COM='ARRAY FOR SOUTH END REFLECTOR'
ARRAY 10 3*0.0
UNIT  34
COM='12.95 THICK MODERATING PLASTIC NORTH CORE'
CUBOID  6 1 2P15.7945 2P6.4750 2P32.0535
UNIT  35
COM='2.95 THICK MODERATING PLASTIC NORTH CORE'
CUBOID  6 1 2P15.7945 2P38.5285 2P1.475
UNIT  36
ARRAY 11 3*0.0
UNIT  37
ARRAY 12 3*0.0
REPLICATE  0 1 0.0 0.011 0.443 0.0 0.1590 0.0 1
UNIT  38
COM='NORTH CORE WITH BOTTOM REFLECTOR'
ARRAY 13 3* 0.0
UNIT  39
COM='NORTH CORE WITH EAST AND WEST REFLECTOR'
ARRAY 14 3*0.0
UNIT  40
COM='NORTH CORE WITH END REFLECTOR'
ARRAY 15 3*0.0
UNIT  41
COM='NORTH SPLIT TABLE FACEPLATE'
CUBOID  3 1 2P0.6150 2P64.0500 2P66.4325
UNIT  42
COM='NORTH CORE WITH TOP REFLECTOR'
ARRAY 16 3*0.0
UNIT  43
COM='NORTH CORE WITH FACEPLATE'
ARRAY 17 3*0.0
UNIT  44
COM='12.95 CM THICK MODERATOR SOUTH CORE'
CUBOID  6 1 2P23.924 2P6.475 2P32.0535
UNIT  45
COM='2.95 THICK MODERATOR SOUTH CORE'
CUBOID  6 1 2P23.924 2P38.5285 2P1.475
UNIT  46
COM='COMBINATION OF CORE WITH 12.95 THICK MODERATOR'
ARRAY 18 3*0.0
UNIT  47
COM='COMBINATION OF CORE WITH 2.95 THICK MODERATOR'
ARRAY 19 3*0.0
REPLICATE  0 1 1.552 0.0 0.4430 0.0 0.159 0.0 1
UNIT  48
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 20 3*0.0
UNIT  49
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 21 3*0.0
```

Table A.3 (continued)

```
UNIT  50
COM='SOUTH CORE END REFLECTOR'
ARRAY 22 3*0.0
UNIT  51
COM='FACEPLATE FOR SOUTH SPLIT TABLE'
CUBOID  3 1 2P0.4620  2P64.0500 2P66.4325
UNIT  52
COM='SOUTH CORE WITH TOP REFLECTOR'
ARRAY 23 3*0.0
UNIT  53
COM='SOUTH CORE WITH FACEPLATE'
ARRAY 24 3*0.0
UNIT  54
COM='AIR GAP'
CUBOID  0 1 2P0.3990 2P64.0500 2P66.4325
GLOBAL
UNIT  55
COM='TOTAL'
ARRAY 25 3*0.0
UNIT  56
COM='NORTH BOTTOM MODERATOR'
CUBOID  6 1 2P15.8000 2P38.7500 2P8.1295
UNIT  57
COM='BOTTOM SOUTH MODERATOR'
CUBOID  6 1 2P24.700 2P38.75  2P8.1295
UNIT  58
COM='EMPTY FUEL LOCATION'
CUBOID  0 1 6P7.665
END GEOMETRY
READ ARRAY
ARA=1  NUX=3 NUY=7 NUZ=7
COM='NORTH SPLIT TABLE CORE'
FILL   1 2 1 3 5 3 2Q6 1 2 1
       4 7 4 6 8 6 2Q6 4 7 4
       2Q42
       1 2 1 3 5 3 2Q6 58 2 58  END FILL
ARA=2  NUX=5 NUY=7 NUZ=7
COM='SOUTH SPLIT TABLE CORE'
FILL   1 2 1 2 1 3 5 3 5 3 2Q10 1 2 1 2 1
       4 7 4 7 4 6 8 6 8 6 2Q10 4 7 4 7 4
       2Q70
       1 2 1 2 1 3 5 3 5 3 2Q10 1 2 1 2 1  END FILL
ARA=3  NUX=1 NUY=1 NUZ=4
COM='NORTH BOTTOM MODERATOR AND REFLECTOR'
FILL   14 11 13 56  END FILL
ARA=4  NUX=1 NUY=1 NUZ=8
COM='SOUTH BOTTOM MODERATOR AND REFLECTOR'
FILL   18 16 17 16 16 17 17 57  END FILL
ARA=5  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF NORTH REFLECTOR'
FILL   20 END FILL
ARA=6  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF SOUTH REFLECTOR'
FILL   22  END FILL
ARA=7  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR NORTH TOP REFLECTOR'
FILL   24  END FILL
ARA=8  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH TOP REFLECTOR'
FILL   26 END FILL
ARA=9  NUX=3 NUY=1 NUZ=1
COM='ARRAY FOR NORTH END REFLECTOR'
FILL   28 29 30  END FILL
ARA=10  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH END REFLECTOR'
FILL   32  END FILL
ARA=11  NUX=1 NUY=2 NUZ=1
COM='COMBINARION OF CORE WITH 12.95CM THICK MODERATOR'
FILL   9 34  END FILL
ARA=12 NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF PREVIOUS ARRAY WITH 2.95CM THICK MODERATOR'
FILL   36 35  END FILL
ARA=13  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF NORTH CORE WITH BOTTOM REFLECTOR'
FILL   15 37  END FILL
ARA=14  NUX=1 NUY=3 NUZ=1
COM='NORTH CORE WITH SIDE REFLECTORS'
FILL   21 38 21  END FILL
ARA=15  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH END REFLECTOR'
FILL   31 39  END FILL
ARA=16  NUX=1 NUY=1 NUZ=2
COM='NORTH CORE WITH TOP REFLECTOR'
FILL   40 25  END FILL
ARA=17  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH FACEPLATE'
FILL   42 41  END FILL
ARA=18  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF S. CORE WITH 12.95 CM THICK MODERATOR'
FILL   10 44  END FILL
ARA=19  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH 2.95 CM THICK MODERATOR'
FILL   46 45  END FILL
ARA=20  NUX=1 NUY=1 NUZ=2
COM='SOUTH CORE WITH BOTTOM REFLECTOR'
FILL   19 47  END FILL
ARA=21 NUX=1 NUY=3 NUZ=1
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
FILL   23 48 23  END FILL
ARA=22 NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH END REFLECTOR'
FILL   49 33  END FILL
ARA=23  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH TOP REFLECTOR'
FILL   50 27  END FILL
ARA=24  NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH FACEPLATE'
FILL   51 52  END FILL
ARA=25  NUX=3 NUY=1 NUZ=1
COM='TOTAL'
FILL   43 54 53  END FILL
END ARRAY
READ PLOT TTL='XZ SLICE OF RFP3 SHOWING MATERIAL REGIONS'
XUL=-1  YUL=64.05 ZUL=135
XLR=136 YLR=64.05 ZLR=-2
UAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF NORTH CORE FIRST ROW'
XUL=48  YUL=-2   ZUL=136
XLR=48  YLR=136 ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF NORTH CORE SECOND ROW'
XUL=28  YUL=-2   ZUL=136
XLR=28  YLR=136 ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF SOUTH CORE SECOND ROW'
```

Table A.3 (continued)

```
XUL=80 YUL=-2  ZUL=136
XLR=80 YLR=136  ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'
END PLOT
END DATA
END


CAR13
=CSAS25
ROCKY FLATS CRITICALS NUREG/CR-1653 EXPERIMENT C (27 GROUP)
' 80 FUEL CANS 0.929 CM MODERATOR GEE.HU125.DATA(UND2)
27GROUPNDF4  LATTICECELL
U3O8  1 5.4078E-1 293.0 92234 0.03 92235 4.46 92236 0.08 92238 95.43 END
H2O   1 1.5627E-1 END
ARBM-BAGGIE  1.0 3 0 0 0 1001 14.01 6012 84.9 8016 1.20 1 1.9134E-2
   END
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 2 9.5390E-1
   END
ARBM-TAPE(VINYL)  1.0 7 0 0 0 1001 5.92 6012 45.91 8016 10.82 17000
   25.73 20040 6.9 22000 1.6 82000 1.1 2 1.1115E-2 END
ARBM-TAPE(MYLAR)  1.0 3 0 0 0 1001 6.83 6012 65.50 8016 27.02 2
   1.7491E-2 END
ARBM-MODERATOR  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 3 END
ARBM-PLEX(REG)  1.0 3 0 0 0 1001 7.84 6012 59.59 8016 32.23 4
   1.1773 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 4
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 4
   1.1648E-3 END
ARBM-PLEX(TRIS)  1.0 8 0 0 1 1001 7.16 6012 52.03 7014 0.16 8016 29.82
   15031 1.02 17000 1.81 35079 4.260 35081 2.840 5 1.2757 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 5
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 5
   1.1648E-3 END
ARBM-FILLER  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 6 .854 END
' THIS MATERIAL IS ACTUALLY MODERATOR ADJUSTED FOR THE VOLUME
' FRACTION OF THE VOID FILLED BETWEEN CORE AND REFLECTOR.
END COMP
SPHTRIANGP  19.00 18.5857 1 3 18.9579 2 END
ROCKY FLATS CRITICALS NUREG/CR-1653 EXPERIMENT C (27 GROUP)
' 80 FUEL CANS 0.929 CM MODERATOR GEE.HU125.DATA(UND2)
READ PARM  RUN=YES NPG=600 FDN=YES NUB=YES PLT=NO  END PARM
READ GEOM
UNIT  1
COM='FUEL BOX 15.28 CM ON A SIDE WITH .15 CM WALLS .05CM STACKING VOID'
CUBOID  1 1 6P7.49
CUBOID  2 1 6P7.64
CUBOID  0 1 6P7.6650
UNIT  2
COM='X-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 2P0.4645 4P7.665
UNIT  3
COM='Y-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 2P7.665 2P0.4645 2P7.665
UNIT  4
COM='Z-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 4P7.665 2P0.4645
UNIT  5
COM='MORE X-FACE MODERATOR'
CUBOID  3 1 4P0.4645 2P7.665
UNIT  6
COM='MORE Y-FACE MODERATOR'
CUBOID  3 1 2P7.665 4P0.4645
UNIT  7
COM='MORE Z-FACE MODERATOR'
CUBOID  3 1 2P0.4645 2P7.665 2P0.4645
UNIT  8
COM='LAST OF INTERSTITIAL MODERATOR'
CUBOID  3 1 6P0.4645
UNIT  9
COM='NORTH SPLIT TABLE CORE'
ARRAY 1 3*0.0
UNIT  10
COM='SOUTH SPLIT TABLE CORE'
ARRAY 2 3*0.0
UNIT  11
COM='PLEXIGLASS REFLECTOR SHEET WITHOUT TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  4 1 2P15.8000 2P38.7500 2P0.6150
UNIT  12
COM='PLEXIGLASS REFLECTOR SHEET WITH TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  5 1 2P15.8000 2P38.7500 2P0.6150
UNIT  13
COM='UPPER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P8.24
UNIT  14
COM='LOWER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P3.69
UNIT  15
COM='NORTH BOTTOM REFLECTOR INCLUDES REGULAR AND TRIS'
ARRAY 3 3*0.0
UNIT  16
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITHOUT TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P0.615
CUBOID  4 1 44.3 -5.1 2P38.75  2P0.615
UNIT  17
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P0.615
CUBOID  5 1 44.3 -5.1 2P38.75 2P0.6150
UNIT  18
COM='LOWER PORTION SOUTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P8.855
CUBOID  5 1 44.3 -5.1 2P38.75 2P8.855
UNIT  19
COM='SOUTH BOTTOM REFLECTOR WITH REGULAR AND TRIS'
ARRAY 4 3*0.0
UNIT  20
COM='EAST AND WEST REFLECTORS FOR NORTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P12.65 2P54.2825
UNIT  21
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR NORTH REFLECTOR'
ARRAY 5 3*0.0
UNIT  22
COM='EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P24.700 2P12.65 2P54.2825
UNIT  23
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR'
ARRAY 6 3*0.0
UNIT  24
COM='NORTH TOP REFLECTOR WITH TRIS'
CUBOID  5 1 2P28.35 2P64.05 2P12.15
UNIT  25
COM='ARRAY FOR NORTH TOP REFLECTOR'
ARRAY 7 3*0.0
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Table A.3 (continued)

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UNIT  26
COM='SOUTH TOP REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P12.15
CUBOID  5 1 69.4 -5.1 2P64.05 2P12.15
UNIT  27
COM='ARRAY FOR SOUTH TOP REFLECTOR'
ARRAY 8 3*0.0
UNIT  28
COM='NORTH END REFLECTOR 9.8CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P4.9000 2P64.0500 2P54.2825
UNIT  29
COM='NORTH END RELFECTOR 5.2 CM PORTION WITH TRIS'
CUBOID  5 1 2P2.6 2P64.0500 2P54.2825
UNIT  30
COM='NORTH END RELFECTOR 10.1 CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P5.05 2P64.05 2P54.2825
UNIT  31
COM='ARRAY FOR NORTH END REFLECTOR'
ARRAY 9 3*0.0
UNIT  32
COM='SOUTH END REFLECTOR'
CUBOID  5 1 2P12.55 2P64.05 2P54.2825
UNIT  33
COM='ARRAY FOR SOUTH END REFLECTOR'
ARRAY 10 3*0.0
UNIT  34
COM='12.95 THICK MODERATING PLASTIC NORTH CORE'
CUBOID  6 1 2P15.7945 2P6.4750 2P32.0535
UNIT  35
COM='2.95 THICK MODERATING PLASTIC NORTH CORE'
CUBOID  6 1 2P15.7945 2P38.5285 2P1.475
UNIT  36
ARRAY 11 3*0.0
UNIT  37
ARRAY 12 3*0.0
REPLICATE  0 1 0.0 0.011 0.443 0.0 0.1590 0.0 1
UNIT  38
COM='NORTH CORE WITH BOTTOM REFLECTOR'
ARRAY 13 3* 0.0
UNIT  39
COM='NORTH CORE WITH EAST AND WEST REFLECTOR'
ARRAY 14 3*0.0
UNIT  40
COM='NORTH CORE WITH END REFLECTOR'
ARRAY 15 3*0.0
UNIT  41
COM='NORTH SPLIT TABLE FACEPLATE'
CUBOID  3 1 2P0.6150 2P64.0500 2P66.4325
UNIT  42
COM='NORTH CORE WITH TOP REFLECTOR'
ARRAY 16 3*0.0
UNIT  43
COM='NORTH CORE WITH FACEPLATE'
ARRAY 17 3*0.0
UNIT  44
COM='12.95 CM THICK MODERATOR SOUTH CORE'
CUBOID  6 1 2P23.924 2P6.475 2P32.0535
UNIT  45
COM='2.95 THICK MODERATOR SOUTH CORE'
CUBOID  6 1 2P23.924 2P38.5285 2P1.475
UNIT  46
COM='COMBINATION OF CORE WITH 12.95 THICK MODERATOR'
ARRAY 18 3*0.0
UNIT  47
COM='COMBINATION OF CORE WITH 2.95 THICK MODERATOR'
ARRAY 19 3*0.0
REPLICATE  0 1 1.552 0.0 0.4430 0.0 0.159 0.0 1
UNIT  48
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 20 3*0.0
UNIT  49
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 21 3*0.0
UNIT  50
COM='SOUTH CORE END REFLECTOR'
ARRAY 22 3*0.0
UNIT  51
COM='FACEPLATE FOR SOUTH SPLIT TABLE'
CUBOID  3 1 2P0.4620  2P64.0500 2P66.4325
UNIT  52
COM='SOUTH CORE WITH TOP REFLECTOR'
ARRAY 23 3*0.0
UNIT  53
COM='SOUTH CORE WITH FACEPLATE'
ARRAY 24 3*0.0
UNIT  54
COM='AIR GAP'
CUBOID  0 1 2P0.7805 2P64.0500 2P66.4325
GLOBAL
UNIT  55
COM='TOTAL'
ARRAY 25 3*0.0
UNIT  56
COM='NORTH BOTTOM MODERATOR'
CUBOID  6 1 2P15.8000 2P38.7500 2P8.1295
UNIT  57
COM='BOTTOM SOUTH MODERATOR'
CUBOID  6 1 2P24.700 2P38.75  2P8.1295
UNIT  58
COM='SOUTH REAR MODERATOR'
CUBOID  3 1
END GEOMETRY
READ ARRAY
ARA=1  NUX=3 NUY=7 NUZ=7
COM='NORTH SPLIT TABLE CORE'
FILL  1 2 1 3 5 3 2Q6 1 2 1
      4 7 4 6 8 6 2Q6 4 7 4
      2Q42
      1 2 1 3 5 3 2Q6 1 2 1  END FILL
ARA=2  NUX=5 NUY=7 NUZ=7
COM='SOUTH SPLIT TABLE CORE'
FILL  1 2 1 2 1 3 5 3 5 3 2Q10 1 2 1 2 1
      4 7 4 7 4 6 8 6 8 6 2Q10 4 7 4 7 4
      2Q70
      1 2 1 2 1 3 5 3 5 3 2Q10 1 2 1 2 1  END FILL
ARA=3  NUX=1 NUY=1 NUZ=4
COM='NORTH BOTTOM MODERATOR AND REFLECTOR'
FILL  14 11 13 56  END FILL
ARA=4  NUX=1 NUY=1 NUZ=8
COM='SOUTH BOTTOM MODERATOR AND REFLECTOR'
FILL  18 16 17 16 16 17 17 57  END FILL
ARA=5  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF NORTH REFLECTOR'
FILL  20 END FILL
ARA=6  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF SOUTH REFLECTOR'
FILL  22  END FILL
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ARA=7  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR NORTH TOP REFLECTOR'
FILL  24  END FILL
ARA=8  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH TOP REFLECTOR'
FILL  26 END FILL
ARA=9  NUX=3 NUY=1 NUZ=1
COM='ARRAY FOR NORTH END REFLECTOR'
FILL  28 29 30  END FILL
ARA=10  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH END REFLECTOR'
FILL  32  END FILL
ARA=11  NUX=1 NUY=2 NUZ=1
COM='COMBINARION OF CORE WITH 12.95CM THICK MODERATOR'
FILL  9 34  END FILL
ARA=12 NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF PREVIOUS ARRAY WITH 2.95CM THICK MODERATOR'
FILL  36 35  END FILL
ARA=13  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF NORTH CORE WITH BOTTOM REFLECTOR'
FILL  15 37  END FILL
ARA=14  NUX=1 NUY=3 NUZ=1
COM='NORTH CORE WITH SIDE REFLECTORS'
FILL  21 38 21  END FILL
ARA=15  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH END REFLECTOR'
FILL  31 39  END FILL
ARA=16  NUX=1 NUY=1 NUZ=2
COM='NORTH CORE WITH TOP REFLECTOR'
FILL  40 25  END FILL
ARA=17  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH FACEPLATE'
FILL  42 41  END FILL
ARA=18  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF S. CORE WITH 12.95 CM THICK MODERATOR'
FILL  10 44  END FILL
ARA=19  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH 2.95 CM THICK MODERATOR'
FILL  46 45  END FILL
ARA=20  NUX=1 NUY=1 NUZ=2
COM='SOUTH CORE WITH BOTTOM REFLECTOR'
FILL  19 47  END FILL
ARA=21 NUX=1 NUY=3 NUZ=1
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
FILL  23 48 23  END FILL
ARA=22 NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH END REFLECTOR'
FILL  49 33  END FILL
ARA=23  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH TOP REFLECTOR'
FILL  50 27  END FILL
ARA=24  NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH FACEPLATE'
FILL  51 52  END FILL
ARA=25  NUX=3 NUY=1 NUZ=1
COM='TOTAL'
FILL  43 54 53  END FILL
END ARRAY
READ PLOT TTL='XZ SLICE OF RFP3 SHOWING MATERIAL REGIONS'
XUL=-1  YUL=64.05 ZUL=135
XLR=136 YLR=64.05 ZLR=-2
UAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF NORTH CORE SECOND ROW'
XUL=28  YUL=-2   ZUL=136
XLR=28  YLR=136 ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF SOUTH CORE SECOND ROW'
XUL=80 YUL=-2   ZUL=136
XLR=80 YLR=136  ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'
END PLOT
END DATA
END


CAR14
=CSAS25
ROCKY FLATS CRITICALS NUREG/CR-1653 EXPERIMENT NUMBER ? (27 GROUP MODEL)
' FUEL CUBE 15.28 CM, U(4.46)3O8 @ H/U=1.25, HI CONC. SOLUTION DRIVEN
27GROUPNDF4  INFHOMMEDIUM
U3O8   1 5.4078E-1 293.0 92234 0.03 92235 4.46 92236 0.08 92238 95.43 END
H2O   1 1.5627E-1 END
ARBM-BAGGIE  1.0 3 0 0 0 1001 14.01 6012 84.9 8016 1.20 1 1.9134E-2
   END
ARBM-AL1100   1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 2 9.5390E-1
   END
ARBM-TAPE(VINYL)  1.0 7 0 0 0 1001 5.92 6012 45.91 8016 10.82 17000
   25.73 20040 6.9 22000 1.6 82000 1.1 2 1.1115E-2 END
ARBM-TAPE(MYLAR)  1.0 3 0 0 0 1001 6.83 6012 65.50 8016 27.02 2
   1.7491E-2 END
ARBM-MODERATOR  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 3 END
ARBM-PLEX(REG)  1.0 3 0 0 0 1001 7.84 6012 59.59 8016 32.23 4
   1.1773 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 4
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 4
   1.1648E-3 END
ARBM-PLEX(TRIS)  1.0 8 0 0 1 1001 7.16 6012 52.03 7014 0.16 8016 29.82
   15031 1.02 17000 1.81 35079 4.260 35081 2.840 5 1.2757 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 5
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 5
   1.1648E-3 END
ARBM-FILLER  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 6 0.7 END
' THIS MATERIAL IS ACTUALLY MODERATOR ADJUSTED FOR THE VOLUME
' FRACTION OF THE VOID FILLED BETWEEN CORE AND REFLECTOR.
ARBM-AL1100   1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 7 2.715   END
SOLNUO2(NO3)2  8 351.18 0.549 1.0 293.0 92234 1.022 92235 93.172
   92236 0.434 92238 5.372  END
SS304  9 1.0 END
END COMP
ROCKY FLATS CRITICALS NUREG/CR-1653 EXPERIMENT NUMBER ? (27 GROUP MODEL)
' FUEL CUBE 15.28 CM, U(4.46)3O8 @ H/U=1.25, HI CONC. SOLUTION DRIVEN
READ PARM  NPG=600 NUB=YES FDN=YES PLT=NO  END PARM
READ GEOM
UNIT  1
COM='FUEL BOX WITH VOID AND PART OF AL BOX'
CUBOID  0 1 9.80  0.0 3.75   0.0   14.98 0.0
CUBOID  2 1 9.95  0.0 3.90  -0.15  14.98 0.0
CUBOID  1 1 14.98 0.0 9.365 -5.615 14.98 0.0
UNIT  2
COM='FRONT OF FUEL BOX'
CUBOID  2 1 0.15 0.0  5.615 0.0 14.98 0.0
CUBOID  0 1 0.15 0.0  9.365 0.0 14.98 0.0
CUBOID  2 1 0.15 0.0 14.98  0.0 14.98 0.0
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Table A.3 (continued)

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UNIT  3
COM='REAR OF FUEL BOX'
CUBOID  2 1 0.15 0.0 14.98  0.0 14.98 0.0
UNIT  4
COM='ARRAY TO ASSEMBLE PART OF BOX'
ARRAY 26 3*0
UNIT  5
COM='TOP AND BOTTOM OF BOX'
CUBOID  0 1  9.80 0.0 3.750  0.0   0.15 0.0
CUBOID  2 1 15.28 0.0 9.365 -5.615 0.15 0.0
GLOBAL
UNIT  6
COM='ARRAY TO ASSEMBLE TOP AND BOTTOM'
ARRAY 27 3*0
CUBOID  2 1 15.28   0.0   15.13  -0.15  15.28   0.0
CUBOID  0 1 15.305 -0.025 15.155 -0.175 15.305 -0.025
UNIT  7
COM='FUEL BOX 15.28 CM ON A SIDE WITH .15 CM WALLS .05CM STACKING VOID'
CUBOID  1 1 6P7.49
CUBOID  2 1 6P7.64
CUBOID  0 1 6P7.6650
UNIT  34
COM='ALUMINUM WEIGHT DISTRIBUTION PLATE FOR SPECIAL BOX'
CUBOID  0 1  9.80 0.0 3.750  0.0   0.16 0.0
CUBOID  7 1 15.33 0.0 9.54 -5.79 0.16 0.0
UNIT  35
COM='ALUMINUM WEIGHT DISTRIBUTION PLATE FOR BOXES'
CUBOID  7 1  4P7.665 0.16 0.0
UNIT  9
COM='NORTH SPLIT TABLE CORE'
ARRAY 1 3*0.0
CUBOID  0 1 30.66 -0.94 77.5 0.0 83.475 0.0
UNIT  10
COM='SOUTH SPLIT TABLE CORE'
ARRAY 2 3*0.0
CUBOID  0 1 49.4 0.0 77.5 0.0 83.475 0.0
UNIT  11
COM='PLEXIGLASS REFLECTOR SHEET WITHOUT TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  4 1 2P15.8000 2P38.7500 2P0.6150
UNIT  12
COM='PLEXIGLASS REFLECTOR SHEET WITH TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  5 1 2P15.8000 2P38.7500 2P0.6150
UNIT  13
COM='UPPER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P8.24
UNIT  14
COM='LOWER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P3.69
UNIT  15
COM='NORTH BOTTOM REFLECTOR INCLUDES REGULAR AND TRIS'
ARRAY 3 3*0.0
UNIT  16
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITHOUT TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P0.6150
CUBOID  4 1 44.3 -5.1 2P38.75  2P0.615
UNIT  17
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P0.6150
CUBOID  5 1 44.3 -5.1 2P38.75 2P0.6150
UNIT  18
COM='LOWER PORTION SOUTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P8.855
CUBOID  5 1 44.3 -5.1 2P38.75 2P8.855
UNIT  19
COM='SOUTH BOTTOM REFLECTOR WITH REGULAR AND TRIS'
ARRAY 4 3*0.0
UNIT  20
COM='EAST AND WEST REFLECTORS FOR NORTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P12.65 2P54.2825
UNIT  21
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR NORTH REFLECTOR'
ARRAY 5 3*0.0
UNIT  22
COM='EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P24.700 2P12.65 2P54.2825
UNIT  23
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR'
ARRAY 6 3*0.0
UNIT  24
COM='NORTH TOP REFLECTOR WITH TRIS'
CUBOID  5 1 2P28.35 2P64.05 2P12.15
UNIT  25
COM='ARRAY FOR NORTH TOP REFLECTOR'
ARRAY 7 3*0.0
UNIT  26
COM='SOUTH TOP REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P12.15
CUBOID  5 1 69.4 -5.1 2P64.05 2P12.15
UNIT  27
COM='ARRAY FOR SOUTH TOP REFLECTOR'
ARRAY 8 3*0.0
UNIT  28
COM='NORTH END REFLECTOR 9.8CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P4.9000 2P64.0500 2P54.2825
UNIT  29
COM='NORTH END RELFECTOR 5.2 CM PORTION WITH TRIS'
CUBOID  5 1 2P2.6 2P64.0500 2P54.2825
UNIT  30
COM='NORTH END RELFECTOR 10.1 CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P5.05 2P64.05 2P54.2825
UNIT  31
COM='ARRAY FOR NORTH END REFLECTOR'
ARRAY 9 3*0.0
UNIT  32
COM='SOUTH END REFLECTOR'
CUBOID  5 1 2P12.55 2P64.05 2P54.2825
UNIT  33
COM='ARRAY FOR SOUTH END REFLECTOR'
ARRAY 10 3*0.0
UNIT  38
COM='NORTH CORE WITH BOTTOM REFLECTOR'
ARRAY 13 3* 0.0
UNIT  39
COM='NORTH CORE WITH EAST AND WEST REFLECTOR'
ARRAY 14 3*0.0
UNIT  40
COM='NORTH CORE WITH END REFLECTOR'
ARRAY 15 3*0.0
UNIT  42
COM='NORTH CORE WITH TOP REFLECTOR'
ARRAY 16 3*0.0
UNIT  48
COM='SOUTH CORE WITH BOTTOM REFLECTORS'
ARRAY 20 3*0.0
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UNIT  49
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 21 3*0.0
UNIT  50
COM='SOUTH CORE END REFLECTOR'
ARRAY 22 3*0.0
UNIT  52
COM='SOUTH CORE WITH TOP REFLECTOR'
ARRAY 23 3*0.0
UNIT  54
COM='AIR GAP'
CUBOID  0 1 0.500 0.0 64.475 -63.625 69.13 -63.735
GLOBAL
UNIT  55
COM='TOTAL'
ARRAY 25 3*0.0
UNIT  56
COM='COMBINATION OF TWO REGULAR FUEL BOXES'
ARRAY 28 3*0.0
UNIT  57
COM='COMBINATION OF REGULAR FUEL BOX AND SPECIAL FUEL BOX'
ARRAY 29 3*0.0
UNIT  58
COM='COMBINATION OF TWO REGULAR WEIGHT DISTRIBUTION PLATES'
ARRAY 30 3*0.0
UNIT  59
COM='COMBINATION OF REGULAR AND SPECIAL WEIGHT DISTRIBUTION PLATES'
ARRAY 31 3*0.0
UNIT  60
COM='NORTH CORE SOLUTION DRIVER'
CUBOID  8 1 2P7.5 2P14.9 1.763 -7.5
CUBOID  0 1 2P7.5 2P14.9 2P7.5
CUBOID  9 1 2P7.65 2P15.05 2P7.65
CUBOID  0 1 2P7.665 2P15.33 2P7.665
UNIT  61
COM='SOUTH CORE SOLUTION DRIVER'
CUBOID  8 1 2P7.5 2P14.9 1.695 -7.5
CUBOID  0 1 2P7.5 2P14.9 2P7.5
CUBOID  9 1 2P7.65 2P15.05 2P7.65
CUBOID  0 1 2P7.665 2P15.33 2P7.665
END GEOMETRY
READ ARRAY
ARA=1  NUX=2 NUY=4 NUZ=9
COM='NORTH SPLIT TABLE CORE'
FILL    2R7   2R56   4R7
        2R35  2R58   4R35
        2R7   2R56   4R7
        2R35  2R58   4R35
        2R7   56 60  4R7
        2R35  2R58   4R35
        2R7   2R56   4R7
        2R35  2R58   4R35
        2R7   2R56   4R7
END FILL
ARA=2  NUX=3 NUY=4 NUZ=9
COM='SOUTH SPLIT TABLE CORE'
FILL    3R7   3R56       6R7
        3R35  3R58       6R35
        3R7   3R56       6R7
        3R35  3R58       6R35
        3R7   61 56 56   6R7
        3R35  3R58       6R35
        3R7   57 56 56   6R7
        3R35  59 58 58   6R35
        3R7   57 56 56   6R7
```

```
END FILL
ARA=3  NUX=1 NUY=1 NUZ=3
COM='NORTH BOTTOM REFLECTOR'
FILL  14 11 13  END FILL
ARA=4  NUX=1 NUY=1 NUZ=7
COM='SOUTH BOTTOM REFLECTOR'
FILL  18 16 17 16 16 17 17  END FILL
ARA=5  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF NORTH REFLECTOR'
FILL  20 END FILL
ARA=6  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF SOUTH REFLECTOR'
FILL  22  END FILL
ARA=7  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR NORTH TOP REFLECTOR'
FILL  24  END FILL
ARA=8  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH TOP REFLECTOR'
FILL  26 END FILL
ARA=9  NUX=3 NUY=1 NUZ=1
COM='ARRAY FOR NORTH END REFLECTOR'
FILL  28 29 30  END FILL
ARA=10  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH END REFLECTOR'
FILL  32  END FILL
ARA=13  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF NORTH CORE WITH BOTTOM REFLECTOR'
FILL  15 9  END FILL
ARA=14  NUX=1 NUY=3 NUZ=1
COM='NORTH CORE WITH SIDE REFLECTORS'
FILL  21 38 21  END FILL
ARA=15  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH END REFLECTOR'
FILL  31 39  END FILL
ARA=16  NUX=1 NUY=1 NUZ=2
COM='NORTH CORE WITH TOP REFLECTOR'
FILL  40 25  END FILL
ARA=20  NUX=1 NUY=1 NUZ=2
COM='SOUTH CORE WITH BOTTOM REFLECTOR'
FILL  19 10  END FILL
ARA=21 NUX=1 NUY=3 NUZ=1
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
FILL  23 48 23  END FILL
ARA=22 NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH END REFLECTOR'
FILL  49 33  END FILL
ARA=23  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH TOP REFLECTOR'
FILL  50 27  END FILL
ARA=25  NUX=3 NUY=1 NUZ=1
COM='TOTAL'
FILL  42 54 52  END FILL
ARA=26  NUX=3 NUY=1 NUZ=1
COM='ASSEMBLY OF FUEL BOX FRONT AND REAR'
FILL  2 1 3  END FILL
ARA=27  NUX=1 NUY=1 NUZ=3
COM='ASSEMBLY OF FUEL BOX TOP AND BOTTOM'
FILL  5 4 5  END FILL
ARA=28  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF TWO FUEL BOXES'
FILL  7 7  END FILL
ARA=29  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF SPECIAL AND REGULAR FUEL BOXES'
FILL  7 6  END FILL
```

Table A.3 (continued)

```
ARA=30  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF TWO WEIGHT DISTRIBUTION PLATES'
FILL  35 35  END FILL
ARA=31  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF SPECIAL AND REGULAR WEIGHT DISTRIBUTION PLATES'
FILL  35 34  END FILL
END ARRAY
READ PLOT TTL='YZ SLICE OF SOUTH CORE FIRST ROW'
XUL=64.319 YUL=40.000 ZUL=72.000
XLR=64.319 YLR=72.000 ZLR=56.000
VAX=1  WDN=-1 NAX=130  NCH='012345678'END
TTL='XZ SLICE OF SPHERE CUBOID'
XUL=56.0 YUL=63.625 ZUL=71.735
XLR=72.0 YLR=63.625 ZLR=55.735
UAX=1  WDN=-1 NAX=130  NCH='012345678'
END PLOT
READ START  NST=1 XSM=41.37 XSP=72.894 YSM=40.63 YSP=71.29
  ZSM=56.071 ZSP=71.4   END START
END DATA
END

CAR15
=CSAS25
ROCKY FLATS CRITICALS NUREG/CR-1653 EXPERIMENT NUMBER ? (27 GROUP MODEL)
' FUEL CUBE 15.28 CM, U(4.46)3O8 @ H/U=1.25, HI CONC. SOLUTION DRIVEN
27GROUPNDF4  INFHOMMEDIUM
U3O8   1 5.4078E-1 293.0 92234 0.03 92235 4.46 92236 0.08 92238 95.43 END
H2O    1 1.5627E-1 END
ARBM-BAGGIE  1.0 3 0 0 0 1001 14.01 6012 84.9 8016 1.20 1 1.9134E-2
   END
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 2 9.5390E-1
   END
ARBM-TAPE(VINYL)  1.0 7 0 0 0 1001 5.92 6012 45.91 8016 10.82 17000
   25.73 20040 6.9 22000 1.6 82000 1.1 2 1.1115E-2 END
ARBM-TAPE(MYLAR)  1.0 3 0 0 0 1001 6.83 6012 65.50 8016 27.02 2
   1.7491E-2 END
ARBM-MODERATOR  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 3 END
ARBM-PLEX(REG)  1.0 3 0 0 0 1001 7.84 6012 59.59 8016 32.23 4
   1.1773 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 4
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 4
   1.1648E-3 END
ARBM-PLEX(TRIS)  1.0 8 0 0 1 1001 7.16 6012 52.03 7014 0.16 8016 29.82
   15031 1.02 17000 1.81 35079 4.260 35081 2.840 5 1.2757 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 5
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 5
   1.1648E-3 END
ARBM-FILLER  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 6 0.7 END
' THIS MATERIAL IS ACTUALLY MODERATOR ADJUSTED FOR THE VOLUME
' FRACTION OF THE VOID FILLED BETWEEN CORE AND REFLECTOR.
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 7 2.715   END
SOLNUO2(NO3)2  8 351.18 0.549 1.0 293.0 92234 1.022 92235 93.172
   92236 0.434 92238 5.372  END
SS304  9 1.0 END
END COMP
ROCKY FLATS CRITICALS NUREG/CR-1653 EXPERIMENT NUMBER ? (27 GROUP MODEL)
' FUEL CUBE 15.28 CM, U(4.46)3O8 @ H/U=1.25, HI CONC. SOLUTION DRIVEN
READ PARM  NPG=600 NUB=YES FDN=YES PLT=NO  END PARM
READ GEOM
UNIT  1
COM='FUEL BOX WITH VOID AND PART OF AL BOX'
CUBOID  0 1 9.80  0.0 3.75   0.0    14.98 0.0
CUBOID  2 1 9.95  0.0 3.90  -0.15   14.98 0.0
CUBOID  1 1 14.98 0.0 9.365 -5.615 14.98 0.0
UNIT  2
COM='FRONT OF FUEL BOX'
CUBOID  2 1 0.15 0.0  5.615 0.0 14.98 0.0
CUBOID  0 1 0.15 0.0  9.365 0.0 14.98 0.0
CUBOID  2 1 0.15 0.0 14.98  0.0 14.98 0.0
UNIT  3
COM='REAR OF FUEL BOX'
CUBOID  2 1 0.15 0.0 14.98  0.0 14.98 0.0
UNIT  4
COM='ARRAY TO ASSEMBLE PART OF BOX'
ARRAY 26 3*0
UNIT  5
COM='TOP AND BOTTOM OF BOX'
CUBOID  0 1  9.80 0.0 3.750  0.0   0.15 0.0
CUBOID  2 1 15.28 0.0 9.365 -5.615 0.15 0.0
GLOBAL
UNIT  6
COM='ARRAY TO ASSEMBLE TOP AND BOTTOM'
ARRAY 27 3*0
CUBOID  2 1 15.28   0.0   15.13  -0.15  15.28   0.0
CUBOID  0 1 15.305 -0.025 15.155 -0.175 15.305 -0.025
UNIT  7
COM='FUEL BOX 15.28 CM ON A SIDE WITH .15 CM WALLS .05CM STACKING VOID'
CUBOID  1 1 6P7.49
CUBOID  2 1 6P7.64
CUBOID  0 1 6P7.6650
UNIT  34
COM='ALUMINUM WEIGHT DISTRIBUTION PLATE FOR SPECIAL BOX'
CUBOID  0 1  9.80 0.0 3.750  0.0   0.16 0.0
CUBOID  7 1 15.33 0.0 9.54 -5.79 0.16 0.0
UNIT  35
COM='ALUMINUM WEIGHT DISTRIBUTION PLATE FOR BOXES'
CUBOID  7 1  4P7.665 0.16 0.0
UNIT  9
COM='NORTH SPLIT TABLE CORE'
ARRAY 1 3*0.0
CUBOID  0 1 30.66 -0.94 77.5 0.0 83.475 0.0
UNIT  10
COM='SOUTH SPLIT TABLE CORE'
ARRAY 2 3*0.0
CUBOID  0 1 49.4 0.0 77.5 0.0 83.475 0.0
UNIT  11
COM='PLEXIGLASS REFLECTOR SHEET WITHOUT TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  4 1 2P15.8000 2P38.7500 2P0.6150
UNIT  12
COM='PLEXIGLASS REFLECTOR SHEET WITH TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  5 1 2P15.8000 2P38.7500 2P0.6150
UNIT  13
COM='UPPER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P8.24
UNIT  14
COM='LOWER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P3.69
UNIT  15
COM='NORTH BOTTOM REFLECTOR INCLUDES REGULAR AND TRIS'
ARRAY 3 3*0.0
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Table A.3 (continued)

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UNIT  16
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITHOUT TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P0.6150
CUBOID  4 1 44.3 -5.1 2P38.75  2P0.615
UNIT  17
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P0.6150
CUBOID  5 1 44.3 -5.1 2P38.75 2P0.6150
UNIT  18
COM='LOWER PORTION SOUTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P8.855
CUBOID  5 1 44.3 -5.1 2P38.75 2P8.855
UNIT  19
COM='SOUTH BOTTOM REFLECTOR WITH REGULAR AND TRIS'
ARRAY 4 3*0.0
UNIT  20
COM='EAST AND WEST REFLECTORS FOR NORTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P12.65 2P54.2825
UNIT  21
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR NORTH REFLECTOR'
ARRAY 5 3*0.0
UNIT  22
COM='EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P24.700 2P12.65 2P54.2825
UNIT  23
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR'
ARRAY 6 3*0.0
UNIT  24
COM='NORTH TOP REFLECTOR WITH TRIS'
CUBOID  5 1 2P28.35 2P64.05 2P12.15
UNIT  25
COM='ARRAY FOR NORTH TOP REFLECTOR'
ARRAY 7 3*0.0
UNIT  26
COM='SOUTH TOP REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P12.15
CUBOID  5 1 69.4 -5.1 2P64.05 2P12.15
UNIT  27
COM='ARRAY FOR SOUTH TOP REFLECTOR'
ARRAY 8 3*0.0
UNIT  28
COM='NORTH END REFLECTOR 9.8CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P4.9000 2P64.0500 2P54.2825
UNIT  29
COM='NORTH END RELFECTOR 5.2 CM PORTION WITH TRIS'
CUBOID  5 1 2P2.6 2P64.0500 2P54.2825
UNIT  30
COM='NORTH END RELFECTOR 10.1 CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P5.05 2P64.05 2P54.2825
UNIT  31
COM='ARRAY FOR NORTH END REFLECTOR'
ARRAY 9 3*0.0
UNIT  32
COM='SOUTH END REFLECTOR'
CUBOID  5 1 2P12.55 2P64.05 2P54.2825
UNIT  33
COM='ARRAY FOR SOUTH END REFLECTOR'
ARRAY 10 3*0.0
UNIT  38
COM='NORTH CORE WITH BOTTOM REFLECTOR'
ARRAY 13 3* 0.0
UNIT  39
COM='NORTH CORE WITH EAST AND WEST REFLECTOR'
ARRAY 14 3*0.0
UNIT  40
COM='NORTH CORE WITH END REFLECTOR'
ARRAY 15 3*0.0
UNIT  42
COM='NORTH CORE WITH TOP REFLECTOR'
ARRAY 16 3*0.0
UNIT  48
COM='SOUTH CORE WITH BOTTOM REFLECTORS'
ARRAY 20 3*0.0
UNIT  49
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 21 3*0.0
UNIT  50
COM='SOUTH CORE END REFLECTOR'
ARRAY 22 3*0.0
UNIT  52
COM='SOUTH CORE WITH TOP REFLECTOR'
ARRAY 23 3*0.0
UNIT  54
COM='AIR GAP'
CUBOID  0 1 0.732 0.0 64.475 -63.625 69.13 -63.735
GLOBAL
UNIT  55
COM='TOTAL'
ARRAY 25 3*0.0
UNIT  56
COM='COMBINATION OF TWO REGULAR FUEL BOXES'
ARRAY 28 3*0.0
UNIT  57
COM='COMBINATION OF REGULAR FUEL BOX AND SPECIAL FUEL BOX'
ARRAY 29 3*0.0
UNIT  58
COM='COMBINATION OF TWO REGULAR WEIGHT DISTRIBUTION PLATES'
ARRAY 30 3*0.0
UNIT  59
COM='COMBINATION OF REGULAR AND SPECIAL WEIGHT DISTRIBUTION PLATES'
ARRAY 31 3*0.0
UNIT  60
COM='NORTH CORE SOLUTION DRIVER'
CUBOID  8 1 2P7.5 2P14.9 1.863 -7.5
CUBOID  0 1 2P7.5 2P14.9 2P7.5
CUBOID  9 1 2P7.65 2P15.05 2P7.65
CUBOID  0 1 2P7.665 2P15.33 2P7.665
UNIT  61
COM='SOUTH CORE SOLUTION DRIVER'
CUBOID  8 1 2P7.5 2P14.9 1.794 -7.5
CUBOID  0 1 2P7.5 2P14.9 2P7.5
CUBOID  9 1 2P7.65 2P15.05 2P7.65
CUBOID  0 1 2P7.665 2P15.33 2P7.665
END GEOMETRY
READ ARRAY
ARA=1  NUX=2 NUY=4 NUZ=9
COM='NORTH SPLIT TABLE CORE'
FILL    2R7   2R56   4R7
        2R35  2R58   4R35
        2R7   2R56   4R7
        2R35  2R58   4R35
        2R7   56 60  4R7
        2R35  2R58   4R35
        2R7   2R56   4R7
        2R35  2R58   4R35
        2R7   2R56   4R7
END FILL
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Table A.3 (continued)

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ARA=2  NUX=3 NUY=4 NUZ=9
COM='SOUTH SPLIT TABLE CORE'
FILL   3R7  3R56      6R7
       3R35 3R58      6R35
       3R7  3R56      6R7
       3R35 3R58      6R35
       3R7  61 56 56  6R7
       3R35 3R58      6R35
       3R7  57 56 56  6R7
       3R35 59 58 58  6R35
       3R7  57 56 56  6R7
END FILL
ARA=3  NUX=1 NUY=1 NUZ=3
COM='NORTH BOTTOM REFLECTOR'
FILL  14 11 13  END FILL
ARA=4  NUX=1 NUY=1 NUZ=7
COM='SOUTH BOTTOM REFLECTOR'
FILL  18 16 17 16 16 17 17  END FILL
ARA=5  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF NORTH REFLECTOR'
FILL  20 END FILL
ARA=6  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF SOUTH REFLECTOR'
FILL  22  END FILL
ARA=7  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR NORTH TOP REFLECTOR'
FILL  24  END FILL
ARA=8  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH TOP REFLECTOR'
FILL  26 END FILL
ARA=9  NUX=3 NUY=1 NUZ=1
COM='ARRAY FOR NORTH END REFLECTOR'
FILL  28 29 30  END FILL
ARA=10  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH END REFLECTOR'
FILL  32  END FILL
ARA=13  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF NORTH CORE WITH BOTTOM REFLECTOR'
FILL  15 9  END FILL
ARA=14  NUX=1 NUY=3 NUZ=1
COM='NORTH CORE WITH SIDE REFLECTORS'
FILL  21 38 21  END FILL
ARA=15  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH END REFLECTOR'
FILL  31 39  END FILL
ARA=16  NUX=1 NUY=1 NUZ=2
COM='NORTH CORE WITH TOP REFLECTOR'
FILL  40 25  END FILL
ARA=20  NUX=1 NUY=1 NUZ=2
COM='SOUTH CORE WITH BOTTOM REFLECTOR'
FILL  19 10  END FILL
ARA=21 NUX=1 NUY=3 NUZ=1
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
FILL  23 48 23  END FILL
ARA=22 NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH END REFLECTOR'
FILL  49 33  END FILL
ARA=23  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH TOP REFLECTOR'
FILL  50 27  END FILL
ARA=25  NUX=3 NUY=1 NUZ=1
COM='TOTAL'
FILL  42 54 52  END FILL
ARA=26  NUX=3 NUY=1 NUZ=1
COM='ASSEMBLY OF FUEL BOX FRONT AND REAR'
FILL  2 1 3  END FILL
ARA=27  NUX=1 NUY=1 NUZ=3
COM='ASSEMBLY OF FUEL BOX TOP AND BOTTOM'
FILL  5 4 5  END FILL
ARA=28  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF TWO FUEL BOXES'
FILL  7 7  END FILL
ARA=29  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF SPECIAL AND REGULAR FUEL BOXES'
FILL  7 6  END FILL
ARA=30  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF TWO WEIGHT DISTRIBUTION PLATES'
FILL  35 35  END FILL
ARA=31  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF SPECIAL AND REGULAR WEIGHT DISTRIBUTION PLATES'
FILL  35 34  END FILL
END ARRAY
READ PLOT TTL='YZ SLICE OF SOUTH CORE FIRST ROW'
XUL=64.319 YUL=40.000 ZUL=72.000
XLR=64.319 YLR=72.000 ZLR=56.000
VAX=1  WDN=-1 NAX=130  NCH='012345678'END
TTL='XZ SLICE OF SPHERE CUBOID'
XUL=56.0 YUL=63.625 ZUL=71.735
XLR=72.0 YLR=63.625 ZLR=55.735
UAX=1  WDN=-1 NAX=130  NCH='012345678'
END PLOT
' READ START  NST=1 XSM=41.37 XSP=72.894 YSM=40.63 YSP=71.29
'   ZSM=56.071 ZSP=71.4   END START
READ START  NST=1  END START
END DATA
END
```

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CAR16
=CSAS25
ROCKY FLATS CRITICALS NUREG/CR-1653 EXPERIMENT NUMBER ? (27 GROUP MODEL)
' FUEL CUBE 15.28 CM, U(4.46)3O8 @ H/U=1.25, LOW CONC. SOLUTION DRIVEN
27GROUPNDF4  INFHOMMEDIUM
U3O8  1 5.4078E-1 293.0 92234 0.03 92235 4.46 92236 0.08 92238 95.43 END
H2O   1 1.5627E-1 END
ARBM-BAGGIE  1.0 3 0 0 0 1001 14.01 6012 84.9 8016 1.20 1 1.9134E-2
   END
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 2 9.5390E-1
   END
ARBM-TAPE(VINYL)  1.0 7 0 0 0 1001 5.92 6012 45.91 8016 10.82 17000
   25.73 20040 6.9 22000 1.6 82000 1.1 2 1.1115E-2 END
ARBM-TAPE(MYLAR)  1.0 3 0 0 0 1001 6.83 6012 65.50 8016 27.02 2
   1.7491E-2 END
ARBM-MODERATOR  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 3 END
ARBM-PLEX(REG)  1.0 3 0 0 0 1001 7.84 6012 59.59 8016 32.23 4
   1.1773 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 4
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 4
   1.1648E-3 END
ARBM-PLEX(TRIS)  1.0 8 0 0 1 1001 7.16 6012 52.03 7014 0.16 8016 29.82
   15031 1.02 17000 1.81 35079 4.260 35081 2.840 5 1.2757 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 5
   3.7534E-3 END
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ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 5
   1.1648E-3 END
ARBM-FILLER  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 6 0.7 END
' THIS MATERIAL IS ACTUALLY MODERATOR ADJUSTED FOR THE VOLUME
' FRACTION OF THE VOID FILLED BETWEEN CORE AND REFLECTOR.
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 7 2.715  END
SOLNUO2(NO3)2  8 86.42 0.149 1.0 293.0 92234 1.022 92235 93.172
   92236 0.434 92238 5.372  END
SS304  9 1.0 END
END COMP
ROCKY FLATS CRITICALS NUREG/CR-1653 EXPERIMENT NUMBER ? (27 GROUP MODEL)
' FUEL CUBE 15.28 CM, U(4.46)3O8 @ H/U=1.25, LOW CONC. SOLUTION DRIVEN
READ PARM  NPG=600 NUB=YES FDN=YES PLT=YES  END PARM
READ GEOM
UNIT  1
COM='FUEL BOX WITH VOID AND PART OF AL BOX'
CUBOID  0 1 9.80  0.0 3.75   0.0   14.98 0.0
CUBOID  2 1 9.95  0.0 3.90  -0.15  14.98 0.0
CUBOID  1 1 14.98 0.0 9.365 -5.615 14.98 0.0
UNIT  2
COM='FRONT OF FUEL BOX'
CUBOID  2 1 0.15 0.0  5.615 0.0 14.98 0.0
CUBOID  0 1 0.15 0.0  9.365 0.0 14.98 0.0
CUBOID  2 1 0.15 0.0 14.98  0.0 14.98 0.0
UNIT  3
COM='REAR OF FUEL BOX'
CUBOID  2 1 0.15 0.0 14.98  0.0 14.98 0.0
UNIT  4
COM='ARRAY TO ASSEMBLE PART OF BOX'
ARRAY 26 3*0
UNIT  5
COM='TOP AND BOTTOM OF BOX'
CUBOID  0 1   9.80 0.0 3.750  0.0    0.15 0.0
CUBOID  2 1  15.28 0.0 9.365 -5.615 0.15 0.0
GLOBAL
UNIT  6
COM='ARRAY TO ASSEMBLE TOP AND BOTTOM'
ARRAY 27 3*0
CUBOID  2 1 15.28   0.0    15.13  -0.15  15.28   0.0
CUBOID  0 1 15.305 -0.025 15.155 -0.175 15.305 -0.025
UNIT  7
COM='FUEL BOX 15.28 CM ON A SIDE WITH .15 CM WALLS .05CM STACKING VOID'
CUBOID  1 1  6P7.49
CUBOID  2 1  6P7.64
CUBOID  0 1  6P7.6650
UNIT  34
COM='ALUMINUM WEIGHT DISTRIBUTION PLATE FOR SPECIAL BOX'
CUBOID  0 1   9.80 0.0 3.750  0.0   0.16 0.0
CUBOID  7 1  15.33 0.0 9.54 -5.79 0.16 0.0
UNIT  35
COM='ALUMINUM WEIGHT DISTRIBUTION PLATE FOR BOXES'
CUBOID  7 1   4P7.665 0.16 0.0
UNIT  9
COM='NORTH SPLIT TABLE CORE'
ARRAY 1 3*0.0
CUBOID  0 1 30.66 -0.94 77.5 0.0 83.475 0.0
UNIT  10
COM='SOUTH SPLIT TABLE CORE'
ARRAY 2 3*0.0
CUBOID  0 1 49.4 0.0 77.5 0.0 83.475 0.0
UNIT  11
COM='PLEXIGLASS REFLECTOR SHEET WITHOUT TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  4 1 2P15.8000 2P38.7500 2P0.6150
UNIT  12
COM='PLEXIGLASS REFLECTOR SHEET WITH TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  5 1 2P15.8000 2P38.7500 2P0.6150
UNIT  13
COM='UPPER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P8.24
UNIT  14
COM='LOWER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P3.69
UNIT  15
COM='NORTH BOTTOM REFLECTOR INCLUDES REGULAR AND TRIS'
ARRAY 3 3*0.0
UNIT  16
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITHOUT TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P0.6150
CUBOID  4 1 44.3 -5.1 2P38.75  2P0.615
UNIT  17
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P0.6150
CUBOID  5 1 44.3 -5.1 2P38.75 2P0.6150
UNIT  18
COM='LOWER PORTION SOUTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P8.855
CUBOID  5 1 44.3 -5.1 2P38.75 2P8.855
UNIT  19
COM='SOUTH BOTTOM REFLECTOR WITH REGULAR AND TRIS'
ARRAY 4 3*0.0
UNIT  20
COM='EAST AND WEST REFLECTORS FOR NORTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P12.65 2P54.2825
UNIT  21
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR NORTH REFLECTOR'
ARRAY 5 3*0.0
UNIT  22
COM='EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P24.700 2P12.65 2P54.2825
UNIT  23
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR'
ARRAY 6 3*0.0
UNIT  24
COM='NORTH TOP REFLECTOR WITH TRIS'
CUBOID  5 1 2P28.35 2P64.05 2P12.15
UNIT  25
COM='ARRAY FOR NORTH TOP REFLECTOR'
ARRAY 7 3*0.0
UNIT  26
COM='SOUTH TOP REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P12.15
CUBOID  5 1 69.4 -5.1 2P64.05 2P12.15
UNIT  27
COM='ARRAY FOR SOUTH TOP REFLECTOR'
ARRAY 8 3*0.0
UNIT  28
COM='NORTH END REFLECTOR 9.8CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P4.9000 2P64.0500 2P54.2825
UNIT  29
COM='NORTH END RELFECTOR 5.2 CM PORTION WITH TRIS'
CUBOID  5 1 2P2.6 2P64.0500 2P54.2825
UNIT  30
COM='NORTH END RELFECTOR 10.1 CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P5.05 2P64.05 2P54.2825
```

Table A.3 (continued)

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UNIT  31
COM='ARRAY FOR NORTH END REFLECTOR'
ARRAY 9 3*0.0
UNIT  32
COM='SOUTH END REFLECTOR'
CUBOID  5 1 2P12.55 2P64.05 2P54.2825
UNIT  33
COM='ARRAY FOR SOUTH END REFLECTOR'
ARRAY 10 3*0.0
UNIT  38
COM='NORTH CORE WITH BOTTOM REFLECTOR'
ARRAY 13 3* 0.0
UNIT  39
COM='NORTH CORE WITH EAST AND WEST REFLECTOR'
ARRAY 14 3*0.0
UNIT  40
COM='NORTH CORE WITH END REFLECTOR'
ARRAY 15 3*0.0
UNIT  42
COM='NORTH CORE WITH TOP REFLECTOR'
ARRAY 16 3*0.0
UNIT  48
COM='SOUTH CORE WITH BOTTOM REFLECTORS'
ARRAY 20 3*0.0
UNIT  49
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 21 3*0.0
UNIT  50
COM='SOUTH CORE END REFLECTOR'
ARRAY 22 3*0.0
UNIT  52
COM='SOUTH CORE WITH TOP REFLECTOR'
ARRAY 23 3*0.0
UNIT  54
COM='AIR GAP'
CUBOID  0 1 0.570 0.0 64.475 -63.625 69.13 -63.735
GLOBAL
UNIT  55
COM='TOTAL'
ARRAY 25 3*0.0
UNIT  56
COM='COMBINATION OF TWO REGULAR FUEL BOXES'
ARRAY 28 3*0.0
UNIT  57
COM='COMBINATION OF REGULAR FUEL BOX AND SPECIAL FUEL BOX'
ARRAY 29 3*0.0
UNIT  58
COM='COMBINATION OF TWO REGULAR WEIGHT DISTRIBUTION PLATES'
ARRAY 30 3*0.0
UNIT  59
COM='COMBINATION OF REGULAR AND SPECIAL WEIGHT DISTRIBUTION PLATES'
ARRAY 31 3*0.0
UNIT  60
COM='NORTH CORE SOLUTION DRIVER'
CUBOID  8 1 2P7.5 2P14.9 3.332 -7.5
CUBOID  0 1 2P7.5 2P14.9 2P7.5
CUBOID  9 1 2P7.65 2P15.05 2P7.65
CUBOID  0 1 2P7.665 2P15.33 2P7.665
UNIT  61
COM='SOUTH CORE SOLUTION DRIVER'
CUBOID  8 1 2P7.5 2P14.9 3.292 -7.5
CUBOID  0 1 2P7.5 2P14.9 2P7.5
CUBOID  9 1 2P7.65 2P15.05 2P7.65
CUBOID  0 1 2P7.665 2P15.33 2P7.665
END GEOMETRY
```

```
READ ARRAY
ARA=1  NUX=2 NUY=4 NUZ=9
COM='NORTH SPLIT TABLE CORE'
FILL    2R7  2R56  4R7
        2R35 2R58  4R35
        2R7  2R56  4R7
        2R35 2R58  4R35
        2R7  56 60 4R7
        2R35 2R58  4R35
        2R7  2R56  4R7
        2R35 2R58  4R35
        2R7  2R56  4R7
END FILL
ARA=2  NUX=3 NUY=4 NUZ=9
COM='SOUTH SPLIT TABLE CORE'
FILL    3R7  3R56      6R7
        3R35 3R58      6R35
        3R7  3R56      6R7
        3R35 3R58      6R35
        3R7  61 56 56 6R7
        3R35 3R58      6R35
        3R7  57 56 56 6R7
        3R35 59 58 58 6R35
        3R7  57 56 56 6R7
END FILL
ARA=3  NUX=1 NUY=1 NUZ=3
COM='NORTH BOTTOM REFLECTOR'
FILL  14 11 13  END FILL
ARA=4  NUX=1 NUY=1 NUZ=7
COM='SOUTH BOTTOM REFLECTOR'
FILL  18 16 17 16 16 17 17  END FILL
ARA=5  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF NORTH REFLECTOR'
FILL  20 END FILL
ARA=6  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF SOUTH REFLECTOR'
FILL  22  END FILL
ARA=7  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR NORTH TOP REFLECTOR'
FILL  24  END FILL
ARA=8  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH TOP REFLECTOR'
FILL  26 END FILL
ARA=9  NUX=3 NUY=1 NUZ=1
COM='ARRAY FOR NORTH END REFLECTOR'
FILL  28 29 30  END FILL
ARA=10  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH END REFLECTOR'
FILL  32  END FILL
ARA=13  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF NORTH CORE WITH BOTTOM REFLECTOR'
FILL  15 9  END FILL
ARA=14  NUX=1 NUY=3 NUZ=1
COM='NORTH CORE WITH SIDE REFLECTORS'
FILL  21 38 21  END FILL
ARA=15  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH END REFLECTOR'
FILL  31 39  END FILL
ARA=16  NUX=1 NUY=1 NUZ=2
COM='NORTH CORE WITH TOP REFLECTOR'
FILL  40 25  END FILL
ARA=20  NUX=1 NUY=1 NUZ=2
COM='SOUTH CORE WITH BOTTOM REFLECTOR'
FILL  19 10  END FILL
```

Table A.3 (continued)

```
ARA=21 NUX=1 NUY=3 NUZ=1
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
FILL  23 48 23  END FILL
ARA=22 NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH END REFLECTOR'
FILL  49 33  END FILL
ARA=23  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH TOP REFLECTOR'
FILL  50 27  END FILL
ARA=25  NUX=3 NUY=1 NUZ=1
COM='TOTAL'
FILL  42 54 52  END FILL
ARA=26  NUX=3 NUY=1 NUZ=1
COM='ASSEMBLY OF FUEL BOX FRONT AND REAR'
FILL  2 1 3  END FILL
ARA=27  NUX=1 NUY=1 NUZ=3
COM='ASSEMBLY OF FUEL BOX TOP AND BOTTOM'
FILL  5 4 5  END FILL
ARA=28  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF TWO FUEL BOXES'
FILL  7 7  END FILL
ARA=29  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF SPECIAL AND REGULAR FUEL BOXES'
FILL  7 6  END FILL
ARA=30  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF TWO WEIGHT DISTRIBUTION PLATES'
FILL  35 35  END FILL
ARA=31  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF SPECIAL AND REGULAR WEIGHT DISTRIBUTION PLATES'
FILL  35 34  END FILL
END ARRAY
READ PLOT TTL='YZ SLICE OF SOUTH CORE FIRST ROW'
XUL=64.319 YUL=40.000 ZUL=72.000
XLR=64.319 YLR=72.000 ZLR=56.000
VAX=1  WDN=-1 NAX=130  NCH='012345678'END
TTL='XZ SLICE OF SPHERE CUBOID'
XUL=56.0 YUL=63.625 ZUL=71.735
XLR=72.0 YLR=63.625 ZLR=55.735
UAX=1  WDN=-1 NAX=130  NCH='012345678'
END PLOT
READ START  NST=1 XSM=41.37 XSP=72.894 YSM=40.63 YSP=71.29
  ZSM=56.071 ZSP=71.4   END START
END DATA
END
CAR17
=CSAS25
ROCKY FLATS CRITICALS NUREG/CR-2500 EXPERIMENT F (27 GROUP)
' 48 FUEL CANS 0.929 CM MODERATOR GEE.HU203.DATA(UNDER)
27GROUPNDF4  LATTICECELL
U3O8   1 5.4078E-1 293.0 92234 0.03 92235 4.46 92236 0.08 92238 95.43 END
H2O    1 2.6356E-1 END
ARBM-BAGGIE  1.0 3 0 0 0 1001 14.01 6012 84.9 8016 1.20 1 1.9134E-2
   END
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 2 9.5390E-1
   END
ARBM-TAPE(VINYL)  1.0 7 0 0 0 1001 5.92 6012 45.91 8016 10.82 17000
   25.73 20040 6.9 22000 1.6 82000 1.1 2 1.1115E-2 END
ARBM-TAPE(MYLAR)  1.0 3 0 0 0 1001 6.83 6012 65.50 8016 27.02 2
   1.7491E-2 END
ARBM-MODERATOR  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 3 END
ARBM-PLEX(REG)  1.0 3 0 0 0 1001 7.84 6012 59.59 8016 32.23 4
   1.1773 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 4
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 4
   1.1648E-3 END
ARBM-PLEX(TRIS)  1.0 8 0 0 1 1001 7.16 6012 52.03 7014 0.16 8016 29.82
   15031 1.02 17000 1.81 35079 4.260 35081 2.840 5 1.2757 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 5
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 5
   1.1648E-3 END
ARBM-FILLER  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 6 1.0 END
' THIS MATERIAL IS ACTUALLY MODERATOR ADJUSTED FOR THE VOLUME
' FRACTION OF THE VOID FILLED BETWEEN CORE AND REFLECTOR.
END COMP
' SPHERICAL  VACUUM  REFLECTED  0.0  END
' 1 9.2929  ONEEXTERMOD  3 10.0  NOEXTERMOD  END ZONE
SPHTRIANGP  19.00 18.5857 1 3 18.9579 2 END
ROCKY FLATS CRITICALS NUREG/CR-2500 EXPERIMENT F (27 GROUP)
' 48 FUEL CANS 0.929 CM MODERATOR GEE.HU203.DATA(UNDER)
READ PARM  RUN=YES NPG=600
PLT=NO  NUB=YES FDN=YES
END PARM
READ GEOM
UNIT  1
COM='FUEL BOX 15.28 CM ON A SIDE WITH .15 CM WALLS .05CM STACKING VOID'
CUBOID  1 1 6P7.49
CUBOID  2 1 6P7.64
CUBOID  0 1 6P7.6650
UNIT  2
COM='X-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 2P0.4645 4P7.665
UNIT  3
COM='Y-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 2P7.665 2P0.4645 2P7.665
UNIT  4
COM='Z-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 4P7.665 2P0.4645
UNIT  5
COM='MORE X-FACE MODERATOR'
CUBOID  3 1 4P0.4645 2P7.665
UNIT  6
COM='MORE Y-FACE MODERATOR'
CUBOID  3 1 2P7.665 4P0.4645
UNIT  7
COM='MORE Z-FACE MODERATOR'
CUBOID  3 1 2P0.4645 2P7.665 2P0.4645
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Table A.3 (continued)

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UNIT  8
COM='LAST OF INTERSTITIAL MODERATOR'
CUBOID  3 1 6P0.4645
UNIT  9
COM='NORTH SPLIT TABLE CORE'
ARRAY 1 3*0.0
REPLICATE 0 1 0.0 0.0 0.0 0.0 17.8910 0.0 1
UNIT  10
COM='SOUTH SPLIT TABLE CORE'
ARRAY 2 3*0.0
REPLICATE 0 1 0.0 0.0 0.0 0.0 17.8910 0.0 1
UNIT  11
COM='PLEXIGLASS REFLECTOR SHEET WITHOUT TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  4 1 2P15.8000 2P38.7500 2P0.6150
UNIT  12
COM='PLEXIGLASS REFLECTOR SHEET WITH TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  5 1 2P15.8000 2P38.7500 2P0.6150
UNIT  13
COM='UPPER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P8.24
UNIT  14
COM='LOWER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P3.69
UNIT  15
COM='NORTH BOTTOM REFLECTOR INCLUDES REGULAR AND TRIS'
ARRAY 3 3*0.0
UNIT  16
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITHOUT TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P0.615
CUBOID  4 1 44.3 -5.1 2P38.75 2P0.615
UNIT  17
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P0.615
CUBOID  5 1 44.3 -5.1 2P38.75 2P0.6150
UNIT  18
COM='LOWER PORTION SOUTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P8.855
CUBOID  5 1 44.3 -5.1 2P38.75 2P8.855
UNIT  19
COM='SOUTH BOTTOM REFLECTOR WITH REGULAR AND TRIS'
ARRAY 4 3*0.0
UNIT  20
COM='EAST AND WEST REFLECTORS FOR NORTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P12.65 2P54.2825
UNIT  21
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR NORTH REFLECTOR'
ARRAY 5 3*0.0
UNIT  22
COM='EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P24.700 2P12.65 2P54.2825
UNIT  23
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR'
ARRAY 6 3*0.0
UNIT  24
COM='NORTH TOP REFLECTOR WITH TRIS'
CUBOID  5 1 2P28.35 2P64.05 2P12.15
UNIT  25
COM='ARRAY FOR NORTH TOP REFLECTOR'
ARRAY 7 3*0.0
UNIT  26
COM='SOUTH TOP REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P12.15
CUBOID  5 1 69.4 -5.1 2P64.05 2P12.15
UNIT  27
COM='ARRAY FOR SOUTH TOP REFLECTOR'
ARRAY 8 3*0.0
UNIT  28
COM='NORTH END REFLECTOR 9.8CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P4.9000 2P64.0500 2P54.2825
UNIT  29
COM='NORTH END RELFECTOR 5.2 CM PORTION WITH TRIS'
CUBOID  5 1 2P2.6 2P64.0500 2P54.2825
UNIT  30
COM='NORTH END RELFECTOR 10.1 CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P5.05 2P64.05 2P54.2825
UNIT  31
COM='ARRAY FOR NORTH END REFLECTOR'
ARRAY 9 3*0.0
UNIT  32
COM='SOUTH END REFLECTOR'
CUBOID  5 1 2P12.55 2P64.05 2P54.2825
UNIT  33
COM='ARRAY FOR SOUTH END REFLECTOR'
ARRAY 10 3*0.0
UNIT  34
COM='12.95 THICK MODERATING PLASTIC NORTH CORE'
CUBOID  6 1 2P15.7945 2P6.6965 2P32.8695
UNIT  35
COM='2.95 THICK MODERATING PLASTIC NORTH CORE'
CUBOID  0 1 2P15.7945 2P38.75 2P1.5545
UNIT  36
ARRAY 11 3*0.0
UNIT  37
ARRAY 12 3*0.0
UNIT  38
COM='NORTH CORE WITH BOTTOM REFLECTOR'
ARRAY 13 3* 0.0
UNIT  39
COM='NORTH CORE WITH EAST AND WEST REFLECTOR'
ARRAY 14 3*0.0
UNIT  40
COM='NORTH CORE WITH END REFLECTOR'
ARRAY 15 3*0.0
UNIT  41
COM='NORTH SPLIT TABLE FACEPLATE FOR THIS CASE AIR GAP HALF THICK'
CUBOID  0 1 2P0.1025 2P64.0500 2P66.4325
UNIT  42
COM='NORTH CORE WITH TOP REFLECTOR'
ARRAY 16 3*0.0
UNIT  43
COM='NORTH CORE WITH FACEPLATE'
ARRAY 17 3*0.0
UNIT  44
COM='12.95 CM THICK MODERATOR SOUTH CORE'
CUBOID  6 1 2P15.7945 2P6.6965 2P32.8695
UNIT  45
COM='2.95 THICK MODERATOR SOUTH CORE'
CUBOID  0 1 2P15.7945 2P38.75 2P1.5545
UNIT  46
COM='COMBINATION OF CORE WITH 12.95 THICK MODERATOR'
ARRAY 18 3*0.0
UNIT  47
COM='COMBINATION OF CORE WITH 2.95 THICK MODERATOR'
ARRAY 19 3*0.0
UNIT  48
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 20 3*0.0
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Table A.3 (continued)

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UNIT  49
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 21 3*0.0
UNIT  50
COM='SOUTH CORE END REFLECTOR'
ARRAY 22 3*0.0
UNIT  51
COM='FACEPLATE FOR SOUTH SPLIT TABLE'
CUBOID  3 1 2P0.4645  2P64.0500 2P66.4325
UNIT  52
COM='SOUTH CORE WITH TOP REFLECTOR'
ARRAY 23 3*0.0
UNIT  53
COM='SOUTH CORE WITH FACEPLATE'
ARRAY 24 3*0.0
UNIT  54
COM='AIR GAP HALF THICKNESS'
CUBOID  0 1 2P0.1025 2P64.0500 2P66.4325
GLOBAL
UNIT  55
COM='TOTAL'
ARRAY 25 3*0.0
UNIT  56
COM='NORTH BOTTOM MODERATOR'
CUBOID  6 1 2P15.8000 2P38.7500 2P7.3135
UNIT  57
COM='BOTTOM SOUTH MODERATOR'
CUBOID  6 1 2P24.700 2P38.75  2P7.3135
UNIT  58
COM='REAR FILLER'
CUBOID  6 1 2P8.9055 2P38.75 2P34.424
UNIT  59
COM='COMBINATION OF SOUTH CORE WITH REAR FILLER'
ARRAY 26 3*0.0
UNIT  60
COM='NORTH CORE REAR FILLER'
CUBOID  6 1 2P0.0055 2P38.75 2P34.424
UNIT  61
COM='COMBINATION OF NORTH CORE WITH REAR FILLER'
ARRAY 27 3*0.0
END GEOMETRY
READ ARRAY
ARA=1  NUX=3 NUY=7 NUZ=5
COM='NORTH SPLIT TABLE CORE'
FILL   1 2 1 3 5 3 2Q6 1 2 1
       4 7 4 6 8 6 2Q6 4 7 4
       1Q42
       1 2 1 3 5 3 2Q6 1 2 1   END FILL
ARA=2  NUX=3 NUY=7 NUZ=5
COM='SOUTH SPLIT TABLE CORE'
FILL   1 2 1 3 5 3 2Q6 1 2 1
       4 7 4 6 8 6 2Q6 4 7 4
       1Q42
       1 2 1 3 5 3 2Q6 1 2 1   END FILL
ARA=3  NUX=1 NUY=1 NUZ=4
COM='NORTH BOTTOM MODERATOR AND REFLECTOR'
FILL  14 11 13 56  END FILL
ARA=4  NUX=1 NUY=1 NUZ=8
COM='SOUTH BOTTOM MODERATOR AND REFLECTOR'
FILL  18 16 17 16 16 17 17 57  END FILL
ARA=5  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF NORTH REFLECTOR'
FILL  20 END FILL
ARA=6  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF SOUTH REFLECTOR'
FILL  22  END FILL
ARA=7  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR NORTH TOP REFLECTOR'
FILL  24  END FILL
ARA=8  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH TOP REFLECTOR'
FILL  26 END FILL
ARA=9  NUX=3 NUY=1 NUZ=1
COM='ARRAY FOR NORTH END REFLECTOR'
FILL  28 29 30  END FILL
ARA=10  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH END REFLECTOR'
FILL  32  END FILL
ARA=11  NUX=1 NUY=2 NUZ=1
COM='COMBINARION OF CORE WITH 12.95CM THICK MODERATOR'
FILL  9 34  END FILL
ARA=12 NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF PREVIOUS ARRAY WITH 2.95CM THICK MODERATOR'
FILL  36 35  END FILL
ARA=13  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF NORTH CORE WITH BOTTOM REFLECTOR'
FILL  15 61  END FILL
ARA=14  NUX=1 NUY=3 NUZ=1
COM='NORTH CORE WITH SIDE REFLECTORS'
FILL  21 38 21  END FILL
ARA=15  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH END REFLECTOR'
FILL  31 39  END FILL
ARA=16  NUX=1 NUY=1 NUZ=2
COM='NORTH CORE WITH TOP REFLECTOR'
FILL  40 25  END FILL
ARA=17  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH FACEPLATE'
FILL  42 41  END FILL
ARA=18  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF S. CORE WITH 12.95 CM THICK MODERATOR'
FILL  10 44  END FILL
ARA=19  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH 2.95 CM THICK MODERATOR'
FILL  46 45  END FILL
ARA=20  NUX=1 NUY=1 NUZ=2
COM='SOUTH CORE WITH BOTTOM REFLECTOR'
FILL  19 59  END FILL
ARA=21 NUX=1 NUY=3 NUZ=1
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
FILL  23 48 23  END FILL
ARA=22 NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH END REFLECTOR'
FILL  49 33  END FILL
ARA=23  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH TOP REFLECTOR'
FILL  50 27  END FILL
ARA=24  NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH FACEPLATE'
FILL  51 52  END FILL
ARA=25  NUX=3 NUY=1 NUZ=1
COM='TOTAL'
FILL  43 54 53  END FILL
ARA=26 NUX=2 NUY=1 NUZ=1
COM='COMBINATION OF SOUTH CORE WITH REAR FILLER'
FILL  47 58 END FILL
```

```
ARA=27 NUX=2 NUY=1 NUZ=1
COM='COMBINATION OF NORTH CORE WITH REAR FILLER'
FILL  37 60 END FILL
END ARRAY
READ PLOT TTL='XZ SLICE OF RFPF SHOWING MATERIAL REGIONS'
XUL=-1  YUL=64.05 ZUL=135
XLR=136 YLR=64.05 ZLR=-2
UAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF NORTH CORE FIRST ROW'
XUL=48  YUL=-2   ZUL=136
XLR=48  YLR=136 ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF NORTH CORE SECOND ROW'
XUL=28  YUL=-2   ZUL=136
XLR=28  YLR=136 ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF SOUTH CORE FIRST ROW'
XUL=62 YUL=-2   ZUL=136
XLR=62 YLR=136  ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='TOP VIEW OF SOURCE SLOT'
XUL=-2 YUL=136  ZUL=125
XLR=138 YLR=-2  ZLR=125
UAX=1  VDN=-1 NAX=130  NCH='0123456'END
TTL='TOP VIEW OF TOP LAYER'
XUL=-2 YUL=136  ZUL=95
XLR=138 YLR=-2  ZLR=95
UAX=1  VDN=-1 NAX=130  NCH='0123456'
END PLOT
READ START NST=1
XSP=108.0 XSM=10.0
YSP=108.0 YSM=10.0
ZSP=123.0 ZSM=44.0
END START
END DATA
END
```

```
CAR18
=CSAS25
ROCKY FLATS CRITICALS NUREG/CR-2500 EXPERIMENT G (27 GROUP)
' 30 FUEL CANS 2.44 CM MODERATOR GEE.HU203.DATA(OPTUM)
27GROUPNDF4  LATTICECELL
U3O8  1 5.4078E-1 293.0 92234 0.03 92235 4.46 92236 0.08 92238 95.43 END
H2O   1 2.6356E-1 END
ARBM-BAGGIE  1.0 3 0 0 0 1001 14.01 6012 84.9 8016 1.20 1 1.9134E-2
   END
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 2 9.5390E-1
   END
ARBM-TAPE(VINYL)  1.0 7 0 0 0 1001 5.92 6012 45.91 8016 10.82 17000
   25.73 20040 6.9 22000 1.6 82000 1.1 2 1.1115E-2 END
ARBM-TAPE(MYLAR)  1.0 3 0 0 0 1001 6.83 6012 65.50 8016 27.02 2
   1.7491E-2 END
ARBM-MODERATOR  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 3 END
ARBM-PLEX(REG)  1.0 3 0 0 0 1001 7.84 6012 59.59 8016 32.23 4
   1.1773 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 4
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 4
   1.1648E-3 END
ARBM-PLEX(TRIS)  1.0 8 0 0 1 1001 7.16 6012 52.03 7014 0.16 8016 29.82
   15031 1.02 17000 1.81 35079 4.260 35081 2.840 5 1.2757 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 5
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 5
   1.1648E-3 END
ARBM-FILLER  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 6 1.0 END
' THIS MATERIAL IS ACTUALLY MODERATOR ADJUSTED FOR THE VOLUME
' FRACTION OF THE VOID FILLED BETWEEN CORE AND REFLECTOR.
END COMP
SPHTRIANGP  19.00 18.5857 1 3 18.9579 2 END
ROCKY FLATS CRITICALS NUREG/CR-2500 EXPERIMENT G (27 GROUP)
' 30 FUEL CANS 2.44 CM MODERATOR GEE.HU203.DATA(OPTUM)
READ PARM  RUN=YES NPG=600 FDN=YES NUB=YES PLT=NO
END PARM
READ GEOM
UNIT  1
COM='FUEL BOX 15.28 CM ON A SIDE WITH .15 CM WALLS .05CM STACKING VOID'
CUBOID  1 1 6P7.49
CUBOID  2 1 6P7.64
CUBOID  0 1 6P7.6650
UNIT  2
COM='X-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 2P1.2200 4P7.665
UNIT  3
COM='Y-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 2P7.665 2P1.2200 2P7.665
UNIT  4
COM='Z-FACE INTERSTITIAL MODERATOR'
CUBOID  3 1 4P7.665 2P1.2200
UNIT  5
COM='MORE X-FACE MODERATOR'
CUBOID  3 1 4P1.2200 2P7.665
UNIT  6
COM='MORE Y-FACE MODERATOR'
CUBOID  3 1 2P7.665 4P1.2200
UNIT  7
COM='MORE Z-FACE MODERATOR'
CUBOID  3 1 2P1.2200 2P7.665 2P1.2200
UNIT  8
COM='LAST OF INTERSTITIAL MODERATOR'
CUBOID  3 1 6P1.2200
```

Table A.3 (continued)

```
UNIT  9
COM='NORTH SPLIT TABLE CORE'
ARRAY 1 3*0.0
UNIT  10
COM='SOUTH SPLIT TABLE CORE'
ARRAY 2 3*0.0
UNIT  11
COM='PLEXIGLASS REFLECTOR SHEET WITHOUT TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  4 1 2P16.5500 2P38.7500 2P0.6150
UNIT  12
COM='PLEXIGLASS REFLECTOR SHEET WITH TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  5 1 2P16.5500 2P38.7500 2P0.6150
UNIT  13
COM='UPPER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P16.5500 2P38.75 2P8.24
UNIT  14
COM='LOWER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P16.5500 2P38.75 2P3.69
UNIT  15
COM='NORTH BOTTOM REFLECTOR INCLUDES REGULAR AND TRIS'
ARRAY 3 3*0.0
UNIT  16
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITHOUT TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P0.615
CUBOID  4 1 44.3 -5.1 2P38.75 2P0.615
UNIT  17
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P0.615
CUBOID  5 1 44.3 -5.1 2P38.75 2P0.6150
UNIT  18
COM='LOWER PORTION SOUTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P8.855
CUBOID  5 1 44.3 -5.1 2P38.75 2P8.855
UNIT  19
COM='SOUTH BOTTOM REFLECTOR WITH REGULAR AND TRIS'
ARRAY 4 3*0.0
UNIT  20
COM='EAST AND WEST REFLECTORS FOR NORTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P16.5500 2P12.65 2P52.7825
UNIT  21
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR NORTH REFLECTOR'
ARRAY 5 3*0.0
UNIT  22
COM='EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P24.700 2P12.65 2P52.7825
UNIT  23
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR'
ARRAY 6 3*0.0
UNIT  24
COM='NORTH TOP REFLECTOR WITH TRIS'
CUBOID  5 1 2P29.1 2P64.05 2P12.15
UNIT  25
COM='ARRAY FOR NORTH TOP REFLECTOR'
ARRAY 7 3*0.0
UNIT  26
COM='SOUTH TOP REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.55 2P12.15
CUBOID  5 1 69.4 -5.1 2P64.05 2P12.15
UNIT  27
COM='ARRAY FOR SOUTH TOP REFLECTOR'
ARRAY 8 3*0.0
UNIT  28
COM='NORTH END REFLECTOR 9.8CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P4.9000 2P64.0500 2P52.7825
UNIT  29
COM='NORTH END RELFECTOR 5.2 CM PORTION WITH TRIS'
CUBOID  5 1 2P2.6 2P64.0500 2P52.7825
UNIT  30
COM='NORTH END RELFECTOR 10.1 CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P5.05 2P64.05 2P52.7825
UNIT  31
COM='ARRAY FOR NORTH END REFLECTOR'
ARRAY 9 3*0.0
UNIT  32
COM='SOUTH END REFLECTOR'
CUBOID  5 1 2P12.55 2P64.05 2P52.7825
UNIT  33
COM='ARRAY FOR SOUTH END REFLECTOR'
ARRAY 10 3*0.0
UNIT  34
COM='12.95 THICK MODERATING PLASTIC NORTH CORE'
CUBOID  0 1 2P16.5500 2P13.315 2P25.4350
UNIT  35
COM='2.95 THICK MODERATING PLASTIC NORTH CORE'
CUBOID  6 1 2P16.5500 2P38.75 2P1.7525
UNIT  36
ARRAY 11 3*0.0
UNIT  37
ARRAY 12 3*0.0
UNIT  38
COM='NORTH CORE WITH BOTTOM REFLECTOR'
ARRAY 13 3* 0.0
UNIT  39
COM='NORTH CORE WITH EAST AND WEST REFLECTOR'
ARRAY 14 3*0.0
UNIT  40
COM='NORTH CORE WITH END REFLECTOR'
ARRAY 15 3*0.0
UNIT  41
COM='NORTH SPLIT TABLE FACEPLATE'
CUBOID  3 1 2P0.61 2P64.0500 2P64.9325
UNIT  42
COM='NORTH CORE WITH TOP REFLECTOR'
ARRAY 16 3*0.0
UNIT  43
COM='NORTH CORE WITH FACEPLATE'
ARRAY 17 3*0.0
UNIT  44
COM='12.95 CM THICK MODERATOR SOUTH CORE'
CUBOID  0 1 2P16.5500 2P13.315 2P25.4350
UNIT  45
COM='2.95 THICK MODERATOR SOUTH CORE'
CUBOID  6 1 2P16.5500 2P38.75 2P1.7525
UNIT  46
COM='COMBINATION OF CORE WITH 12.95 THICK MODERATOR'
ARRAY 18 3*0.0
UNIT  47
COM='COMBINATION OF CORE WITH 2.95 THICK MODERATOR'
ARRAY 19 3*0.0
UNIT  48
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 20 3*0.0
UNIT  49
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 21 3*0.0
UNIT  50
COM='SOUTH CORE END REFLECTOR'
ARRAY 22 3*0.0
```

Table A.3 (continued)

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UNIT  51
COM='FACEPLATE FOR SOUTH SPLIT TABLE'
CUBOID  3 1 2P0.610  2P64.0500 2P64.9325
UNIT  52
COM='SOUTH CORE WITH TOP REFLECTOR'
ARRAY 23 3*0.0
UNIT  53
COM='SOUTH CORE WITH FACEPLATE'
ARRAY 24 3*0.0
UNIT  54
COM='AIR GAP'
CUBOID  0 1 2P0.2850 2P64.0500 2P64.9325
GLOBAL
UNIT  55
COM='TOTAL'
ARRAY 25 3*0.0
UNIT  56
COM='NORTH BOTTOM MODERATOR'
CUBOID  6 1 2P16.5500 2P38.7500 2P13.05
UNIT  57
COM='BOTTOM SOUTH MODERATOR'
CUBOID  6 1 2P24.700 2P38.75  2P13.05
UNIT  58
COM='REAR FILLER'
CUBOID  6 1 2P8.1500 2P38.75 2P27.1875
UNIT  59
COM='COMBINATION OF SOUTH CORE WITH REAR FILLER'
ARRAY 26 3*0.0
UNIT  60
COM='NORTH CORE REAR FILLER'
CUBOID  6 1 2P0.0 2P38.75 2P27.1875
UNIT  61
COM='COMBINATION OF NORTH CORE WITH REAR FILLER'
ARRAY 27 3*0.0
UNIT  62
COM='EMPTY FUEL LOCATION'
CUBOID  0 1 6P7.6650
UNIT  63
COM='Y-FACE MODERATOR VOID'
CUBOID  0 1 2P7.665 2P1.22 2P7.665
END GEOMETRY
READ ARRAY
ARA=1  NUX=3 NUY=5 NUZ=5
COM='NORTH SPLIT TABLE CORE'
FILL   1 2 1 3 5 3 1Q6 1 2 1
       4 7 4 6 8 6 1Q6 4 7 4
       1Q30
       62 2 1 63 5 3 1Q6 62 2 1   END FILL
ARA=2  NUX=3 NUY=5 NUZ=5
COM='SOUTH SPLIT TABLE CORE'
FILL   1 2 1 3 5 3 1Q6 1 2 1
       4 7 4 6 8 6 1Q6 4 7 4
       1Q30
       1 2 62 3 5 63 1Q6 1 2 62   END FILL
ARA=3  NUX=1 NUY=1 NUZ=4
COM='NORTH BOTTOM MODERATOR AND REFLECTOR'
FILL   14 11 13 56  END FILL
ARA=4  NUX=1 NUY=1 NUZ=8
COM='SOUTH BOTTOM MODERATOR AND REFLECTOR'
FILL   18 16 17 16 16 17 17 57  END FILL
ARA=5  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF NORTH REFLECTOR'
FILL   20 END FILL
ARA=6  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF SOUTH REFLECTOR'
FILL  22  END FILL
ARA=7  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR NORTH TOP REFLECTOR'
FILL  24  END FILL
ARA=8  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH TOP REFLECTOR'
FILL  26 END FILL
ARA=9  NUX=3 NUY=1 NUZ=1
COM='ARRAY FOR NORTH END REFLECTOR'
FILL  28 29 30  END FILL
ARA=10  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH END REFLECTOR'
FILL  32  END FILL
ARA=11  NUX=1 NUY=2 NUZ=1
COM='COMBINARION OF CORE WITH 12.95CM THICK MODERATOR'
FILL  9 34  END FILL
ARA=12 NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF PREVIOUS ARRAY WITH 2.95CM THICK MODERATOR'
FILL  36 35  END FILL
ARA=13  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF NORTH CORE WITH BOTTOM REFLECTOR'
FILL  15 61  END FILL
ARA=14  NUX=1 NUY=3 NUZ=1
COM='NORTH CORE WITH SIDE REFLECTORS'
FILL  21 38 21  END FILL
ARA=15  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH END REFLECTOR'
FILL  31 39  END FILL
ARA=16  NUX=1 NUY=1 NUZ=2
COM='NORTH CORE WITH TOP REFLECTOR'
FILL  40 25  END FILL
ARA=17  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH FACEPLATE'
FILL  42 41  END FILL
ARA=18  NUX=1 NUY=2 NUZ=1
COM='COMBINATION OF S. CORE WITH 12.95 CM THICK MODERATOR'
FILL  10 44  END FILL
ARA=19  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH 2.95 CM THICK MODERATOR'
FILL  46 45  END FILL
ARA=20  NUX=1 NUY=1 NUZ=2
COM='SOUTH CORE WITH BOTTOM REFLECTOR'
FILL  19 59  END FILL
ARA=21 NUX=1 NUY=3 NUZ=1
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
FILL  23 48 23  END FILL
ARA=22 NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH END REFLECTOR'
FILL  49 33  END FILL
ARA=23  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH TOP REFLECTOR'
FILL  50 27  END FILL
ARA=24  NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH FACEPLATE'
FILL  51 52  END FILL
ARA=25  NUX=3 NUY=1 NUZ=1
COM='TOTAL'
FILL  43 54 53  END FILL
ARA=26 NUX=2 NUY=1 NUZ=1
COM='COMBINATION OF SOUTH CORE WITH REAR FILLER'
FILL  47 58 END FILL
```

Table A.3 (continued)

```
ARA=27 NUX=2 NUY=1 NUZ=1
COM='COMBINATION OF NORTH CORE WITH REAR FILLER'
FILL  37 60 END FILL
END ARRAY
READ PLOT TTL='XZ SLICE OF RFPG SHOWING MATERIAL REGIONS'
XUL=-1  YUL=64.05 ZUL=135
XLR=136 YLR=64.05 ZLR=-2
UAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF NORTH CORE FIRST ROW'
XUL=48  YUL=-2   ZUL=136
XLR=48  YLR=136 ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF NORTH CORE SECOND ROW'
XUL=28  YUL=-2   ZUL=136
XLR=28  YLR=136 ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='YZ SLICE OF SOUTH CORE FIRST ROW'
XUL=62 YUL=-2   ZUL=136
XLR=62 YLR=136  ZLR=-2
VAX=1  WDN=-1 NAX=130  NCH='0123456'END
TTL='TOP VIEW OF SOURCE SLOT'
XUL=-2 YUL=136  ZUL=125
XLR=138 YLR=-2  ZLR=125
UAX=1  VDN=-1 NAX=130  NCH='0123456'END
TTL='TOP VIEW OF TOP LAYER'
XUL=-2 YUL=136  ZUL=95
XLR=138 YLR=-2  ZLR=95
UAX=1  VDN=-1 NAX=130  NCH='0123456'
END PLOT
READ START      NST=1
XSP=100.0  XSM=10.0
YSP=100.0  YSM=10.0
ZSP=117.0  ZSM=60.0
END DATA
END
```

```
CAR19
=CSAS25
ROCKY FLATS CRITICALS NUREG/CR-2500 EXPERIMENT NUMBER ? (27 GROUP MODEL)
' FUEL CUBE 15.28 CM, U(4.46)3O8 @ H/U=2.03, HI ENRICHED SPHERE DRIVEN
27GROUPNDF4  INFHOMMEDIUM
U3O8  1 5.4078E-1 293.0 92234 0.03 92235 4.46 92236 0.08 92238 95.43 END
H2O   1 2.6356E-1 END
ARBM-BAGGIE  1.0 3 0 0 0 1001 14.01 6012 84.9 8016 1.20 1 1.9134E-2
   END
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 2 9.5390E-1
   END
ARBM-TAPE(VINYL)  1.0 7 0 0 0 1001 5.92 6012 45.91 8016 10.82 17000
   25.73 20040 6.9 22000 1.6 82000 1.1 2 1.1115E-2 END
ARBM-TAPE(MYLAR)  1.0 3 0 0 0 1001 6.83 6012 65.50 8016 27.02 2
   1.7491E-2 END
ARBM-MODERATOR  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 3 END
ARBM-PLEX(REG)  1.0 3 0 0 0 1001 7.84 6012 59.59 8016 32.23 4
   1.1773 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 4
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 4
   1.1648E-3 END
ARBM-PLEX(TRIS)  1.0 8 0 0 1 1001 7.16 6012 52.03 7014 0.16 8016 29.82
   15031 1.02 17000 1.81 35079 4.260 35081 2.840 5 1.2757 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 5
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 5
   1.1648E-3 END
ARBM-FILLER  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 6 0.7 END
' THIS MATERIAL IS ACTUALLY MODERATOR ADJUSTED FOR THE VOLUME
' FRACTION OF THE VOID FILLED BETWEEN CORE AND REFLECTOR.
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 7 2.715  END
URANIUM  8 0.9483 293.0 92234 1.0 92235 93.19 92236 0.4 92238  5.41 END
ARBM-PJ  0.816 2 0 0 0 1001 85.1 6012 14.9 8 0.0089  END
SS304  9 1.0 END
END COMP
ROCKY FLATS CRITICALS NUREG/CR-2500 EXPERIMENT NUMBER ? (27 GROUP MODEL)
' FUEL CUBE 15.28 CM, U(4.46)3O8 @ H/U=2.03, HI ENRICHED SPHERE DRIVEN
READ PARM  NPG=600 NUB=YES FDN=YES PLT=NO  END PARM
READ GEOM
UNIT  1
COM='FUEL BOX WITH VOID AND PART OF AL BOX'
CUBOID  0 1 9.80  0.0 3.75   0.0   14.98 0.0
CUBOID  2 1 9.95  0.0 3.90  -0.15  14.98 0.0
CUBOID  1 1 14.98 0.0 9.365 -5.615 14.98 0.0
UNIT  2
COM='FRONT OF FUEL BOX'
CUBOID  2 1 0.15 0.0  5.615 0.0 14.98 0.0
CUBOID  0 1 0.15 0.0  9.365 0.0 14.98 0.0
CUBOID  2 1 0.15 0.0 14.98  0.0 14.98 0.0
UNIT  3
COM='REAR OF FUEL BOX'
CUBOID  2 1 0.15 0.0 14.98  0.0 14.98 0.0
UNIT  4
COM='ARRAY TO ASSEMBLE PART OF BOX'
ARRAY 26 3*0
UNIT  5
COM='TOP AND BOTTOM OF BOX'
CUBOID  0 1  9.80 0.0 3.750  0.0   0.15 0.0
CUBOID  2 1 15.28 0.0 9.365 -5.615 0.15 0.0
GLOBAL
UNIT  6
COM='ARRAY TO ASSEMBLE TOP AND BOTTOM'
ARRAY 27 3*0
CUBOID  2 1 15.28   0.0   15.13  -0.15  15.28   0.0
CUBOID  0 1 15.305 -0.025 15.155 -0.175 15.305 -0.025
UNIT  7
COM='FUEL BOX 15.28 CM ON A SIDE WITH .15 CM WALLS .05CM STACKING VOID'
CUBOID  1 1 6P7.49
CUBOID  2 1 6P7.64
CUBOID  0 1 6P7.6650
UNIT  8
COM='BOX FOR DRIVER'
CYLINDER  9 1 0.3175 2P5.66
SPHERE    8 1 5.67
CUBOID  0 1 9.62 -5.71 2P7.665 7.365 -7.965
HOLE  37 0.0 0.0 -7.965
UNIT  34
COM='ALUMINUM WEIGHT DISTRIBUTION PLATE FOR SPECIAL BOX'
CUBOID  0 1  9.80 0.0 3.750  0.0   0.16 0.0
CUBOID  7 1 15.33 0.0 9.54 -5.79 0.16 0.0
UNIT  35
COM='ALUMINUM WEIGHT DISTRIBUTION PLATE FOR BOXES'
CUBOID  7 1  4P7.665 0.16 0.0
```

Table A.3 (continued)

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UNIT  37
COM='DRIVER MOUNT'
CYLINDER  9 1 1.56 2.2 0.0
UNIT  9
COM='NORTH SPLIT TABLE CORE'
ARRAY 1 3*0.0
CUBOID  0 1 30.66 -0.94 77.5 0.0 83.475 0.0
UNIT  10
COM='SOUTH SPLIT TABLE CORE'
ARRAY 2 3*0.0
CUBOID  0 1 49.4 0.0 77.5 0.0 83.475 0.0
UNIT  11
COM='PLEXIGLASS REFLECTOR SHEET WITHOUT TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  4 1 2P15.8000 2P38.7500 2P0.6150
UNIT  12
COM='PLEXIGLASS REFLECTOR SHEET WITH TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  5 1 2P15.8000 2P38.7500 2P0.6150
UNIT  13
COM='UPPER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P8.24
UNIT  14
COM='LOWER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P3.69
UNIT  15
COM='NORTH BOTTOM REFLECTOR INCLUDES REGULAR AND TRIS'
ARRAY 3 3*0.0
UNIT  16
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITHOUT TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P0.6150
CUBOID  4 1 44.3 -5.1 2P38.75  2P0.615
UNIT  17
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P0.6150
CUBOID  5 1 44.3 -5.1 2P38.75 2P0.6150
UNIT  18
COM='LOWER PORTION SOUTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P8.855
CUBOID  5 1 44.3 -5.1 2P38.75 2P8.855
UNIT  19
COM='SOUTH BOTTOM REFLECTOR WITH REGULAR AND TRIS'
ARRAY 4 3*0.0
UNIT  20
COM='EAST AND WEST REFLECTORS FOR NORTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P12.65 2P54.2825
UNIT  21
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR NORTH REFLECTOR'
ARRAY 5 3*0.0
UNIT  22
COM='EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P24.700 2P12.65 2P54.2825
UNIT  23
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR'
ARRAY 6 3*0.0
UNIT  24
COM='NORTH TOP REFLECTOR WITH TRIS'
CUBOID  5 1 2P28.35 2P64.05 2P12.15
UNIT  25
COM='ARRAY FOR NORTH TOP REFLECTOR'
ARRAY 7 3*0.0
UNIT  26
COM='SOUTH TOP REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P12.15
CUBOID  5 1 69.4 -5.1 2P64.05 2P12.15
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UNIT  27
COM='ARRAY FOR SOUTH TOP REFLECTOR'
ARRAY 8 3*0.0
UNIT  28
COM='NORTH END REFLECTOR 9.8CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P4.9000 2P64.0500 2P54.2825
UNIT  29
COM='NORTH END RELFECTOR 5.2 CM PORTION WITH TRIS'
CUBOID  5 1 2P2.6 2P64.0500 2P54.2825
UNIT  30
COM='NORTH END RELFECTOR 10.1 CM PORTION WITHOUT TRIS'
CUBOID  4 1 2P5.05 2P64.05 2P54.2825
UNIT  31
COM='ARRAY FOR NORTH END REFLECTOR'
ARRAY 9 3*0.0
UNIT  32
COM='SOUTH END REFLECTOR'
CUBOID  5 1 2P12.55 2P64.05 2P54.2825
UNIT  33
COM='ARRAY FOR SOUTH END REFLECTOR'
ARRAY 10 3*0.0
UNIT  38
COM='NORTH CORE WITH BOTTOM REFLECTOR'
ARRAY 13 3* 0.0
UNIT  39
COM='NORTH CORE WITH EAST AND WEST REFLECTOR'
ARRAY 14 3*0.0
UNIT  40
COM='NORTH CORE WITH END REFLECTOR'
ARRAY 15 3*0.0
UNIT  42
COM='NORTH CORE WITH TOP REFLECTOR'
ARRAY 16 3*0.0
UNIT  48
COM='SOUTH CORE WITH BOTTOM REFLECTORS'
ARRAY 20 3*0.0
UNIT  49
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 21 3*0.0
UNIT  50
COM='SOUTH CORE END REFLECTOR'
ARRAY 22 3*0.0
UNIT  52
COM='SOUTH CORE WITH TOP REFLECTOR'
ARRAY 23 3*0.0
UNIT  54
COM='AIR GAP'
CUBOID  0 1 1.49 0.0 64.475 -63.625 69.13 -63.735
GLOBAL
UNIT  55
COM='TOTAL'
ARRAY 25 3*0.0
END GEOMETRY
READ ARRAY
ARA=1  NUX=2 NUY=5 NUZ=9
COM='NORTH SPLIT TABLE CORE'
FILL  10R7
      10R35
      10R7
      10R35
      10R7
      10R35
      10R7
      10R35
      10R7   END FILL
```

```
ARA=2  NUX=3 NUY=5 NUZ=9
COM='SOUTH SPLIT TABLE CORE'
FILL  6R7 6 8R7
      6R35 34 8R35
      6R7 6 8R7
      6R35 34 8R35
      6R7 8 8R7
      6R35 34 8R35
      6R7 6 8R7
      6R35 34 8R35
      6R7 6 8R7  END FILL
ARA=3  NUX=1 NUY=1 NUZ=3
COM='NORTH BOTTOM REFLECTOR'
FILL  14 11 13  END FILL
ARA=4  NUX=1 NUY=1 NUZ=7
COM='SOUTH BOTTOM REFLECTOR'
FILL  18 16 17 16 16 17 17  END FILL
ARA=5  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF NORTH REFLECTOR'
FILL  20 END FILL
ARA=6  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF SOUTH REFLECTOR'
FILL  22  END FILL
ARA=7  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR NORTH TOP REFLECTOR'
FILL  24  END FILL
ARA=8  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH TOP REFLECTOR'
FILL  26 END FILL
ARA=9  NUX=3 NUY=1 NUZ=1
COM='ARRAY FOR NORTH END REFLECTOR'
FILL  28 29 30  END FILL
ARA=10  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH END REFLECTOR'
FILL  32  END FILL
ARA=13  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF NORTH CORE WITH BOTTOM REFLECTOR'
FILL  15 9  END FILL
ARA=14  NUX=1 NUY=3 NUZ=1
COM='NORTH CORE WITH SIDE REFLECTORS'
FILL  21 38 21  END FILL
ARA=15  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH END REFLECTOR'
FILL  31 39  END FILL
ARA=16  NUX=1 NUY=1 NUZ=2
COM='NORTH CORE WITH TOP REFLECTOR'
FILL  40 25  END FILL
ARA=20  NUX=1 NUY=1 NUZ=2
COM='SOUTH CORE WITH BOTTOM REFLECTOR'
FILL  19 10  END FILL
ARA=21 NUX=1 NUY=3 NUZ=1
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
FILL  23 48 23  END FILL
ARA=22 NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH END REFLECTOR'
FILL  49 33  END FILL
ARA=23  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH TOP REFLECTOR'
FILL  50 27  END FILL
ARA=25  NUX=3 NUY=1 NUZ=1
COM='TOTAL'
FILL  42 54 52  END FILL
ARA=26  NUX=3 NUY=1 NUZ=1
COM='ASSEMBLY OF FUEL BOX FRONT AND REAR'
FILL  2 1 3  END FILL
ARA=27  NUX=1 NUY=1 NUZ=3
COM='ASSEMBLY OF FUEL BOX TOP AND BOTTOM'
FILL  5 4 5  END FILL
END ARRAY
READ PLOT TTL='YZ SLICE OF SOUTH CORE FIRST ROW'
XUL=64.319 YUL=55.625 ZUL=71.735
XLR=64.319 YLR=71.625 ZLR=55.735
VAX=1  WDN=-1 NAX=130  NCH='012345678'END
TTL='XZ SLICE OF SPHERE CUBOID'
XUL=56.0 YUL=63.625 ZUL=71.735
XLR=72.0 YLR=63.625 ZLR=55.735
UAX=1  WDN=-1 NAX=130  NCH='012345678'
END PLOT
' READ START  NST=6 TFX=65 TFY=63.625 TFZ=63.735 LNU=300  END START
READ START  NST=1 XSM=56.981 XSP=71.649 YSM=56.219 YSP=70.959
  ZSM=56.401 ZSP=71.069   END START
END DATA
END
```

```
CAR20
=CSAS25
ROCKY FLATS CRITICALS NUREG/CR-2500 EXPERIMENT NUMBER ? (27 GROUP MODEL)
' FUEL CUBE 15.28 CM, U(4.46)308 @ H/U=2.03, HI ENRICHED SPHERE DRIVEN
27GROUPNDF4  INFHOMMEDIUM
U308  1 5.4078E-1 293.0 92234 0.03 92235 4.46 92236 0.08 92238 95.43 END
H2O   1 2.6356E-1 END
ARBM-BAGGIE  1.0 3 0 0 0 1001 14.01 6012 84.9 8016 1.20 1 1.9134E-2
   END
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 2 9.5390E-1
   END
ARBM-TAPE(VINYL)  1.0 7 0 0 0 1001 5.92 6012 45.91 8016 10.82 17000
   25.73 20040 6.9 22000 1.6 82000 1.1 2 1.1115E-2 END
ARBM-TAPE(MYLAR)  1.0 3 0 0 0 1001 6.83 6012 65.50 8016 27.02 2
   1.7491E-2 END
ARBM-MODERATOR  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 3 END
ARBM-PLEX(REG)  1.0 3 0 0 0 1001 7.84 6012 59.59 8016 32.23 4
   1.1773 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 4
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 4
   1.1648E-3 END
ARBM-PLEX(TRIS)  1.0 8 0 0 1 1001 7.16 6012 52.03 7014 0.16 8016 29.82
   15031 1.02 17000 1.81 35079 4.260 35081 2.840 5 1.2757 END
ARBM-PLEX(PAPER)  1.0 3 0 0 0 1001 6.48 6012 42.17 8016 49.5 5
   3.7534E-3 END
ARBM-PLEX(GLUE)  1.0 3 0 0 0 1001 11.67 6012 86.29 8016 1.20 5
   1.1648E-3 END
ARBM-FILLER  1.185 3 0 0 0 1001 7.83 6012 59.49 8016 32.48 6 0.7 END
' THIS MATERIAL IS ACTUALLY MODERATOR ADJUSTED FOR THE VOLUME
' FRACTION OF THE VOID FILLED BETWEEN CORE AND REFLECTOR.
ARBM-AL1100  1.0 3 0 0 1 13027 99.18 26000 0.5 29000 0.2 7 2.715  END
URANIUM  8 0.9483 293.0 92234 1.0 92235 93.19 92236 0.4 92238  5.41 END
ARBM-PJ  0.816 2 0 0 0 1001 85.1 6012 14.9 8 0.0089  END
SS304  9 1.0 END
END COMP
ROCKY FLATS CRITICALS NUREG/CR-2500 EXPERIMENT NUMBER ? (27 GROUP MODEL)
' FUEL CUBE 15.28 CM, U(4.46)308 @ H/U=2.03, HI ENRICHED SPHERE DRIVEN
READ PARM  NPG=600 NUB=YES FDN=YES PLT=NO  END PARM
READ GEOM
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Table A.3 (continued)

```
UNIT  1
COM='FUEL BOX WITH VOID AND PART OF AL BOX'
CUBOID  0 1 9.80  0.0 3.75   0.0   14.98 0.0
CUBOID  2 1 9.95  0.0 3.90  -0.15  14.98 0.0
CUBOID  1 1 14.98 0.0 9.365 -5.615 14.98 0.0
UNIT  2
COM='FRONT OF FUEL BOX'
CUBOID  2 1 0.15 0.0  5.615 0.0 14.98 0.0
CUBOID  0 1 0.15 0.0  9.365 0.0 14.98 0.0
CUBOID  2 1 0.15 0.0 14.98  0.0 14.98 0.0
UNIT  3
COM='REAR OF FUEL BOX'
CUBOID  2 1 0.15 0.0 14.98  0.0 14.98 0.0
UNIT  4
COM='ARRAY TO ASSEMBLE PART OF BOX'
ARRAY 26 3*0
UNIT  5
COM='TOP AND BOTTOM OF BOX'
CUBOID  0 1  9.80 0.0 3.750  0.0   0.15 0.0
CUBOID  2 1 15.28 0.0 9.365 -5.615 0.15 0.0
GLOBAL
UNIT  6
COM='ARRAY TO ASSEMBLE TOP AND BOTTOM'
ARRAY 27 3*0
CUBOID  2 1 15.28   0.0   15.13  -0.15  15.28   0.0
CUBOID  0 1 15.305 -0.025 15.155 -0.175 15.305 -0.025
UNIT  7
COM='FUEL BOX 15.28 CM ON A SIDE WITH .15 CM WALLS .05CM STACKING VOID'
CUBOID  1 1 6P7.49
CUBOID  2 1 6P7.64
CUBOID  0 1 6P7.6650
UNIT  8
COM='BOX FOR DRIVER'
CYLINDER  9 1 0.3175 2P2.318
SPHERE    0 1 2.34
SPHERE    8 1 5.67
HOLE   36 0.0 0.0  2.3401
HOLE  100 0.0 0.0 -2.3401
CUBOID  0 1 8.71 -6.62 2P7.665 7.365 -7.965
HOLE   37 0.0 0.0 -7.965
UNIT  34
COM='ALUMINUM WEIGHT DISTRIBUTION PLATE FOR SPECIAL BOX'
CUBOID  0 1  9.80 0.0 3.750  0.0   0.16 0.0
CUBOID  7 1 15.33 0.0 9.54 -5.79 0.16 0.0
UNIT  35
COM='ALUMINUM WEIGHT DISTRIBUTION PLATE FOR BOXES'
CUBOID  7 1  4P7.665 0.16 0.0
UNIT  36
COM='DRIVER SUPPORT'
CYLINDER  9 1 0.3175 3.32 0.0
UNIT  100
COM='DRIVER SUPPORT'
CYLINDER  9 1 0.3175 0.0 -3.32
UNIT  37
COM='DRIVER MOUNT'
CYLINDER  9 1 1.56 2.2 0.0
UNIT  9
COM='NORTH SPLIT TABLE CORE'
ARRAY 1 3*0.0
CUBOID  0 1 30.66 -0.94 77.5 0.0 83.475 0.0
UNIT  10
COM='SOUTH SPLIT TABLE CORE'
ARRAY 2 3*0.0
CUBOID  0 1 49.4 0.0 77.5 0.0 83.475 0.0
UNIT  11
COM='PLEXIGLASS REFLECTOR SHEET WITHOUT TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  4 1 2P15.8000 2P38.7500 2P0.6150
UNIT  12
COM='PLEXIGLASS REFLECTOR SHEET WITH TRIS, NORTH BOTTOM REFLECTOR'
CUBOID  5 1 2P15.8000 2P38.7500 2P0.6150
UNIT  13
COM='UPPER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P8.24
UNIT  14
COM='LOWER PORTION NORTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P38.75 2P3.69
UNIT  15
COM='NORTH BOTTOM REFLECTOR INCLUDES REGULAR AND TRIS'
ARRAY 3 3*0.0
UNIT  16
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITHOUT TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P0.6150
CUBOID  4 1 44.3 -5.1 2P38.75  2P0.615
UNIT  17
COM='PLEXIGLAS SHEET BOTTOM SOUTH REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P0.6150
CUBOID  5 1 44.3 -5.1 2P38.75 2P0.6150
UNIT  18
COM='LOWER PORTION SOUTH BOTTOM REFLECTOR WITH TRIS'
CUBOID  0 1 2P5.1 2P2.5 2P8.855
CUBOID  5 1 44.3 -5.1 2P38.75 2P8.855
UNIT  19
COM='SOUTH BOTTOM REFLECTOR WITH REGULAR AND TRIS'
ARRAY 4 3*0.0
UNIT  20
COM='EAST AND WEST REFLECTORS FOR NORTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P15.8 2P12.65 2P54.2825
UNIT  21
COM='ARRAY FOR EAST AND WEST REFLECTORS FOR NORTH REFLECTOR'
ARRAY 5 3*0.0
UNIT  22
COM='EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR WITH TRIS'
CUBOID  5 1 2P24.700 2P12.65 2P54.2825
 UNIT  23
 COM='ARRAY FOR EAST AND WEST REFLECTORS FOR SOUTH REFLECTOR'
 ARRAY 6 3*0.0
 UNIT  24
 COM='NORTH TOP REFLECTOR WITH TRIS'
 CUBOID  5 1 2P28.35 2P64.05 2P12.15
 UNIT  25
 COM='ARRAY FOR NORTH TOP REFLECTOR'
 ARRAY 7 3*0.0
 UNIT  26
 COM='SOUTH TOP REFLECTOR WITH TRIS'
 CUBOID  0 1 2P5.1 2P2.5 2P12.15
 CUBOID  5 1 69.4 -5.1 2P64.05 2P12.15
 UNIT  27
 COM='ARRAY FOR SOUTH TOP REFLECTOR'
 ARRAY 8 3*0.0
 UNIT  28
 COM='NORTH END REFLECTOR 9.8CM PORTION WITHOUT TRIS'
 CUBOID  4 1 2P4.9000 2P64.0500 2P54.2825
 UNIT  29
 COM='NORTH END RELFECTOR 5.2 CM PORTION WITH TRIS'
 CUBOID  5 1 2P2.6 2P64.0500 2P54.2825
 UNIT  30
 COM='NORTH END RELFECTOR 10.1 CM PORTION WITHOUT TRIS'
 CUBOID  4 1 2P5.05 2P64.05 2P54.2825
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Table A.3 (continued)

```
UNIT  31
COM='ARRAY FOR NORTH END REFLECTOR'
ARRAY 9 3*0.0
UNIT  32
COM='SOUTH END REFLECTOR'
CUBOID  5 1 2P12.55 2P64.05 2P54.2825
UNIT  33
COM='ARRAY FOR SOUTH END REFLECTOR'
ARRAY 10 3*0.0
UNIT  38
COM='NORTH CORE WITH BOTTOM REFLECTOR'
ARRAY 13 3* 0.0
UNIT  39
COM='NORTH CORE WITH EAST AND WEST REFLECTOR'
ARRAY 14 3*0.0
UNIT  40
COM='NORTH CORE WITH END REFLECTOR'
ARRAY 15 3*0.0
UNIT  42
COM='NORTH CORE WITH TOP REFLECTOR'
ARRAY 16 3*0.0
UNIT  48
COM='SOUTH CORE WITH BOTTOM REFLECTORS'
ARRAY 20 3*0.0
UNIT  49
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
ARRAY 21 3*0.0
UNIT  50
COM='SOUTH CORE END REFLECTOR'
ARRAY 22 3*0.0
UNIT  52
COM='SOUTH CORE WITH TOP REFLECTOR'
ARRAY 23 3*0.0
UNIT  54
COM='AIR GAP'
CUBOID  0 1 1.49 0.0 64.475 -63.625 69.13 -63.735
GLOBAL
UNIT  55
COM='TOTAL'
ARRAY 25 3*0.0
END GEOMETRY
READ ARRAY
ARA=1  NUX=2 NUY=5 NUZ=9
COM='NORTH SPLIT TABLE CORE'
FILL   10R7
       10R35
       10R7
       10R35
       10R7
       10R35
       10R7
       10R35
       10R7   END FILL
ARA=2  NUX=3 NUY=5 NUZ=9
COM='SOUTH SPLIT TABLE CORE'
FILL   6R7 6 8R7
       6R35 34 8R35
       6R7 6 8R7
       6R35 34 8R35
       6R7 8 8R7
       6R35 34 8R35
       6R7 6 8R7
       6R35 34 8R35
ARA=3  NUX=1 NUY=1 NUZ=3
COM='NORTH BOTTOM REFLECTOR'
FILL  14 11 13  END FILL
ARA=4  NUX=1 NUY=1 NUZ=7
COM='SOUTH BOTTOM REFLECTOR'
FILL  18 16 17 16 16 17 17  END FILL
ARA=5  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF NORTH REFLECTOR'
FILL  20 END FILL
ARA=6  NUX=1 NUY=1 NUZ=1
COM='EAST AND WEST WALLS OF SOUTH REFLECTOR'
FILL  22  END FILL
ARA=7  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR NORTH TOP REFLECTOR'
FILL  24  END FILL
ARA=8  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH TOP REFLECTOR'
FILL  26 END FILL
ARA=9  NUX=3 NUY=1 NUZ=1
COM='ARRAY FOR NORTH END REFLECTOR'
FILL  28 29 30  END FILL
ARA=10  NUX=1 NUY=1 NUZ=1
COM='ARRAY FOR SOUTH END REFLECTOR'
FILL  32  END FILL
ARA=13  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF NORTH CORE WITH BOTTOM REFLECTOR'
FILL  15 9  END FILL
ARA=14  NUX=1 NUY=3 NUZ=1
COM='NORTH CORE WITH SIDE REFLECTORS'
FILL  21 38 21  END FILL
ARA=15  NUX=2 NUY=1 NUZ=1
COM='NORTH CORE WITH END REFLECTOR'
FILL  31 39  END FILL
ARA=16  NUX=1 NUY=1 NUZ=2
COM='NORTH CORE WITH TOP REFLECTOR'
FILL  40 25  END FILL
ARA=20  NUX=1 NUY=1 NUZ=2
COM='SOUTH CORE WITH BOTTOM REFLECTOR'
FILL  19 10  END FILL
ARA=21 NUX=1 NUY=3 NUZ=1
COM='SOUTH CORE WITH EAST WEST REFLECTORS'
FILL  23 48 23  END FILL
ARA=22 NUX=2 NUY=1 NUZ=1
COM='SOUTH CORE WITH END REFLECTOR'
FILL  49 33  END FILL
ARA=23  NUX=1 NUY=1 NUZ=2
COM='COMBINATION OF CORE WITH TOP REFLECTOR'
FILL  50 27  END FILL
ARA=25  NUX=3 NUY=1 NUZ=1
COM='TOTAL'
FILL  42 54 52  END FILL
ARA=26  NUX=3 NUY=1 NUZ=1
COM='ASSEMBLY OF FUEL BOX FRONT AND REAR'
FILL  2 1 3  END FILL
ARA=27  NUX=1 NUY=1 NUZ=3
COM='ASSEMBLY OF FUEL BOX TOP AND BOTTOM'
FILL  5 4 5  END FILL
END ARRAY
```

Table A.3 (continued)

```
READ PLOT TTL='YZ SLICE OF SOUTH CORE FIRST ROW'
XUL=64.319 YUL=55.625 ZUL=71.735
XLR=64.319 YLR=71.625 ZLR=55.735
VAX=1  WDN=-1 NAX=130  NCH='012345678'END
TTL='XZ SLICE OF SPHERE CUBOID'
XUL=56.0 YUL=63.625 ZUL=71.735
XLR=72.0 YLR=63.625 ZLR=55.735
UAX=1  WDN=-1 NAX=130  NCH='012345678'
END PLOT
  READ START  NST=6 TFX=65 TFY=63.625 TFZ=63.735 LNU=300  END START
READ START  NST=1 XSM=56.981 XSP=71.649 YSM=56.219 YSP=70.959
  ZSM=56.401 ZSP=71.069   END START
END DATA
END
```

Table A.4. Table 4 input data

```
CAA03
=CSAS25
UO2(NO3)2 SOLN H/U-235=1379 BARE SPHERE CASE 3
27GROUPNDF4  MULTIREGION
U-234   1 0 5.400-7 END
U-235   1 0 4.815-5 END
U-236   1 0 1.390-7 END
U-238   1 0 2.811-6 END
H       1 0 6.640-2 END
O       1 0 3.379-2 END
N       1 0 1.753-4 END
AL      2 1 END
END COMP
SPHERICAL END
1 34.6 NOEXTERMOD  2 34.92 NOEXTERMOD  END ZONE
UO2(NO3)2 SOLN H/U-235=1379 BARE SPHERE CASE 3
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
SPHERE  1 1 34.6
SPHERE  2 1 34.92
END GEOM
END DATA
END
```

```
CAA04
=CSAS25
UO2F2 SOLN H/U-235=76.1 H2O REFL SPHERE CASE 4
27GROUPNDF4  MULTIREGION
U-234   1 0 8.795-6 END
U-235   1 0 8.327-4 END
U-236   1 0 4.449-6 END
U-238   1 0 4.729-5 END
H       1 0 6.337-2 END
O       1 0 3.347-2 END
F       1 0 1.786-3 END
AL      2 1 END
H2O     3 1 END
END COMP
SPHERICAL END
1 11.5 ONEXTERMOD  2 11.66 NOEXTERMOD  3 29.66 NOEXTERMOD END ZONE
UO2F2 SOLN H/U-235=76.1 H2O REFL SPHERE CASE 4
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
SPHERE  1 1 11.5
SPHERE  2 1 11.66
REFLECTOR  3 2 3 6
END GEOM
READ BIAS ID=500 2 7 END BIAS
END DATA
END
```

```
CAA05
=CSAS25
UO2F2 SOLN H/U-235=126.5 H2O REFL SPHERE CASE 5
27GROUPNDF4  MULTIREGION
U-234   1 0 5.405-6 END
U-235   1 0 5.117-4 END
U-236   1 0 2.734-6 END
U-238   1 0 2.906-5 END
H       1 0 6.473-2 END
O       1 0 3.346-2 END
F       1 0 1.098-3 END
AL      2 1 END
H2O     3 1 END
END COMP
SPHERICAL END
1 11.8 ONEXTERMOD  2 11.96 NOEXTERMOD  3 29.96 NOEXTERMOD END ZONE
UO2F2 SOLN H/U-235=126.5 H2O REFL SPHERE CASE 5
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
SPHERE  1 1 11.8
SPHERE  2 1 11.96
REFLECTOR  3 2 3 6
END GEOM
READ BIAS ID=500 2 7 END BIAS
END DATA
END
```

```
CAA06
=CSAS25
UO2F2 SOLN H/U-235=1270 H2O REFL SPHERE CASE 6
27GROUPNDF4  MULTIREGION
U-234   1 0 5.530-7 END
U-235   1 0 5.231-5 END
U-236   1 0 2.800-7 END
U-238   1 0 2.971-6 END
H       1 0 6.643-2 END
O       1 0 3.333-2 END
F       1 0 1.122-4 END
AL      2 1 END
H2O     3 1 END
END COMP
SPHERICAL END
1 27.9 ONEXTERMOD  2 28.10 NOEXTERMOD  3 46.10 NOEXTERMOD END ZONE
UO2F2 SOLN H/U-235=1270 H2O REFL SPHERE CASE 6
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
SPHERE  1 1 27.9
SPHERE  2 1 28.1
REFLECTOR  3 2 3 6
END GEOM
READ BIAS ID=500 2 7 END BIAS
END DATA
END
```

Table A.4 (continued)

```
CAA07
=CSAS25
UO2F2 SOLN H/U-235=268.8 H2O REFL SPHERE CASE 7
27GROUPNDF4  MULTIREGION
U-235   1 0 2.438-4 300 END
U-238   1 0 1.756-5 300 END
H       1 0 6.553-2 300 END
O       1 0 3.329-2 300 END
F       1 0 5.227-4 300 END
AL      2 1 300 END
H2O     3 1 300 END
END COMP
SPHERICAL END
1 13.2 ONEXTERMOD  2 13.33 NOEXTERMOD  3 31.33 NOEXTERMOD END ZONE
UO2F2 SOLN H/U-235=268.8 H2O REFL SPHERE CASE 7
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
SPHERE  1 1 13.2
SPHERE  2 1 13.33
REFLECTOR  3 2 3 6
END GEOM
READ BIAS ID=500 2 7 END BIAS
END DATA
END

CAA08
=CSAS25
UO2F2 SOLN H/U-235=515.1 H2O REFL SPHERE CASE 8
27GROUPNDF4  MULTIREGION
U-235   1 0 1.289-4 300 END
U-238   1 0 9.282-6 300 END
H       1 0 6.640-2 300 END
O       1 0 3.348-2 300 END
F       1 0 2.764-4 300 END
AL      2 1 300 END
H2O     3 1 300 END
END COMP
SPHERICAL END
1 16.0 ONEXTERMOD  2 16.13 NOEXTERMOD  3 34.13 NOEXTERMOD END ZONE
UO2F2 SOLN H/U-235=515.1 H2O REFL SPHERE CASE 8
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
SPHERE  1 1 16.0
SPHERE  2 1 16.13
REFLECTOR  3 2 3 6
END GEOM
READ BIAS ID=500 2 7 END BIAS
END DATA
END

CAA09
=CSAS25
UO2F2 SOLN H/U-235=203.5 BARE SPHERE CASE 9
27GROUPNDF4  MULTIREGION
U-235   1 0 3.207-4 297 END
U-238   1 0 2.311-5 297 END
H       1 0 6.526-2 297 END
O       1 0 3.332-2 297 END
F       1 0 6.876-4 297 END
AL      2 1 297 END
END COMP
SPHERICAL END
1 16.0 NOEXTERMOD  2 16.13 NOEXTERMOD  END ZONE
UO2F2 SOLN H/U-235=203.5 BARE SPHERE CASE 9
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
SPHERE  1 1 16.0
SPHERE  2 1 16.13
END GEOM
END DATA
END

CAA10
=CSAS25
UO2F2 SOLN H/U-235=239.3 H2O REFL SPHERE CASE 10
27GROUPNDF4  MULTIREGION
U-235   1 0 2.735-4 359 END
U-238   1 0 1.970-5 359 END
H       1 0 6.545-2 359 END
O       1 0 3.331-2 359 END
F       1 0 5.864-4 359 END
AL      2 1 359 END
H2O     3 1 359 END
END COMP
SPHERICAL END
1 13.2 ONEXTERMOD  2 13.33 NOEXTERMOD  3 31.33 NOEXTERMOD END ZONE
UO2F2 SOLN H/U-235=239.3 H2O REFL SPHERE CASE 10
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
SPHERE  1 1 13.2
SPHERE  2 1 13.33
REFLECTOR  3 2 3 6
END GEOM
READ BIAS ID=500 2 7 END BIAS
END DATA
END

CAA11
=CSAS25
UO2F2 SOLN H/U-235=468.2 H2O REFL SPHERE CASE 11
27GROUPNDF4  MULTIREGION
U-235   1 0 1.416-4 361 END
U-238   1 0 1.020-5 361 END
H       1 0 6.630-2 361 END
O       1 0 3.345-2 361 END
F       1 0 3.036-4 361 END
AL      2 1 361 END
H2O     3 1 361 END
END COMP
SPHERICAL END
1 16.0 ONEXTERMOD  2 16.13 NOEXTERMOD  3 34.13 NOEXTERMOD END ZONE
UO2F2 SOLN H/U-235=468.2 H2O REFL SPHERE CASE 11
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
SPHERE  1 1 16.0
SPHERE  2 1 16.13
REFLECTOR  3 2 3 6
END GEOM
READ BIAS ID=500 2 7 END BIAS
END DATA
END
```

Table A.4 (continued)

```
CAA12
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 142.92 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 142.92 0.283 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL     2 1 END
END COMP
CYLINDRICAL END
1 14 NOEXTERMOD  2 14.3 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 28.01 CM D1AM BARE 1
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 14.005 33.55 0
CYLINDER  2 1 14.325 33.55 -.32
END GEOM
END DATA
END
```

```
CAA13
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 357.71 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 357.71 0.549 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL     2 1 END
END COMP
CYLINDRICAL END
1 14 NOEXTERMOD  2 14.3 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 28.01 CM D1AM BARE 2
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 14.005 30.91 0
CYLINDER  2 1 14.325 30.91 -.32
END GEOM
END DATA
END
```

```
CAA14
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 54.89 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 54.89 0.105 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL     2 1 END
END COMP
CYLINDRICAL END
1 16.5 NOEXTERMOD  2 16.8 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 33.01 CM D1AM BARE 3
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 16.505 39.48 0
CYLINDER  2 1 16.825 39.48 -.32
END GEOM
END DATA
END
```

```
CAA15
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 137.40 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 137.4 .287 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL     2 1 END
END COMP
CYLINDRICAL END
1 16.5 NOEXTERMOD  2 16.8 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 33.01 CM D1AM BARE 4
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 16.505 23.96 0
CYLINDER  2 1 16.825 23.96 -.32
END GEOM
END DATA
END
```

```
CAA16
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 357.71 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 357.71 .549 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL     2 1 END
END COMP
CYLINDRICAL END
1 16.5 NOEXTERMOD  2 16.8 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 33.01 CM D1AM BARE 5
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 16.505 22.53 0
CYLINDER  2 1 16.825 22.53 -.32
END GEOM
END DATA
END
```

```
CAA17
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 144.38 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 144.38 .272 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL     2 1 END
RFCONCRETE  3 1 END
END COMP
CYLINDRICAL END
1 14 NOEXTERMOD  2 14.3 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 28.01 CM D1AM REFL 1 CONC REFL
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 14.005 31.37 0
CYLINDER  2 1 14.325 31.37 -.32
CUBOID    0 1 64.6 -57.2 57.4 -64.8 80.8 -41.1
REFLECTOR 3 2 4R5.14 2R0 5
REFLECTOR 0 1 4R0 2R0.9  1
REFLECTOR 3 2 4R0 2R5.14 5
END GEOM
READ BIAS ID=301 2 6 END BIAS
END DATA
END
```

Table A.4 (continued)

```
CAA18
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 334.77 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 334.77 .521 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
RFCONCRETE  3 1 END
END COMP
CYLINDRICAL END
1 14 NOEXTERMOD  2 14.3 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 28.01 CM D1AM REFL 2 CONC REFL
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 14.005 28.60 0
CYLINDER  2 1 14.325 28.60 -.32
CUBOID    0 1 64.6 -57.2 57.4 -64.8 80.8 -41.1
REFLECTOR 3 2 4R5.14 2R0 5
REFLECTOR 0 1 4R0 2R0.9  1
REFLECTOR 3 2 4R0 2R5.14 5
END GEOM
READ BIAS ID=301 2 6 END BIAS
END DATA
END
```

```
CAA19
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 144.38 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 144.38 .272 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
RFCONCRETE  3 1 END
END COMP
CYLINDRICAL END
1 16.5 NOEXTERMOD  2 16.8 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 33.01 CM DIAM REFL 3 CONC REFL
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 16.505 22.85 0
CYLINDER  2 1 16.825 22.85 -.32
CUBOID    0 1 64.6 -57.2 57.4 -64.8 80.8 -41.1
REFLECTOR 3 2 4R5.14 2R0 5
REFLECTOR 0 1 4R0 2R0.9  1
REFLECTOR 3 2 4R0 2R5.14 5
END GEOM
READ BIAS ID=301 2 6 END BIAS
END DATA
END
```

```
CAA20
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 334.77 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 334.77 .521 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
RFCONCRETE  3 1 END
END COMP
CYLINDRICAL END
1 16.5 NOEXTERMOD  2 16.8 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 33.01 CM DIAM REFL 4 CONC REFL
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 16.505 21.50 0
CYLINDER  2 1 16.825 21.50 -.32
CUBOID    0 1 64.6 -57.2 57.4 -64.8 80.8 -41.1
REFLECTOR 3 2 4R5.14 2R0 5
REFLECTOR 0 1 4R0 2R0.9  1
REFLECTOR 3 2 4R0 2R5.14 5
END GEOM
READ BIAS ID=301 2 6 END BIAS
END DATA
END
```

```
CAA21
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 144.38 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 144.38 .272 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
RFCONCRETE  3 1 END
END COMP
CYLINDRICAL END
1 14 NOEXTERMOD  2 14.3 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 28.01 CM D1AM REFL 5 CONC REFL
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 14.005 24.70 0
CYLINDER  2 1 14.325 24.70 -.32
CUBOID    0 1 104.0 -17.8 16.5 -105.7 121.58 -.32
REFLECTOR 3 2 4R5.14 2R0 5
REFLECTOR 0 1 4R0 2R0.9  1
REFLECTOR 3 2 4R0 2R5.14 5
END GEOM
READ BIAS ID=301 2 6 END BIAS
END DATA
END
```

Table A.4 (continued)

```
CAA22
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 334.77 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 334.77 .521 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
RFCONCRETE  3 1 END
END COMP
CYLINDRICAL END
1 16.5 NOEXTERMOD  2 16.8 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 33.01 CM D1AM REFL 6 CONC REFL
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 16.505 16.78 0
CYLINDER  2 1 16.825 16.78 -.32
CUBOID    0 1 104.55 -17.25 16.825 -105.375 121.58 -.32
REFLECTOR 3 2 4R5.14 2R0 5
REFLECTOR 0 1 4R0 2R0.9  1
REFLECTOR 3 2 4R0 2R5.14 5
END GEOM
READ BIAS ID=301 2 6 END BIAS
END DATA
END
```

```
CAA23
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 147.66 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 147.66 .271 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
PLEXIGLASS  3 1 END
H     4 0 5.5169-2 END
C     4 0 3.3967-2 END
O     4 0 1.4231-2 END
P     4 0 3.8500-4 END
CL    4 0 3.5610-4 END
BR-79  4 0 3.184-4 END
BR-81  4 0 3.116-4 END
END COMP
CYLINDRICAL END
1 14 NOEXTERMOD  2 14.3 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 28.01 CM D1AM REFL 7 PLEXIGLASS REFL
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 14.005 31.26 0
CYLINDER  2 1 14.325 31.26 -.32
CUBOID    0 1 61.2 -61.7 60.4 -62.5 81.1 -41.8
REFLECTOR 3 2 4R2.971 2R0  7
REFLECTOR 4 2 5R0 2.971    7
REFLECTOR 4 2 4R0 2.886 0  7
END GEOM
READ BIAS ID=500 2 8 END BIAS
END DATA
END
```

```
CAA24
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 345.33 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 345.33 .534 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
PLEXIGLASS  3 1 END
H     4 0 5.5169-2 END
C     4 0 3.3967-2 END
O     4 0 1.4231-2 END
P     4 0 3.8500-4 END
CL    4 0 3.5610-4 END
BR-79  4 0 3.184-4 END
BR-81  4 0 3.116-4 END
END COMP
CYLINDRICAL END
1 14 NOEXTERMOD  2 14.3 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 28.01 CM D1AM REFL 8 PLEXIGLASS REFL
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 14.005 28.84 0
CYLINDER  2 1 14.325 28.84 -.32
CUBOID    0 1 61.2 -61.7 60.4 -62.5 81.1 -41.8
REFLECTOR 3 2 4R2.971 2R0  7
REFLECTOR 4 2 5R0 2.971    7
REFLECTOR 4 2 4R0 2.886 0  7
END GEOM
READ BIAS ID=500 2 8 END BIAS
END DATA
END
```

```
CAA25
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 147.66 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 147.66 .271 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
PLEXIGLASS  3 1 END
H     4 0 5.5169-2 END
C     4 0 3.3967-2 END
O     4 0 1.4231-2 END
P     4 0 3.8500-4 END
CL    4 0 3.5610-4 END
BR-79  4 0 3.184-4 END
BR-81  4 0 3.116-4 END
END COMP
CYLINDRICAL END
1 16.5 NOEXTERMOD  2 16.8 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 33.01 CM D1AM REFL 9 PLEXIGLASS REFL
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 16.505 22.78 0
CYLINDER  2 1 16.825 22.78 -.32
CUBOID    0 1 61.2 -61.7 60.4 -62.5 81.1 -41.8
REFLECTOR 3 2 4R2.971 2R0  7
REFLECTOR 4 2 5R0 2.971    7
REFLECTOR 4 2 4R0 2.886 0  7
END GEOM
READ BIAS ID=500 2 8 END BIAS
END DATA
END
```

Table A.4 (continued)

```
CAA26
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 345.33 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 345.33 .534 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
PLEXIGLASS  3 1 END
H     4 0 5.5169-2 END
C     4 0 3.3967-2 END
O     4 0 1.4231-2 END
P     4 0 3.8500-4 END
CL    4 0 3.5610-4 END
BR-79  4 0 3.184-4 END
BR-81  4 0 3.116-4 END
END COMP
CYLINDRICAL END
1 16.5 NOEXTERMOD  2 16.8 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 33.01 CM D1AM REFL 10 PLEXIGLASS REFL
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 16.505 21.67 0
CYLINDER  2 1 16.825 21.67 -.32
CUBOID    0 1 61.2 -61.7 60.4 -62.5 81.1 -41.8
REFLECTOR 3 2 4R2.971 2R0  7
REFLECTOR 4 2 5R0 2.971    7
REFLECTOR 4 2 4R0 2.886 0  7
END GEOM
READ BIAS ID=500 2 8 END BIAS
END DATA
END
```

```
CAA27
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 147.66 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 147.66 .271 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
PLEXIGLASS  3 1 END
H     4 0 5.5169-2 END
C     4 0 3.3967-2 END
O     4 0 1.4231-2 END
P     4 0 3.8500-4 END
CL    4 0 3.5610-4 END
BR-79  4 0 3.184-4 END
BR-81  4 0 3.116-4 END
END COMP
CYLINDRICAL END
1 14 NOEXTERMOD  2 14.3 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 28.01 CM D1AM REFL 11 PLEXIGLASS REFL
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 14.005 25.26 0
CYLINDER  2 1 14.325 25.26 -.32
CUBOID    0 1 104.95 -17.95 17.52 -105.38 122.58 -.32
REFLECTOR 3 2 4R2.971 2R0  7
REFLECTOR 4 2 5R0 2.971    7
REFLECTOR 4 2 4R0 2.886 0  7
END GEOM
READ BIAS ID=500 2 8 END BIAS
END DATA
END
```

```
CAA28
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 345.33 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 345.33 .534 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
PLEXIGLASS  3 1 END
H     4 0 5.5169-2 END
C     4 0 3.3967-2 END
O     4 0 1.4231-2 END
P     4 0 3.8500-4 END
CL    4 0 3.5610-4 END
BR-79  4 0 3.184-4 END
BR-81  4 0 3.116-4 END
END COMP
CYLINDRICAL END
1 16.5 NOEXTERMOD  2 16.8 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 33.01 CM D1AM REFL 12 PLEXIGLASS REFL
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 16.505 17.2 0
CYLINDER  2 1 16.825 17.2 -.32
CUBOID    0 1 105.2 -17.7 17.3 -105.6 122.58 -.32
REFLECTOR 3 2 4R2.971 2R0  7
REFLECTOR 4 2 5R0 2.971    7
REFLECTOR 4 2 4R0 2.886 0  7
END GEOM
READ BIAS ID=500 2 8 END BIAS
END DATA
END
```

```
CAA29
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 67.28 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 67.28 .128 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
RFCONCRETE  3 1 END
END COMP
CYLINDRICAL END
1 10.5 NOEXTERMOD  2 10.9 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 21.12 CM D1AM 4X4 ARRAY CONC REFL
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 10.56 27.15 0
CYLINDER  2 1 10.96 27.15 -.32
CUBOID    0 1 4P15.24 121.58 -.32
CORE      0 1 2R-60.96 -.32
REFLECTOR 3 2 4R5.14 2R0 5
REFLECTOR 0 1 4R0 2R1.25  1
REFLECTOR 3 2 4R0 2R5.14 5
END GEOM
READ ARRAY NUX=4 NUY=4 NUZ=1 END ARRAY
READ BIAS ID=301 2 6 END BIAS
END DATA
END
```

Table A.4 (continued)

```
CAA30
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 364.11 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 364.11 .584 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
RFCONCRETE  3 1 END
END COMP
CYLINDRICAL END
1 10.5 NOEXTERMOD  2 10.9 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 21.12 CM D1AM 4X4 ARRAY CONC REFL C2
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 10.56 17.13 0
CYLINDER  2 1 10.96 17.13 -.32
CUBOID    0 1 4P15.24 121.58 -.32
CORE      0 1 2R-60.96 -.32
REFLECTOR 3 2 4R5.14 2R0 5
REFLECTOR 0 1 4R0 2R1.25  1
REFLECTOR 3 2 4R0 2R5.14 5
END GEOM
READ ARRAY NUX=4 NUY=4 NUZ=1 END ARRAY
READ BIAS ID=301 2 6 END BIAS
END DATA
END
```

```
CAA31
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 83.49 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 83.49 .151 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
RFCONCRETE  3 1 END
END COMP
CYLINDRICAL END
1 8 NOEXTERMOD  2 8.3 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 16.12 CM D1AM 4X4 ARRAY CONC REFL C3
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 8.06 51.21 0
CYLINDER  2 1 8.38 51.21 -.32
CUBOID    0 1 4P15.24 121.58 -.32
CORE      0 1 2R-60.96 -.32
REFLECTOR 3 2 4R5.14 2R0 5
REFLECTOR 0 1 4R0 2R1.25  1
REFLECTOR 3 2 4R0 2R5.14 5
END GEOM
READ ARRAY NUX=4 NUY=4 NUZ=1 END ARRAY
READ BIAS ID=301 2 6 END BIAS
END DATA
END
```

```
CAA32
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 359.55 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 359.55 .578 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
RFCONCRETE  3 1 END
END COMP
CYLINDRICAL END
1 8 NOEXTERMOD  2 8.3 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 16.12 CM D1AM 4X4 ARRAY CONC REFL C4
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 8.06 31.82 0
CYLINDER  2 1 8.38 31.82 -.32
CUBOID    0 1 4P15.24 121.58 -.32
CORE      0 1 2R-60.96 -.32
REFLECTOR 3 2 4R5.14 2R0 5
REFLECTOR 0 1 4R0 2R1.25  1
REFLECTOR 3 2 4R0 2R5.14 5
END GEOM
READ ARRAY NUX=4 NUY=4 NUZ=1 END ARRAY
READ BIAS ID=301 2 6 END BIAS
END DATA
END
```

```
CAA33
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 76.09 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 76.09 .137 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
RFCONCRETE  3 1 END
END COMP
CYLINDRICAL END
1 10.5 NOEXTERMOD  2 10.9 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 21.12 CM D1AM 2X2 ARRAY CONC REFL C5
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 10.56 62.34 0
CYLINDER  2 1 10.96 62.34 -.32
CUBOID    0 1 4P15.24 121.58 -.32
UNIT 2
CUBOID    0 1 4P15.24 121.58 -.32
CORE      0 1 2R-60.96 -.32
REFLECTOR 3 2 4R5.14 2R0 5
REFLECTOR 0 1 4R0 2R1.25  1
REFLECTOR 3 2 4R0 2R5.14 5
END GEOM
READ ARRAY NUX=4 NUY=4 NUZ=1
FILL 5R2 2R1 2R2 2R1 5R2 END FILL
END ARRAY
READ BIAS ID=301 2 6 END BIAS
END DATA
END
```

Table A.4 (continued)

```
CAA34
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 364.11 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 364.11 .584 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
RFCONCRETE  3 1 END
END COMP
CYLINDRICAL END
1 10.5 NOEXTERMOD  2 10.9 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 21.12 CM D1AM 2X2 ARRAY CONC REFL C6
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 10.56 31.11 0
CYLINDER  2 1 10.96 31.11 -.32
CUBOID    0 1 4P15.24 121.58 -.32
UNIT 2
CUBOID    0 1 4P15.24 121.58 -.32
CORE      0 1 2R-60.96 -.32
REFLECTOR 3 2 4R5.14 2R0 5
REFLECTOR 0 1 4R0 2R1.25  1
REFLECTOR 3 2 4R0 2R5.14 5
END GEOM
READ ARRAY NUX=4 NUY=4 NUZ=1
FILL 5R2 2R1 2R2 2R1 5R2 END FILL
END ARRAY
READ BIAS ID=301 2 6 END BIAS
END DATA
END
```

```
CAA35
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 359.55 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 359.55 .578 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
RFCONCRETE  3 1 END
END COMP
CYLINDRICAL END
1 8 NOEXTERMOD  2 8.3 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 16.12 CM D1AM 2X2 ARRAY CONC REFL C7
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 8.06 104.04 0
CYLINDER  2 1 8.38 104.04 -.32
CUBOID    0 1 4P15.24 121.58 -.32
UNIT 2
CUBOID    0 1 4P15.24 121.58 -.32
CORE      0 1 2R-60.96 -.32
REFLECTOR 3 2 4R5.14 2R0 5
REFLECTOR 0 1 4R0 2R1.25  1
REFLECTOR 3 2 4R0 2R5.14 5
END GEOM
READ ARRAY NUX=4 NUY=4 NUZ=1
FILL 8R2 2R1 2R2 2R1 2R2 END FILL
END ARRAY
READ BIAS ID=301 2 6 END BIAS
END DATA
END
```

```
CAA36
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 359.55 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 359.55 .578 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
RFCONCRETE  3 1 END
END COMP
CYLINDRICAL END
1 8 NOEXTERMOD  2 8.3 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 16.12 CM D1AM 2X4 ARRAY CONC REFL C8
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 8.06 51.45 0
CYLINDER  2 1 8.38 51.45 -.32
CUBOID    0 1 4P15.24 121.58 -.32
UNIT 2
CUBOID    0 1 4P15.24 121.58 -.32
CORE      0 1 2R-60.96 -.32
REFLECTOR 3 2 4R5.14 2R0 5
REFLECTOR 0 1 4R0 2R1.25  1
REFLECTOR 3 2 4R0 2R5.14 5
END GEOM
READ ARRAY NUX=4 NUY=4 NUZ=1
FILL 2R1 2R2 3Q4 END FILL
END ARRAY
READ BIAS ID=301 2 6 END BIAS
END DATA
END
```

```
CAA37
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 60.32 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 60.32 .113 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
PLEXIGLASS  3 1 END
H     4 0 5.5169-2 END
C     4 0 3.3967-2 END
O     4 0 1.4231-2 END
P     4 0 3.8500-4 END
CL    4 0 3.5610-4 END
BR-79  4 0 3.184-4 END
BR-81  4 0 3.116-4 END
END COMP
CYLINDRICAL END
1 10.5 NOEXTERMOD  2 10.9 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 21.12 CM D1AM 4X4 ARRAY PLEXIGLASS REFL P1
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 10.56 31.76 0
CYLINDER  2 1 10.96 31.76 -.32
CUBOID    0 1 4P15.24 122.58 -.32
CORE      0 1 2R-60.96 -.32
REFLECTOR 0 1 4R.49  2R0 1
REFLECTOR 3 2 4R2.971 2R0   7
REFLECTOR 4 2 5R0 2.971     7
REFLECTOR 4 2 4R0 2.886 0   7
END GEOM
READ ARRAY NUX=4 NUY=4 NUZ=1
END ARRAY
READ BIAS ID=500 2 8 END BIAS
END DATA
END
```

Table A.4 (continued)

```
CAA38
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 355.94 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 355.94 .494 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
PLEXIGLASS  3 1 END
H     4 0 5.5169-2 END
C     4 0 3.3967-2 END
O     4 0 1.4231-2 END
P     4 0 3.8500-4 END
CL    4 0 3.5610-4 END
BR-79  4 0 3.184-4 END
BR-81  4 0 3.116-4 END
END COMP
CYLINDRICAL END
1 10.5 NOEXTERMOD  2 10.9 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 21.12 CM D1AM 4X4 ARRAY PLEXIGLASS REFL P2
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 10.56 18.82 0
CYLINDER  2 1 10.96 18.82 -.32
CUBOID    0 1 4P15.24 122.58 -.32
CORE      0 1 2R-60.96 -.32
REFLECTOR 0 1 4R.49  2R0 1
REFLECTOR 3 2 4R2.971 2R0  7
REFLECTOR 4 2 5R0 2.971    7
REFLECTOR 4 2 4R0 2.886 0  7
END GEOM
READ ARRAY NUX=4 NUY=4 NUZ=1
END ARRAY
READ BIAS ID=500 2 8 END BIAS
END DATA
END

CAA39
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 60.32 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 60.32 .113 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
PLEXIGLASS  3 1 END
H     4 0 5.5169-2 END
C     4 0 3.3967-2 END
O     4 0 1.4231-2 END
P     4 0 3.8500-4 END
CL    4 0 3.5610-4 END
BR-79  4 0 3.184-4 END
BR-81  4 0 3.116-4 END
END COMP
CYLINDRICAL END
1 8 NOEXTERMOD  2 8.3 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 16.12 CM D1AM 4X4 ARRAY PLEXIGLASS REFL P3
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 8.06 78.40 0
CYLINDER  2 1 8.38 78.40 -.32
CUBOID    0 1 4P15.24 122.58 -.32
CORE      0 1 2R-60.96 -.32
REFLECTOR 0 1 4R.49  2R0 1
REFLECTOR 3 2 4R2.971 2R0  7
REFLECTOR 4 2 5R0 2.971    7
REFLECTOR 4 2 4R0 2.886 0  7
END GEOM
READ ARRAY NUX=4 NUY=4 NUZ=1
END ARRAY
READ BIAS ID=500 2 8 END BIAS
END DATA
END

CAA40
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 355.94 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 355.94 .494 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
PLEXIGLASS  3 1 END
H     4 0 5.5169-2 END
C     4 0 3.3967-2 END
O     4 0 1.4231-2 END
P     4 0 3.8500-4 END
CL    4 0 3.5610-4 END
BR-79  4 0 3.184-4 END
BR-81  4 0 3.116-4 END
END COMP
CYLINDRICAL END
1 8 NOEXTERMOD  2 8.3 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 16.12 CM D1AM 4X4 ARRAY PLEXIGLASS REFL P4
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
CYLINDER  1 1 8.06 35.56 0
CYLINDER  2 1 8.38 35.56 -.32
CUBOID    0 1 4P15.24 122.58 -.32
CORE      0 1 2R-60.96 -.32
REFLECTOR 0 1 4R.49  2R0 1
REFLECTOR 3 2 4R2.971 2R0  7
REFLECTOR 4 2 5R0 2.971    7
REFLECTOR 4 2 4R0 2.886 0  7
END GEOM
READ ARRAY NUX=4 NUY=4 NUZ=1
END ARRAY
READ BIAS ID=500 2 8 END BIAS
END DATA
END

CAA41
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 60.32 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 60.32 .113 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
PLEXIGLASS  3 1 END
H     4 0 5.5169-2 END
C     4 0 3.3967-2 END
O     4 0 1.4231-2 END
P     4 0 3.8500-4 END
CL    4 0 3.5610-4 END
BR-79  4 0 3.184-4 END
BR-81  4 0 3.116-4 END
```

Table A.4 (continued)

```
END COMP
CYLINDRICAL END
1 10.5 NOEXTERMOD  2 10.9 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 21.12 CM D1AM 2X2 ARRAY PLEXIGLASS REFL P5
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 10.56 102.29 0
CYLINDER  2 1 10.96 102.29 -.32
CUBOID    0 1 4P15.24 122.58 -.32
UNIT 2
CUBOID    0 1 4P15.24 122.58 -.32
CORE      0 1 2R-60.96 -.32
REFLECTOR 0 1 4R.49  2R0 1
REFLECTOR 3 2 4R2.971 2R0  7
REFLECTOR 4 2 5R0 2.971    7
REFLECTOR 4 2 4R0 2.886 0  7
END GEOM
READ ARRAY NUX=4 NUY=4 NUZ=1
FILL 5R2 2R1 2R2 2R1 5R2 END FILL
END ARRAY
READ BIAS ID=500 2 8 END BIAS
END DATA
END


CAA42
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 355.94 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 355.94 .494 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
PLEXIGLASS  3 1 END
H     4 0 5.5169-2 END
C     4 0 3.3967-2 END
O     4 0 1.4231-2 END
P     4 0 3.8500-4 END
CL    4 0 3.5610-4 END
BR-79   4 0 3.184-4 END
BR-81   4 0 3.116-4 END
END COMP
CYLINDRICAL END
1 10.5 NOEXTERMOD  2 10.9 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 21.12 CM D1AM 2X2 ARRAY PLEXIGLASS REFL P6
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 10.56 33.20 0
CYLINDER  2 1 10.96 33.20 -.32
CUBOID    0 1 4P15.24 122.58 -.32
UNIT 2
CUBOID    0 1 4P15.24 122.58 -.32
CORE      0 1 2R-60.96 -.32
REFLECTOR 0 1 4R.49  2R0 1
REFLECTOR 3 2 4R2.971 2R0  7
REFLECTOR 4 2 5R0 2.971    7
REFLECTOR 4 2 4R0 2.886 0  7
END GEOM
READ ARRAY NUX=4 NUY=4 NUZ=1
FILL 5R2 2R1 2R2 2R1 5R2 END FILL
END ARRAY
READ BIAS ID=500 2 8 END BIAS
END DATA
END


CAA43
=CSAS25
ROCKY FLATS UO2(NO3)2 SOLN 355.94 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 355.94 .494 1 293 92234 1.022 92235 93.172 92236 .434
92238 5.372 END
AL      2 1 END
PLEXIGLASS  3 1 END
H     4 0 5.5169-2 END
C     4 0 3.3967-2 END
O     4 0 1.4231-2 END
P     4 0 3.8500-4 END
CL    4 0 3.5610-4 END
BR-79   4 0 3.184-4 END
BR-81   4 0 3.116-4 END
END COMP
CYLINDRICAL END
1 8 NOEXTERMOD  2 8.3 NOEXTERMOD END ZONE
ROCKY FLATS UO2(NO3)2 SOLN 16.12 CM D1AM 3X2 ARRAY PLEXIGLASS REFL P7
READ PARAM NPG=600  NUB=YES FDN=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 8.06 89.78 0
CYLINDER  2 1 8.38 89.78 -.32
CUBOID    0 1 4P15.24 122.58 -.32
UNIT 2
CUBOID    0 1 4P15.24 122.58 -.32
CORE      0 1 2R-60.96 -.32
REFLECTOR 0 1 4R.49  2R0 1
REFLECTOR 3 2 4R2.971 2R0  7
REFLECTOR 4 2 5R0 2.971    7
REFLECTOR 4 2 4R0 2.886 0  7
END GEOM
READ ARRAY NUX=4 NUY=4 NUZ=1
FILL 4R2 3R1 2 3R1 5R2 END FILL
END ARRAY
READ BIAS ID=500 2 8 END BIAS
END DATA
END
```

Table A.5. Table 5 input data

```
CAS01
=CSAS25
KENO-5 VALIDATION CASE A-1
27GROUPNDF4  MULTIREGION
URANIUM  1 .9837 293 92235 93.8 92238 6.2 END
END COMP
SPHERICAL  END
1 8.73136 NOEXTERMOD END ZONE
KENO-5 VALIDATION CASE A-1
READ PARAM     NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
SPHERE     1 1 8.73136
END GEOM
END DATA
END
```

```
CAS02
=CSAS25
KENO-5 VALIDATION CASE A-10
27GROUPNDF4  MULTIREGION
URANIUM  1 .9866 293 92235 97.67 92238 2.33 END
H2O       2 END
PLEXIGLASS  3 END
END COMP
SPHERICAL  END
1 6.55 ONEEXTERMOD  2 12.7 NOEXTERMOD END ZONE
KENO-5 VALIDATION CASE A-10
READ PARAM TME=60    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
BOX TYPE  1
SPHERE      1 1 6.5537
CUBOID  2 1 12.7 -12.7 12.7 -12.7 6.5537 -6.5537
BOX TYPE  2
CYLINDER  2 1 4.1275 1.27 -1.27
CYLINDER  3 1 12.7 1.27 -1.27
CUBOID      2 1 12.7 -12.7 12.7 -12.7 1.27 -1.27
CORE        0 1 -12.7 -12.7 -7.8237
CYLINDER  2 1 30.48 24.3337 -39.5737
END GEOM
READ ARRAY NUX=1 NUY=1 NUZ=2 LOOP
1     1 1 1  1 1 1   2 2 1
2     1 1 1  1 1 1   1 1 1
END ARRAY
END DATA
END
```

```
CAS03
=CSAS25
KENO-5 VALIDATION CASE A11
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2 1 346.73 .542 1 293 92235 93.172 92238 6.828 END
SS304  2 END
END COMP
CYLINDRICAL  END
1 13.96 ONEEXTERMOD  2 14.28 ONEEXTERMOD  END ZONE
KENO-5 VALIDATION CASE A11
READ PARAM     NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 13.96 14.465 -14.465
CYLINDER  0 1 13.96 27.135 -14.465
CYLINDER  2 1 14.28 27.135 -15.105
END GEOM
END DATA
END
```

```
CAS04
=CSAS25
KENO-5 VALIDATION CASE A-2
27GROUPNDF4  MULTIREGION
ARBMUMO  17.08 2 1 0 1 92000 90 42000 10 1 1 293 92235 93.2 92238 6.8 END
END COMP
CYLINDRICAL  END
1 7.62 NOEXTERMOD END ZONE
KENO-5 VALIDATION CASE A-2
READ PARAM     NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  0 1 2.54 9.87 -9.87
CYLINDER  1 1 10.16 9.87 -9.87
CUBE      0 1 10.16 -10.16
END GEOM
END DATA
END
```

```
CAS05
=CSAS25
KENO-5 VALIDATION CASE A-3
27GROUPNDF4  MULTIREGION
SOLNUO2F2   1 19.992 0 1 293 92235 93.2 92238 6.8 END
AL          2 END
END COMP
SPHERICAL  END
1 34.6 ONEEXTERMOD  2 34.92 NOEXTERMOD END ZONE
KENO-5 VALIDATION CASE A-3
READ PARAM   NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
SPHERE     1 1 34.6
SPHERE     2 1 34.92
CUBE       0 1 35.0 -35.0
END GEOM
END DATA
END
```

```
CAS06
=CSAS25
KENO-5 VALIDATION CASE A-4
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 20.15 .139 1 293 92235 93.18 92238 6.82 END
AL              2 END
END COMP
SPHERICAL  END
1 34.6 ONEEXTERMOD  2 34.92 NOEXTERMOD END ZONE
KENO-5 VALIDATION CASE A-4
READ PARAM   NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
SPHERE     1 1 34.6
SPHERE     2 1 34.92
CUBE       0 1 35.0 -35.0
END GEOM
END DATA
END
```

Table A.5 (continued)

```
CAS07
=CSAS25
KENO-5 VALIDATION CASE A-5
27GROUPNDF4  MULTIREGION
URANIUM  1  .9848 283 92235 93.5 92238 6.5 END
H2O      2 END
END COMP
SPHERICAL  END
1 12.7 ONEEXTERMOD  2 31. NOEXTERMOD END ZONE
KENO-5 VALIDATION CASE A-5
READ PARAM TME=60    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
HEMISPHERE  2 1 12.7
HEMISPHERE  1 1 15.24
CUBOID      2 1 31.00 -31.00 31.00 -31.00 31.00 -16.
END GEOM
END DATA
END
```

```
CAS08
=CSAS25
KENO-5 VALIDATION CASE A-6
27GROUPNDF4  MULTIREGION
C       1 .7522 END
URANIUM  2 .9848 293 92235 93.2 92238 6.8 END
END COMP
CYLINDRICAL  END
1 8.89 NOEXTERMOD 2 13.97 TWOEXTERMOD  1 31.75 NOEXTERMOD  END ZONE
KENO-5 VALIDATION CASE A-6
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1  8.89 3.425 -3.425
CYLINDER  2 1 11.43 3.425 -3.425
CYLINDER  1 1 11.43 3.495 -3.425
CYLINDER  2 1 13.97 3.495 -3.425
CYLINDER  1 1 31.75 21.275 -21.205
CUBE     0 1 32.0 -32.0
END GEOM
END DATA
END
```

```
CAS09
=CSAS25
KENO-5 VALIDATION CASE A-7
27GROUPNDF4  MULTIREGION
URANIUM  1 .9848 293 92235 94 92238 6 END
URANIUM  2 END
END COMP
SLAB  END
1 7.62 NOEXTERMOD  2 52.02 NOEXTERMOD END ZONE
KENO-5 VALIDATION CASE A-7
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CUBOID     1 1 3.81 -3.81 4.445 -4.445 7.62 -7.62
CUBOID     2 1 26.01 -26.01 26.645 -26.645 29.82 -29.82
CUBE        0 1 30.0 -30.0
END GEOM
END DATA
END
```

```
CAS10
=CSAS25
KENO-5 VALIDATION CASE A-8
27GROUPNDF4  MULTIREGION
ARBMOIL    .88 3 0 0 0 6012 86.82 1001 13.16 16032 .02 1 END
URANIUM    2 .9528 293 92235 93.1 92238 6.9 END
ARBMPJEL  .024 2 0 0 0 6012 85 1001 15 2 END
END COMP
SPHERICAL  END
1 6.679 NOEXTERMOD 2 25.5 TWOEXTERMOD  1 40.5 NOEXTERMOD  END ZONE
KENO-5 VALIDATION CASE A-8
READ PARAM TME=60   NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
HEMISPHERE   1 1 6.679
HEMISPHERE   2 1 10.5254
SPHERE      1 1 40.5254
CUBE       0 1 42.0 -42.0
END GEOM
END DATA
END
```

```
CAS11
=CSAS25
KENO-5 VALIDATION CASE A-9
27GROUPNDF4  MULTIREGION
ARBMOIL    .88 3 0 0 0 6012 86.82 1001 13.16 16032 .02 1 END
URANIUM    2 .9528 293 92235 93.1 92238 6.9 END
ARBMPJEL  .024 2 0 0 0 6012 85 1001 15 2 END
CARBONSTEEL 3 END
END COMP
SPHERICAL  END
2 8.2 ONEEXTERMOD  1 40.5 NOEXTERMOD END ZONE
KENO-5 VALIDATION CASE A-9
READ PARAM
TME=60  NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
HEMISPHERE   3 1 6.012
HEMISPHERE  2 1 10.488
SPHERE      1 1 40.488
CUBE        0 1 41.0 -41.0
END GEOM
END DATA
END
```

```
CAS12
=CSAS25
KENO-5 VALIDATION CASE B-1
27GROUPNDF4  MULTIREGION
URANIUM  1 .9848 293 92235 93.2 92238 6.8 END
END COMP
CYLINDRICAL  END
1 8.89 NOEXTERMOD END ZONE
KENO-5 VALIDATION CASE B-1
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 8.89 10.1092 0. ORIGIN -5.08 0.
CYLINDER  0 1 13.97 10.1092 0.
CYLINDER  1 1 19.05 10.1092 0.
END GEOM
END DATA
END
```

Table A.5 (continued)

```
CAS13
=CSAS25
KENO-5 VALIDATION CASE B-10
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 63.3  0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS  2 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD  2 10.16 NOEXTERMOD  END ZONE
KENO-5 VALIDATION CASE B-10
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
BOX TYPE  1
CYLINDER  1 1 9.52 8.7804 -8.7804
CYLINDER  0 1 9.52 8.9895 -8.7804
CYLINDER  2 1 10.16 9.6295 -9.4204
CUBOID    0 1 11.282 -11.282 11.282 -11.282 10.7179 -11.7179
END GEOM
READ ARRAY NUX=3 NUY=3 NUZ=3 END ARRAY
READ START NST=1 END START
END DATA
END
```

```
CAS14
=CSAS25
KENO-5 VALIDATION CASE B-11
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 505 0 1 293 92235 93.2 92238 6.8 END
PLEXIGLASS  2 1 END
SS304  3 END
END COMP
CYLINDRICAL  END
1 6.8 NOEXTERMOD  2 7.08 NOEXTERMOD  END ZONE
KENO-5 VALIDATION CASE B-11
READ PARAM   NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
BOX TYPE  1
CYLINDER  1 1 6.8 1.76 -1.76
CYLINDER  3 1 7.08 1.76 -2.04
CUBOID    1 1 15.0875 -15.0875 15.0875 -15.0875 1.76 -2.04
BOX TYPE  2
CYLINDER  1 1 6.8 30.5 -30.5
CYLINDER  0 1 6.8 96.7 -30.5
CYLINDER  3 1 7.08 96.7 -30.5
CUBOID    0 1 15.0875 -15.0875 15.0875 -15.0875 125.7 -30.5
CORE      0 1 -60.35 -60.35 -80.0
REFLECTOR  3 1 5Z .635 1
CUBOID    2 1 70.55 -70.55 70.55 -70.55 90.2 -90.835
CUBE      0 1 95.0 -95.0
END GEOM
READ ARRAY NUX=4 NUY=4 NUZ=2 LOOP
1  1 4 1  1 4 1  1 1 1   2  1 4 1  1 4 1  2 2 1
END LOOP END ARRAY
END DATA
END
```

```
CAS15
=CSAS25
KENO-5 VALIDATION CASE B-12
27GROUPNDF4  MULTIREGION
URANIUM  1 .9829 293 92235 93.2 92238 6.8 END
C         2 .8296 END
POLYETHYLENE  3 1 END
END COMP
CYLINDRICAL  END
1 5.747 ONEEXTERMOD  2 10.92 NOEXTERMOD END ZONE
KENO-5 VALIDATION CASE B-12
READ PARAM TME=60   NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
BOX TYPE  1
CYLINDER  1 1 5.747 3.9699 -4.1071
CYLINDER  0 1 5.777 4.1071 -4.1071
CUBOID    2 1 10.9195 -10.9195 10.9195 -10.9195 7.8755 -7.8755
CUBOID    0 1 15.047 -15.047 15.047 -15.047 12.0035 -12.0035
CORE      0 1 -30.094 -30.094 -24.007
CUBOID    3 1 45.344 -45.344 45.344 -45.344 39.247 -39.247
CUBE      0 1 46.0 -46.0
END GEOM
READ ARRAY NUX=2 NUY=2 NUZ=2 END ARRAY
END DATA
END
```

```
CAS16
=CSAS25
KENO-5 VALIDATION CASE B-13
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS  2 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD  2 10.16 NOEXTERMOD  END ZONE
KENO-5 VALIDATION CASE B-13
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 8.7804 -8.7804
CYLINDER  0 1 9.52 8.9896 -8.7804
CYLINDER  2 1 10.16 9.6296 -9.4204
CUBOID    0 1 15.495 -15.495 15.495 -15.495 14.9646 -14.7554
END GEOM
READ ARRAY NUX=4 NUY=4 NUZ=4 END ARRAY
END DATA
END
```

Table A.5 (continued)

```
CAS17
=CSAS25
KENO-5 VALIDATION CASE B-14
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS  2 1 END
PARAFFIN  3 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD  2 10.16 NOEXTERMOD  END ZONE
KENO-5 VALIDATION CASE B-14
READ PARAM TME=60   NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 8.7804 -8.7804
CYLINDER  0 1 9.52 8.9896 -8.7804
CYLINDER  2 1 10.16 9.6296 -9.4204
CUBOID    0 1 18.425 -18.425 18.425 -18.425 17.8946 -17.6854
CORE      0 1 -55.275 -55.275 -53.37
CUBOID    3 1 70.515 -70.515 70.515 -70.515 68.61 -68.61
END GEOM
READ ARRAY NUX=3 NUY=3 NUZ=3 END ARRAY
END DATA
END

CAS18
=CSAS25
KENO-5 VALIDATION CASE B-15
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS  2 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD  2 10.16 NOEXTERMOD  END ZONE
KENO-5 VALIDATION CASE B-15
READ PARAM TME=60   NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 8.7804 -8.7804
CYLINDER  0 1 9.52 8.9896 -8.7804
CYLINDER  2 1 10.16 9.6296 -9.4204
CUBOID    0 1 14.54 -14.54 14.54 -14.54 14.0096 -13.8004
CORE      0 1 -43.62 -43.62 -41.715
CUBOID    2 1 44.89 -44.89 44.89 -44.89 42.985 -42.985
END GEOM
READ ARRAY NUX=3 NUY=3 NUZ=3 END ARRAY
END DATA
END
```

```
CAS19
=CSAS25
KENO-5 VALIDATION CASE B-16
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2 1 450.8 .72 1 293 92235 93.1 92238 6.9 END
SS304         2 END
END COMP
CYLINDRICAL  END
1 8.128 NOEXTERMOD  2 8.4074 NOEXTERMOD  END ZONE
KENO-5 VALIDATION CASE B-16
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
BOX TYPE   1
XCYLINDER  1 1 8.128 68.3006 -68.3006
XCYLINDER  2 1 8.4074 68.58 -68.58
CUBOID     0 1 68.58 -68.58 9.2075 -9.2075 14.999 -110.32
BOX TYPE   2
YCYLINDER  1 1 8.128 68.3006 -68.3006
YCYLINDER  2 1 8.4074 68.58 -68.58
CUBOID     0 1 9.2075 -9.2075 68.58 -68.58 14.999 -110.32
BOX TYPE   3
XCYLINDER  1 1 8.128 68.3006 -68.3006
XCYLINDER  2 1 8.4074 68.58 -68.58
CUBOID     0 1 68.58 -68.58 9.2075 -9.2075 125.09 -14.999
BOX TYPE   4
YCYLINDER  1 1 8.128 68.3006 -68.3006
YCYLINDER  2 1 8.4074 68.58 -68.58
CUBOID     0 1 9.2075 -9.2075 68.58 -68.58 125.09 -14.999
BOX TYPE   5
CUBOID     1 1 8.89 -8.89 8.89 -8.89 14.999 -110.00
CUBOID     2 1 9.2075 -9.2075 9.2075 -9.2075 14.999 -110.32
BOX TYPE   6
CUBOID     1 1 8.89 -8.89 8.89 -8.89 125.09 -14.999
CUBOID     2 1 9.2075 -9.2075 9.2075 -9.2075 125.09 -14.999
BOX TYPE   7
CUBOID     0 1 68.58 -68.58 68.58 -68.58 14.999 -110.32
BOX TYPE   8
CUBOID     0 1 68.58 -68.58 68.58 -68.58 125.09 -14.999
END GEOM
READ ARRAY NUX=3 NUY=3 NUZ=2 LOOP
1  1 3 2 2 2 1 1 1 1  2  2 2 1 1 3 2 1 1 1  3  1 3 2 2 2 1 2 2 1
4  2 2 1 1 3 2 2 2 1  5  2 2 1 2 2 1 1 1 1  6  2 2 1 2 2 1 2 2 1
7  1 3 2 1 3 2 1 1 1  8  1 3 2 1 3 2 2 2 1
END LOOP END ARRAY
END DATA
END
```

Table A.5 (continued)

```
CAS20
=CSAS25
KENO-5 VALIDATION CASE B-17
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2 1 355.96 .494 1 293 92235 93.172 92238 6.828 END
ARBMAL         2.737 9 0 0 1 12000 1 13027 97.35 14028 .6 22000 .03
24000 .17 25055 .07 26000 .47 29000 .25 14028 .06 2 END
PLEXIGLASS  3 1 END
END COMP
CYLINDRICAL  END
1 10.56 NOEXTERMOD  2 10.96 NOEXTERMOD  END ZONE
KENO-5 VALIDATION CASE B-17
READ PARAM TME=60   NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 10.56 9.41 -9.41
CYLINDER  0 1 10.56  109.69 -9.41
CYLINDER  2 1 10.96  109.69 -9.73
CUBOID    0 1 15.24 -15.24 15.24 -15.24 113.17 -9.73
CORE      0 1 -60.96 -60.96 -61.45
REFLECTOR  0 1 4R0.49 2Z 1
CUBE      3 1 82.05 -82.05
END GEOM
READ ARRAY NUX=4 NUY=4 END ARRAY
END DATA
END
```

```
CAS21
=CSAS25
KENO-5 VALIDATION CASE B-18
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2 1 364.11 .584 1 293 92235 93.172 92238 6.828 END
ARBMAL         2.737 9 0 0 1 12000 1 13027 97.35 14028 .6 22000 .03
24000 .17 25055 .07 26000 .47 29000 .25 14028 .06 2 END
ARBMCONC     2.321 13 0 0 1 1001 .75 6012 5.55 7014 .01 8016 49.29
11023 .42 12000 1.48 13027 2.06 14028 15.7 16032 .17 19039 .75 20040 22.95
22000 .05 26000 .82 3 END
END COMP
CYLINDRICAL  END
1 10.56 NOEXTERMOD  2 10.96 NOEXTERMOD  END ZONE
KENO-5 VALIDATION CASE B-18
READ PARAM TME=60   NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
BOX TYPE  1
CYLINDER  1 1 10.56 8.565 -8.565
CYLINDER  0 1 10.56 110.535 -8.565
CYLINDER  2 1 10.96 110.535 -8.885
CUBOID    0 1 15.25 -15.15 15.25 -15.25 115.515 -8.885
BOX TYPE  2
CYLINDER  1 1 10.56 8.565 -8.565
CYLINDER  0 1 10.56 110.535 -8.565
CYLINDER  2 1 10.96 110.535 -8.885
CUBOID    0 1 15.15 -15.25 15.25 -15.25 115.515 -8.885
BOX TYPE  3
CYLINDER  1 1 10.56 8.565 -8.565
CYLINDER  0 1 10.56 110.535 -8.565
CYLINDER  2 1 10.96 110.535 -8.885
CUBOID    0 1 15.25 -15.25 15.25 -15.25 115.515 -8.885
CORE      0 1 -60.9 -61.0 -62.2
REFLECTOR 0 1 2Z 2R.1 2Z 1
CUBOID    3 1 86.6 -86.6 86.8 -86.8 87.9 -87.9
END GEOM
READ ARRAY NUX=4 NUY=4 LOOP
1  1 1 1 1 4 1 1 1 1   2  4 4 1 1 4 1 1 1 1   3  2 3 1 1 4 1 1 1 1
END LOOP END ARRAY
END DATA
END
```

```
CAS22
=CSAS25
KENO-5 VALIDATION CASE B-2
27GROUPNDF4  MULTIREGION
URANIUM  1 .9848 293 92235 93.2 92238 6.8 END
END COMP
CYLINDRICAL  END
1 8.89 NOEXTERMOD  END ZONE
KENO-5 VALIDATION CASE B-2
READ PARAM     NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CUBOID     1 1 0.3434 -12.4434 6.35 -6.35 6.49 -6.49
CYLINDER  0 1 13.97 6.49 -6.49
CYLINDER  1 1 19.05 6.49 -6.49
CUBE      0 1 20.0 -20.0
END GEOM
END DATA
END
```

```
CAS23
=CSAS25
KENO-5 VALIDATION CASE B-3
27GROUPNDF4  MULTIREGION
URANIUM  1 .98231 293 92235 93.2 92238 6.8 END
END COMP
CYLINDRICAL  END
1 4.55 NOEXTERMOD  END ZONE
KENO-5 VALIDATION CASE B-3
READ PARAM   PLT=NO  NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID  1 1 2P6.3515 1.2685 -3.8115 13.377 13.058
CUBOID  0 1 2P6.3515 6.3515 -3.8115 13.377 13.058
CUBOID  1 1 2P6.3515 6.3515 -3.8115 13.377 11.155
CUBOID  0 1 4P6.3515 13.377 11.155
CUBOID  1 1 4P6.3515 13.377 0.
UNIT 2
CYLINDER  1 1 4.5555 12.918 0.
UNIT 3
CYLINDER  1 1 5.761  13.475 0.
UNIT 4
CYLINDER  1 1 4.5525 12.969 0.
UNIT 5
ARRAY     1 -4.573 -4.573 0.
UNIT 6
CYLINDER  1 1 4.5545 12.974 0.
UNIT 7
CYLINDER  1 1 5.7495 13.475 0.
UNIT 8
CYLINDER  1 1 4.5565 12.954 0.
UNIT 9
COM='CENTERPIECE'
ARRAY     2 -6.35 -6.35 0.
UNIT 10
COM='BOTTOM OF UNIT 5'
CUBOID    1 1 2P3.81 8.13 -4.573 8.91 0
CUBOID    0 1 2P4.573 8.13 -4.573 8.91 0.
```

Table A.5 (continued)

```
UNIT 11
COM='TOP OF UNIT 5'
CYLINDER  1 1 4.573 4.319 0.
CUBOID    0 1 2P4.573 8.13 -4.573 4.319 0.
UNIT 12
COM='BOTTOM OF CENTERPIECE'
CYLINDER  1 1 5.757 2.690 0.  ORIGIN -.593 -.593
CUBOID    0 1 4P6.35 2.690 0.
UNIT 13
COM='MIDDLE OF CENTERPIECE'
CUBOID    1 1 4P6.35 5.718 0.
UNIT 14
COM='TOP OF CENTERPIECE'
HEMISPHERE  1 1 6.082  ORIGIN  -.268 .268 0.
CUBOID    0 1 4P6.35 6.082 0.
GLOBAL
UNIT 15
CUBOID    0 1 4P25.0 15.0 -2.0
HOLE  1 0.0 -17.306 0.15
HOLE  2 -12.051 -9.247 0.111
HOLE  3   -16.196 1.845 0.174
HOLE  4  -9.394 10.999 0.156
HOLE  5  0.0 15.400 0.29
HOLE  6  9.727 10.803 0.134
HOLE  7   16.224 1.419 0.140
HOLE  8  11.931 -9.322 0.087
HOLE  9   0.0      0.0    -1.755
END GEOM
READ ARRAY
ARA=1 NUX=1 NUY=1 NUZ=2 FILL 10 11 END FILL
ARA=2 NUX=1 NUY=1 NUZ=3 FILL 12 13 14 END FILL
END ARRAY
READ PLOT TTL='GROTESQUE' PIC=MIX
XUL=-25 YUL=25 ZUL=0.5   XLR=25 YLR=-25 ZLR=.5
UAX=1 VDN=-1  NAX=130  END
XUL=-25 YUL=25 ZUL=2   XLR=25 YLR=-25 ZLR=2  END
XUL=-25 YUL=25 ZUL=9.5   XLR=25 YLR=-25 ZLR=9.5  END
XUL=-.593 YUL=-25 ZUL=15  XLR=-.593 YLR=25 ZLR=-2
UAX=0 VAX=1  VDN=0 WDN=-1 NAX=130  END
END PLOT
END DATA
END
```

```
CAS24
=CSAS25
KENO-5 VALIDATION CASE B-4
27GROUPNDF4  MULTIREGION
URANIUM  1 .9848 293 92235 93.2 92238 6.8 END
SS304    2 END
INCONEL  3 END
END COMP
CYLINDRICAL  END
2 .254 NOEXTERMOD  1 5.74 NOEXTERMOD END ZONE
KENO-5 VALIDATION CASE B-4
READ PARAM    NPG=600 FDN=YES NUB=YES PLT=NO END PARAM
READ GEOM
UNIT 1
COM='SS RODS IN FUEL'
CYLINDER 2 1 .254 2P2.691
UNIT 2
COM='SS ROD & INCONEL SLEEVE'
CYLINDER 2 1 .254 2P.987
CYLINDER 3 1 .381 2P.987
UNIT 3
COM='A6 CYLINDER & SUPPORT RODS'
CYLINDER 1 1 5.7405 2P2.691
HOLE     1 -4.2735 2R0
HOLE     1  4.2735 2R0
CUBOID   0 1 4P7.7165 2P4.667
HOLE     2 -4.2735 0 -3.679
HOLE     2 -4.2735 0  3.679
HOLE     2  4.2735 0 -3.679
HOLE     2 4.2735 0  3.679
END GEOM
READ ARRAY
 NUX=4 NUY=4 NUZ=4 FILL F3 END FILL
END ARRAY
READ PLOT TTL='A6 UNIT WITH SUPPORTS' PLT=NO
XUL=0 YUL=7.7165 ZUL=9.334 XLR=15.433 YLR=7.7165 ZLR=0
UAX=1 WDN=-1 NAX=125 END PLOT
END DATA
END
```

```
CAS25
=CSAS25
KENO-5 VALIDATION CASE B-5
27GROUPNDF4  MULTIREGION
URANIUM  1 .9809 293 92235 93.2 92238 6.8 END
END COMP
CYLINDRICAL  END
1 4.56 NOEXTERMOD END ZONE
KENO-5 VALIDATION CASE B-5
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
BOX TYPE  1
CYLINDER  1 1 4.558 2.16 -2.16
CYLINDER  0 1 5.747 2.16 -2.16
CYLINDER  1 1 5.747 4.851 -4.851
CUBOID    0 1 5.8554 -5.8554 5.8554 -5.8554 4.9771 -4.9771
END GEOM
READ ARRAY NUX=2 NUY=2 NUZ=2 END ARRAY
END DATA
END
```

Table A.5 (continued)

```
CAS26
=CSAS25
KENO-5 VALIDATION CASE B-6
27GROUPNDF4  MULTIREGION
URANIUM     1 .9809 293 92235 93.2 92238 6.8 END
PARAFFIN    2 END
END COMP
CYLINDRICAL  END
1 4.56 NOEXTERMOD  END ZONE
KENO-5 VALIDATION CASE B-6
READ PARAM TME=60 NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
BOX TYPE  1
CYLINDER  1 1 4.558 8.641 -8.641
CUBOID    0 1 9.7212 -9.7212 9.7212 -9.7212 13.8041 -13.8041
CORE      0 1 -19.4424 -19.4424 -27.6082
REFLECTOR  2 1 6R15.2 1
END GEOM
READ ARRAY NUX=2 NUY=2 NUZ=2 END ARRAY
END DATA
END
```

```
CAS27
=CSAS25
KENO-5 VALIDATION CASE B-7
27GROUPNDF4  MULTIREGION
URANIUM  1 .9848 293 92235 93.2 92238 6.8 END
PARAFFIN 2 END
END COMP
CYLINDRICAL  END
1 4.558 NOEXTERMOD  END ZONE
KENO-5 VALIDATION CASE B-7
READ PARAM TME=60   NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
BOX TYPE  1
CYLINDER  1 1 4.558 2.160 -2.160
CYLINDER  0 1 5.747 2.160 -2.160
CYLINDER  1 1 5.747 4.851 -4.851
CUBOID    0 1 9.2083 -9.2083 9.2083 -9.2083 8.2875 -8.2875
CORE      0 1 -18.4166 -18.4166 -16.575
REFLECTOR  2 1 6R15.2 1
END GEOM
READ ARRAY NUX=2 NUY=2 NUZ=2 END ARRAY
END DATA
END
```

```
CAS28
=CSAS25
KENO-5 VALIDATION CASE B-8
27GROUPNDF4  MULTIREGION
URANIUM  1 .9848 293 92235 93.2 92238 6.8 END
PLEXIGLASS  2 1 END
END COMP
CYLINDRICAL  END
1 5.753 NOEXTERMOD  END ZONE
KENO-5 VALIDATION CASE B-8
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
BOX TYPE  1
CYLINDER  1 1 5.753 5.3825 -5.3825
CUBOID    0 1 7.68 -7.68 7.68 -7.68 7.33 -7.33
CUBOID    2 1 8.95 -8.95 8.95 -8.95 8.6 -8.6
CUBOID    0 1 9.0599 -9.0599 9.0599 -9.0599 8.6975 -8.6975
END GEOM
READ ARRAY NUX=2 NUY=2 NUZ=2 END ARRAY
END DATA
END
```

```
CAS29
=CSAS25
KENO-5 VALIDATION CASE B-9
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS  2 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD  2 10.16 NOEXTERMOD  END ZONE
KENO-5 VALIDATION CASE B-9
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
BOX TYPE  1
CYLINDER  1 1 9.52 8.7804 -8.7804
CYLINDER  0 1 9.52 8.9896 -8.7804
CYLINDER  2 1 10.16 9.6296 -9.4204
CUBOID    0 1 13.4 -13.4 13.4 -13.4 12.8696 -12.6604
END GEOM
READ ARRAY NUX=3 NUY=3 NUZ=3 END ARRAY
END DATA
END
```

Table A.5 (continued)

```
CAS30
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL         2 1 END
CARBONSTEEL  3 1 END
PLEXIGLASS     4 1 END
ARBMWOOD  .640525 3 0 0 0 6012 44.435 1001 6.2639 8016 49.301 5 END
REG-CONCRETE  6 END
END COMP
SLAB END
1 3.81 NOEXTERMOD  2 4.12 NOEXTERMOD END ZONE
93.2% UO2F2 3 IN AL SLAB 3X1X1 ARRAY 0 IN SEP ROOM
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CUBOID      1 1 2P3.81 2P60.325 25.50 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P4.128 2P65. 150. -1.
CORE 0  1 -12.384 -65. -1.
CYLINDER  0 1 142.8 212. -60.
CYLINDER  3 1 144.8 212. -62.
CUBOID    0 1 275.5 -638.9 475. -744.2 588. -62.
REFLECTOR 4 1 5R0 .32 1
REFLECTOR 5 1 5R0 1.27 1
REFLECTOR 3 1 5R0 .64 1
REFLECTOR 0 1 5R0 365 1
REFLECTOR 6 2 6R3 10
REFLECTOR 6 12 0 3 4R0 10
END GEOM
READ BIAS ID=301 2 21 END BIAS
READ ARRAY NUX=3 NUY=1 NUZ=1 END ARRAY
END DATA
END
```

```
CAS31
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL         2 1 END
H2O        3 1 END
END COMP
SLAB END
1 3.81 ONEXTERMOD  2 4.12 NOEXTERMOD 3 22.12 NOEXTERMOD END ZONE
93.2% UO2F2 3 IN AL SLAB 3X1X1 ARRAY 0 IN SEP H2O REFL
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CUBOID      1 1 2P3.81 2P60.325 17.32 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P4.128 2P60.643 17.32 -.318
CORE        0 1 3R0
REFLECTOR   3 2 4R3 0 3 6
END GEOM
READ ARRAY NUX=3 NUY=1 NUZ=1 END ARRAY
READ BIAS ID=500 2 7 END BIAS
END DATA
END
```

```
CAS32
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL         2 1 END
CARBONSTEEL  3 1 END
PLEXIGLASS     4 1 END
ARBMWOOD  .640525 3 0 0 0 6012 44.435 1001 6.2639 8016 49.301 5 END
REG-CONCRETE  6 END
END COMP
SLAB END
1 3.81 NOEXTERMOD  2 4.12 NOEXTERMOD END ZONE
93.2% UO2F2 3 IN AL SLAB 3X1X1 ARRAY 1 IN SEP ROOM
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CUBOID      1 1 2P3.81 2P60.325 34.44 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P5.398 2P65. 150. -1.
CORE 0 1 -16.194 -65. -1.
CYLINDER  0 1 142.8 212. -60.
CYLINDER  3 1 144.8 212. -62.
CUBOID    0 1 275.5 -638.9 475. -744.2 588. -62.
REFLECTOR 4 1 5R0 .32 1
REFLECTOR 5 1 5R0 1.27 1
REFLECTOR 3 1 5R0 .64 1
REFLECTOR 0 1 5R0 365 1
REFLECTOR 6 2 6R3 10
REFLECTOR 6 12 0 3 4R0 10
END GEOM
READ BIAS ID=301 2 21 END BIAS
READ ARRAY NUX=3 NUY=1 NUZ=1 END ARRAY
END DATA
END
```

```
CAS33
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL         2 1 END
H2O        3 1 END
END COMP
SLAB END
1 3.81 ONEXTERMOD  2 4.12 NOEXTERMOD 3 22.12 NOEXTERMOD END ZONE
93.2% UO2F2 3 IN AL SLAB 3X1X1 ARRAY 1 IN SEP H2O REFL
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID      1 1 2P3.81 2P60.325 19.13 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P4.128 2P60.643 19.13 -.318
UNIT 2
CUBOID      3 1 2.54 0 2P60.643 19.13 -.318
CORE        0 1 3R0
REFLECTOR   3 2 4R3 0 3 6
END GEOM
READ ARRAY NUX=5 NUY=1 NUZ=1 FILL 1 2 1 2 1 END FILL END ARRAY
READ BIAS ID=500 2 7 END BIAS
END DATA
END
```

Table A.5 (continued)

```
CAS34
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL        2 1 END
CARBONSTEEL  3 1 END
PLEXIGLASS     4 1 END
ARBMWOOD  .640525 3 0 0 0 6012 44.435 1001 6.2639 8016 49.301 5 END
REG-CONCRETE  6 END
END COMP
SLAB END
1 3.81 NOEXTERMOD  2 4.12 NOEXTERMOD END ZONE
93.2% UO2F2 3 IN AL SLAB 3X1X1 ARRAY 3 IN SEP ROOM
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CUBOID      1 1 2P3.81 2P60.325 58.78 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P7.938 2P65. 150. -1.
CORE 0 1 -23.814 -65. -1.
CYLINDER  0 1 142.8 212. -60.
CYLINDER  3 1 144.8 212. -62.
CUBOID    0 1 275.5 -638.9 475. -744.2 588. -62.
REFLECTOR 4 1 5R0 .32 1
REFLECTOR 5 1 5R0 1.27 1
REFLECTOR 3 1 5R0 .64 1
REFLECTOR 0 1 5R0 365 1
REFLECTOR 6 2 6R3 10
REFLECTOR 6 12 0 3 4R0 10
END GEOM
READ BIAS ID=301 2 21 END BIAS
READ ARRAY NUX=3 NUY=1 NUZ=1 END ARRAY
END DATA
END
```

```
CAS35
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL        2 1 END
H2O       3 1 END
END COMP
SLAB END
1 3.81 ONEXTERMOD  2 4.12 NOEXTERMOD 3 22.12 NOEXTERMOD END ZONE
93.2% UO2F2 3 IN AL SLAB 3X1X1 ARRAY 3 IN SEP H2O REFL
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID      1 1 2P3.81 2P60.325 32.92 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P4.128 2P60.643 32.92 -.318
UNIT 2
CUBOID      3 1 7.62 0 2P60.643 32.92 -.318
CORE        0 1 3R0
REFLECTOR   3 2 4R3 0 3 6
END GEOM
READ ARRAY NUX=5 NUY=1 NUZ=1 FILL 1 2 1 2 1 END FILL END ARRAY
READ BIAS ID=500 2 7 END BIAS
END DATA
END
```

```
CAS36
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL        2 1 END
CARBONSTEEL  3 1 END
PLEXIGLASS     4 1 END
ARBMWOOD  .640525 3 0 0 0 6012 44.435 1001 6.2639 8016 49.301 5 END
REG-CONCRETE  6 END
END COMP
SLAB END
1 3.81 NOEXTERMOD  2 4.12 NOEXTERMOD END ZONE
93.2% UO2F2 3 IN AL SLAB 3X1X1 ARRAY 4.5 IN SEP ROOM
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CUBOID      1 1 2P3.81 2P60.325 85.52 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P9.843 2P65. 150. -1.
CORE 0 1 -29.529 -65. -1.
CYLINDER  0 1 142.8 212. -60.
CYLINDER  3 1 144.8 212. -62.
CUBOID    0 1 275.5 -638.9 475. -744.2 588. -62.
REFLECTOR 4 1 5R0 .32 1
REFLECTOR 5 1 5R0 1.27 1
REFLECTOR 3 1 5R0 .64 1
REFLECTOR 0 1 5R0 365 1
REFLECTOR 6 2 6R3 10
REFLECTOR 6 12 0 3 4R0 10
END GEOM
READ BIAS ID=301 2 21 END BIAS
READ ARRAY NUX=3 NUY=1 NUZ=1 END ARRAY
END DATA
END
```

```
CAS37
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL        2 1 END
H2O       3 1 END
END COMP
SLAB END
1 3.81 ONEXTERMOD  2 4.12 NOEXTERMOD 3 22.12 NOEXTERMOD END ZONE
93.2% UO2F2 3 IN AL SLAB 3X1X1 ARRAY 4.5 IN SEP H2O REFL
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID      1 1 2P3.81 2P60.325 61.06 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P4.128 2P60.643 61.06 -.318
UNIT 2
CUBOID      3 1 11.43 0 2P60.643 61.06 -.318
CORE        0 1 3R0
REFLECTOR   3 2 4R3 0 3 6
END GEOM
READ ARRAY NUX=5 NUY=1 NUZ=1 FILL 1 2 1 2 1 END FILL END ARRAY
READ BIAS ID=500 2 7 END BIAS
END DATA
END
```

Table A.5 (continued)

```
CAS38
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL          2 1 END
CARBONSTEEL  3 1 END
PLEXIGLASS     4 1 END
ARBMWOOD  .640525 3 0 0 0 6012 44.435 1001 6.2639 8016 49.301 5 END
REG-CONCRETE  6 END
END COMP
SLAB END
1 3.81 NOEXTERMOD  2 4.12 NOEXTERMOD END ZONE
93.2% UO2F2 3 IN AL SLAB 3X1X1 ARRAY 5.5 IN SEP ROOM
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CUBOID      1 1 2P3.81 2P60.325 107.37 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P11.113 2P65. 150. -1.
CORE 0 1 -33.339 -65. -1.
CYLINDER  0 1 142.8 212. -60.
CYLINDER  3 1 144.8 212. -62.
CUBOID    0 1 275.5 -638.9 475. -744.2 588. -62.
REFLECTOR 4 1 5R0 .32 1
REFLECTOR 5 1 5R0 1.27 1
REFLECTOR 3 1 5R0 .64 1
REFLECTOR 0 1 5R0 365 1
REFLECTOR 6 2 6R3 10
REFLECTOR 6 12 0 3 4R0 10
END GEOM
READ BIAS ID=301 2 21 END BIAS
READ ARRAY NUX=3 NUY=1 NUZ=1 END ARRAY
END DATA
END
```

```
CAS39
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL          2 1 END
H2O         3 1 END
END COMP
SLAB END
1 3.81 ONEXTERMOD  2 4.12 NOEXTERMOD 3 22.12 NOEXTERMOD END ZONE
93.2% UO2F2 3 IN AL SLAB 3X1X1 ARRAY 5.5 IN SEP H2O REFL
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID       1 1 2P3.81 2P60.325 111.68 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P4.128 2P60.643 111.68 -.318
UNIT 2
CUBOID       3 1 13.97 0 2P60.643 111.68 -.318
CORE         0 1 3R0
REFLECTOR    3 2 4R3 0 3 6
END GEOM
READ ARRAY NUX=5 NUY=1 NUZ=1 FILL 1 2 1 2 1 END FILL END ARRAY
READ BIAS ID=500 2 7 END BIAS
END DATA
END
```

```
CAS40
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL          2 1 END
CARBONSTEEL  3 1 END
PLEXIGLASS     4 1 END
ARBMWOOD  .640525 3 0 0 0 6012 44.435 1001 6.2639 8016 49.301 5 END
REG-CONCRETE  6 END
END COMP
SLAB END
1 3.81 NOEXTERMOD  2 4.12 NOEXTERMOD END ZONE
93.2% UO2F2 3 IN AL SLAB 3X1X1 ARRAY 6 IN SEP ROOM
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CUBOID      1 1 2P3.81 2P60.325 120.4 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P11.748 2P65. 150. -1.
CORE 0 1 -35.244 -65. -1.
CYLINDER  0 1 142.8 212. -60.
CYLINDER  3 1 144.8 212. -62.
CUBOID    0 1 275.5 -638.9 475. -744.2 588. -62.
REFLECTOR 4 1 5R0 .32 1
REFLECTOR 5 1 5R0 1.27 1
REFLECTOR 3 1 5R0 .64 1
REFLECTOR 0 1 5R0 365 1
REFLECTOR 6 2 6R3 10
REFLECTOR 6 12 0 3 4R0 10
END GEOM
READ BIAS ID=301 2 21 END BIAS
READ ARRAY NUX=3 NUY=1 NUZ=1 END ARRAY
END DATA
END
```

```
CAS41
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL          2 1 END
END COMP
SLAB END
1 3.81 NOEXTERMOD  2 4.12 NOEXTERMOD END ZONE
93.2% UO2F2 3, 6 IN AL SLABS 2X1X1 ARRAY 15 IN SEP
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID       1 1 2P3.81 2P60.325 65.81 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P4.128 2P65. 150. -1.
UNIT 2
CUBOID       1 1 2P7.417 2P60.325 65.81 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P7.735 2P65. 150. -1.
UNIT 3
CUBOID       0 1 38.1 0 2P65. 150. -1.
END GEOM
READ ARRAY NUX=3 NUY=1 NUZ=1 FILL 2 3 1 END FILL END ARRAY
END DATA
END
```

Table A.5 (continued)

```
CAS42
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL         2 1 END
END COMP
SLAB END
1 3.81 NOEXTERMOD  2 4.12 NOEXTERMOD END ZONE
93.2% UO2F2 3, 6 IN AL SLABS 2X1X1 ARRAY 2 IN SEP
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID      1 1 2P3.81 2P60.325 32.39 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P4.128 2P65. 150. -1.
UNIT 2
CUBOID      1 1 2P7.417 2P60.325 32.39 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P7.735 2P65. 150. -1.
UNIT 3
CUBOID      0 1 5.08 0 2P65. 150. -1.
END GEOM
READ ARRAY NUX=3 NUY=1 NUZ=1 FILL 2 3 1 END FILL END ARRAY
END DATA
END
```

```
CAS43
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL         2 1 END
END COMP
SLAB END
1 3.81 NOEXTERMOD  2 4.12 NOEXTERMOD END ZONE
93.2% UO2F2 3, 6 IN AL SLABS 2X1X1 ARRAY 30 IN SEP
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID      1 1 2P3.81 2P60.325 92.48 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P4.128 2P65. 150. -1.
UNIT 2
CUBOID      1 1 2P7.417 2P60.325 92.48 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P7.735 2P65. 150. -1.
UNIT 3
CUBOID      0 1 76.2 0 2P65. 150. -1.
END GEOM
READ ARRAY NUX=3 NUY=1 NUZ=1 FILL 2 3 1 END FILL END ARRAY
END DATA
END
```

```
CAS44
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL         2 1 END
END COMP
SLAB END
1 3.81 NOEXTERMOD  2 4.12 NOEXTERMOD END ZONE
93.2% UO2F2 3, 6 IN AL SLABS 2X1X1 ARRAY 48 IN SEP
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID      1 1 2P3.81 2P60.325 113.84 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P4.128 2P65. 150. -1.
UNIT 2
CUBOID      1 1 2P7.417 2P60.325 113.84 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P7.735 2P65. 150. -1.
UNIT 3
CUBOID      0 1 121.92 0 2P65. 150. -1.
END GEOM
READ ARRAY NUX=3 NUY=1 NUZ=1 FILL 2 3 1 END FILL END ARRAY
END DATA
END
```

```
CAS45
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL         2 1 END
END COMP
SLAB END
1 3.81 NOEXTERMOD  2 4.12 NOEXTERMOD END ZONE
93.2% UO2F2 3, 6, 3 IN AL SLABS 3X1X1 ARRAY 0 IN SEP
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID      1 1 2P3.81 2P60.325 19.63 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P4.128 2P65. 150. -1.
UNIT 2
CUBOID      1 1 2P7.417 2P60.325 19.63 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P7.735 2P65. 150. -1.
END GEOM
READ ARRAY NUX=3 NUY=1 NUZ=1 FILL 1 2 1 END FILL END ARRAY
END DATA
END
```

Table A.5 (continued)

```
CAS46
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL         2 1 END
END COMP
SLAB END
1 3.81 NOEXTERMOD  2 4.12 NOEXTERMOD END ZONE
93.2% UO2F2 3, 6, 3 IN AL SLABS 3X1X1 ARRAY 10 IN SEP
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID       1 1 2P3.81 2P60.325 44.25 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P4.128 2P65. 150. -1.
UNIT 2
CUBOID       1 1 2P7.417 2P60.325 44.25 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P7.735 2P65. 150. -1.
UNIT 3
CUBOID       0 1 25.4 0 2P65. 150. -1.
END GEOM
READ ARRAY NUX=5 NUY=1 NUZ=1 FILL 1 3 2 3 1 END FILL END ARRAY
END DATA
END
```

```
CAS47
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL         2 1 END
END COMP
SLAB END
1 3.81 NOEXTERMOD  2 4.12 NOEXTERMOD END ZONE
93.2% UO2F2 3, 6, 3 IN AL SLABS 3X1X1 ARRAY 20 IN SEP
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID       1 1 2P3.81 2P60.325 62.56 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P4.128 2P65. 150. -1.
UNIT 2
CUBOID       1 1 2P7.417 2P60.325 62.56 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P7.735 2P65. 150. -1.
UNIT 3
CUBOID       0 1 50.8 0 2P65. 150. -1.
END GEOM
READ ARRAY NUX=5 NUY=1 NUZ=1 FILL 1 3 2 3 1 END FILL END ARRAY
END DATA
END
```

```
CAS48
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL         2 1 END
END COMP
SLAB END
1 3.81 NOEXTERMOD  2 4.12 NOEXTERMOD END ZONE
93.2% UO2F2 3, 6, 3 IN AL SLABS 3X1X1 ARRAY 32 IN SEP
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID       1 1 2P3.81 2P60.325 81.56 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P4.128 2P65. 150. -1.
UNIT 2
CUBOID       1 1 2P7.417 2P60.325 81.56 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P7.735 2P65. 150. -1.
UNIT 3
CUBOID       0 1 81.28 0 2P65. 150. -1.
END GEOM
READ ARRAY NUX=5 NUY=1 NUZ=1 FILL 1 3 2 3 1 END FILL END ARRAY
END DATA
END
```

```
CAS49
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL         2 1 END
END COMP
SLAB END
1 7.62 NOEXTERMOD  2 7.94 NOEXTERMOD END ZONE
93.2% UO2F2 6 & 3 IN AL SLABS 2X1X1 ARRAY 12 IN SEP
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID       1 1 2P3.81 2P60.325 58.19 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P4.128 2P65. 150. -1.
UNIT 2
CUBOID       2 1 2P.318 2P60.325 58.19 0
CUBOID       1 1 2P7.938 2P60.325 58.19 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P8.574 2P65. 150. -1.
UNIT 3
CUBOID       0 1 30.48 0 2P65. 150. -1.
END GEOM
READ ARRAY NUX=3 NUY=1 NUZ=1 FILL 2 3 1 END FILL END ARRAY
END DATA
END
```

Table A.5 (continued)

```
CAS50
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL        2 1 END
END COMP
SLAB END
1 7.62 NOEXTERMOD  2 7.94 NOEXTERMOD END ZONE
93.2% UO2F2 6 & 3 IN AL SLABS 2X1X1 ARRAY 18 IN SEP
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID      1 1 2P3.81 2P60.325 68.3 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P4.128 2P65. 150. -1.
UNIT 2
CUBOID      2 1 2P.318 2P60.325 68.3 0
CUBOID      1 1 2P7.938 2P60.325 68.3 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P8.574 2P65. 150. -1.
UNIT 3
CUBOID      0 1 45.72 0 2P65. 150. -1.
END GEOM
READ ARRAY NUX=3 NUY=1 NUZ=1 FILL 2 3 1 END FILL END ARRAY
END DATA
END
```

```
CAS51
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL        2 1 END
END COMP
SLAB END
1 7.62 NOEXTERMOD  2 7.94 NOEXTERMOD END ZONE
93.2% UO2F2 6 & 3 IN AL SLABS 2X1X1 ARRAY 30 IN SEP
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID      1 1 2P3.81 2P60.325 83.11 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P4.128 2P65. 150. -1.
UNIT 2
CUBOID      2 1 2P.318 2P60.325 83.11 0
CUBOID      1 1 2P7.938 2P60.325 83.11 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P8.574 2P65. 150. -1.
UNIT 3
CUBOID      0 1 76.2 0 2P65. 150. -1.
END GEOM
READ ARRAY NUX=3 NUY=1 NUZ=1 FILL 2 3 1 END FILL END ARRAY
END DATA
END
```

```
CAS52
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL        2 1 END
END COMP
SLAB END
1 7.62 NOEXTERMOD  2 7.94 NOEXTERMOD END ZONE
93.2% UO2F2 6 & 3 IN AL SLABS 2X1X1 ARRAY 6 IN SEP
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID      1 1 2P3.81 2P60.325 45.03 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P4.128 2P65. 150. -1.
UNIT 2
CUBOID      2 1 2P.318 2P60.325 45.03 0
CUBOID      1 1 2P7.938 2P60.325 45.03 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P8.574 2P65. 150. -1.
UNIT 3
CUBOID      0 1 15.24 0 2P65. 150. -1.
END GEOM
READ ARRAY NUX=3 NUY=1 NUZ=1 FILL 2 3 1 END FILL END ARRAY
END DATA
END
```

```
CAS53
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL        2 1 END
END COMP
SLAB END
1 7.62 NOEXTERMOD  2 7.94 NOEXTERMOD END ZONE
93.2% UO2F2 6 IN AL SLAB 2X1X1 ARRAY 15 IN SEP
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID      1 1 2P7.417 2P60.325 44.88 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P26.784 2P65. 150. -1.
UNIT 2
CUBOUD      2 1 2P.318 2P60.325 44.88 0
CUBOID      1 1 2P7.938 2P60.325 44.88 0
REFLECTOR   2 1 4R.318 0 .318 1
CUBOID      0 1 2P27.305 2P65. 150. -1.
END GEOM
READ ARRAY NUX=2 NUY=1 NUZ=1 FILL 1 2 END FILL END ARRAY
END DATA
END
```

Table A.5 (continued)

```
CAS54
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL         2 1 END
END COMP
SLAB END
1 7.62 NOEXTERMOD  2 7.94 NOEXTERMOD END ZONE
93.2% UO2F2 6 IN AL SLAB 2X1X1 ARRAY 2 IN SEP
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID       1 1 2P7.417 2P60.325 25.43 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P10.274 2P65. 150. -1.
UNIT 2
CUBOUD       2 1 2P.318 2P60.325 25.43 0
CUBOID       1 1 2P7.938 2P60.325 25.43 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P10.795 2P65. 150. -1.
END GEOM
READ ARRAY NUX=2 NUY=1 NUZ=1 FILL 1 2 END FILL END ARRAY
END DATA
END
```

```
CAS55
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL         2 1 END
END COMP
SLAB END
1 7.62 NOEXTERMOD  2 7.94 NOEXTERMOD END ZONE
93.2% UO2F2 6 IN AL SLAB 2X1X1 ARRAY 20 IN SEP
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID       1 1 2P7.417 2P60.325 50.27 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P33.134 2P65. 150. -1.
UNIT 2
CUBOUD       2 1 2P.318 2P60.325 50.27 0
CUBOID       1 1 2P7.938 2P60.325 50.27 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P33.655 2P65. 150. -1.
END GEOM
READ ARRAY NUX=2 NUY=1 NUZ=1 FILL 1 2 END FILL END ARRAY
END DATA
END
```

```
CAS56
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL         2 1 END
END COMP
SLAB END
1 7.62 NOEXTERMOD  2 7.94 NOEXTERMOD END ZONE
93.2% UO2F2 6 IN AL SLAB 2X1X1 ARRAY 30 IN SEP
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID       1 1 2P7.417 2P60.325 59.72 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P45.834 2P65. 150. -1.
UNIT 2
CUBOUD       2 1 2P.318 2P60.325 59.72 0
CUBOID       1 1 2P7.938 2P60.325 59.72 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P46.355 2P65. 150. -1.
END GEOM
READ ARRAY NUX=2 NUY=1 NUZ=1 FILL 1 2 END FILL END ARRAY
END DATA
END
```

```
CAS57
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL         2 1 END
END COMP
SLAB END
1 7.62 NOEXTERMOD  2 7.94 NOEXTERMOD END ZONE
93.2% UO2F2 6 IN AL SLAB 2X1X1 ARRAY 48 IN SEP
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID       1 1 2P7.417 2P60.325 73.23 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P68.694 2P65. 150. -1.
UNIT 2
CUBOUD       2 1 2P.318 2P60.325 73.23 0
CUBOID       1 1 2P7.938 2P60.325 73.23 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P69.215 2P65. 150. -1.
END GEOM
READ ARRAY NUX=2 NUY=1 NUZ=1 FILL 1 2 END FILL END ARRAY
END DATA
END
```

Table A.5 (continued)

```
CAS58
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL         2 1 END
END COMP
SLAB END
1 7.62 NOEXTERMOD  2 7.94 NOEXTERMOD END ZONE
93.2% UO2F2 6 IN AL SLAB 2X1X1 ARRAY 6 IN SEP
READ PARAM     NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID       1 1 2P7.417 2P60.325 32.79 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P15.354 2P65. 150. -1.
UNIT 2
CUBOUD       2 1 2P.318 2P60.325 32.79 0
CUBOID       1 1 2P7.938 2P60.325 32.79 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P15.875 2P65. 150. -1.
END GEOM
READ ARRAY NUX=2 NUY=1 NUZ=1 FILL 1 2 END FILL END ARRAY
END DATA
END
```

```
CAS59
=CSAS25
93.2% UO2F2 H/U-235=337
27GROUPNDF4  MULTIREGION
SOLNUO2F2  1 81.845 0 1 293  92235 93.2
92238 6.8 END
AL         2 1 END
END COMP
SLAB END
1 7.62 NOEXTERMOD  2 7.94 NOEXTERMOD END ZONE
93.2% UO2F2 6 IN AL SLAB 2X1X1 ARRAY 66 IN SEP
READ PARAM     NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CUBOID       1 1 2P7.417 2P60.325 82.12 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P91.554 2P65. 150. -1.
UNIT 2
CUBOUD       2 1 2P.318 2P60.325 82.12 0
CUBOID       1 1 2P7.938 2P60.325 82.12 0
REFLECTOR    2 1 4R.318 0 .318 1
CUBOID       0 1 2P92.075 2P65. 150. -1.
END GEOM
READ ARRAY NUX=2 NUY=1 NUZ=1 FILL 1 2 END FILL END ARRAY
END DATA
END
```

```
CAS60
=CSAS25
UO2(NO3)2 279 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 279 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS      2 1 END
ARBMWOOD  .640525 3 0 0 0 6012 44.435 1001 6.2639 8016 49.301 3 END
CARBONSTEEL   4 END
REG-CONCRETE  5 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 279 G U/L 3X3X3 ARRAY UNREFL. WALLS, TANK, & FLOOR
READ PARAM     NPG=600 FDN=YES NUB=YES PLT=NO END PARAM
READ GEOM
UNIT 1
CYLINDER   1 1 9.52 17.5609 0.
CYLINDER   0 1 9.52 17.77   0.
CYLINDER   2 1 10.16 18.41  -.64
CUBOID     0 1 4P13.36 21.61 -3.84
UNIT 2
ARRAY  1 2R-40.08 0.
CUBOID 0 1 4P200. 250. -50.
UNIT 3
CYLINDER  0 1 142.8 224. -48.
CYLINDER  4 1 144.8 224. -50.
CUBOID 0 1 218.1 -181.9 215. -185. 250. -50.
ARRAY  2 3R0.
REFLECTOR 0 1 57.4 57. 260. 559.2 400. 0. 1
REFLECTOR 2 1 5R0 .32 1
REFLECTOR 3 1 5R0 1.27 1
REFLECTOR 4 1 5R0 .64 1
REFLECTOR 0 1 5R0 365 1
REFLECTOR 5 2 6R3 10
REFLECTOR 5 12 0 3 4R0 10
END GEOM
READ START XSM=160 XSP=240 YSM=160 YSP=240 ZSM=50 ZSP=127 END START
READ BIAS ID=301 2 21 END BIAS
READ ARRAY ARA=1 NUX=3 NUY=3 NUZ=3 FILL F1 END FILL
ARA=2 NUX=2 NUY=1 NUZ=1 FILL 2 3 END FILL END ARRAY
READ PLOT PLT=NO
XUL=113.2 YUL=286.8 ZUL=60. XLR=286.8 YLR=113.2 ZLR=60.
UAX=1 VDN=-1 NAX=125  END
XUL=437.1 YUL=329.8 ZUL=60. XLR=726.7 YLR=40.2 ZLR=60. END
END PLOT
END DATA
END
```

Table A.5 (continued)

```
CAS61
=CSAS25
UO2(NO3)2 279 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 279 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS     2 1 END
ARBMWOOD  .640525 3 0 0 0 6012 44.435 1001 6.2639 8016 49.301 3 END
CARBONSTEEL   4 END
REG-CONCRETE  5 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 279 G U/L 2X2X2 ARRAY UNREFL. WALLS, TANK, & FLOOR
READ PARAM   PLT=NO  NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P10.875 19.125 -1.355
UNIT 2
ARRAY  1 2R-21.75 0.
CUBOID 0 1 4P200. 250. -50.
UNIT 3
CYLINDER  0 1 142.8 224. -48.
CYLINDER  4 1 144.8 224. -50.
CUBOID 0 1 218.1 -181.9 215. -185. 250. -50.
ARRAY  2 3R0.
REFLECTOR 0 1 57.4 57. 260. 559.2 400. 0. 1
REFLECTOR 2 1 5R0 .32 1
REFLECTOR 3 1 5R0 1.27 1
REFLECTOR 4 1 5R0 .64 1
REFLECTOR 0 1 5R0 365 1
REFLECTOR 5 2 6R3 10
REFLECTOR 5 12 0 3 4R0 10
END GEOM
READ START XSM=178 XSP=222 YSM=178 YSP=222 ZSM=50 ZSP=91 END START
READ BIAS ID=301 2 21 END BIAS
READ ARRAY ARA=1 NUX=2 NUY=2 NUZ=2 FILL F1 END FILL
ARA=2 NUX=2 NUY=1 NUZ=1 FILL 2 3 END FILL END ARRAY
READ PLOT
XUL=113.2 YUL=286.8 ZUL=60. XLR=286.8 YLR=113.2 ZLR=60.
UAX=1 VDN=-1 NAX=125  END
XUL=437.1 YUL=329.8 ZUL=60. XLR=726.7 YLR=40.2 ZLR=60. END
END PLOT
END DATA
END
```

```
CAS62
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS     2 1 END
ARBMWOOD  .640525 3 0 0 0 6012 44.435 1001 6.2639 8016 49.301 3 END
CARBONSTEEL   4 END
REG-CONCRETE  5 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 5X5X5 ARRAY UNREFL. WALLS, TANK, & FLOOR
READ PARAM   PLT=NO  NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P17.36 25.61 -7.84
UNIT 2
ARRAY  1 2R-86.8 0.
CUBOID 0 1 4P200. 250. -50.
UNIT 3
CYLINDER  0 1 142.8 224. -48.
CYLINDER  4 1 144.8 224. -50.
CUBOID 0 1 218.1 -181.9 215. -185. 250. -50.
ARRAY  2 3R0.
REFLECTOR 0 1 57.4 57. 260. 559.2 400. 0. 1
REFLECTOR 2 1 5R0 .32 1
REFLECTOR 3 1 5R0 1.27 1
REFLECTOR 4 1 5R0 .64 1
REFLECTOR 0 1 5R0 365 1
REFLECTOR 5 2 6R3 10
REFLECTOR 5 12 0 3 4R0 10
END GEOM
READ START XSM=113 XSP=287 YSM=113 YSP=287 ZSM=50 ZSP=151 END START
READ BIAS ID=301 2 21 END BIAS
READ ARRAY ARA=1 NUX=5 NUY=5 NUZ=5 FILL F1 END FILL
ARA=2 NUX=2 NUY=1 NUZ=1 FILL 2 3 END FILL END ARRAY
READ PLOT
XUL=113.2 YUL=286.8 ZUL=60. XLR=286.8 YLR=113.2 ZLR=60.
UAX=1 VDN=-1 NAX=125  END
XUL=437.1 YUL=329.8 ZUL=60. XLR=726.7 YLR=40.2 ZLR=60. END
END PLOT
END DATA
END
```

Table A.5 (continued)

```
CAS63
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2   1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS       2 1 END
ARBMWOOD  .640525 3 0 0 0 6012 44.435 1001 6.2639 8016 49.301 3 END
CARBONSTEEL    4 END
REG-CONCRETE  5 END
END COMP
CYLINDRICAL   END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 3X3X3 ARRAY UNREFL. WALLS, TANK, & FLOOR
READ PARAM    PLT=NO  NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P13.40 21.65 -3.88
UNIT 2
ARRAY  1 2R-40.2 0.
CUBOID 0 1 4P200. 250. -50.
UNIT 3
CYLINDER  0 1 142.8 224. -48.
CYLINDER  4 1 144.8 224. -50.
CUBOID 0 1 218.1 -181.9 215. -185. 250. -50.
ARRAY  2 3R0.
REFLECTOR 0 1 57.4 57. 260. 559.2 400. 0. 1
REFLECTOR 2 1 5R0 .32 1
REFLECTOR 3 1 5R0 1.27 1
REFLECTOR 4 1 5R0 .64 1
REFLECTOR 0 1 5R0 365 1
REFLECTOR 5 2 6R3 10
REFLECTOR 5 12 0 3 4R0 10
END GEOM
READ START XSM=160 XSP=240 YSM=160 YSP=240 ZSM=50 ZSP=127 END START
READ BIAS ID=301 2 21 END BIAS
READ ARRAY ARA=1 NUX=3 NUY=3 NUZ=3 FILL F1 END FILL
ARA=2 NUX=2 NUY=1 NUZ=1 FILL 2 3 END FILL END ARRAY
READ PLOT
XUL=113.2 YUL=286.8 ZUL=60. XLR=286.8 YLR=113.2 ZLR=60.
UAX=1 VDN=-1 NAX=125  END
XUL=437.1 YUL=329.8 ZUL=60. XLR=726.7 YLR=40.2 ZLR=60. END
END PLOT
END DATA
END
```

```
CAS64
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2   1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS       2 1 END
ARBMWOOD  .640525 3 0 0 0 6012 44.435 1001 6.2639 8016 49.301 3 END
CARBONSTEEL    4 END
REG-CONCRETE  5 END
END COMP
CYLINDRICAL   END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 4X4X4 ARRAY UNREFL. WALLS, FLOOR, & TANK
READ PARAM    PLT=NO  NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P15.495 23.745 -5.975
UNIT 2
ARRAY  1 2R-61.98 0.
CUBOID 0 1 4P200. 250. -50.
UNIT 3
CYLINDER  0 1 142.8 224. -48.
CYLINDER  4 1 144.8 224. -50.
CUBOID 0 1 218.1 -181.9 215. -185. 250. -50.
ARRAY  2 3R0.
REFLECTOR 0 1 57.4 57. 260. 559.2 400. 0. 1
REFLECTOR 2 1 5R0 .32 1
REFLECTOR 3 1 5R0 1.27 1
REFLECTOR 4 1 5R0 .64 1
REFLECTOR 0 1 5R0 365 1
REFLECTOR 5 2 6R3 10
REFLECTOR 5 12 0 3 4R0 10
END GEOM
READ START XSM=138 XSP=262 YSM=138 YSP=262 ZSM=50 ZSP=169 END START
READ BIAS ID=301 2 21 END BIAS
READ ARRAY ARA=1 NUX=4 NUY=4 NUZ=4 FILL F1 END FILL
ARA=2 NUX=2 NUY=1 NUZ=1 FILL 2 3 END FILL END ARRAY
READ PLOT
XUL=113.2 YUL=286.8 ZUL=60. XLR=286.8 YLR=113.2 ZLR=60.
UAX=1 VDN=-1 NAX=125  END
XUL=437.1 YUL=329.8 ZUL=60. XLR=726.7 YLR=40.2 ZLR=60. END
END PLOT
END DATA
END
```

Table A.5 (continued)

```
CAS65
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS     2 1 END
ARBMWOOD  .640525 3 0 0 0 6012 44.435 1001 6.2639 8016 49.301 3 END
CARBONSTEEL   4 END
REG-CONCRETE  5 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 2X2X2 ARRAY UNREFL.  WALLS, FLOOR, & TANK
READ PARAM     PLT=NO  NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P10.875 19.125 -1.355
UNIT 2
ARRAY  1 2R-21.75 0.
CUBOID 0 1 4P200. 250. -50.
UNIT 3
CYLINDER  0 1 142.8 224. -48.
CYLINDER  4 1 144.8 224. -50.
CUBOID 0 1 218.1 -181.9 215. -185. 250. -50.
ARRAY  2 3R0.
REFLECTOR 0 1 57.4 57. 260. 559.2 400. 0. 1
REFLECTOR 2 1 5R0 .32 1
REFLECTOR 3 1 5R0 1.27 1
REFLECTOR 4 1 5R0 .64 1
REFLECTOR 0 1 5R0 365 1
REFLECTOR 5 2 6R3 10
REFLECTOR 5 12 0 3 4R0 10
END GEOM
READ START XSM=178 XSP=222 YSM=178 YSP=222 ZSM=50 ZSP=91 END START
READ BIAS ID=301 2 21 END BIAS
READ ARRAY ARA=1 NUX=2 NUY=2 NUZ=2 FILL F1 END FILL
ARA=2 NUX=2 NUY=1 NUZ=1 FILL 2 3 END FILL END ARRAY
READ PLOT
XUL=113.2 YUL=286.8 ZUL=60. XLR=286.8 YLR=113.2 ZLR=60.
UAX=1 VDN=-1 NAX=125  END
XUL=437.1 YUL=329.8 ZUL=60. XLR=726.7 YLR=40.2 ZLR=60. END
END PLOT
END DATA
END
```

```
CAS66
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS     2 1 END
PARAFFIN       3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 3X3X3 ARRAY 15.24 CM PAR. BOT., 1.27 CM PLEX.
READ PARAM     NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P14.95 23.20 -5.43
CORE  0 1 3R0.
REFLECTOR  2 2 5R1.27 0 1
REFLECTOR  3 2 5R0 3 4
REFLECTOR  3 6 5R0 3.24 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=3 NUY=3 NUZ=3 END ARRAY
END DATA
END
```

```
CAS67
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS     2 1 END
PARAFFIN       3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 3X3X3 ARRAY 15.24 CM PAR. BOT., 2.54 CM PLEX.
READ PARAM     NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P16.13 24.38 -6.61
CORE  0 1 3R0.
REFLECTOR  2 2 5R2.54 0 1
REFLECTOR  3 2 5R0 3 4
REFLECTOR  3 6 5R0 3.24 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=3 NUY=3 NUZ=3 END ARRAY
END DATA
END
```

Table A.5 (continued)

```
CAS68
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS      2 1 END
PARAFFIN        3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 3X3X3 ARRAY 15.24 CM PAR. BOT., 1.27 CM PAR.
READ PARAM     NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P15.10 23.35 -5.58
CORE  0 1 3R0.
REFLECTOR  3 2 5R1.27 0 1
REFLECTOR  3 2 5R0 3 4
REFLECTOR  3 6 5R0 3.24 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=3 NUY=3 NUZ=3 END ARRAY
END DATA
END
```

```
CAS69
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS      2 1 END
PARAFFIN        3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 3X3X3 ARRAY 15.24 CM PAR 5 FC, PLEX 1 FC
READ PARAM     NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P18.615 26.865 -9.095
CORE  0 1 3R0.
REFLECTOR  3 2 0 5R3 4
REFLECTOR  3 6 0 5R3.24 1
REFLECTOR  2 2 3 5R0 4
REFLECTOR  2 6 3.24 5R0 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=3 NUY=3 NUZ=3 END ARRAY
END DATA
END
```

```
CAS70
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS      2 1 END
PARAFFIN        3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 3X3X3 ARRAY 15.24 CM PAR. BOT., 3.81 CM PAR.
READ PARAM     NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P17.295 25.545 -7.775
CORE  0 1 3R0.
REFLECTOR  3 2 5R3.81 0 1
REFLECTOR  3 2 5R0 3 4
REFLECTOR  3 6 5R0 3.24 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=3 NUY=3 NUZ=3 END ARRAY
END DATA
END
```

```
CAS71
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS      2 1 END
PARAFFIN        3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 3X3X3 ARRAY 15.24 CM PAR. BOT., 7.62 CM PAR.
READ PARAM     NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P18.085 26.335 -8.565
CORE  0 1 3R0.
REFLECTOR  3 2 5R3  0 2
REFLECTOR  3 4 5R1.62 0 1
REFLECTOR  3 2 5R0 3 4
REFLECTOR  3 6 5R0 3.24 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=3 NUY=3 NUZ=3 END ARRAY
END DATA
END
```

Table A.5 (continued)

```
CAS72
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS      2 1 END
PARAFFIN        3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 3X3X3 ARRAY 1.27 CM PLEXIGLASS REFL.
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P14.54 22.79 -5.02
CORE  0 1 3R0.
REFLECTOR  2 2 6R1.27 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=3 NUY=3 NUZ=3 END ARRAY
END DATA
END
```

```
CAS73
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS      2 1 END
PARAFFIN        3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 3X3X3 ARRAY 1.27 CM PARAFFIN REFL.
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P14.67 22.92 -5.15
CORE  0 1 3R0.
REFLECTOR  3 2 6R1.27 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=3 NUY=3 NUZ=3 END ARRAY
END DATA
END
```

```
CAS74
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS      2 1 END
PARAFFIN        3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 3X3X3 ARRAY 15.24 CM PARAFFIN REFL.
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P18.425 26.675 -8.905
CORE  0 1 3R0.
REFLECTOR  3 2 6R3 4
REFLECTOR  3 6 6R3.24 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=3 NUY=3 NUZ=3 END ARRAY
END DATA
END
```

```
CAS75
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS      2 1 END
PARAFFIN        3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 3X3X3 ARRAY 3.81 CM PARAFFIN REFL.
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P17.005 25.255 -7.485
CORE  0 1 3R0.
REFLECTOR  3 2 6R3.81 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=3 NUY=3 NUZ=3 END ARRAY
END DATA
END
```

Table A.5 (continued)

```
CAS76
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2   1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS      2 1 END
PARAFFIN        3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 2X2X2 ARRAY 15.24 CM PAR. BOT., 1.27 CM PLEX.
READ PARAM     NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P11.965 20.215 -2.445
CORE  0 1 3R0.
REFLECTOR  2 2 5R1.27 0 1
REFLECTOR  3 2 5R0 3 4
REFLECTOR  3 6 5R0 3.24 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=2 NUY=2 NUZ=2 END ARRAY
END DATA
END
```

```
CAS77
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2   1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS      2 1 END
PARAFFIN        3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 2X2X2 ARRAY 15.24 CM PAR. BOT., 11.43 CM PLEX.
READ PARAM     NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P14.925 23.175 -5.405
CORE  0 1 3R0.
REFLECTOR  2 2 5R3.0 0 3
REFLECTOR  2 5 5R2.43 0 1
REFLECTOR  3 2 5R0 3 4
REFLECTOR  3 6 5R0 3.24 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=2 NUY=2 NUZ=2 END ARRAY
END DATA
END
```

```
CAS78
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2   1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS      2 1 END
PARAFFIN        3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 2X2X2 ARRAY 15.24 CM PAR. BOT., 15.24 CM PLEX.
READ PARAM     NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P14.96 23.21 -5.44
CORE  0 1 3R0.
REFLECTOR  2 2 5R3.0 0 4
REFLECTOR  2 6 5R3.24 0 1
REFLECTOR  3 2 5R0 3 4
REFLECTOR  3 6 5R0 3.24 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=2 NUY=2 NUZ=2 END ARRAY
END DATA
END
```

```
CAS79
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2   1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS      2 1 END
PARAFFIN        3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 2X2X2 ARRAY 15.24 CM PAR. BOT., 2.54 CM PLEX.
READ PARAM     NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P12.865 21.115 -3.345
CORE  0 1 3R0.
REFLECTOR  2 2 5R2.54 0 1
REFLECTOR  3 2 5R0 3 4
REFLECTOR  3 6 5R0 3.24 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=2 NUY=2 NUZ=2 END ARRAY
END DATA
END
```

Table A.5 (continued)

```
CAS80
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2   1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS      2 1 END
PARAFFIN        3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 2X2X2 ARRAY 15.24 CM PAR. BOT., 4.45 CM PLEX.
READ PARAM     NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P13.855 22.105 -4.335
CORE  0 1 3R0.
REFLECTOR  2 2 5R3.0 0 1
REFLECTOR  2 3 5R1.45 0 1
REFLECTOR  3 2 5R0 3 4
REFLECTOR  3 6 5R0 3.24 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=2 NUY=2 NUZ=2 END ARRAY
END DATA
END
```

```
CAS81
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2   1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS      2 1 END
PARAFFIN        3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 2X2X2 ARRAY 15.24 CM PAR. BOT., 6.35 CM PLEX.
READ PARAM     NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P14.48 22.73 -4.96
CORE  0 1 3R0.
REFLECTOR  2 2 5R3.0 0 1
REFLECTOR  2 3 5R3.35 0 1
REFLECTOR  3 2 5R0 3 4
REFLECTOR  3 6 5R0 3.24 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=2 NUY=2 NUZ=2 END ARRAY
END DATA
END
```

```
CAS82
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2   1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS      2 1 END
PARAFFIN        3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 2X2X2 ARRAY 15.24 CM PAR. BOT., 1.27 CM PAR.
READ PARAM     NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P12.09 20.34 -2.57
CORE  0 1 3R0.
REFLECTOR  3 2 5R1.27 0 1
REFLECTOR  3 2 5R0 3 4
REFLECTOR  3 6 5R0 3.24 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=2 NUY=2 NUZ=2 END ARRAY
END DATA
END
```

```
CAS83
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2   1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS      2 1 END
PARAFFIN        3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 2X2X2 ARRAY 15.24 CM PAR. BOT., 3.81 CM PAR.
READ PARAM     NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P13.79 22.04 -4.27
CORE  0 1 3R0.
REFLECTOR  3 2 5R3.81 0 1
REFLECTOR  3 2 5R0 3 4
REFLECTOR  3 6 5R0 3.24 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=2 NUY=2 NUZ=2 END ARRAY
END DATA
END
```

Table A.5 (continued)

```
CAS84
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS     2 1 END
PARAFFIN       3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 2X2X2 ARRAY 15.24 CM PAR. BOT., 7.62 CM PAR.
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P14.515 22.765 -4.995
CORE  0 1 3R0.
REFLECTOR  3 2 5R3  0 2
REFLECTOR  3 4 5R1.62 0 1
REFLECTOR  3 2 5R0 3 4
REFLECTOR  3 6 5R0 3.24 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=2 NUY=2 NUZ=2 END ARRAY
END DATA
END
```

```
CAS85
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS     2 1 END
PARAFFIN       3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 2X2X2 ARRAY 1.27 CM PLEXIGLASS REFL.
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P11.66 19.91 -2.14
CORE  0 1 3R0.
REFLECTOR  2 2 6R1.27 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=2 NUY=2 NUZ=2 END ARRAY
END DATA
END
```

```
CAS86
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS     2 1 END
PARAFFIN       3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 2X2X2 ARRAY 1.27 CM PARAFFIN REFL.
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P11.80 20.05 -2.28
CORE  0 1 3R0.
REFLECTOR  3 2 6R1.27 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=2 NUY=2 NUZ=2 END ARRAY
END DATA
END
```

```
CAS87
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
U-235   1 0 9.846-4 END
U-238   1 0 7.769-5 END
H       1 0 5.809-2 END
N       1 0 2.131-3 END
O       1 0 3.756-2 END
PLEXIGLASS     2 1 END
PARAFFIN       3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 2X2X2 ARRAY 15.24 CM PARAFFIN REFL.
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P14.655 22.905 -5.135
CORE  0 1 3R0.
REFLECTOR  3 2 6R3 4
REFLECTOR  3 6 6R3.24 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=2 NUY=2 NUZ=2 END ARRAY
END DATA
END
```

Table A.5 (continued)

```
CAS88
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS      2 1 END
PARAFFIN        3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 2X2X2 ARRAY 3.81 CM PARAFFIN REFL.
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P13.615 21.865 -4.095
CORE  0 1 3R0.
REFLECTOR  3 2 6R3.81 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=2 NUY=2 NUZ=2 END ARRAY
END DATA
END
```

```
CAS89
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS      2 1 END
PARAFFIN        3 1 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 2X2X2 ARRAY 7.62 CM PARAFFIN REFL.
READ PARAM    NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P14.40 22.65 -4.88
CORE  0 1 3R0.
REFLECTOR  3 2 6R3 2
REFLECTOR  3 4 6R1.62 1
END GEOM
READ BIAS ID=400 2 6 END BIAS
READ ARRAY NUX=2 NUY=2 NUZ=2 END ARRAY
END DATA
END
```

```
CAS90
=CSAS25
UO2(NO3)2 415 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 415 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS     2 1 END
ARBMWOOD  .640525 3 0 0 0 6012 44.435 1001 6.2639 8016 49.301 3 END
CARBONSTEEL   4 END
REG-CONCRETE  5 END
SOLNUO2(NO3)2  6 279 0 1 293 92235 92.6 92238 7.4 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 415 G U/L 3X3X3 ARRAY UNREFL. 279 G U/L 5 CENT. UNITS WALLS, FLOOR, &
READ PARAM    PLT=NO  NPG=600 FDN=YES NUB=YES END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P13.365 21.615 -3.845
UNIT 4
CYLINDER  6 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P13.365 21.615 -3.845
UNIT 2
ARRAY  1 2R-40.095 0.
CUBOID 0 1 4P200. 250. -50.
UNIT 3
CYLINDER  0 1 142.8 224. -48.
CYLINDER  4 1 144.8 224. -50.
CUBOID 0 1 218.1 -181.9 215. -185. 250. -50.
ARRAY  2 3R0.
REFLECTOR 0 1 57.4 57. 260. 559.2 400. 0. 1
REFLECTOR 2 1 5R0 .32 1
REFLECTOR 3 1 5R0 1.27 1
REFLECTOR 4 1 5R0 .64 1
REFLECTOR 0 1 5R0 365 1
REFLECTOR 5 2 6R3 10
REFLECTOR 5 12 0 3 4R0 10
END GEOM
READ START XSM=138 XSP=262 YSM=138 YSP=262 ZSM=50 ZSP=169 END START
READ BIAS ID=301 2 21 END BIAS
READ ARRAY ARA=1 NUX=3 NUY=3 NUZ=3 FILL 10R1 4 1 3R4 1 4 10R1 END FILL
ARA=2 NUX=2 NUY=1 NUZ=1 FILL 2 3 END FILL END ARRAY
READ PLOT
XUL=113.2 YUL=286.8 ZUL=60. XLR=286.8 YLR=113.2 ZLR=60.
UAX=1 VDN=-1 NAX=125  END
XUL=437.1 YUL=329.8 ZUL=60. XLR=726.7 YLR=40.2 ZLR=60. END
END PLOT
END DATA
END
```

Table A.5 (continued)

```
CAS91
=CSAS25
UO2(NO3)2 63.3 G U/L
27GROUPNDF4  MULTIREGION
SOLNUO2(NO3)2  1 63.3 0 1 293 92235 92.6 92238 7.4 END
PLEXIGLASS     2 1 END
ARBMWOOD  .640525 3 0 0 0 6012 44.435 1001 6.2639 8016 49.301 3 END
CARBONSTEEL   4 END
REG-CONCRETE  5 END
END COMP
CYLINDRICAL  END
1 9.52 ONEEXTERMOD   2 10.16 NOEXTERMOD END ZONE
UO2(NO3)2 63.3 G U/L 3X3X3 ARRAY UNREFL. WALLS, FLOOR, & TANK
READ PARAM    NPG=600 FDN=YES NUB=YES PLT=NO END PARAM
READ GEOM
UNIT 1
CYLINDER  1 1 9.52 17.5609 0.
CYLINDER  0 1 9.52 17.77   0.
CYLINDER  2 1 10.16 18.41  -.64
CUBOID    0 1 4P11.365 19.615 -1.845
UNIT 2
ARRAY  1 2R-34.095 0.
CUBOID 0 1 4P200. 250. -50.
UNIT 3
CYLINDER  0 1 142.8 224. -48.
CYLINDER  4 1 144.8 224. -50.
CUBOID 0 1 218.1 -181.9 215. -185. 250. -50.
ARRAY  2 3R0.
REFLECTOR 0 1 57.4 57. 260. 559.2 400. 0. 1
REFLECTOR 2 1 5R0 .32 1
REFLECTOR 3 1 5R0 1.27 1
REFLECTOR 4 1 5R0 .64 1
REFLECTOR 0 1 5R0 365 1
REFLECTOR 5 2 6R3 10
REFLECTOR 5 12 0 3 4R0 10
END GEOM
READ START XSM=165 XSP=234 YSM=165 YSP=234 ZSM=50 ZSP=115 END START
READ BIAS ID=301 2 21 END BIAS
READ ARRAY ARA=1 NUX=3 NUY=3 NUZ=3 FILL F1 END FILL
ARA=2 NUX=2 NUY=1 NUZ=1 FILL 2 3 END FILL END ARRAY
READ PLOT
XUL=113.2 YUL=286.8 ZUL=60. XLR=286.8 YLR=113.2 ZLR=60.
UAX=1 VDN=-1 NAX=125  END
XUL=437.1 YUL=329.8 ZUL=60. XLR=726.7 YLR=40.2 ZLR=60. END
END PLOT
END DATA
END
```

Table A.6. Table 6 input data

```
CAS01
=CSAS25
ETA EXPERIMENTS  EXP # 1
27GROUPNDF4  INFHOMMEDIUM
U-233          1  0  0.0           END
U-234          1  0  0.00538-4    END
U-235          1  0  0.48006-4    END
U-236          1  0  0.00138-4    END
U-238          1  0  0.02807-4    END
N              1  0  1.869-4      END
H              1  0  0.066228     END
O              1  0  0.033736     END
B-10           1  0  0.0          END
B-11           1  0  0.0          END
TH-232         1  0  0.0          END
AL             2  1                END
SS316          3  1                END
CARBONSTEEL    4  1                END
END COMP
ETA EXPERIMENTS  # 1
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM
SPHERE  1 1 34.5948   SPHERE 2 1 34.9148   CUBOID 0 1 6P34.9148
END GEOM  READ START NST=1 END START
END DATA
END
```

```
CAS02
=CSAS25
ETA EXPERIMENTS  EXP # 2
27GROUPNDF4  INFHOMMEDIUM
U-233          1  0  0.0           END
U-234          1  0  0.00631-4    END
U-235          1  0  0.56206-4    END
U-236          1  0  0.00163-4    END
U-238          1  0  0.03281-4    END
N              1  0  2.129-4      END
H              1  0  0.066148     END
O              1  0  0.033800     END
B-10           1  0  0.01029-4    END
B-11           1  0  0.04166-4    END
TH-232         1  0  0.0          END
AL             2  1                END
SS316          3  1                END
CARBONSTEEL    4  1                END
END COMP
ETA EXPERIMENTS  # 2
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM
SPHERE  1 1 34.5948   SPHERE 2 1 34.9148   CUBOID 0 1 6P34.9148
END GEOM  READ START NST=1 END START
END DATA
END
```

```
CAS03
=CSAS25
ETA EXPERIMENTS  EXP # 3
27GROUPNDF4  INFHOMMEDIUM
U-233          1  0  0.0           END
U-234          1  0  0.00716-4    END
U-235          1  0  0.63944-4    END
U-236          1  0  0.00184-4    END
U-238          1  0  0.03734-4    END
N              1  0  2.392-4      END
H              1  0  0.066070     END
O              1  0  0.033865     END
B-10           1  0  0.02057-4    END
B-11           1  0  0.08332-4    END
TH-232         1  0  0.0          END
AL             2  1                END
SS316          3  1                END
CARBONSTEEL    4  1                END
END COMP
ETA EXPERIMENTS  # 3
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM
SPHERE  1 1 34.5948   SPHERE 2 1 34.9148   CUBOID 0 1 6P34.9148
END GEOM  READ START NST=1 END START
END DATA
END
```

```
CAS04
=CSAS25
ETA EXPERIMENTS  EXP # 4
27GROUPNDF4  INFHOMMEDIUM
U-233          1  0  0.0           END
U-234          1  0  0.00762-4    END
U-235          1  0  0.67959-4    END
U-236          1  0  0.00197-4    END
U-238          1  0  0.03967-4    END
N              1  0  2.548-4      END
H              1  0  0.066028     END
O              1  0  0.034028     END
B-10           1  0  0.02532-4    END
B-11           1  0  0.10255-4    END
TH-232         1  0  0.0          END
AL             2  1                END
SS316          3  1                END
CARBONSTEEL    4  1                END
END COMP
ETA EXPERIMENTS  # 4
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM
SPHERE  1 1 34.5948   SPHERE 2 1 34.9148   CUBOID 0 1 6P34.9148
END GEOM  READ START NST=1 END START
END DATA
END
```

Table A.6 (continued)

```
CAS05
=CSAS25
ETA EXPERIMENTS  EXP # 5
27GROUPNDF4  INFHOMMEDIUM
U-233          1  0  0.43284-4  END
U-234          1  0  0.00716-4  END
U-235          1  0  0.00018-4  END
U-236          1  0  0.0        END
U-238          1  0  0.00281-4  END
N              1  0  1.178-4    END
H              1  0  0.066360   END
O              1  0  0.033608   END
B-10           1  0  0.0        END
B-11           1  0  0.0        END
TH-232         1  0  0.000196-3 END
AL             2  1             END
SS316          3  1             END
CARBONSTEEL    4  1             END
END COMP
ETA EXPERIMENTS  # 5
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM
SPHERE  1 1 34.5948   SPHERE 2 1 34.9148   CUBOID 0 1 6P34.9148
END GEOM  READ START NST=1 END START
END DATA
END
```

```
CAS06
=CSAS25
ETA EXPERIMENTS  EXP # 6
27GROUPNDF4  INFHOMMEDIUM
U-233          1  0  0.45120-4  END
U-234          1  0  0.00744-4  END
U-235          1  0  0.00018-4  END
U-236          1  0  0.0        END
U-238          1  0  0.00291-4  END
N              1  0  1.224-4    END
H              1  0  0.066345   END
O              1  0  0.033621   END
B-10           1  0  0.00263-4  END
B-11           1  0  0.01066-4  END
TH-232         1  0  0.000205-3 END
AL             2  1             END
SS316          3  1             END
CARBONSTEEL    4  1             END
END COMP
ETA EXPERIMENTS  # 6
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM
SPHERE  1 1 34.5948   SPHERE 2 1 34.9148   CUBOID 0 1 6P34.9148
END GEOM  READ START NST=1 END START
END DATA
END
```

```
CAS07
=CSAS25
ETA EXPERIMENTS  EXP # 7
27GROUPNDF4  INFHOMMEDIUM
U-233          1  0  0.46798-4  END
U-234          1  0  0.00772-4  END
U-235          1  0  0.00018-4  END
U-236          1  0  0.0        END
U-238          1  0  0.00301-4  END
N              1  0  1.274-4    END
H              1  0  0.066329   END
O              1  0  0.033634   END
B-10           1  0  0.00512-4  END
B-11           1  0  0.02075-4  END
TH-232         1  0  0.000213-3 END
AL             2  1             END
SS316          3  1             END
CARBONSTEEL    4  1             END
END COMP
ETA EXPERIMENTS  # 7
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM
SPHERE  1 1 34.5948   SPHERE 2 1 34.9148   CUBOID 0 1 6P34.9148
END GEOM  READ START NST=1 END START
END DATA
END
```

```
CAS08
=CSAS25
ETA EXPERIMENTS  EXP # 8
27GROUPNDF4  INFHOMMEDIUM
U-233          1  0  0.48455-4  END
U-234          1  0  0.00801-4  END
U-235          1  0  0.00021-4  END
U-236          1  0  0.0        END
U-238          1  0  0.00311-4  END
N              1  0  1.319-4    END
H              1  0  0.066315   END
O              1  0  0.033646   END
B-10           1  0  0.00758-4  END
B-11           1  0  0.03069-4  END
TH-232         1  0  0.000221-3 END
AL             2  1             END
SS316          3  1             END
CARBONSTEEL    4  1             END
END COMP
ETA EXPERIMENTS  # 8
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM
SPHERE  1 1 34.5948   SPHERE 2 1 34.9148   CUBOID 0 1 6P34.9148
END GEOM  READ START NST=1 END START
END DATA
END
```

Table A.6 (continued)

```
CAS09
=CSAS25
ETA EXPERIMENTS  EXP # 9
27GROUPNDF4  INFHOMMEDIUM
U-233          1  0  0.5066-4    END
U-234          1  0  0.00827-4   END
U-235          1  0  0.00021-4   END
U-236          1  0  0.0         END
U-238          1  0  0.00327-4   END
N              1  0  1.363-4     END
H              1  0  0.0663      END
O              1  0  0.033659    END
B-10           1  0  0.01005-4   END
B-11           1  0  0.04070-4   END
TH-232         1  0  0.000227-3  END
AL             2  1              END
SS316          3  1              END
CARBONSTEEL    4  1              END
END COMP
ETA EXPERIMENTS  # 9
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM
SPHERE  1 1 34.5948   SPHERE 2 1 34.9148   CUBOID 0 1 6P34.9148
END GEOM  READ START NST=1 END START
END DATA
END
```

```
CAS10
=CSAS25
ETA EXPERIMENTS  EXP # 10
27GROUPNDF4  INFHOMMEDIUM
U-233          1  0  0.0         END
U-234          1  0  0.00409-4   END
U-235          1  0  0.36185-4   END
U-236          1  0  0.00220-4   END
U-238          1  0  0.01985-4   END
N              1  0  1.116-4     END
H              1  0  0.066394    END
O              1  0  0.033592    END
B-10           1  0  0.0         END
B-11           1  0  0.0         END
TH-232         1  0  0.0         END
AL             2  1              END
SS316          3  1              END
CARBONSTEEL    4  1              END
END COMP
ETA EXPERIMENTS  # 10
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM
SPHERE  1 1 61.0108  SPHERE 2 1 61.7808  CUBOID 0 1 6P61.7808
END GEOM  READ START NST=1 END START
END DATA
END
```

```
CAS11
=CSAS25
ETA EXPERIMENTS  EXP # 11
27GROUPNDF4  INFHOMMEDIUM
U-233          1  0  0.33460-4   END
U-234          1  0  0.00525-4   END
U-235          1  0  0.00010-4   END
U-236          1  0  0.0         END
U-238          1  0  0.00256-4   END
N              1  0  0.753-4     END
H              1  0  0.066467    END
O              1  0  0.033525    END
B-10           1  0  0.0         END
B-11           1  0  0.0         END
TH-232         1  0  0.000148-3  END
AL             2  1              END
SS316          3  1              END
CARBONSTEEL    4  1              END
END COMP
ETA EXPERIMENTS  # 11
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM
SPHERE  1 1 61.0108  SPHERE 2 1 61.7808  CUBOID 0 1 6P61.7808
END GEOM  READ START NST=1 END START
END DATA
END
```

```
CAS12
=CSAS25
ETA EXPERIMENTS  EXP # 12
27GROUPNDF4  INFHOMMEDIUM
U-233          1  0  0.00000-4   END
U-234          1  0  0.00469-4   END
U-235          1  0  0.41364-4   END
U-236          1  0  0.00243-4   END
U-238          1  0  0.02271-4   END
N              1  0  1.27200-4   END
H              1  0  0.066345    END
O              1  0  0.033624    END
B-10           1  0  0.0         END
B-11           1  0  0.0         END
TH-232         1  0  0.000000-3  END
AL             2  1              END
SS316          3  1              END
CARBONSTEEL    4  1              END
END COMP
ETA EXPERIMENTS  # 12
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM  CYLINDER  1 1  77.3684     45.1358    0.0
CYLINDER  0 1  77.3684     264.0     0.0
CYLINDER  3 1  77.4984     264.13  -0.13
CUBOID    0 1  4P77.4984   264.13  -0.13
END GEOM
READ START NST=1 END START
END DATA
END
```

Table A.6 (continued)

```
CAS13
=CSAS25
ETA EXPERIMENTS  EXP # 13
27GROUPNDF4  INFHOMMEDIUM
U-233          1  0  0.00000-4   END
U-234          1  0  0.00451-4   END
U-235          1  0  0.40595-4   END
U-236          1  0  0.00222-4   END
U-238          1  0  0.02339-4   END
N              1  0  1.40900-4   END
H              1  0  0.066343    END
O              1  0  0.033655    END
B-10           1  0  0.0         END
B-11           1  0  0.0         END
TH-232         1  0  0.000000-3  END
AL             2  1              END
SS316          3  1              END
CARBONSTEEL    4  1              END
END COMP
ETA EXPERIMENTS  # 13
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM  CYLINDER  1 1  77.3684      47.4472   0.0
CYLINDER  0 1  77.3684     264.0     0.0
CYLINDER  3 1  77.4984     264.13  -0.13
CUBOID    0 1  4P77.4984  264.13  -0.13
END GEOM
READ START NST=1 END START
END DATA
END
```

```
CAS14
=CSAS25
ETA EXPERIMENTS  EXP # 14
27GROUPNDF4  INFHOMMEDIUM
U-233          1  0  0.00000-4   END
U-234          1  0  0.00409-4   END
U-235          1  0  0.36452-4   END
U-236          1  0  0.00209-4   END
U-238          1  0  0.02048-4   END
N              1  0  1.18500-4   END
H              1  0  0.066383    END
O              1  0  0.033605    END
B-10           1  0  0.0         END
B-11           1  0  0.0         END
TH-232         1  0  0.000000-3  END
AL             2  1              END
SS316          3  1              END
CARBONSTEEL    4  1              END
END COMP
ETA EXPERIMENTS  # 14
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM  CYLINDER  1 1  77.3684      72.7456   0.0
CYLINDER  0 1  77.3684     264.0     0.0
CYLINDER  3 1  77.4984     264.13  -0.13
CUBOID    0 1  4P77.4984  264.13  -0.13
END GEOM
READ START NST=1 END START
END DATA
END
```

```
CAS15
=CSAS25
ETA EXPERIMENTS  EXP # 15
27GROUPNDF4  INFHOMMEDIUM
U-233          1  0  0.00000-4   END
U-234          1  0  0.00397-4   END
U-235          1  0  0.34845-4   END
U-236          1  0  0.00194-4   END
U-238          1  0  0.01962-4   END
N              1  0  1.20800-4   END
H              1  0  0.066389    END
O              1  0  0.033609    END
B-10           1  0  0.0         END
B-11           1  0  0.0         END
TH-232         1  0  0.000000-3  END
AL             2  1              END
SS316          3  1              END
CARBONSTEEL    4  1              END
END COMP
ETA EXPERIMENTS  # 15
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM  CYLINDER  1 1  77.3684     105.2068   0.0
CYLINDER  0 1  77.3684     264.0     0.0
CYLINDER  3 1  77.4984     264.13  -0.13
CUBOID    0 1  4P77.4984  264.13  -0.13
END GEOM
READ START NST=1 END START
END DATA
END
```

```
CAS16
=CSAS25
ETA EXPERIMENTS  EXP # 16
27GROUPNDF4  INFHOMMEDIUM
U-233          1  0  0.00000-4   END
U-234          1  0  0.00384-4   END
U-235          1  0  0.33519-4   END
U-236          1  0  0.00186-4   END
U-238          1  0  0.01924-4   END
N              1  0  1.24400-4   END
H              1  0  0.066391    END
O              1  0  0.033615    END
B-10           1  0  0.0         END
B-11           1  0  0.0         END
TH-232         1  0  0.000000-3  END
AL             2  1              END
SS316          3  1              END
CARBONSTEEL    4  1              END
END COMP
ETA EXPERIMENTS  # 16
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM  CYLINDER  1 1  77.3684     203.2762   0.0
CYLINDER  0 1  77.3684     264.0     0.0
CYLINDER  3 1  77.4984     264.13  -0.13
CUBOID    0 1  4P77.4984  264.13  -0.13
END GEOM
READ START NST=1 END START
END DATA
END
```

```
CAS17
=CSAS25
ETA EXPERIMENTS  EXP # 17
27GROUPNDF4  INFHOMMEDIUM
U-233          1  0  0.36517-4  END
U-234          1  0  0.00556-4  END
U-235          1  0  0.00000-4  END
U-236          1  0  0.00000-4  END
U-238          1  0  0.00410-4  END
N              1  0  0.82600-4  END
H              1  0  0.066439   END
O              1  0  0.033539   END
B-10           1  0  0.0        END
B-11           1  0  0.0        END
TH-232         1  0  0.000037-3 END
AL             2  1             END
SS316          3  1             END
CARBONSTEEL    4  1             END
END COMP
ETA EXPERIMENTS  # 17
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM  CYLINDER  1 1  77.3684     49.5046   0.0
CYLINDER  0 1  77.3684    264.0    0.0
CYLINDER  3 1  77.4984    264.13  -0.13
CUBOID    0 1  4P77.4984  264.13  -0.13
END GEOM
READ START NST=1 END START
END DATA
END
```

```
CAS18
=CSAS25
ETA EXPERIMENTS  EXP # 18
27GROUPNDF4  INFHOMMEDIUM
U-233          1  0  0.34978-4  END
U-234          1  0  0.00525-4  END
U-235          1  0  0.00000-4  END
U-236          1  0  0.00000-4  END
U-238          1  0  0.00395-4  END
N              1  0  0.84900-4  END
H              1  0  0.066444   END
O              1  0  0.033542   END
B-10           1  0  0.0        END
B-11           1  0  0.0        END
TH-232         1  0  0.000032-3 END
AL             2  1             END
SS316          3  1             END
CARBONSTEEL    4  1             END
END COMP
ETA EXPERIMENTS  # 18
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM  CYLINDER  1 1  77.3684     59.2074   0.0
CYLINDER  0 1  77.3684    264.0    0.0
CYLINDER  3 1  77.4984    264.13  -0.13
CUBOID    0 1  4P77.4984  264.13  -0.13
END GEOM
READ START NST=1 END START
END DATA
END
```

```
CAS19
=CSAS25
ETA EXPERIMENTS  EXP # 19
27GROUPNDF4  INFHOMMEDIUM
U-233          1  0  0.33292-4  END
U-234          1  0  0.00507-4  END
U-235          1  0  0.00000-4  END
U-236          1  0  0.00000-4  END
U-238          1  0  0.00375-4  END
N              1  0  0.80200-4  END
H              1  0  0.066459   END
O              1  0  0.033533   END
B-10           1  0  0.0        END
B-11           1  0  0.0        END
TH-232         1  0  0.000037-3 END
AL             2  1             END
SS316          3  1             END
CARBONSTEEL    4  1             END
END COMP
ETA EXPERIMENTS  # 19
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM  CYLINDER  1 1  77.3684     77.6732   0.0
CYLINDER  0 1  77.3684    264.0    0.0
CYLINDER  3 1  77.4984    264.13  -0.13
CUBOID    0 1  4P77.4984  264.13  -0.13
END GEOM
READ START NST=1 END START
END DATA
END
```

```
CAS20
=CSAS25
ETA EXPERIMENTS  EXP # 20
27GROUPNDF4  INFHOMMEDIUM
U-233          1  0  0.31567-4  END
U-234          1  0  0.00481-4  END
U-235          1  0  0.00000-4  END
U-236          1  0  0.00000-4  END
U-238          1  0  0.00354-4  END
N              1  0  0.79500-4  END
H              1  0  0.066470   END
O              1  0  0.033531   END
B-10           1  0  0.0        END
B-11           1  0  0.0        END
TH-232         1  0  0.000258-3 END
AL             2  1             END
SS316          3  1             END
CARBONSTEEL    4  1             END
END COMP
ETA EXPERIMENTS  # 20
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM  CYLINDER  1 1  77.3684     138.9126   0.0
CYLINDER  0 1  77.3684    264.0    0.0
CYLINDER  3 1  77.4984    264.13  -0.13
CUBOID    0 1  4P77.4984  264.13  -0.13
END GEOM
READ START NST=1 END START
END DATA
END
```

Table A.6 (continued)

```
CAS21
=CSAS25
ETA EXPERIMENTS  EXP # 21
27GROUPNDF4  INFHOMMEDIUM
U-233         1  0  0.00000-4   END
U-234         1  0  0.00397-4   END
U-235         1  0  0.33940-4   END
U-236         1  0  0.00240-4   END
U-238         1  0  0.01975-4   END
N             1  0  1.40700-4   END
H             1  0  0.066367    END
O             1  0  0.033645    END
B-10          1  0  0.0         END
B-11          1  0  0.0         END
TH-232        1  0  0.000000-3  END
AL            2  1              END
SS316         3  1              END
CARBONSTEEL   4  1              END
END COMP
ETA EXPERIMENTS  # 21
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM  CYLINDER  1 1 136.7790     90.8812   0.0
CYLINDER  0 1  136.7790   274.0    0.0
CYLINDER  4 1  138.6840   275.905 -1.905
CUBOID    0 1 4P138.6840  275.905 -1.905
END GEOM
READ START NST=1 END START
END DATA
END
```

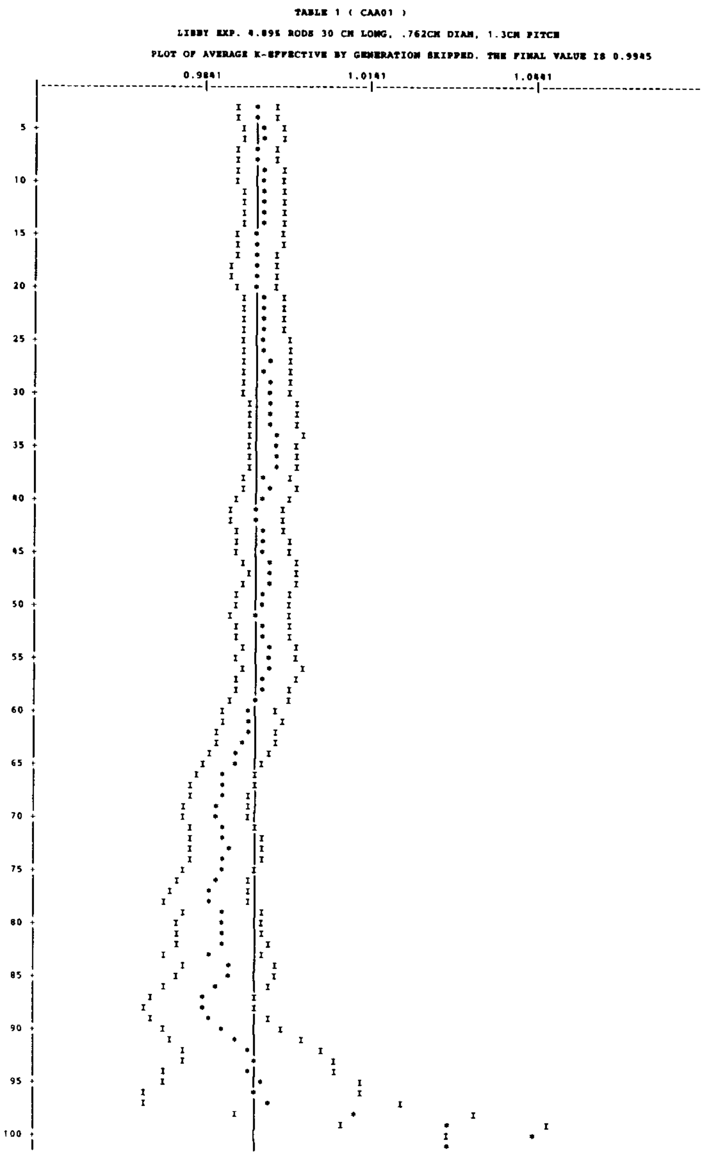
```
CAS22
=CSAS25
ETA EXPERIMENTS  EXP # 22
27GROUPNDF4  INFHOMMEDIUM
U-233         1  0  0.00000-4   END
U-234         1  0  0.00381-4   END
U-235         1  0  0.33124-4   END
U-236         1  0  0.00232-4   END
U-238         1  0  0.01942-4   END
N             1  0  1.36700-4   END
H             1  0  0.066374    END
O             1  0  0.033634    END
B-10          1  0  0.0         END
B-11          1  0  0.0         END
TH-232        1  0  0.000000-3  END
AL            2  1              END
SS316         3  1              END
CARBONSTEEL   4  1              END
END COMP
ETA EXPERIMENTS  # 22
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM  CYLINDER  1 1 136.7790     122.4280   0.0
CYLINDER  0 1  136.7790   274.0    0.0
CYLINDER  4 1  138.6840   275.905 -1.905
CUBOID    0 1 4P138.6840  275.905 -1.905
END GEOM
READ START NST=1 END START
END DATA
END
```

```
CAS23
=CSAS25
ETA EXPERIMENTS  EXP # 23
27GROUPNDF4  INFHOMMEDIUM
U-233         1  0  0.00000-4   END
U-234         1  0  0.00368-4   END
U-235         1  0  0.32347-4   END
U-236         1  0  0.00220-4   END
U-238         1  0  0.01894-4   END
N             1  0  1.33800-4   END
H             1  0  0.066385    END
O             1  0  0.033631    END
B-10          1  0  0.0         END
B-11          1  0  0.0         END
TH-232        1  0  0.000000-3  END
AL            2  1              END
SS316         3  1              END
CARBONSTEEL   4  1              END
END COMP
ETA EXPERIMENTS  # 23
READ PARAM NPG=600 FDN=YES  NUB=YES  TME=59  END PARAM
READ GEOM  CYLINDER  1 1 136.7790     241.1222   0.0
CYLINDER  0 1  136.7790   274.0    0.0
CYLINDER  4 1  138.6840   275.905 -1.905
CUBOID    0 1 4P138.6840  275.905 -1.905
END GEOM
READ START NST=1 END START
END DATA
END
```

Appendix B

PLOT OF AVERAGE K_{eff} BY GENERATION SKIPPED FOR VALIDATION CASES

Plots of average k_{eff} by generation skipped for the validation cases appear in the same order as listed in Tables 1-6 of Sect. 1 of this report.



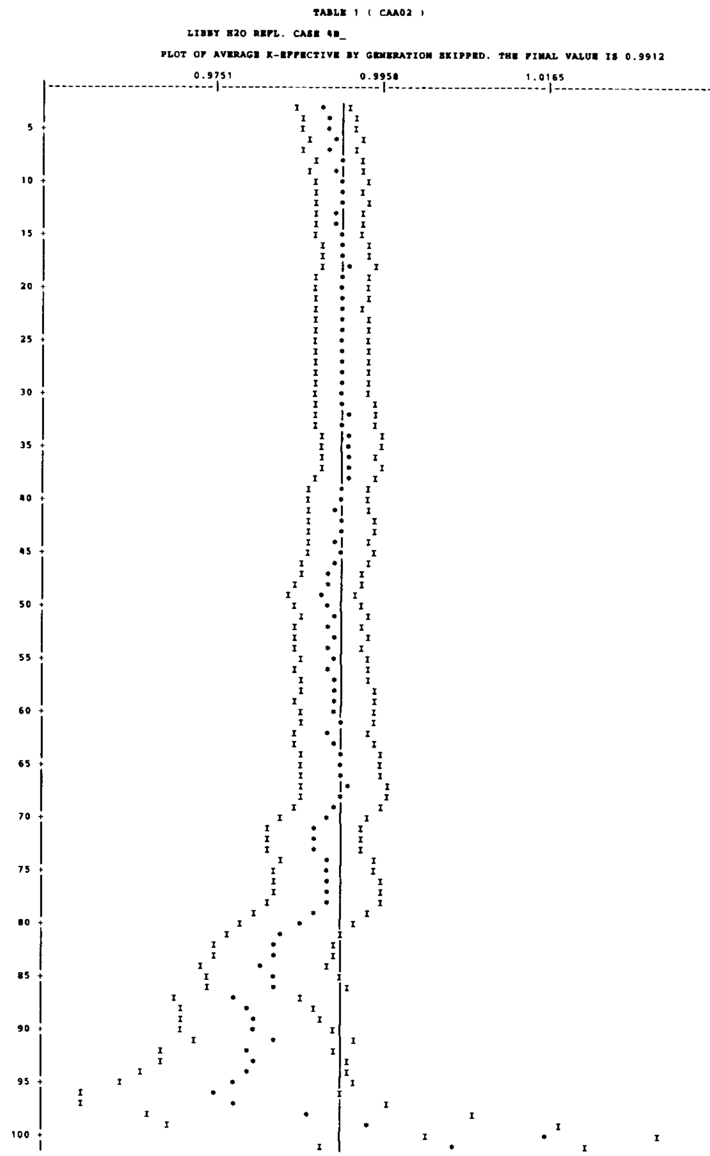
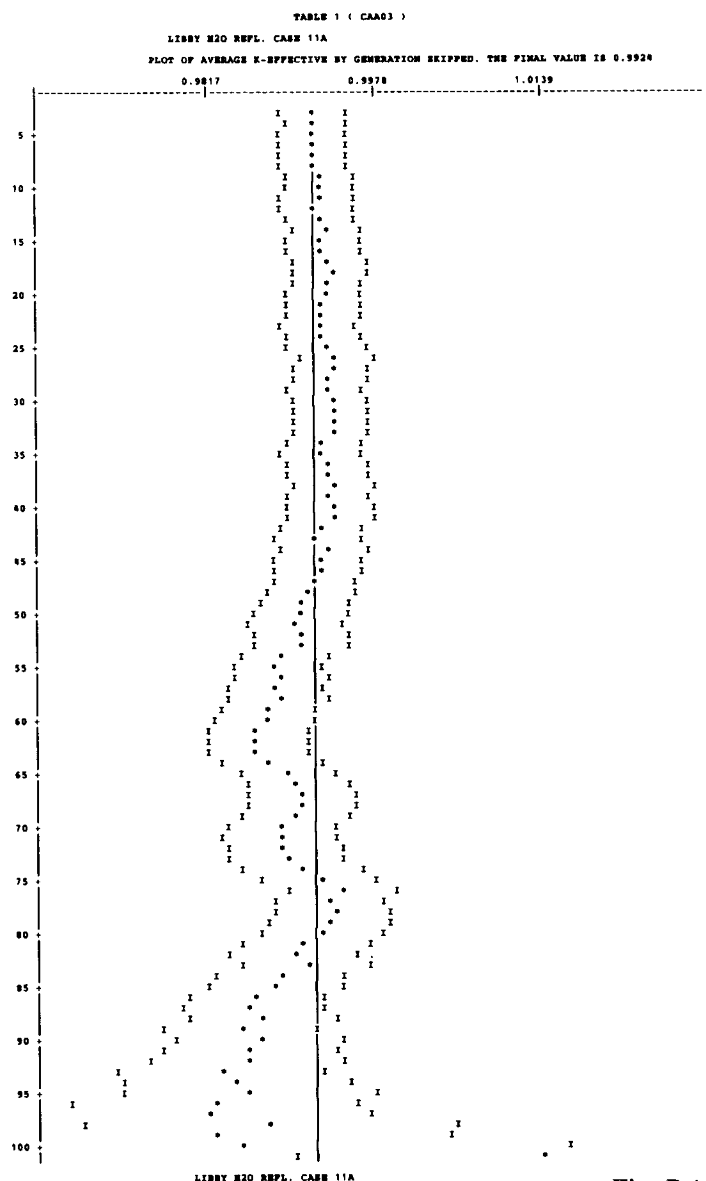


Fig. B.1. Plots for Table 1.



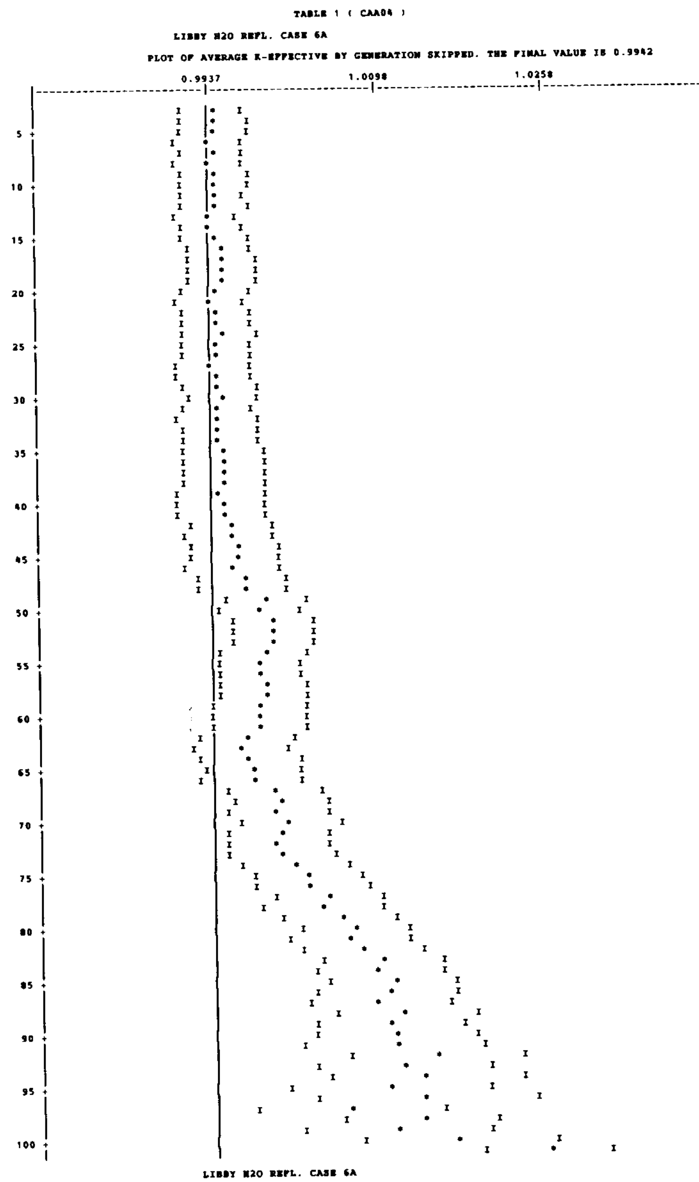
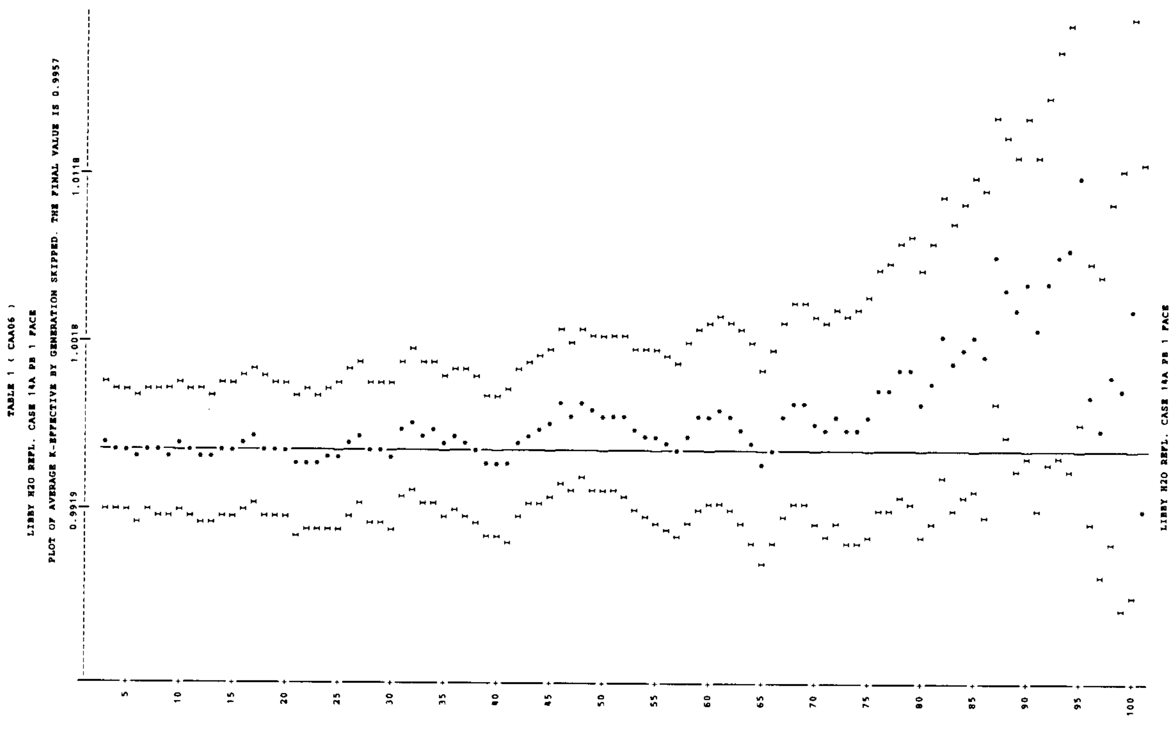


Fig. B.1 (continued)



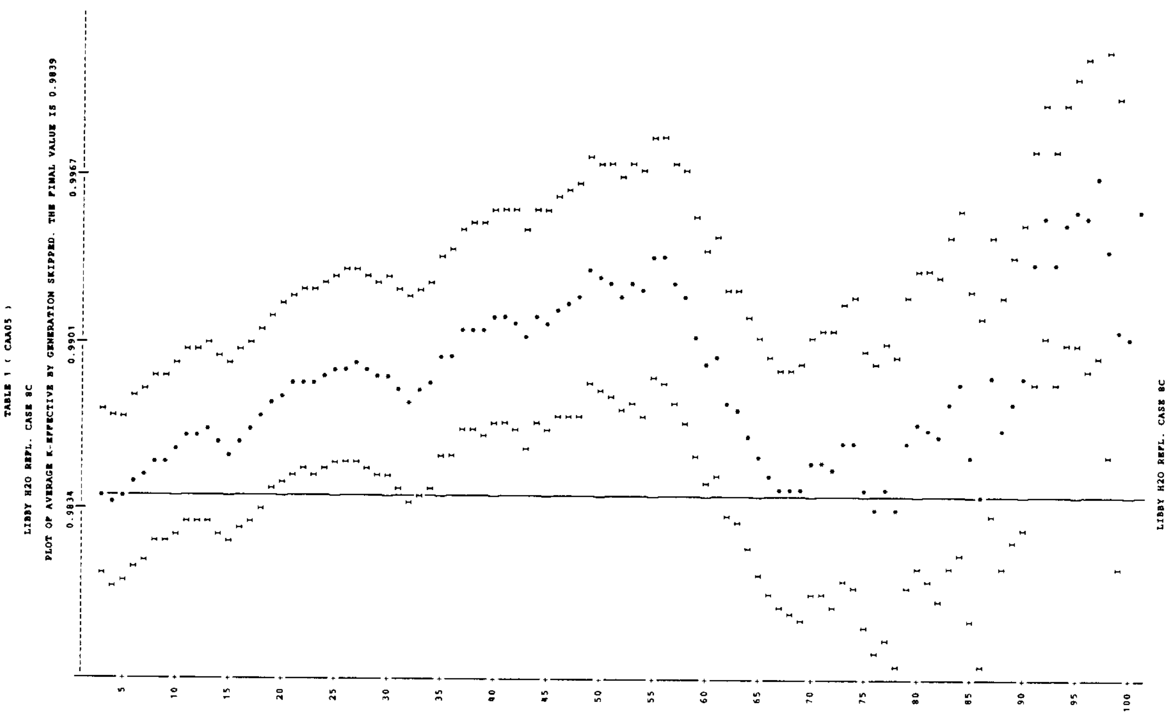
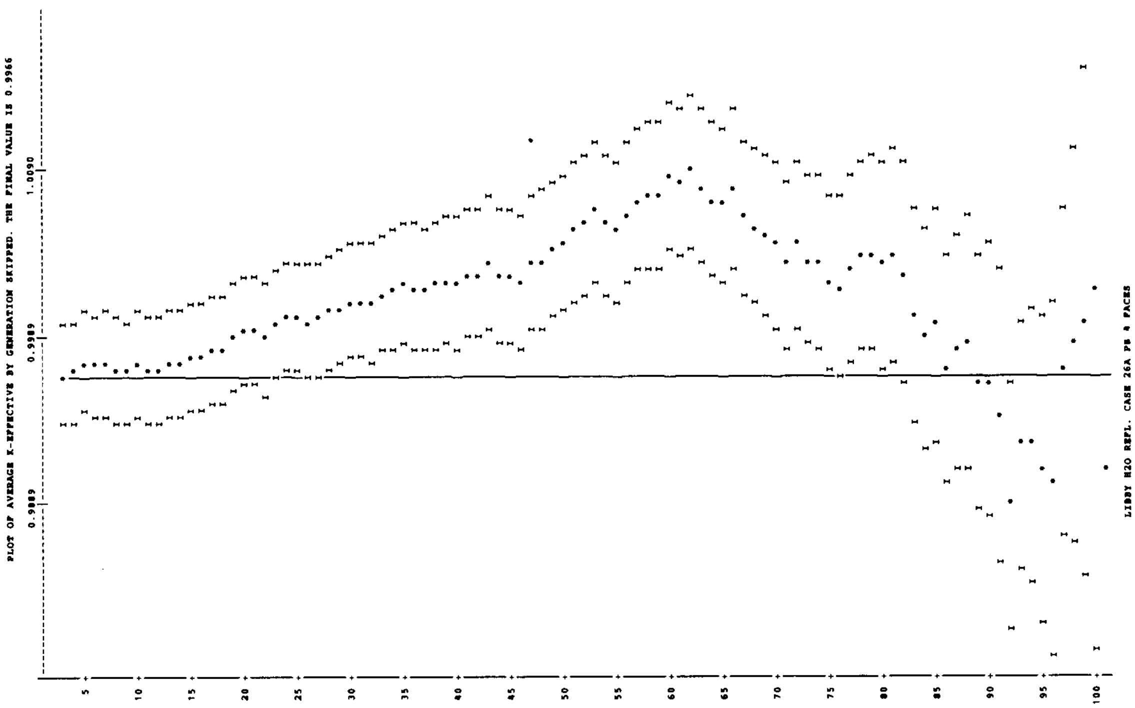


Fig. B.1 (continued)



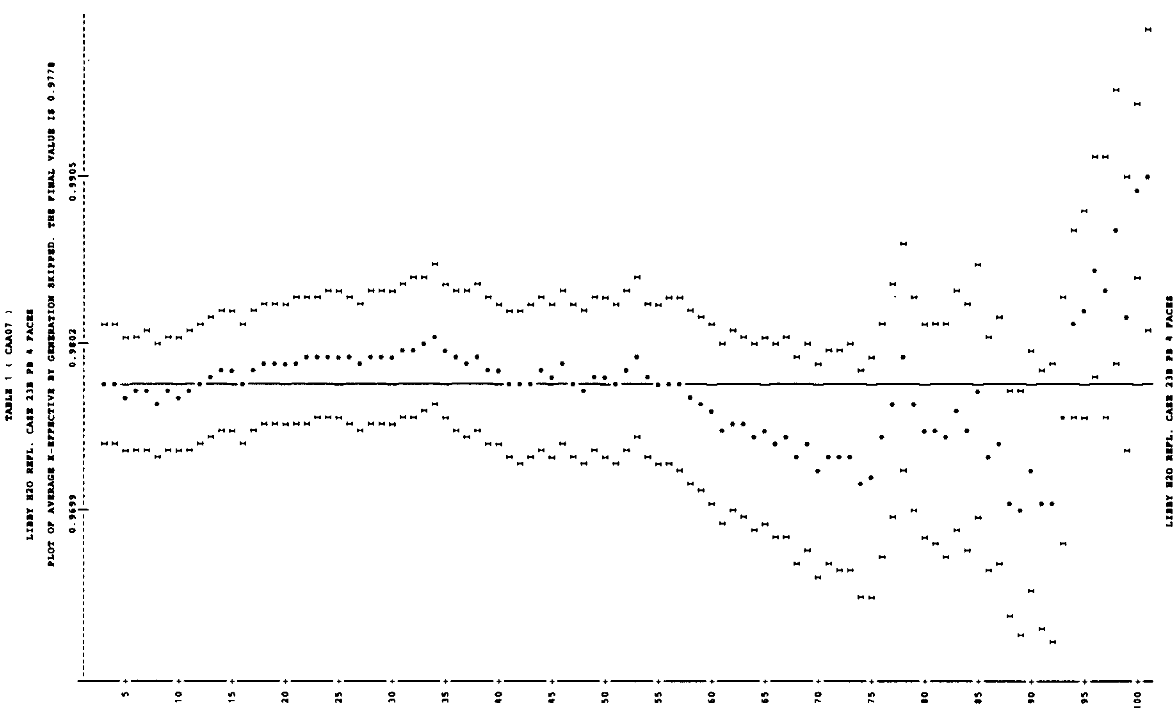
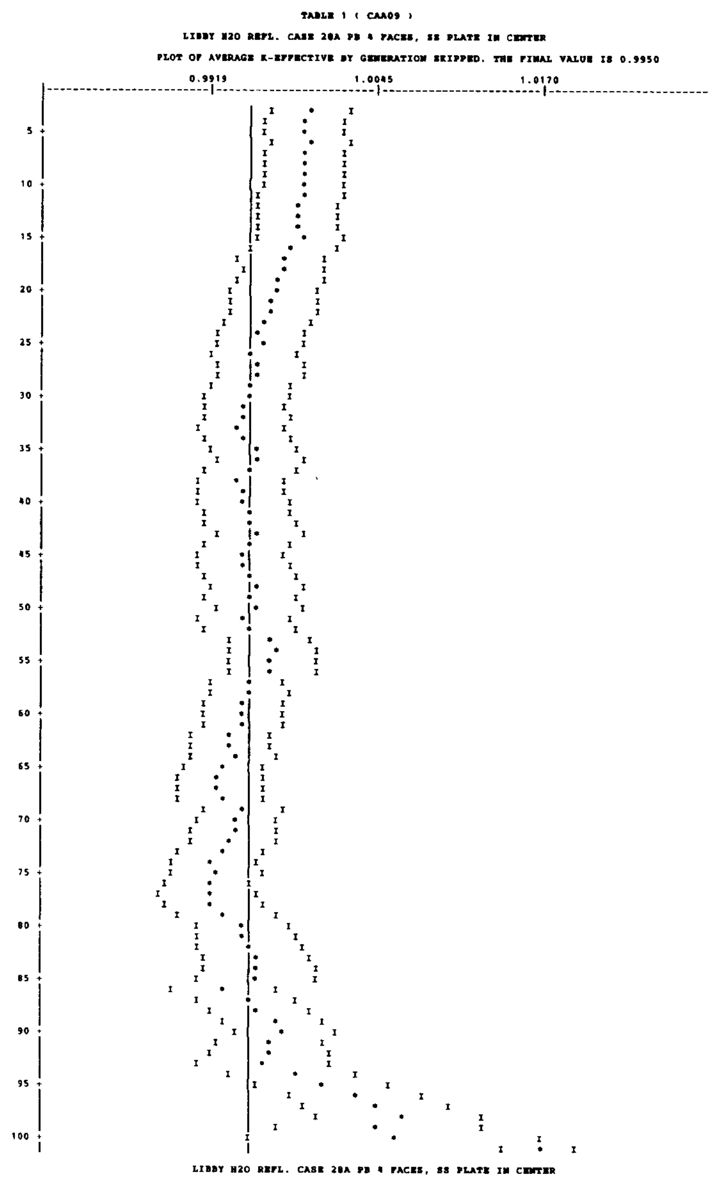


Fig. B.1 (continued)



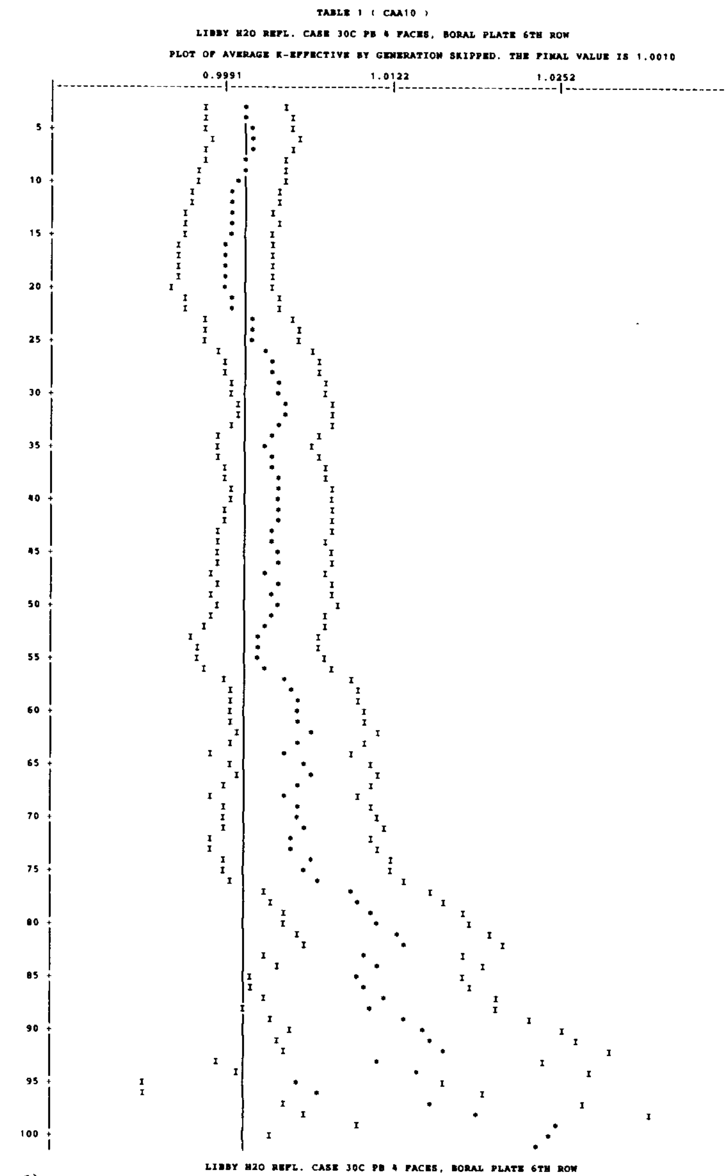
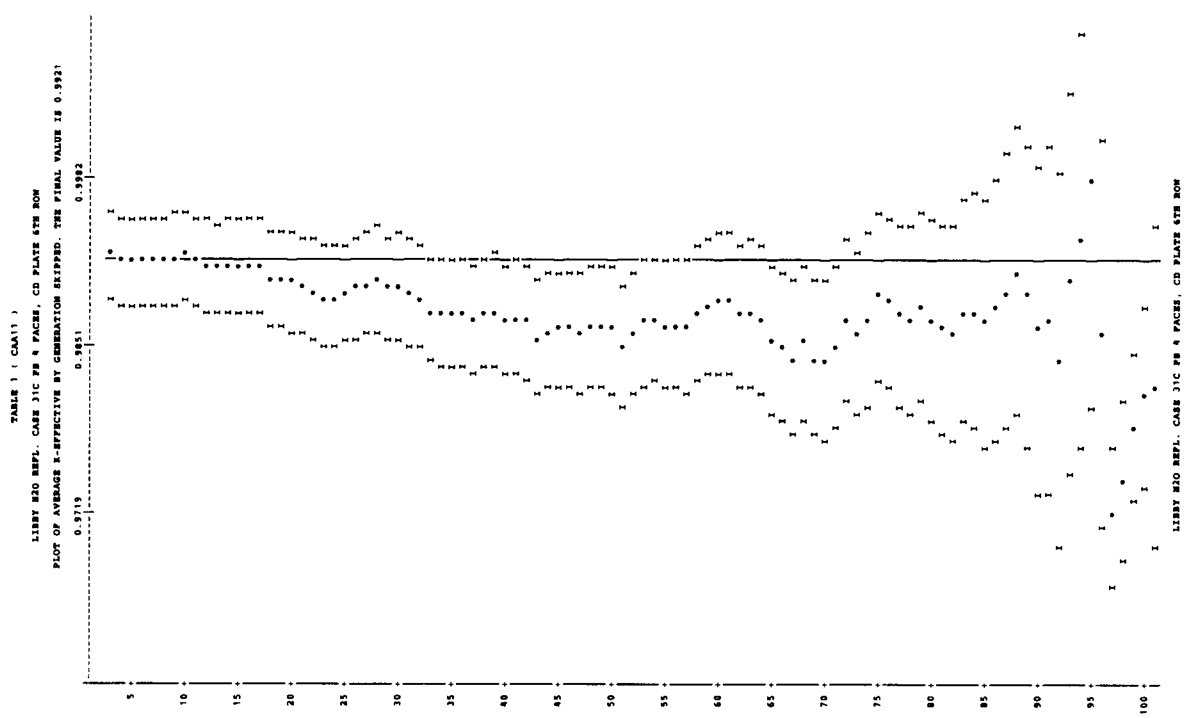


Fig. B.1 (continued)



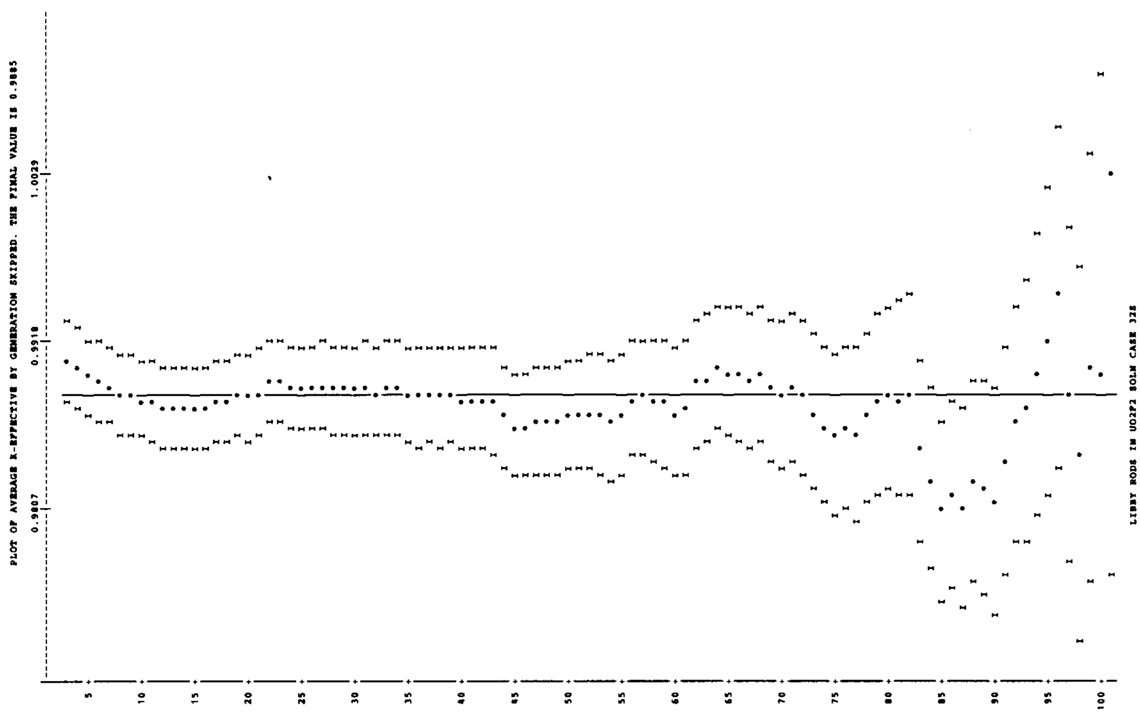
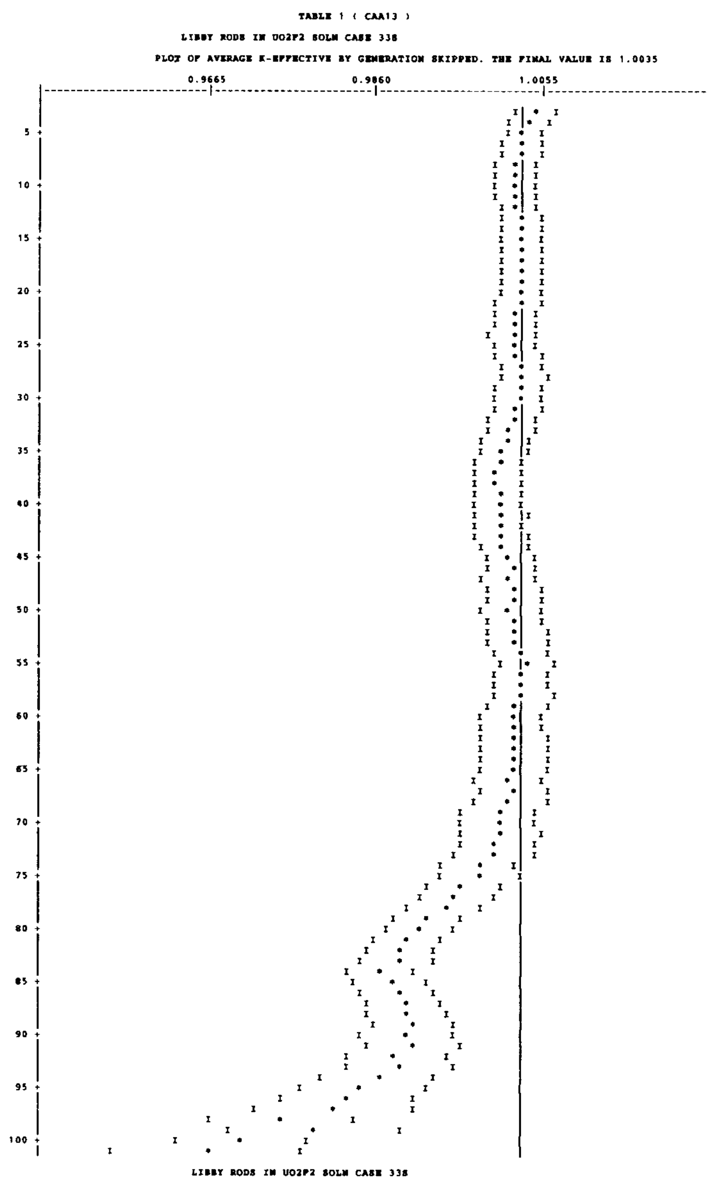


Fig. B.1 (continued)



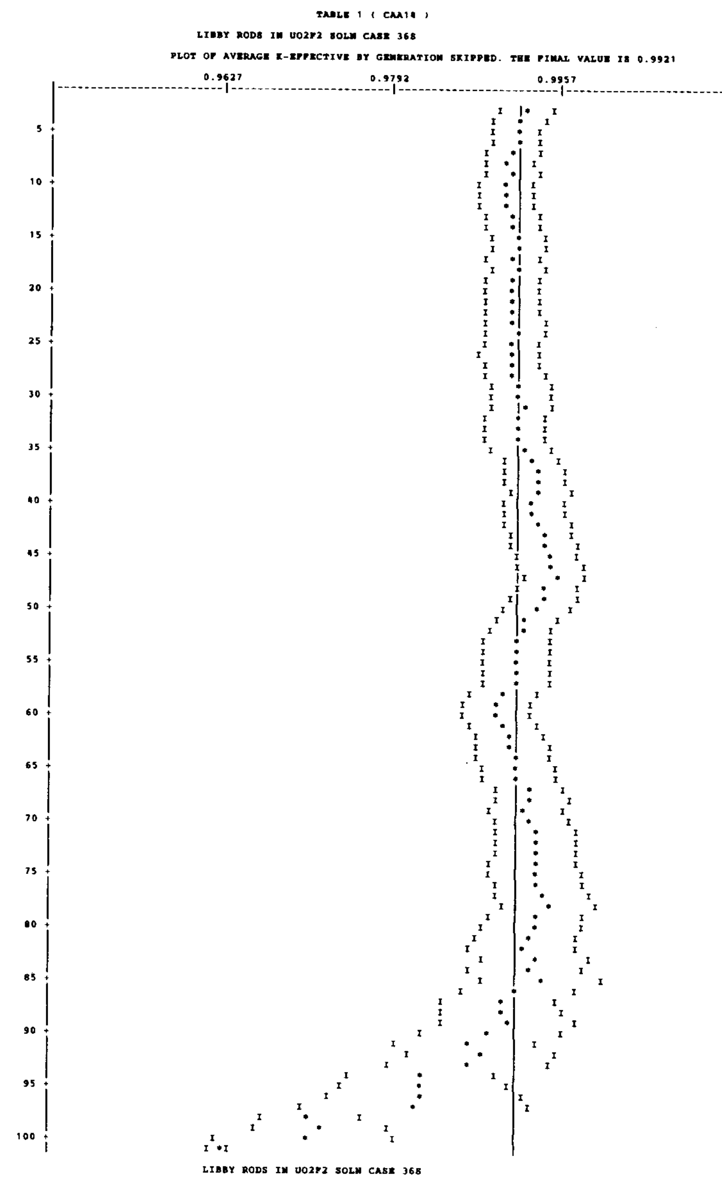
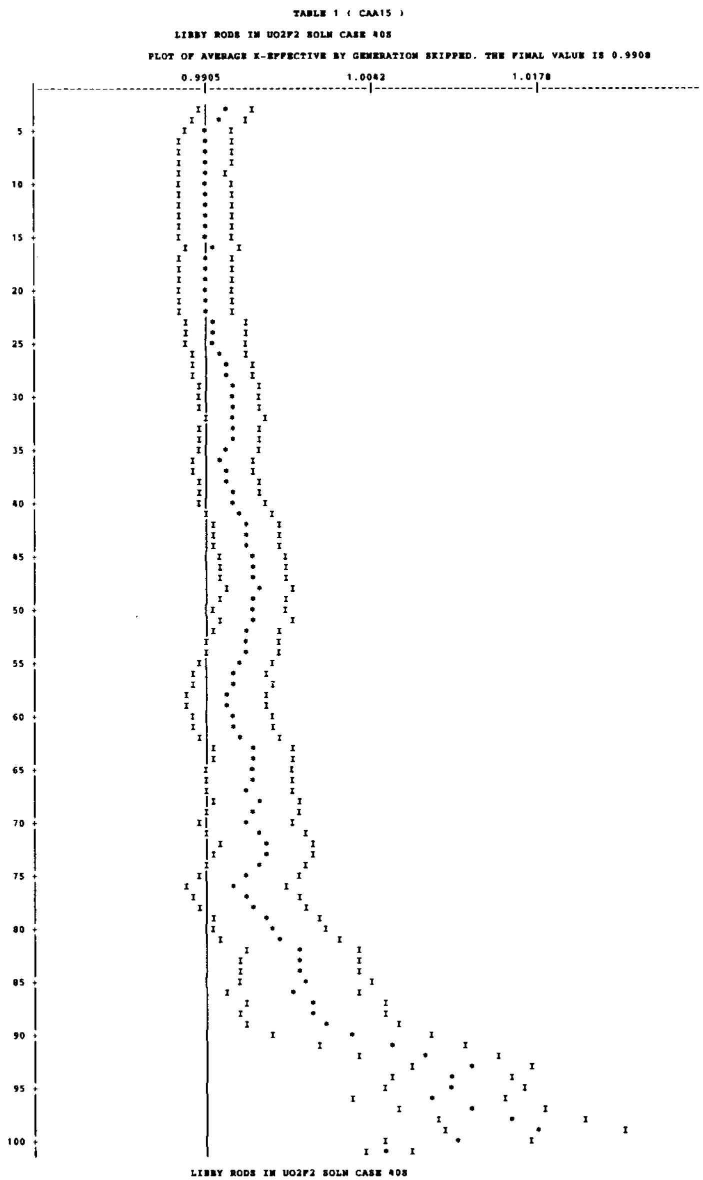


Fig. B.1 (continued)



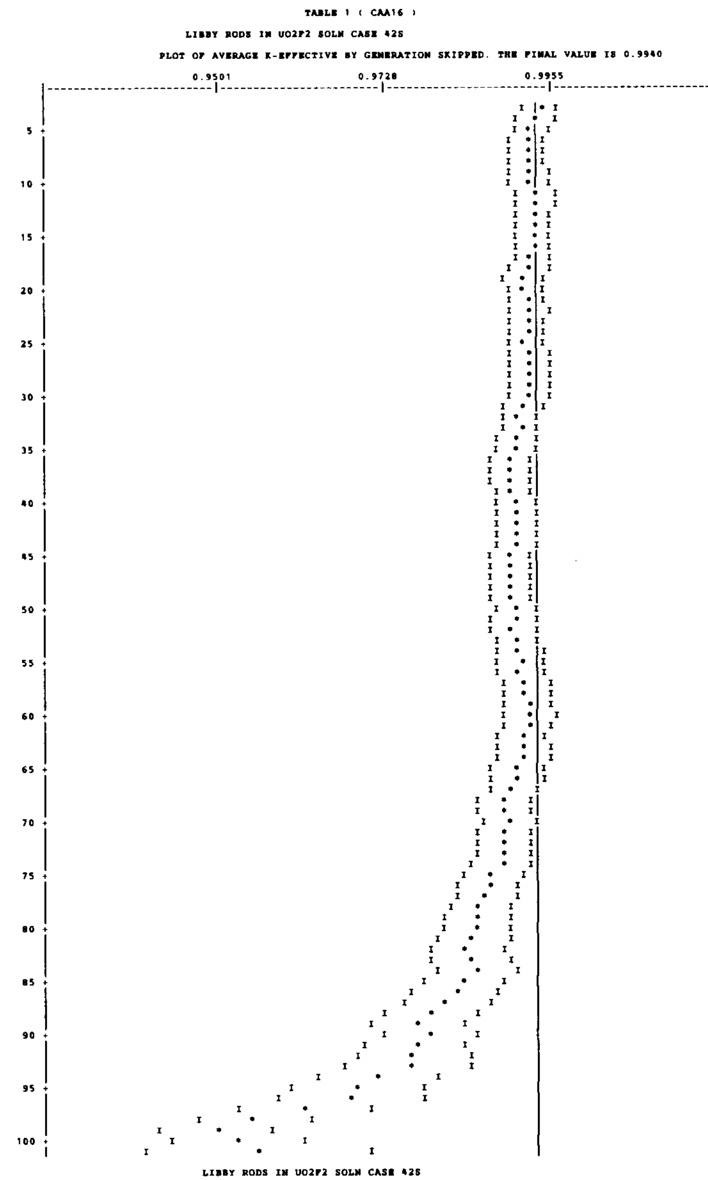
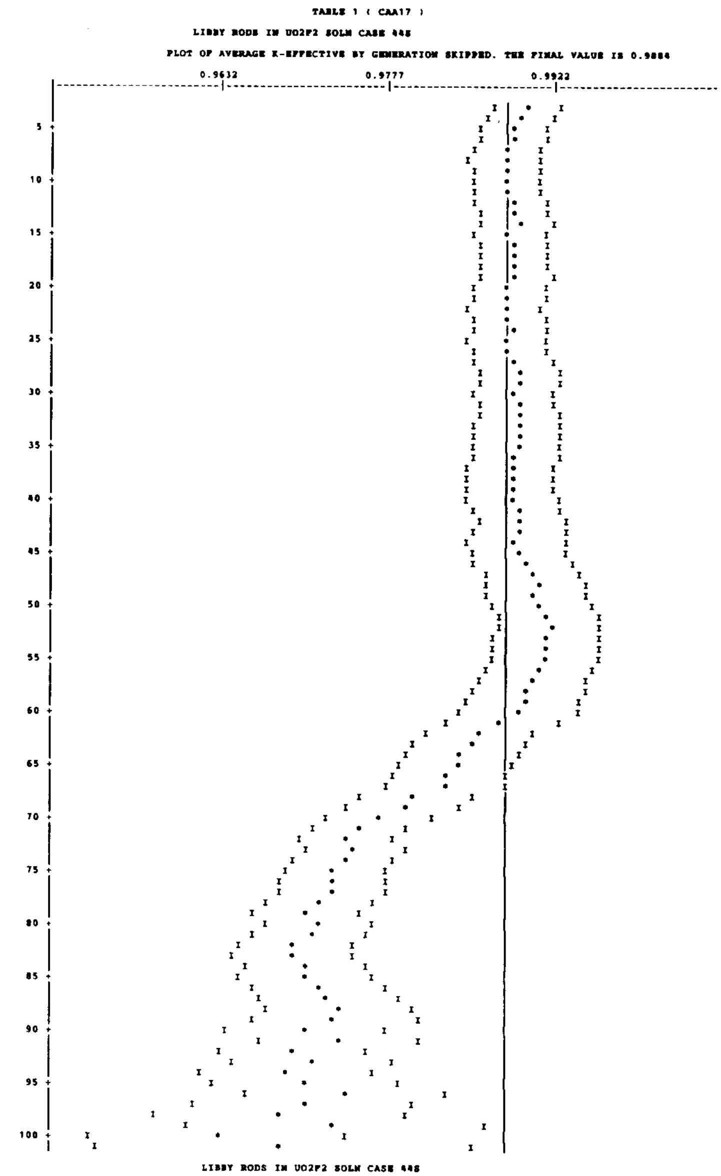


Fig. B.1 (continued)



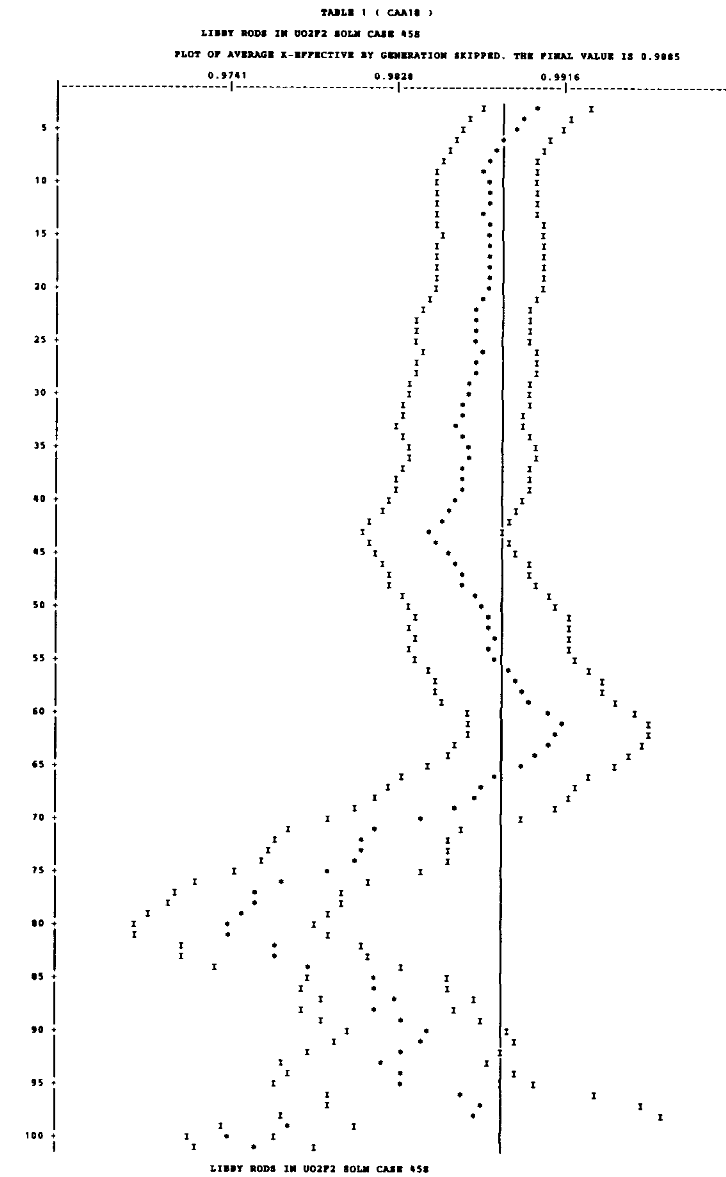
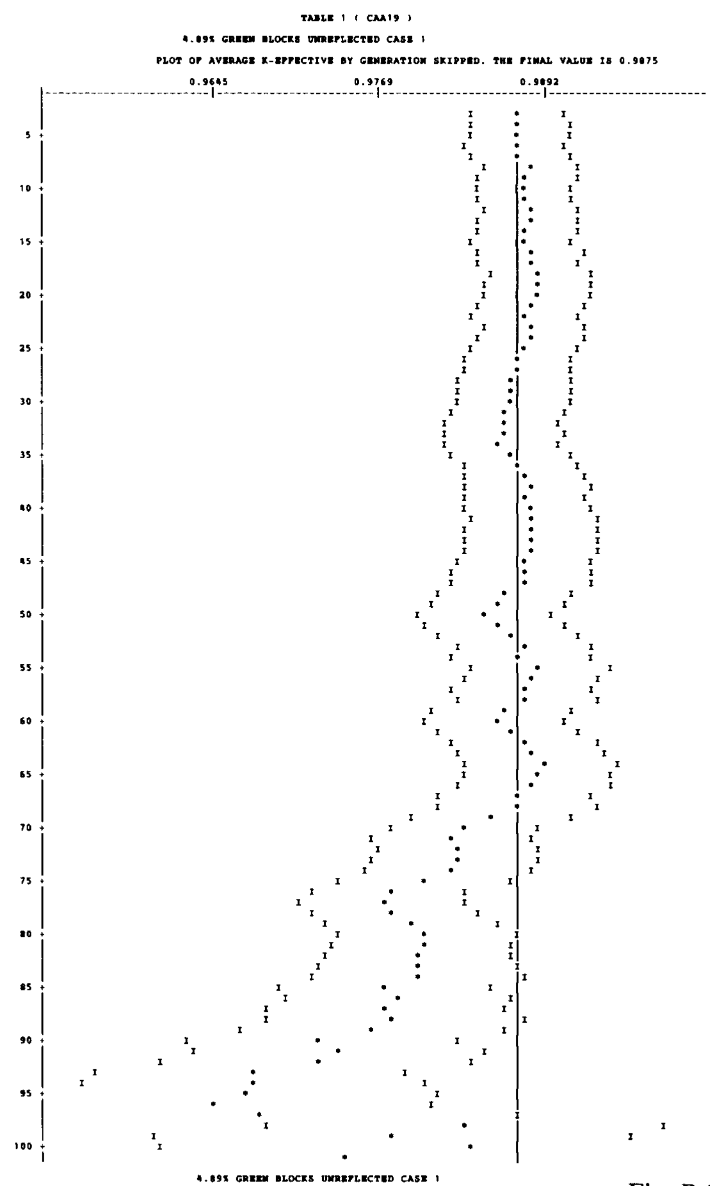


Fig. B.1 (continued)



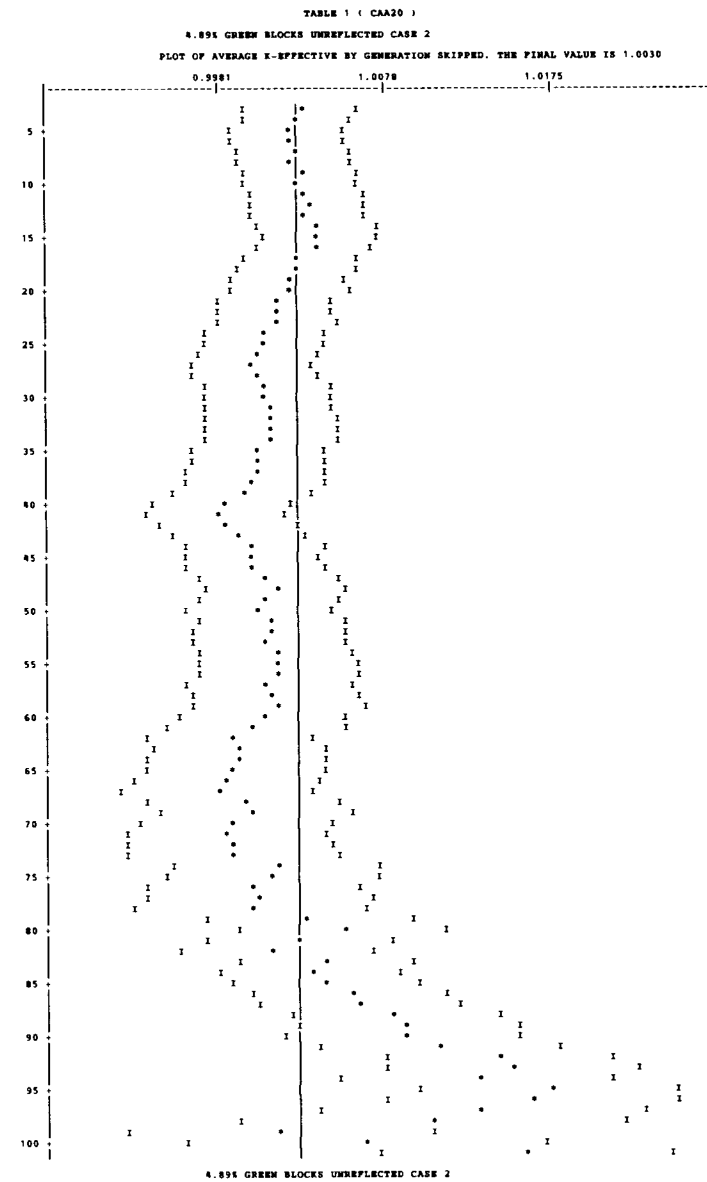
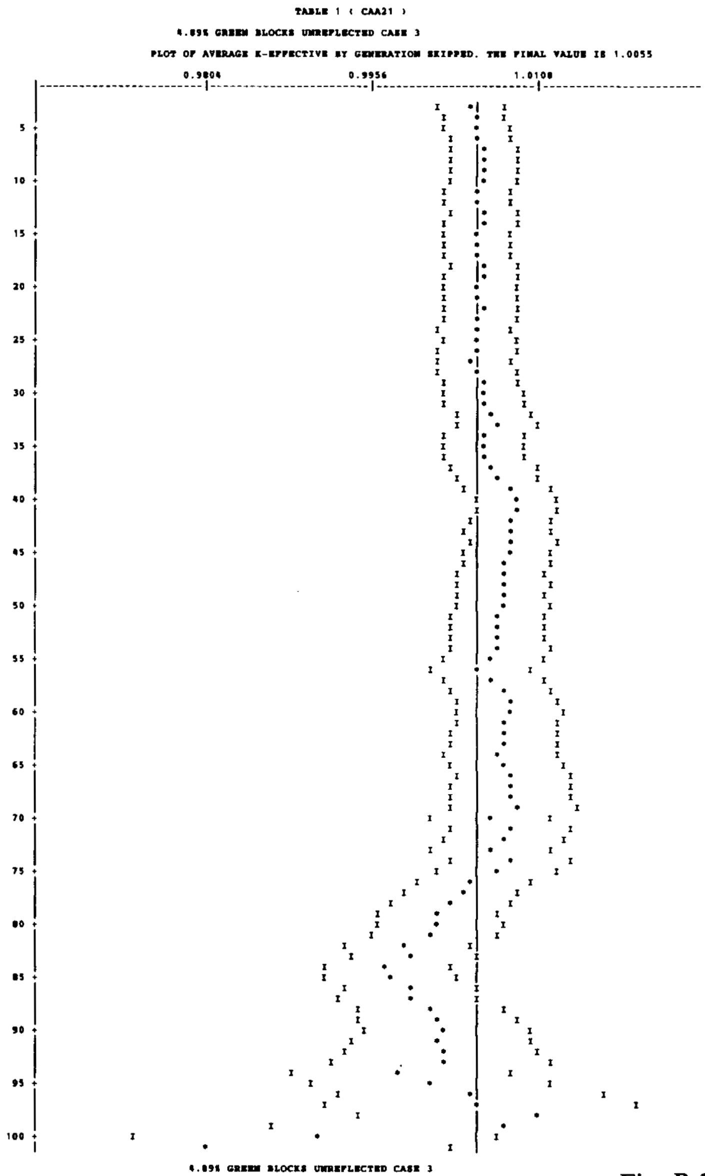


Fig. B.1 (continued)



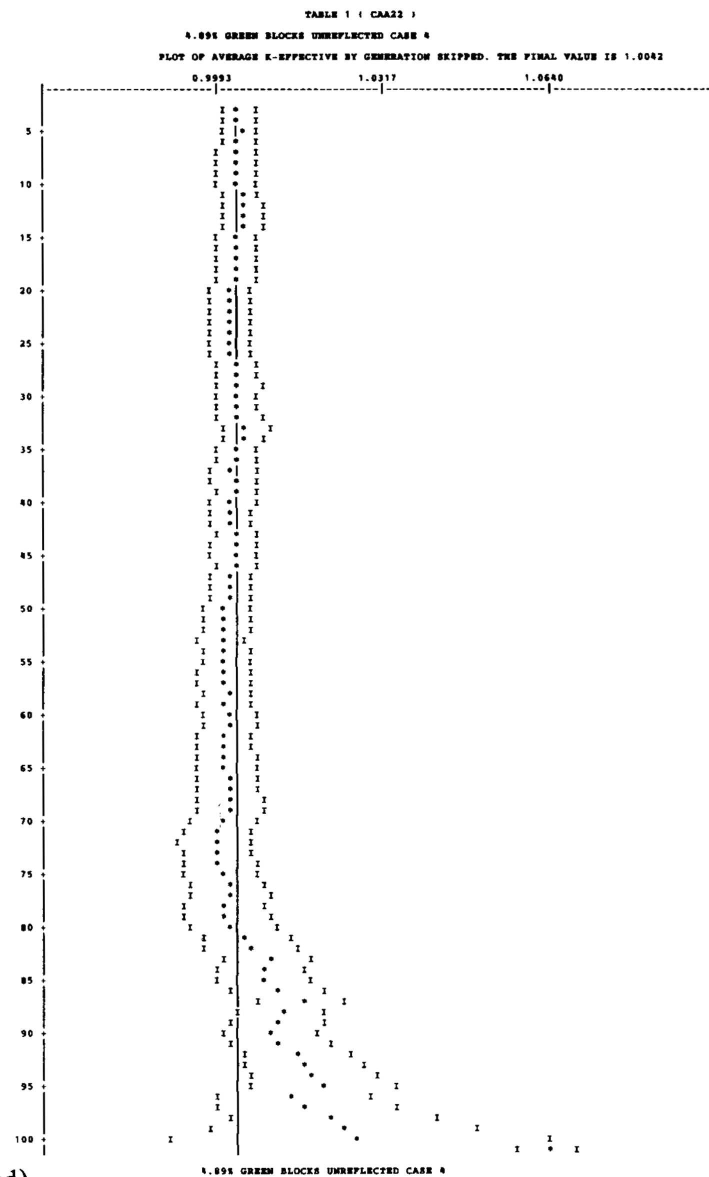
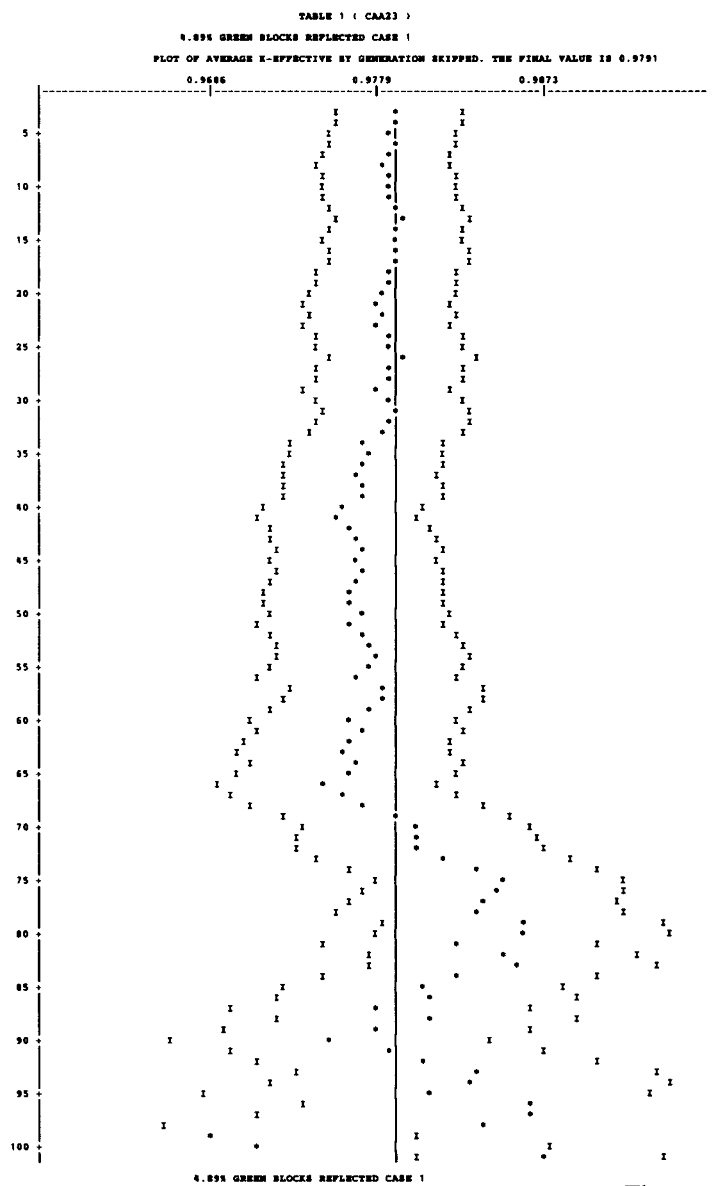


Fig. B.1 (continued)



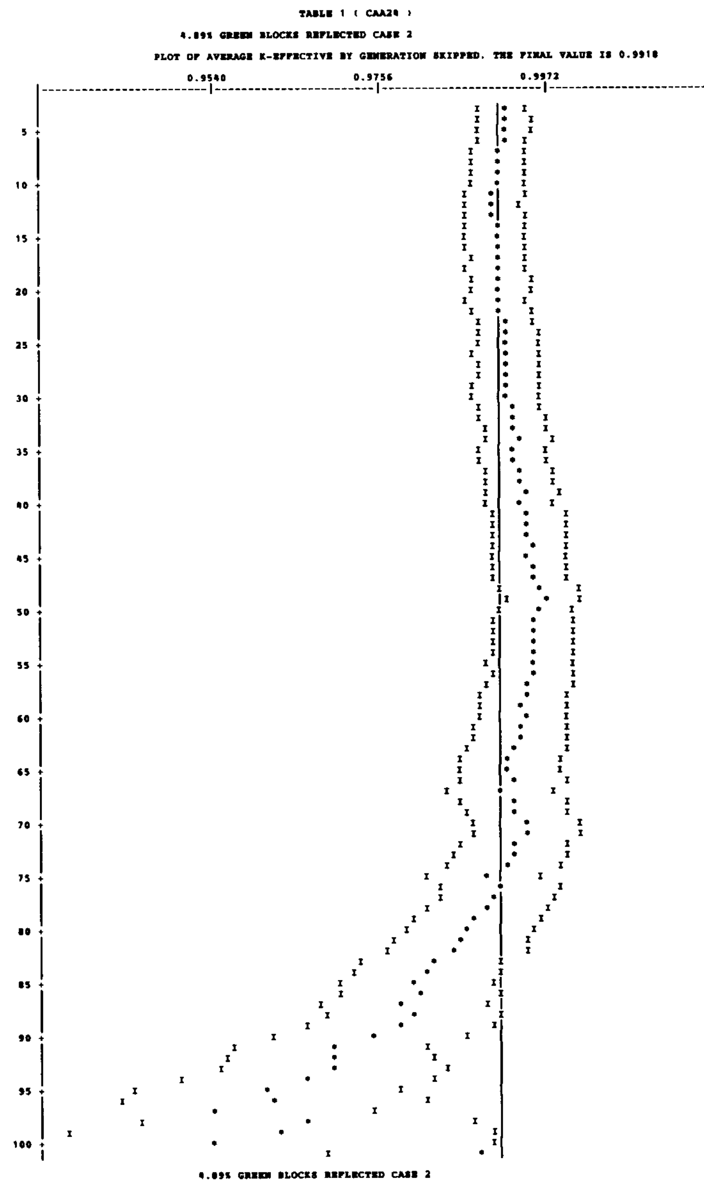
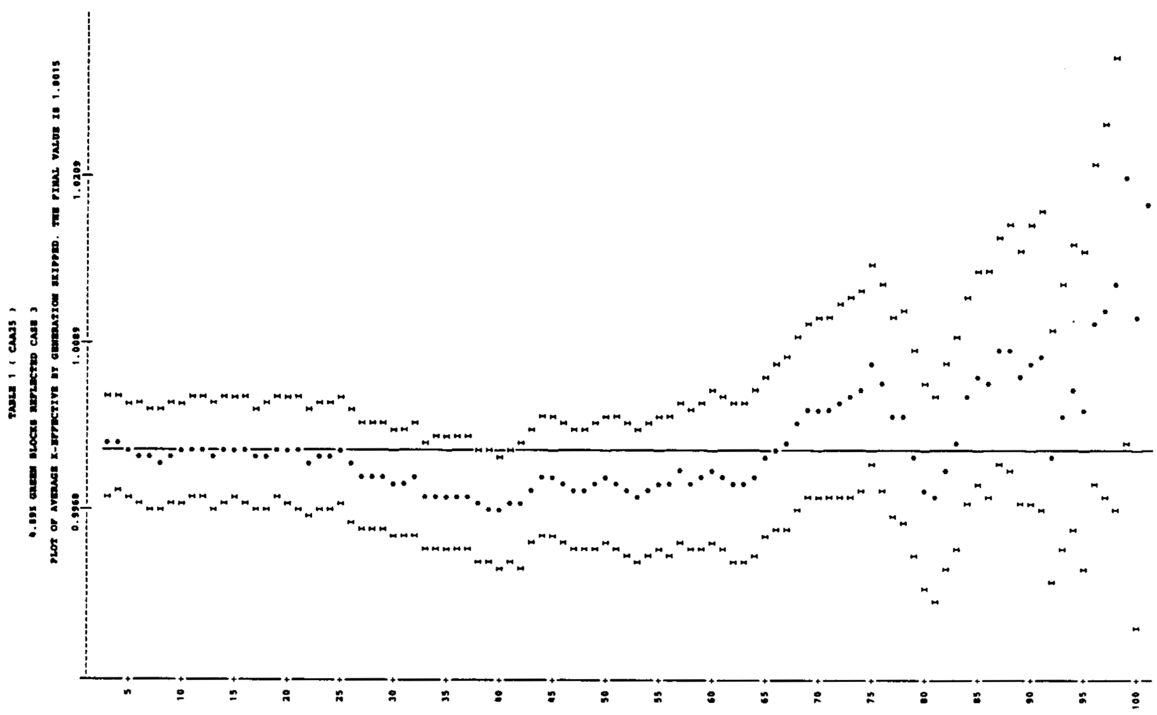


Fig. B.1 (continued)



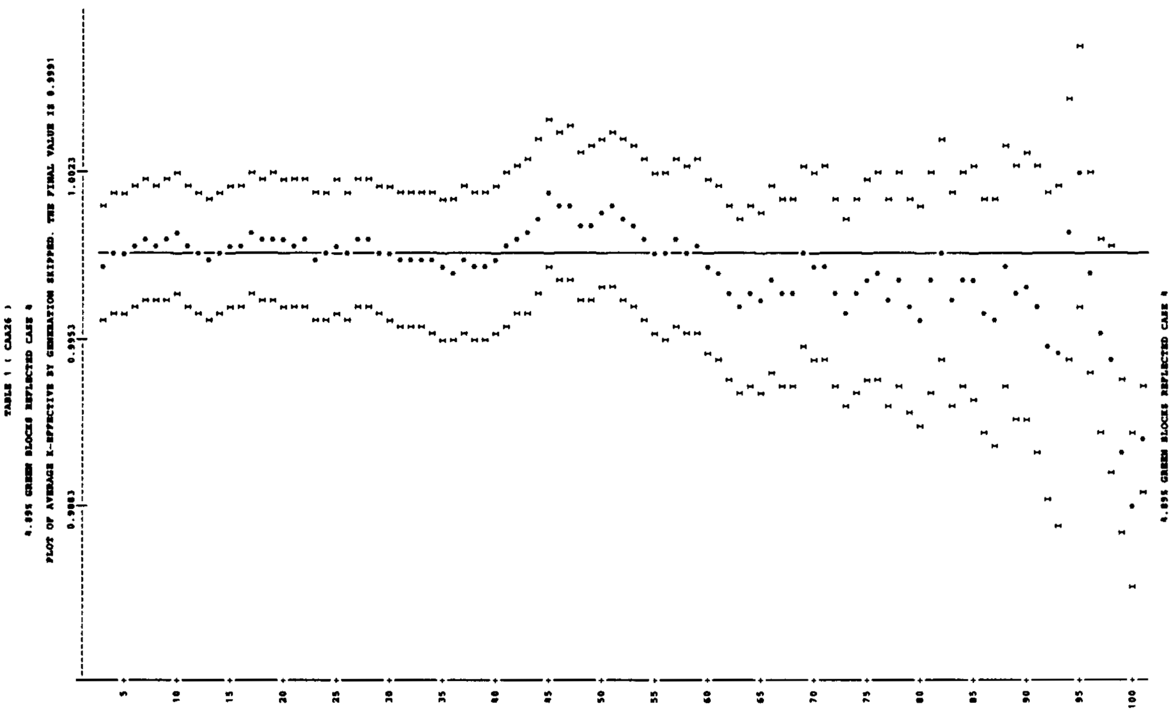


Fig. B.1 (continued)

TABLE 1 (CAA27)
4.89% GREEN BLOCKS REFLECTED CASE 5
PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 0.9991

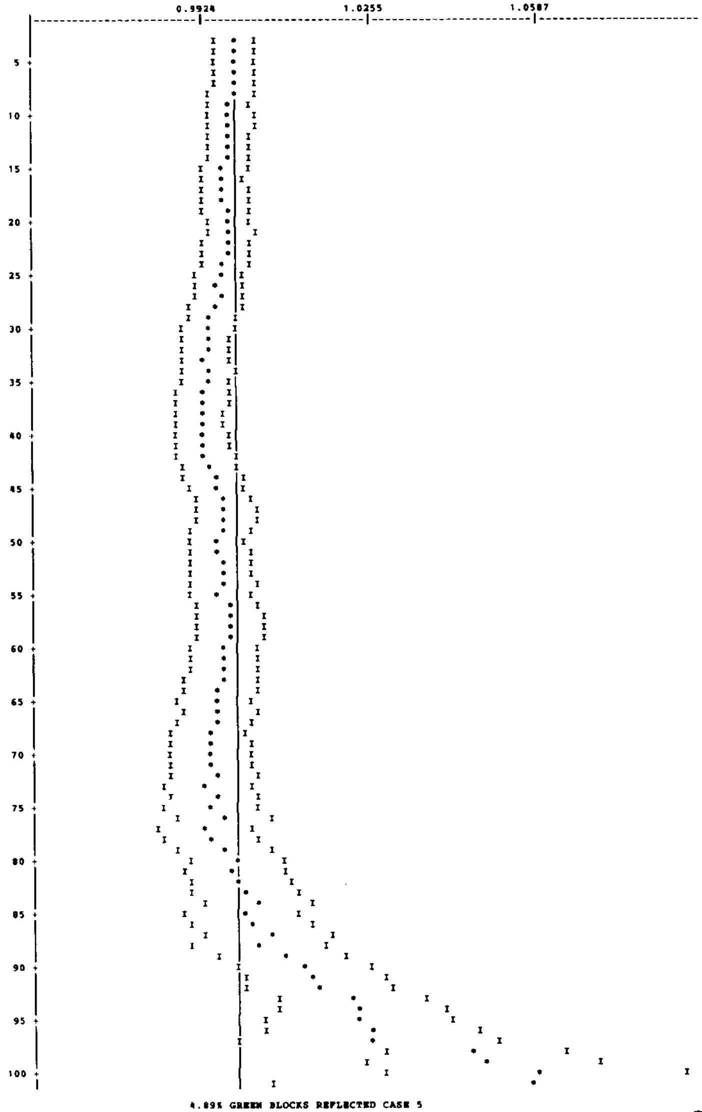


TABLE 1 (CAA28)
4.89% GREEN BLOCKS REFLECTED CASE 6
PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 0.9739

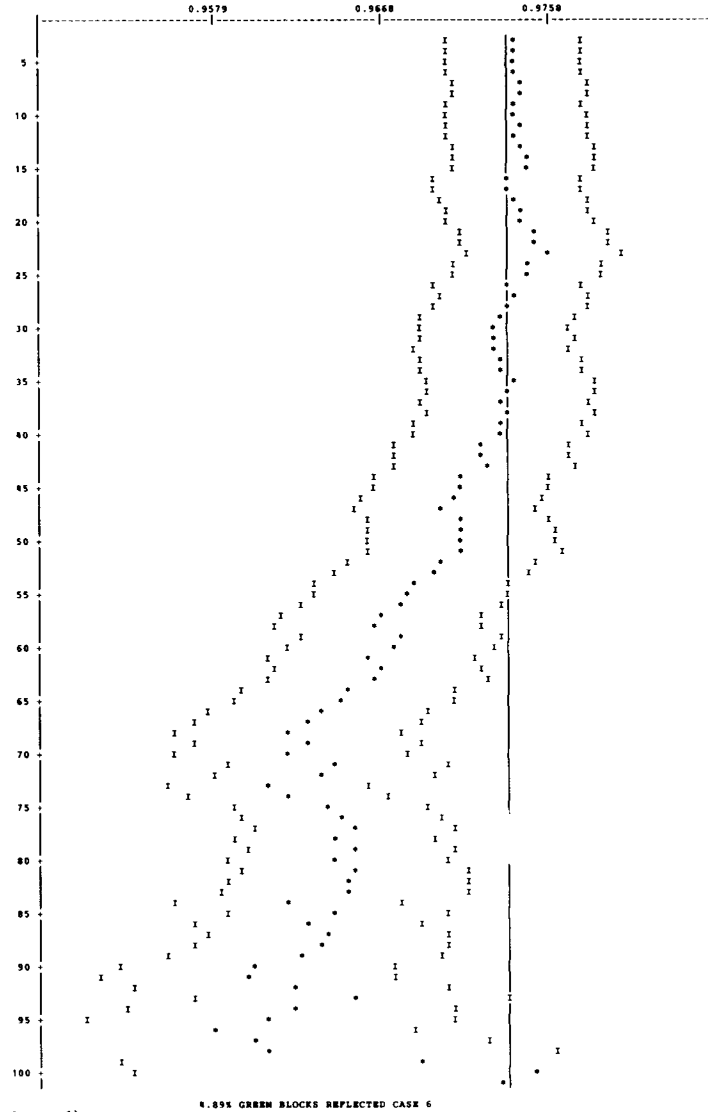
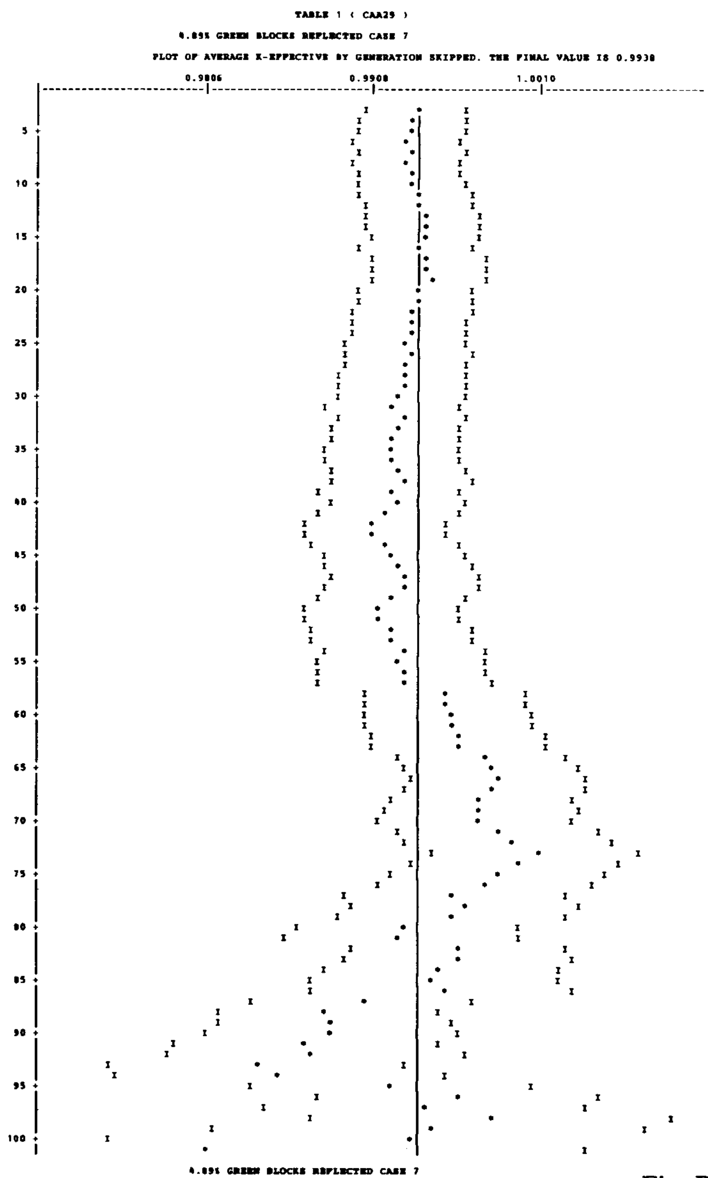


Fig. B.1 (continued)



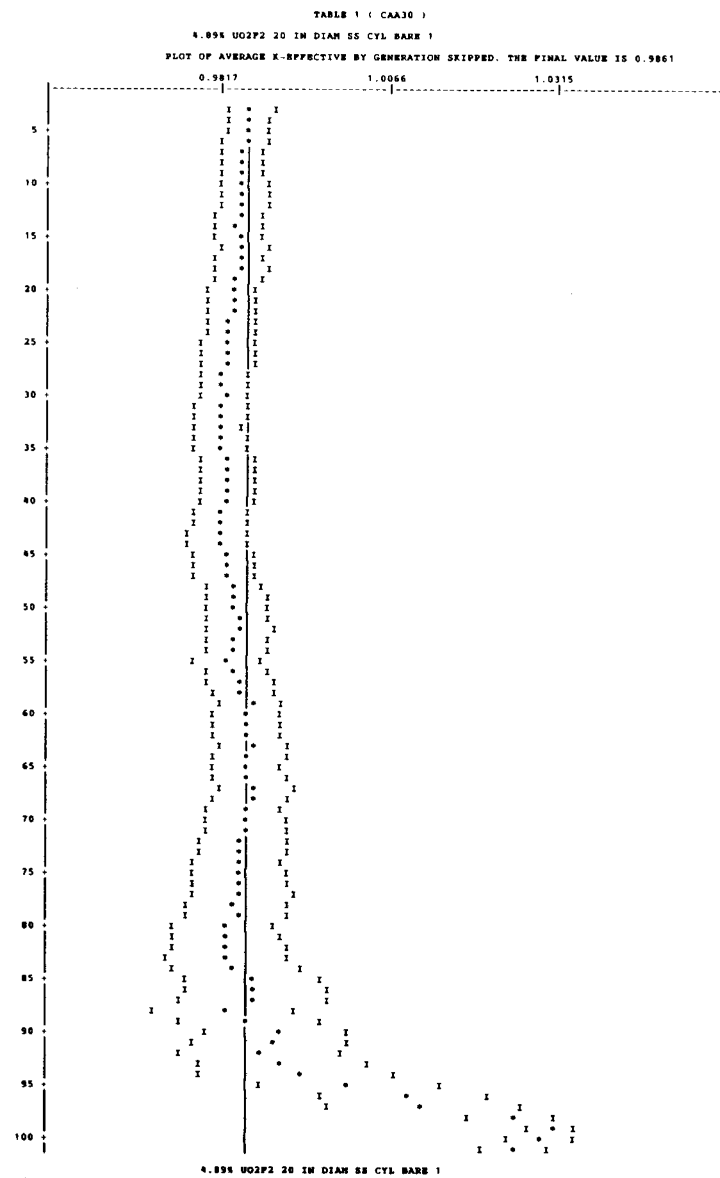
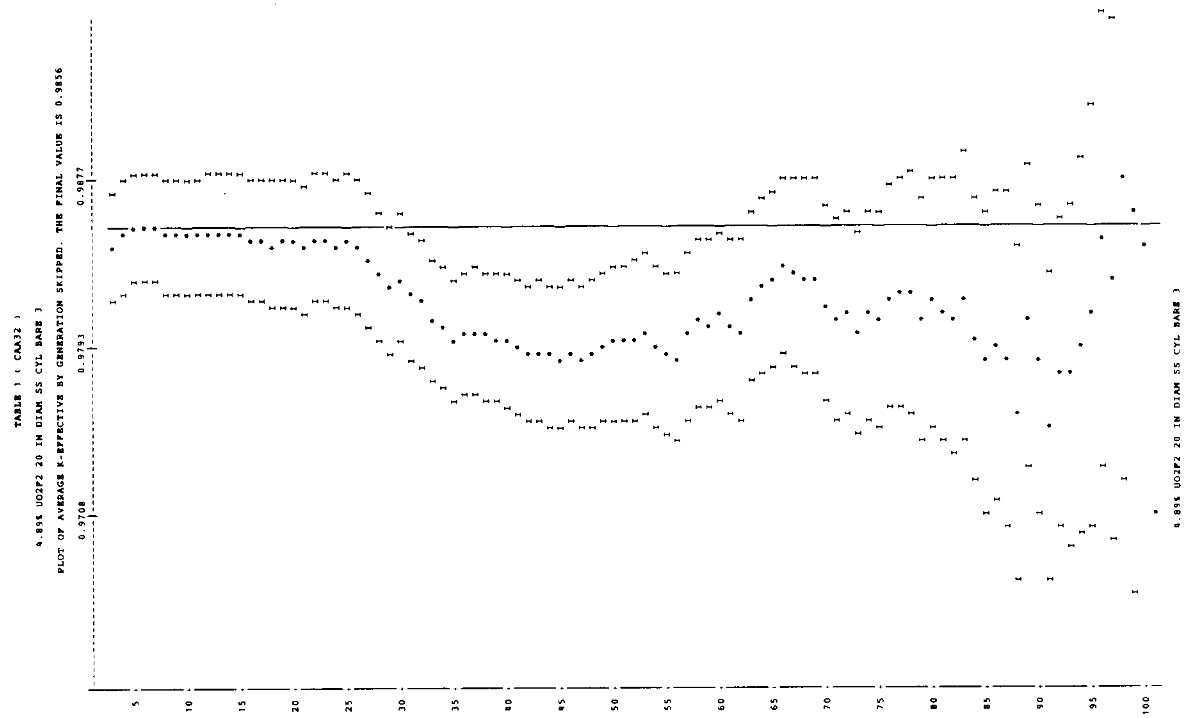


Fig. B.1 (continued)



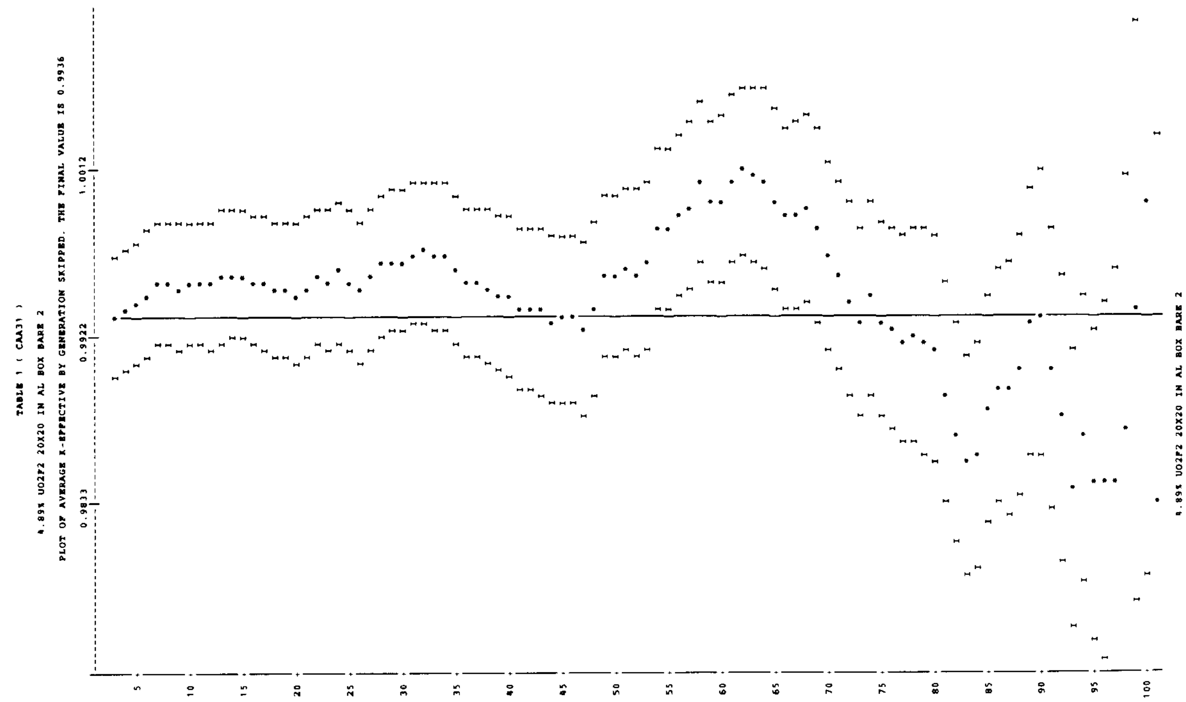
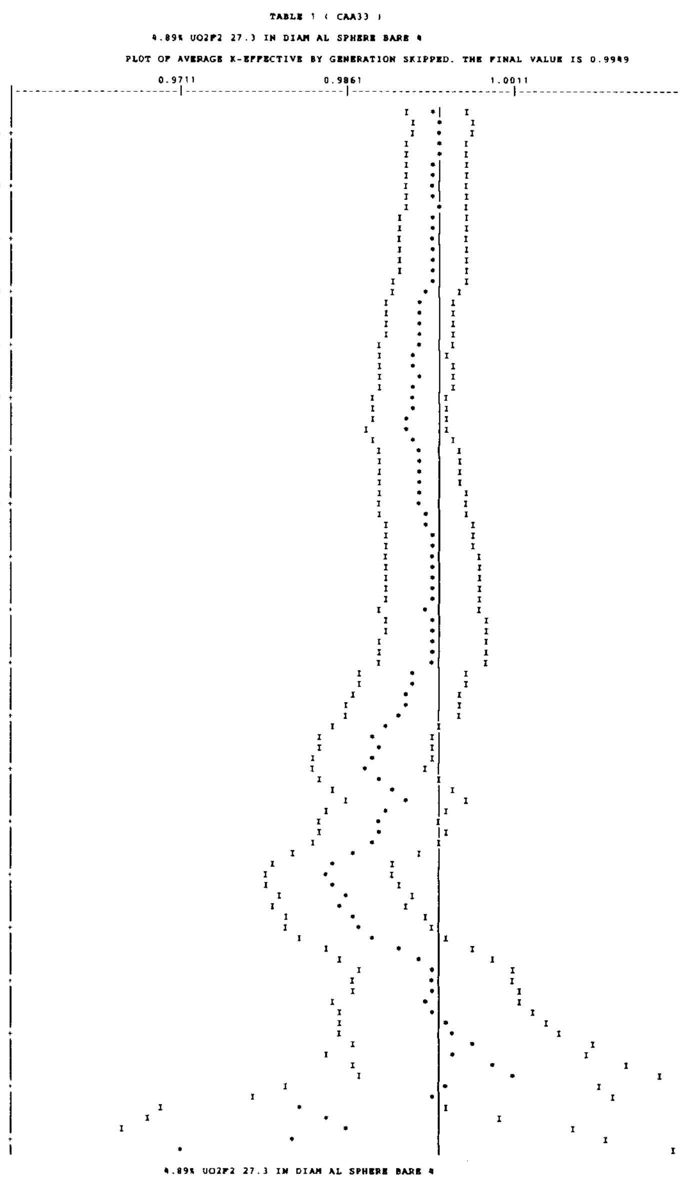


Fig. B.1 (continued)



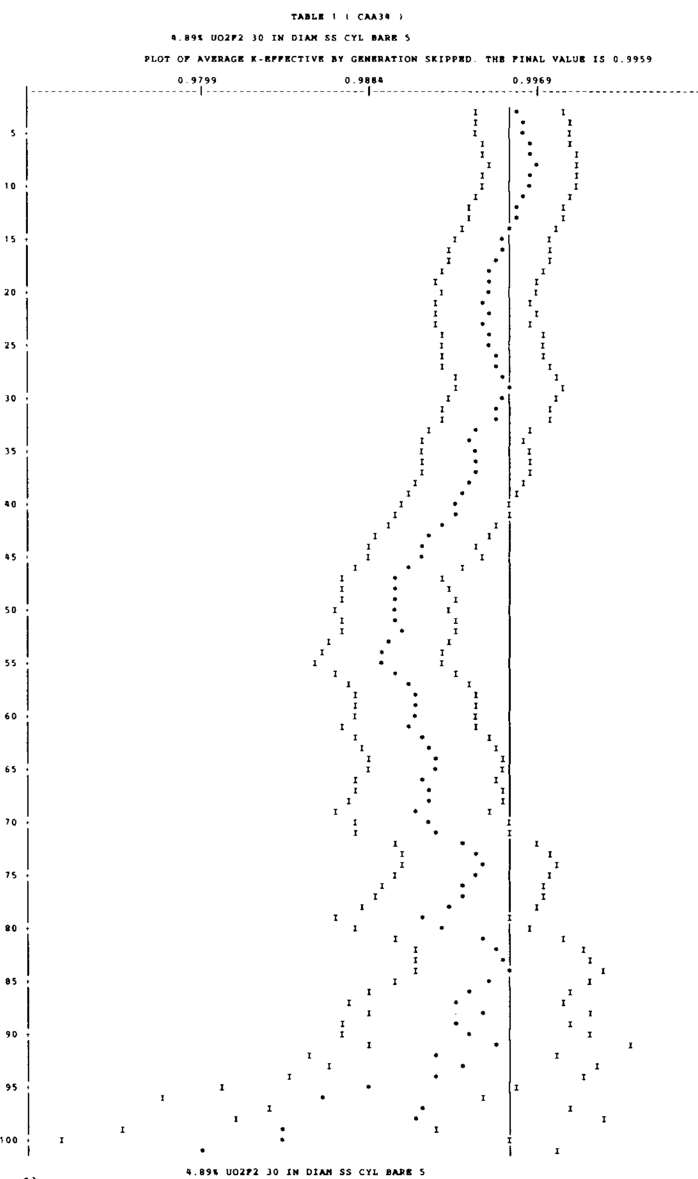
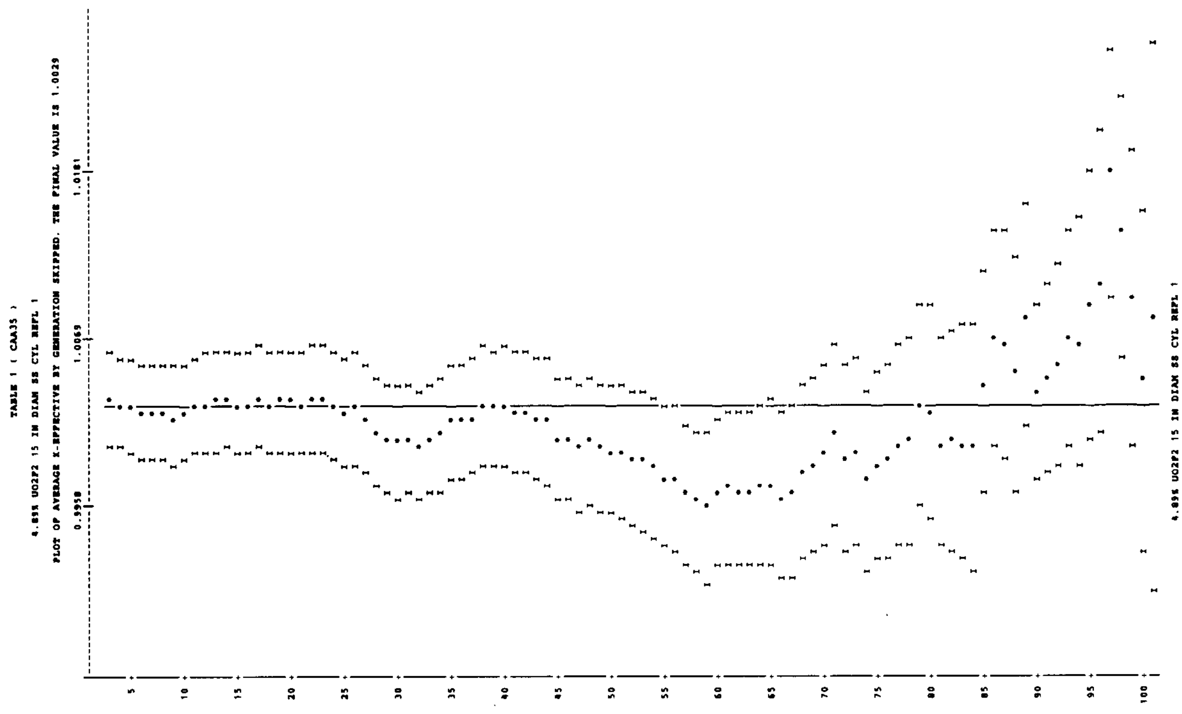


Fig. B.1 (continued)



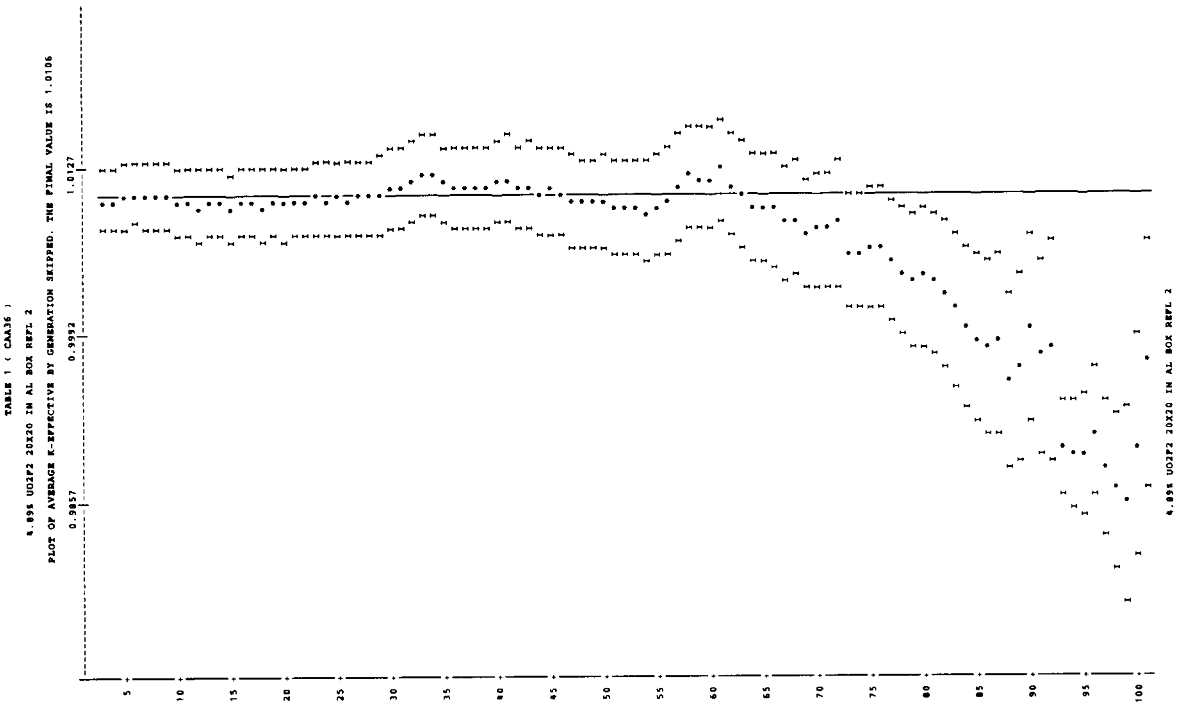
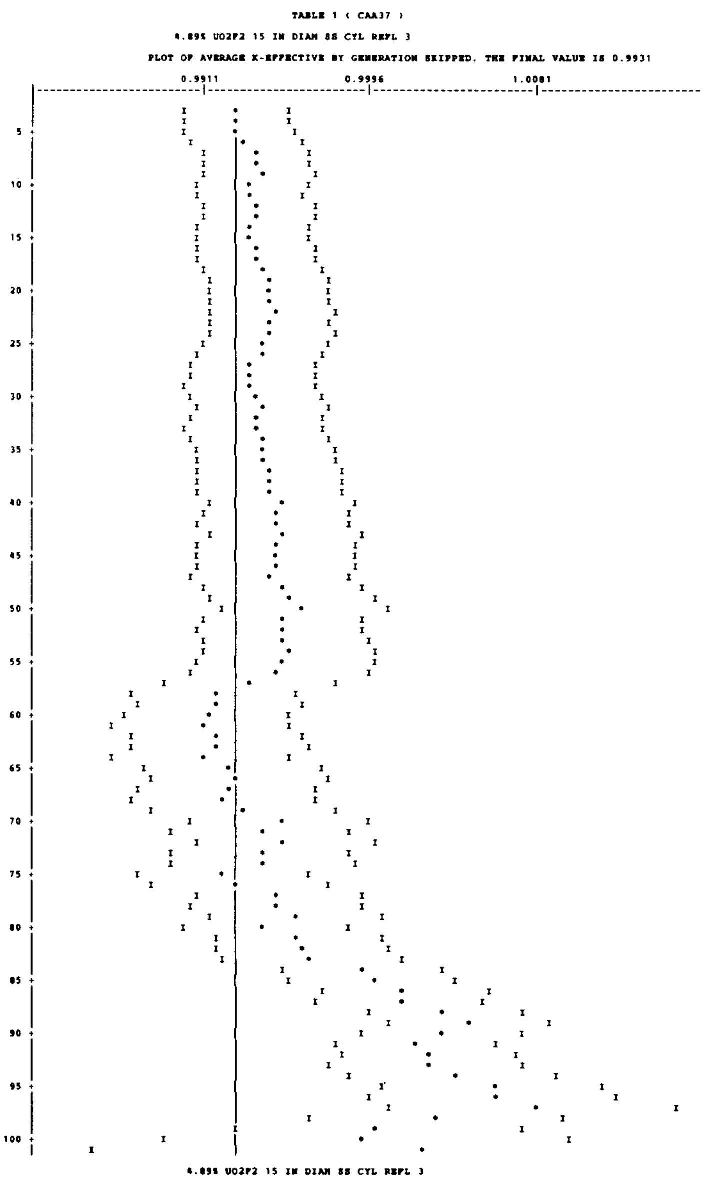


Fig. B.1 (continued)



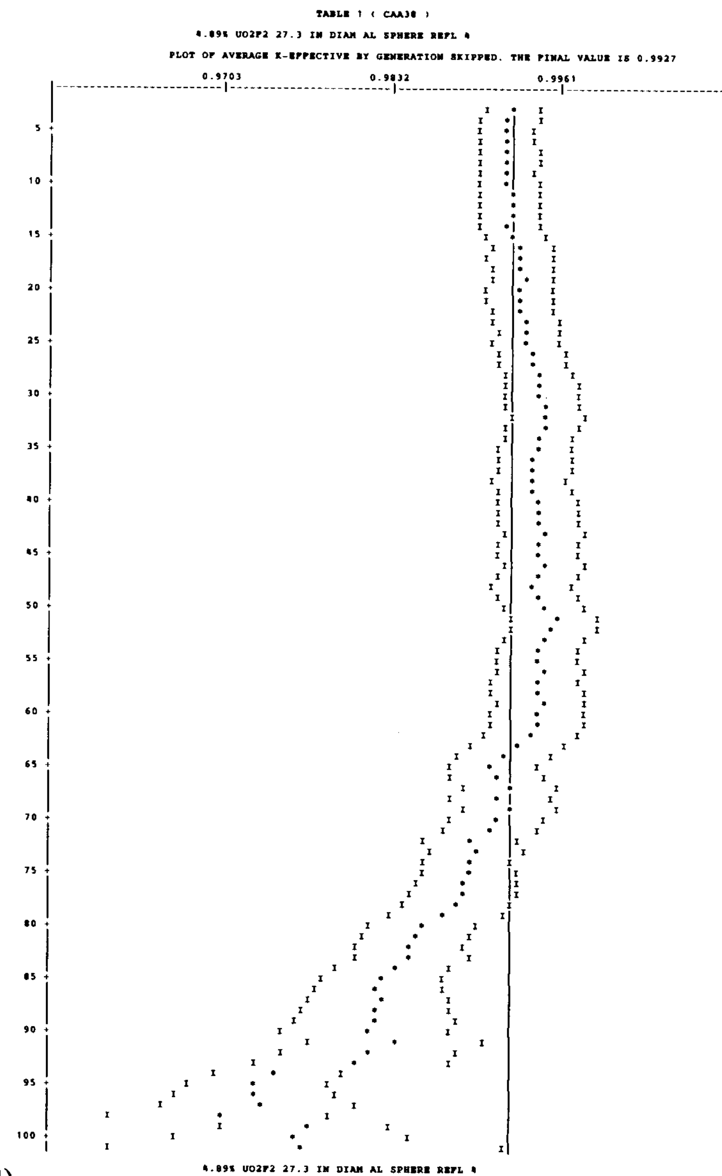


Fig. B.1 (continued)

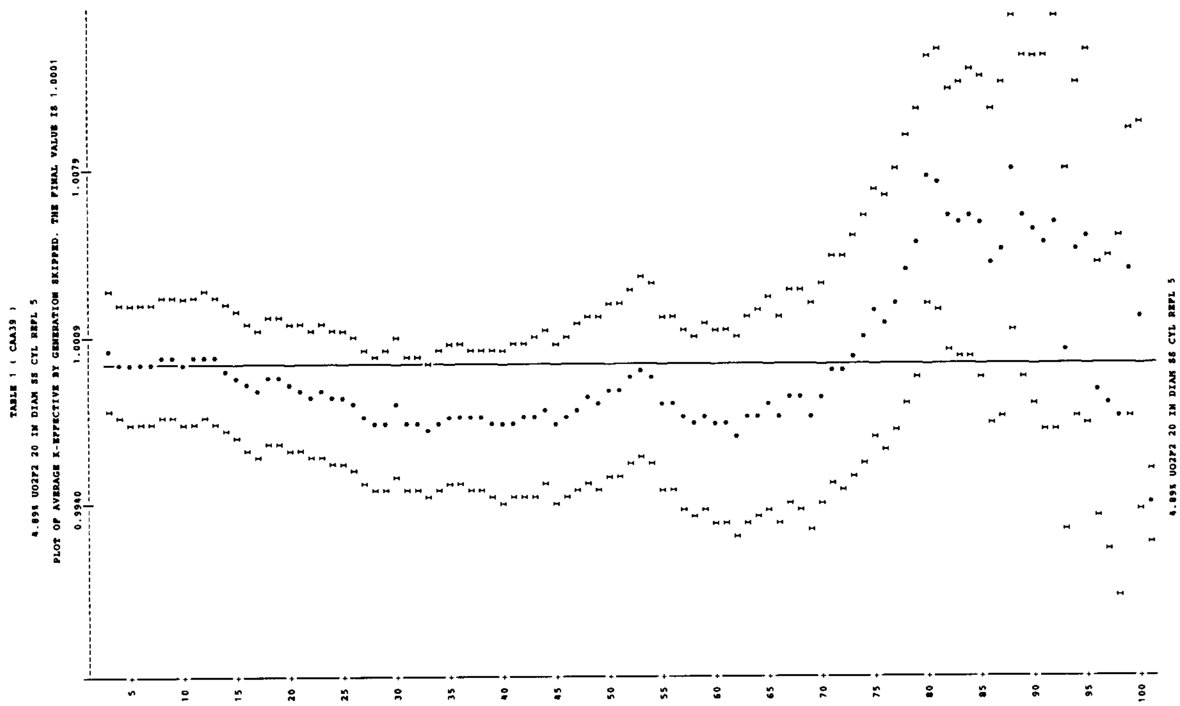
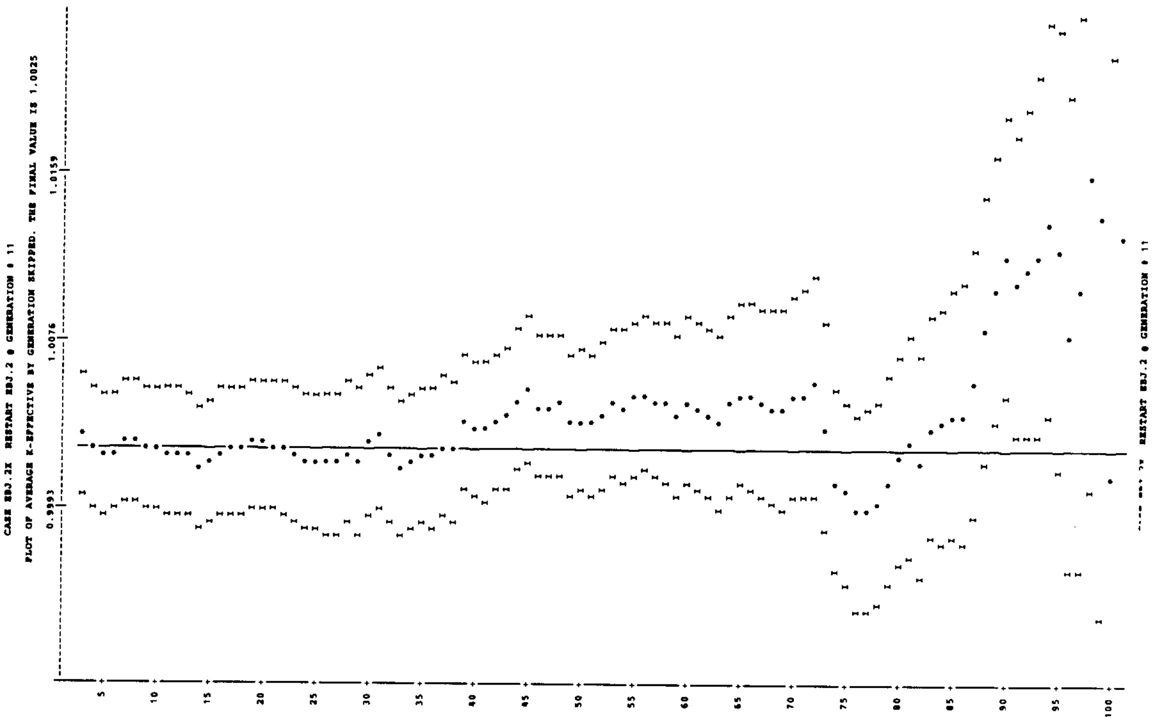


Fig. B.1 (continued)



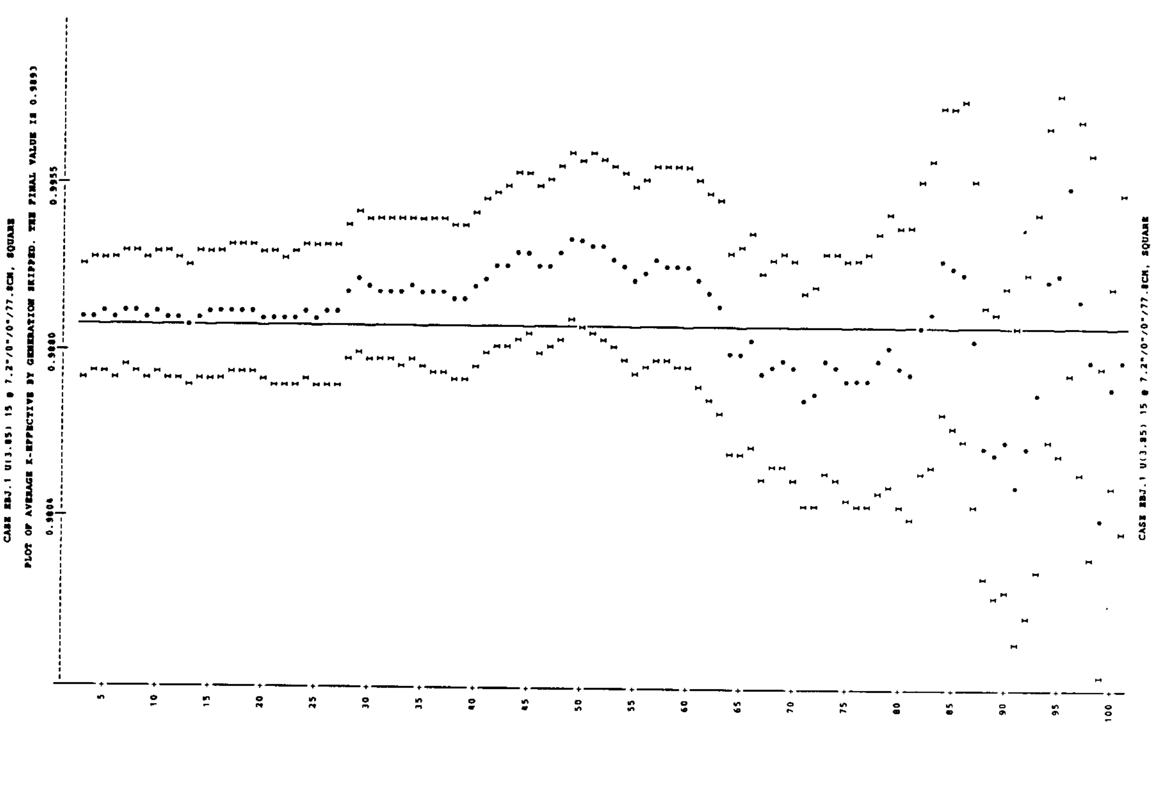
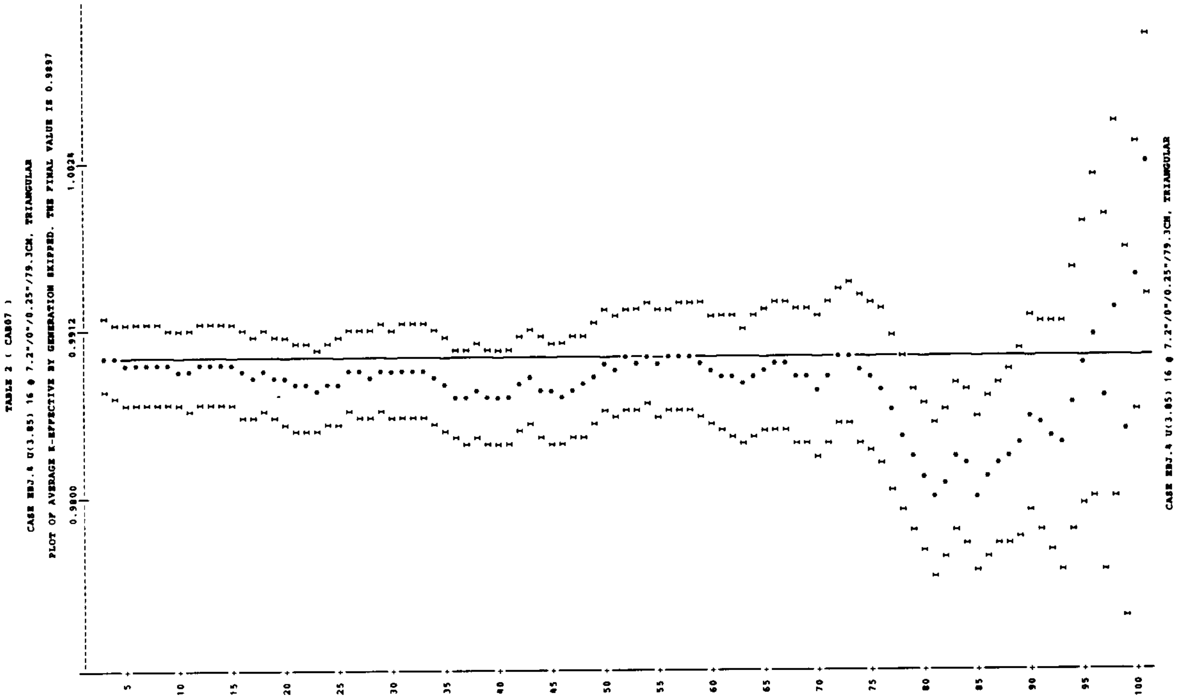


Fig. B.2. Plots for Table 2.



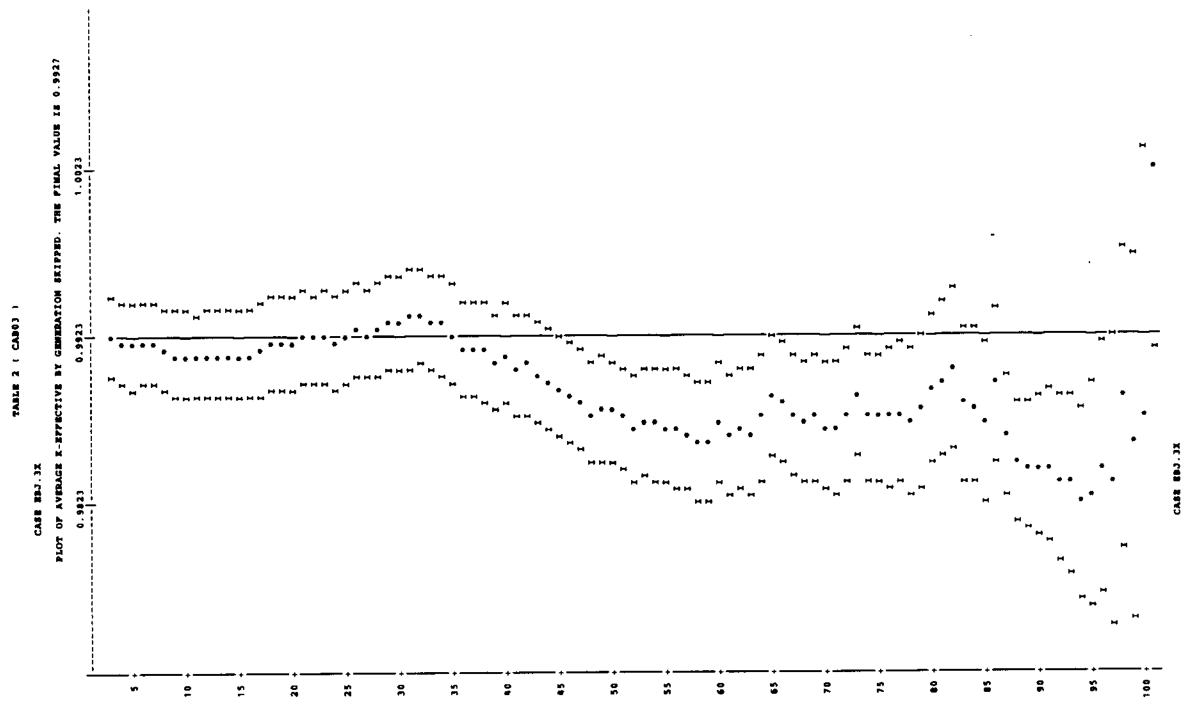
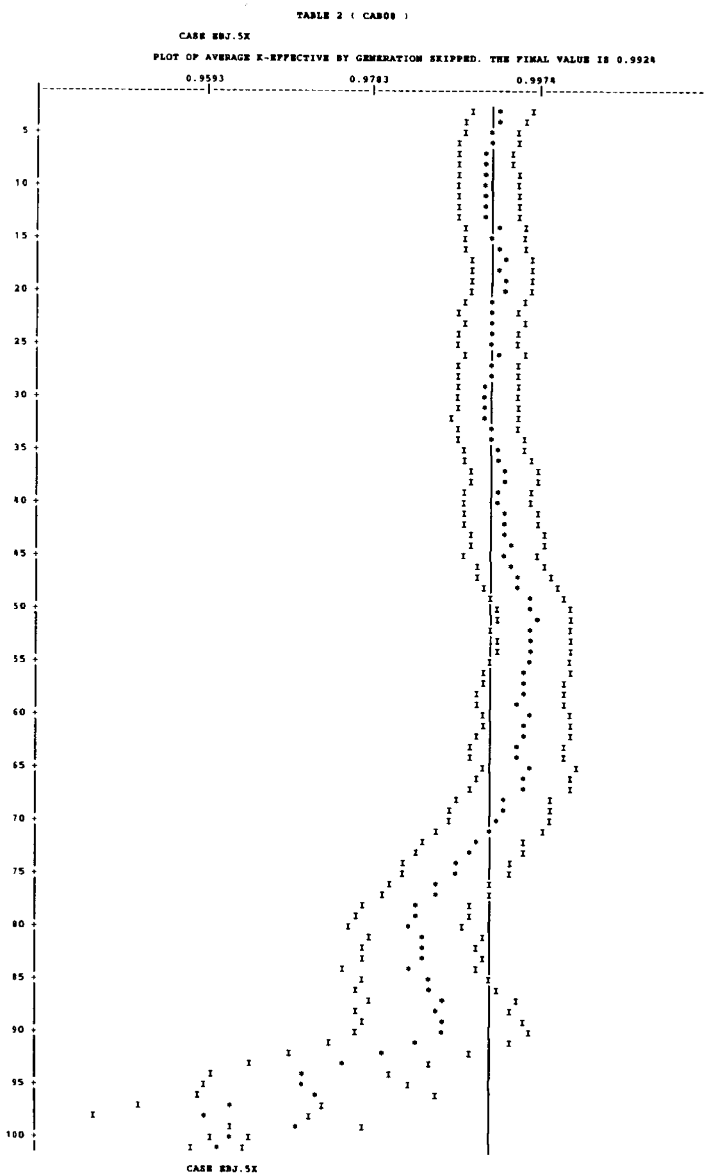
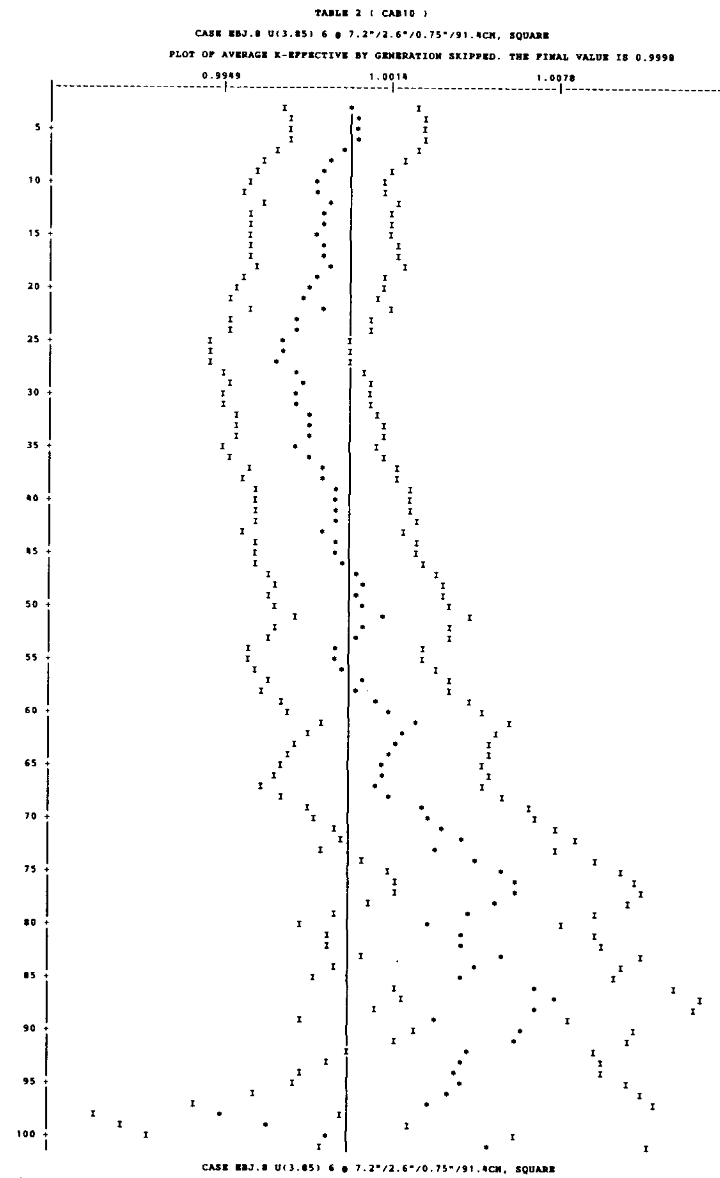


Fig. B.2 (continued)





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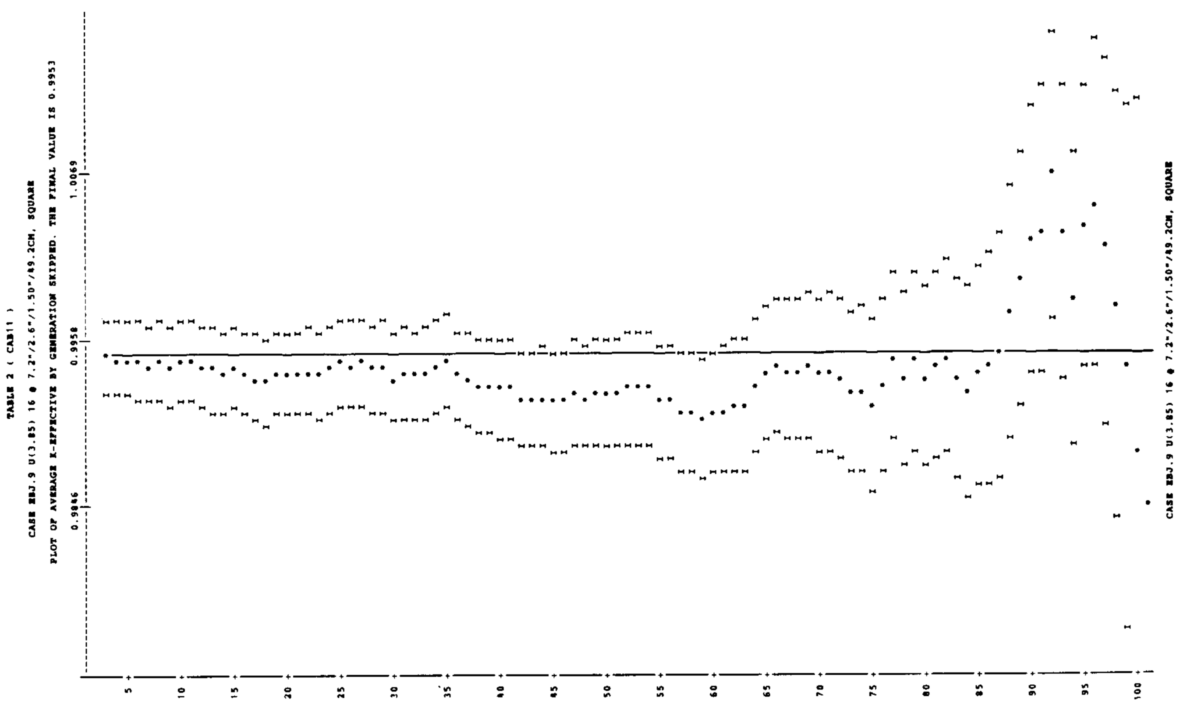

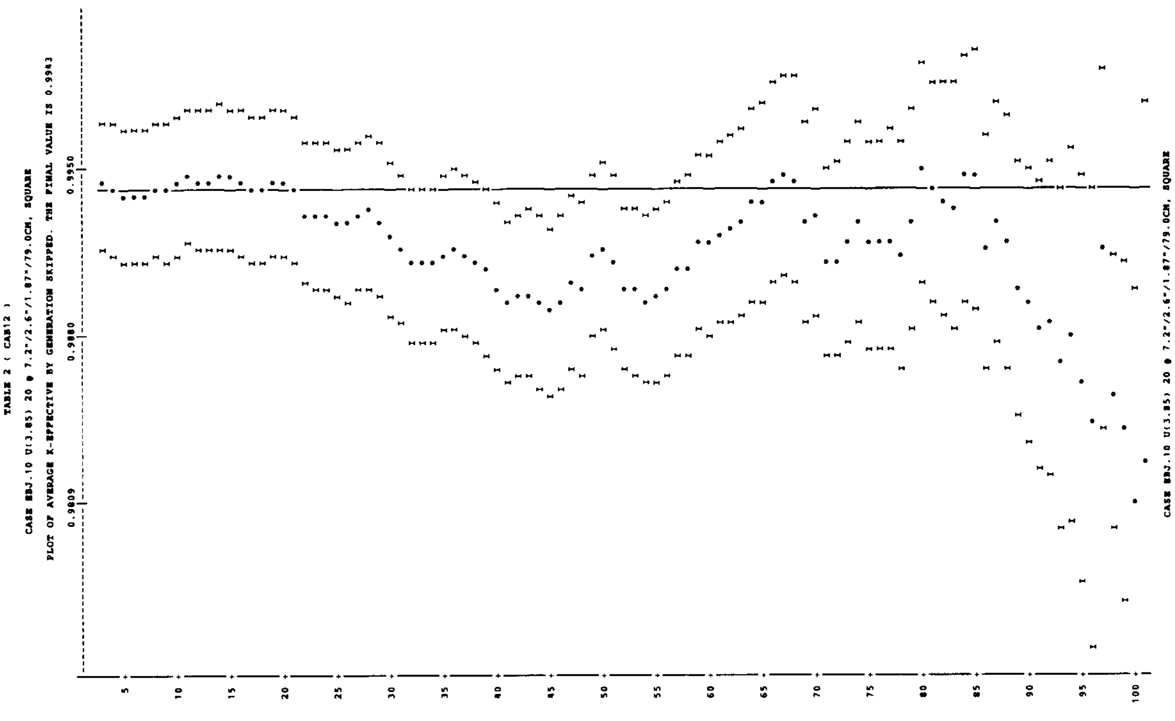

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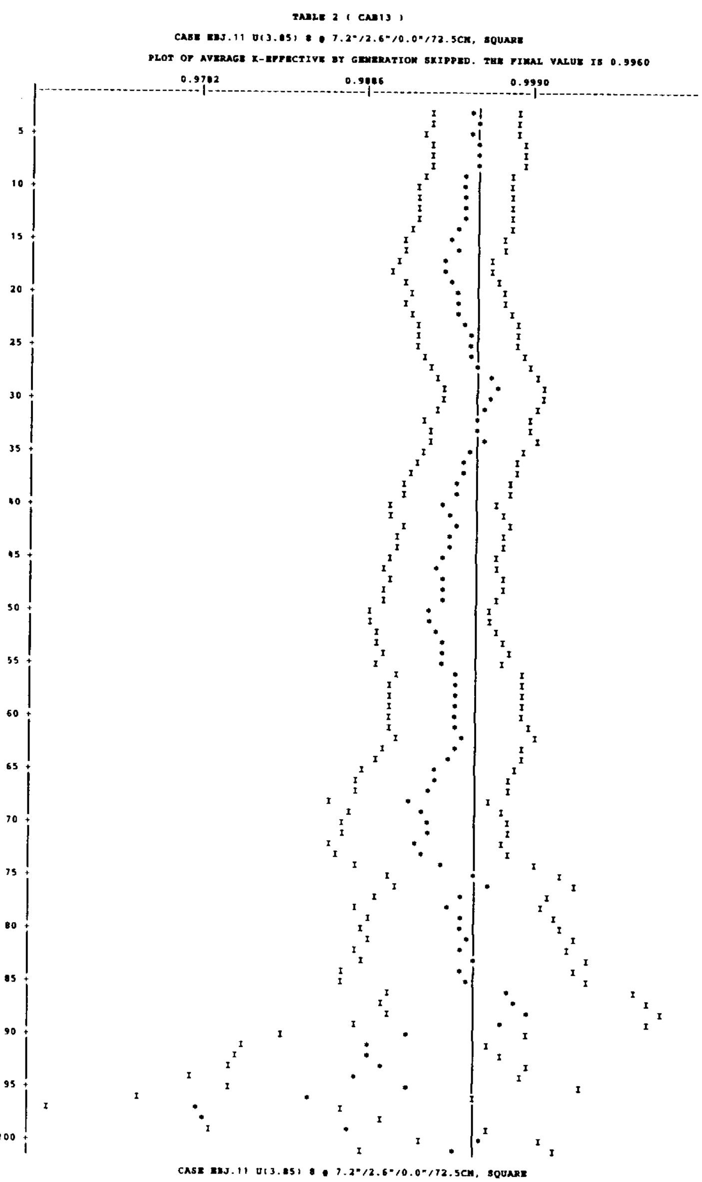


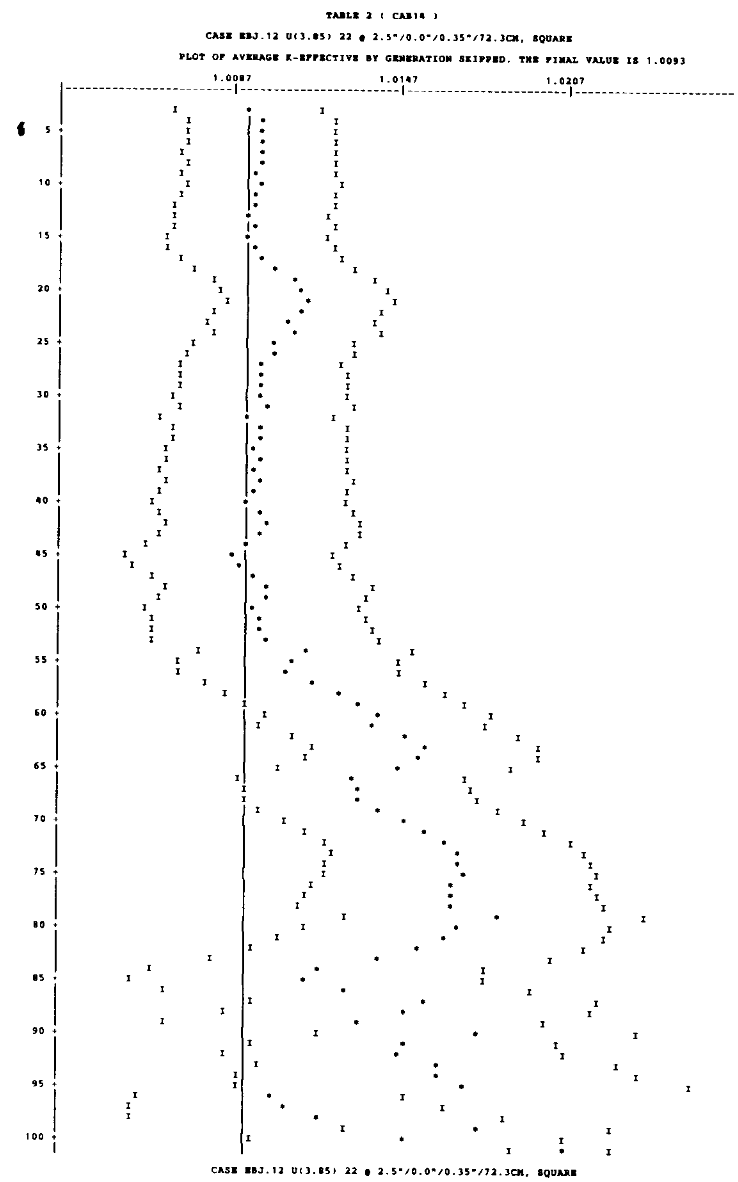


Fig. B.2 (continued)

TABLE 2 (CAB15)

CASE EBJ.13 U(3.85) 15 @ 2.5"/0.0"/0.75"/64.8CM, SQUARE

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 0.9992

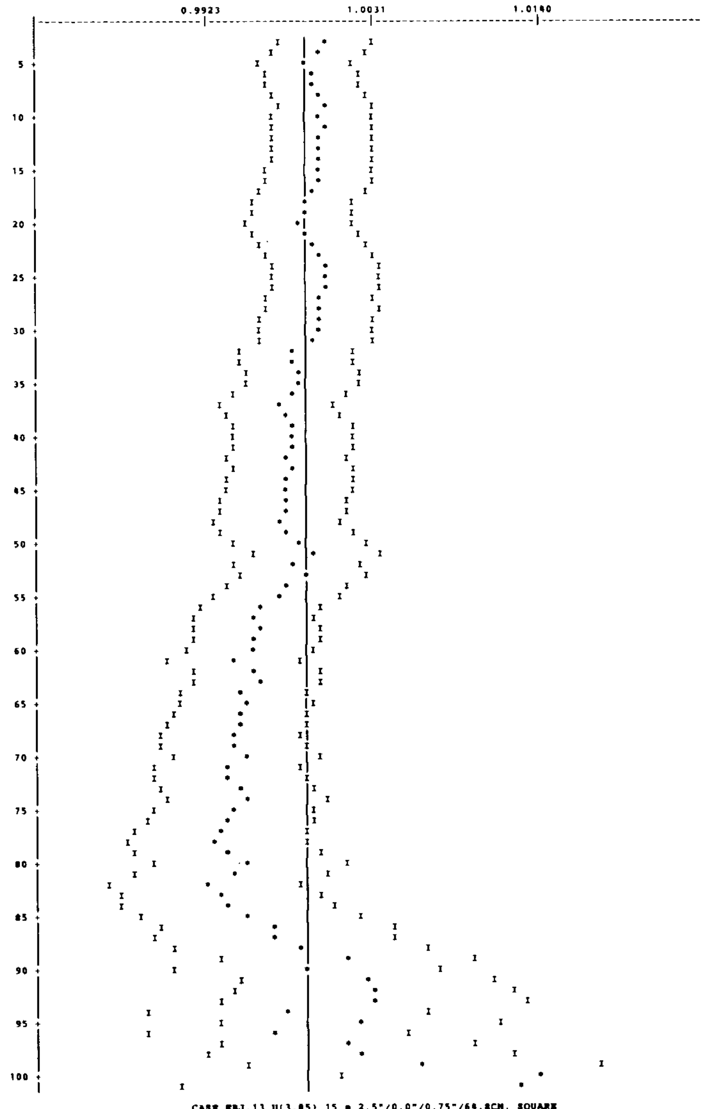


TABLE 2 (CAB16)

CASE EBJ.14 U(3.85) 23 @ 2.5"/0.0"/1.50"/68.9CM, SQUARE

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 0.9877

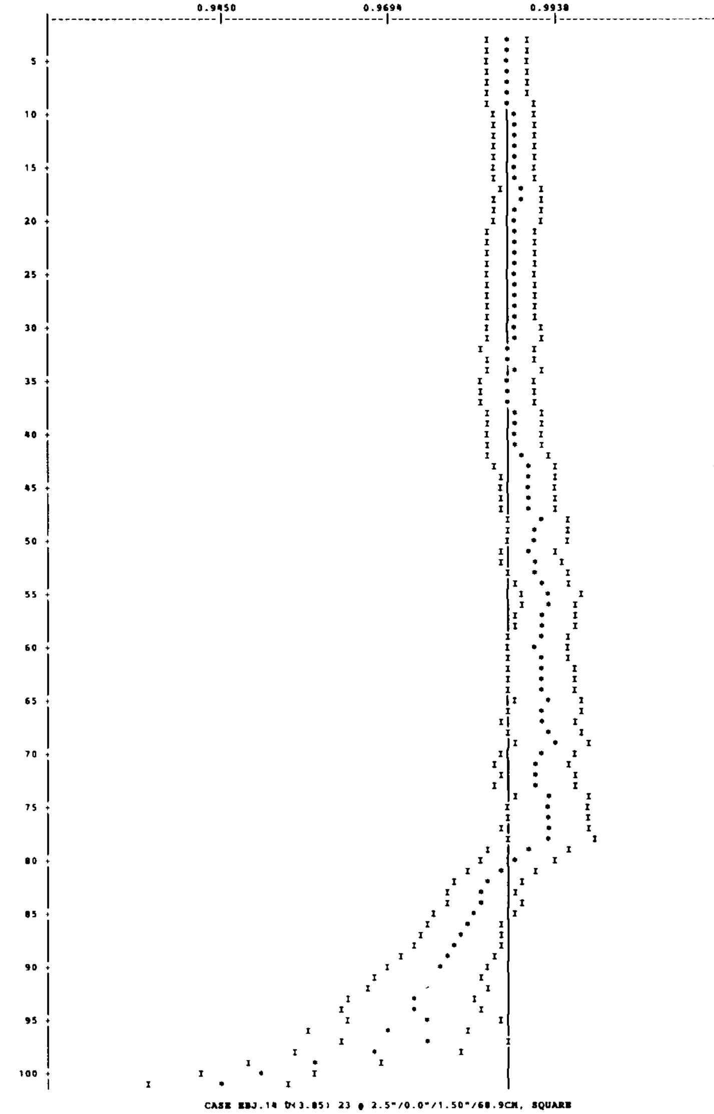
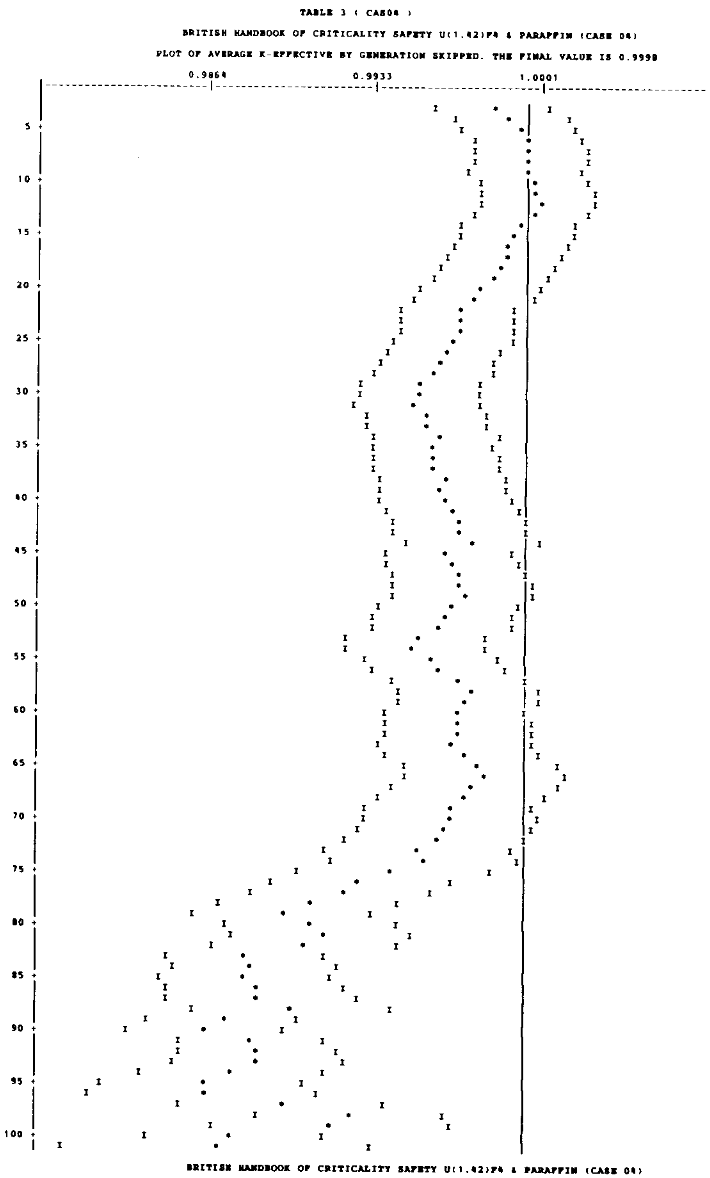


Fig. B.2 (continued)



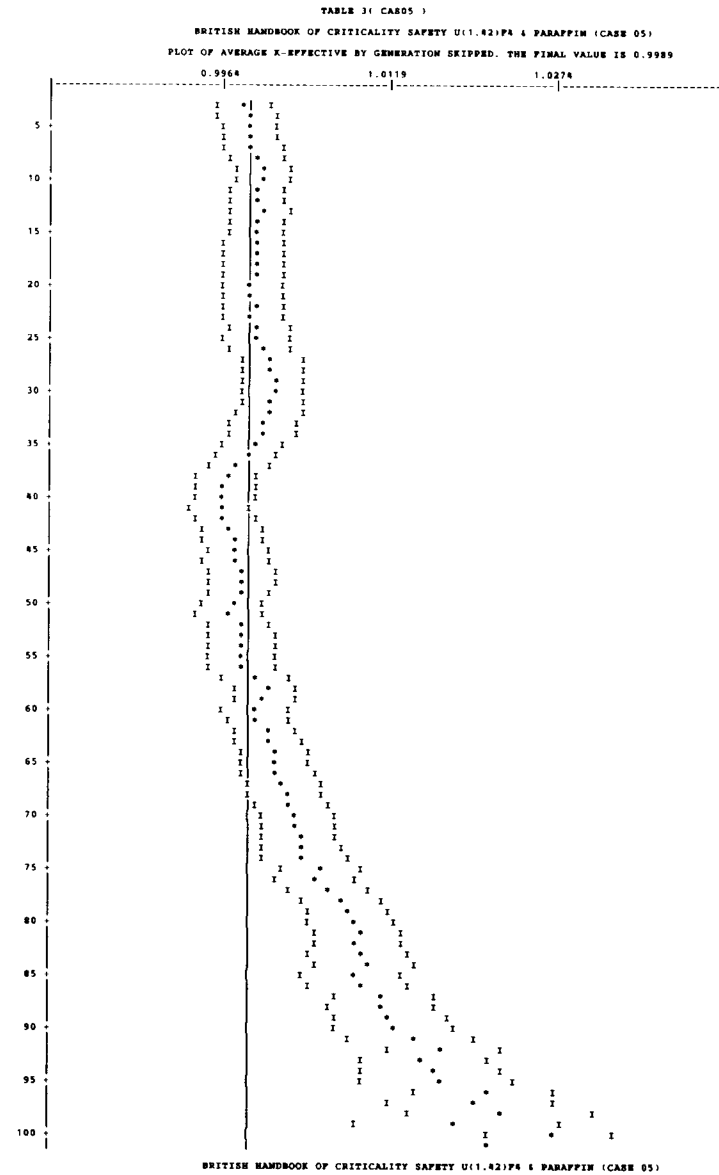
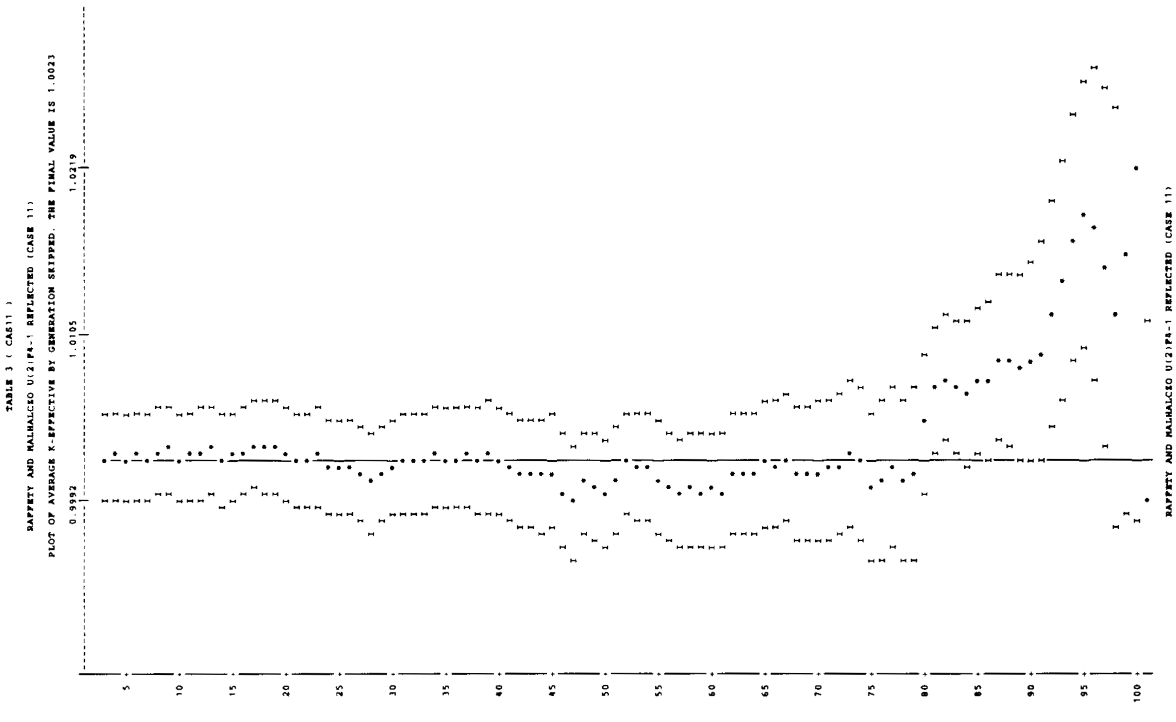


Fig. B.3. Plots for Table 3.



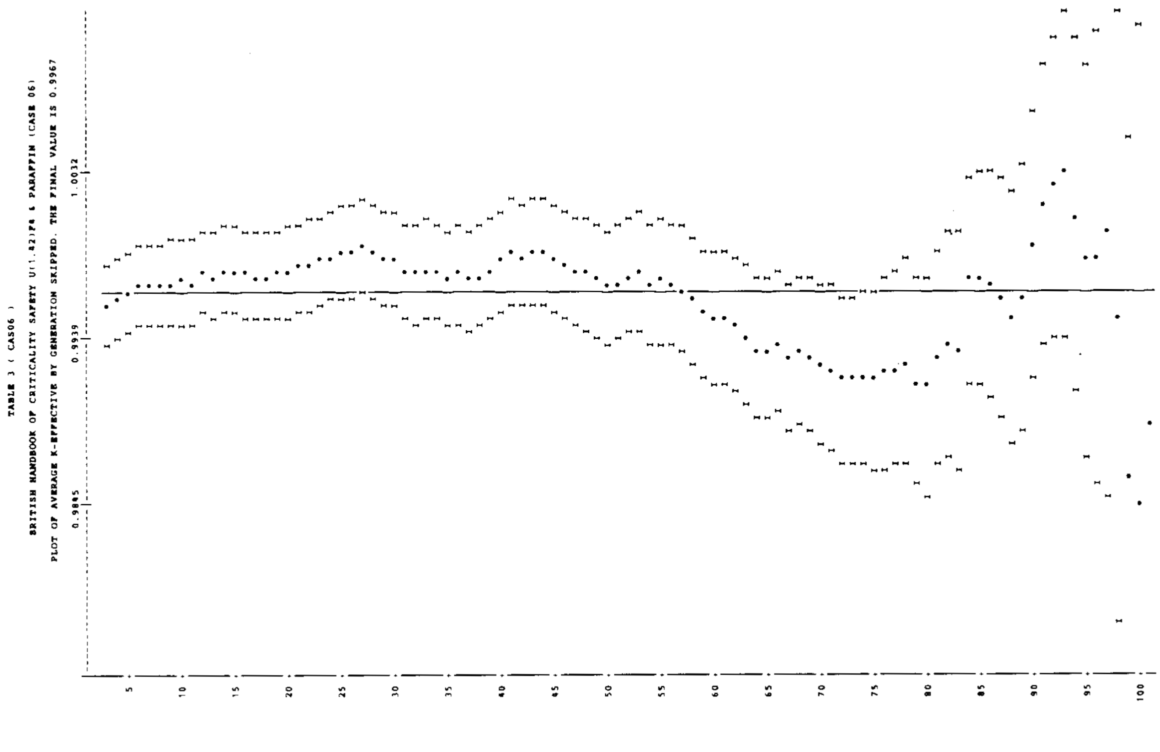
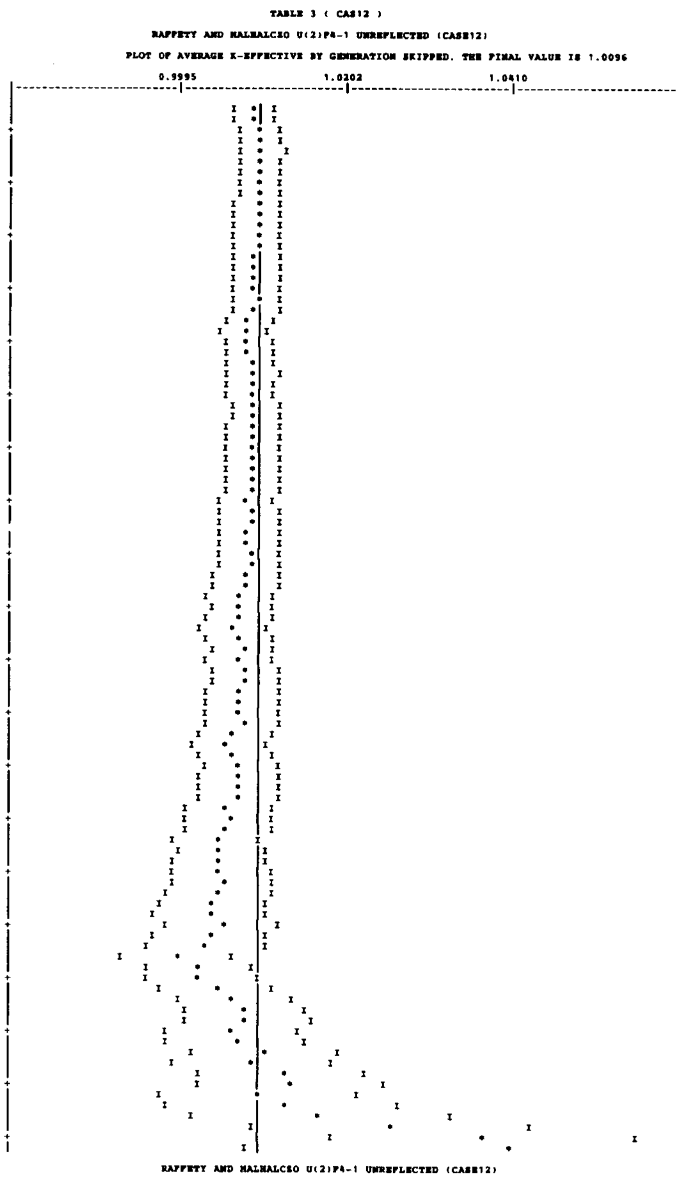


Fig. B.3 (continued)



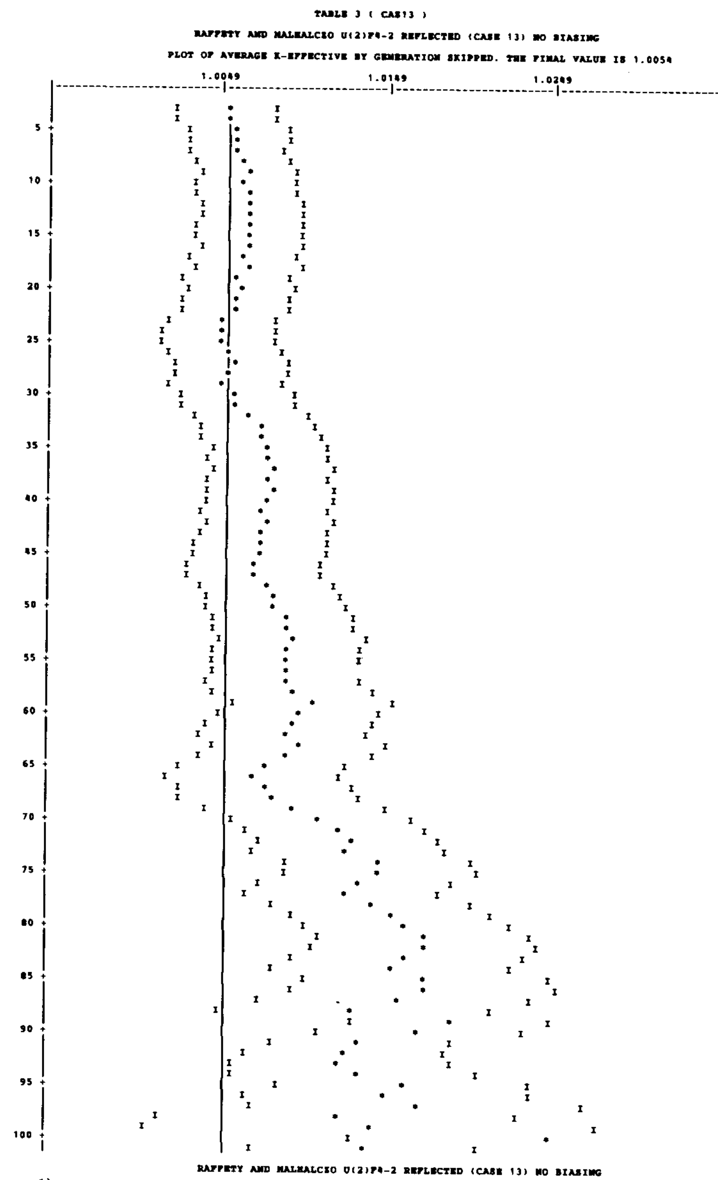
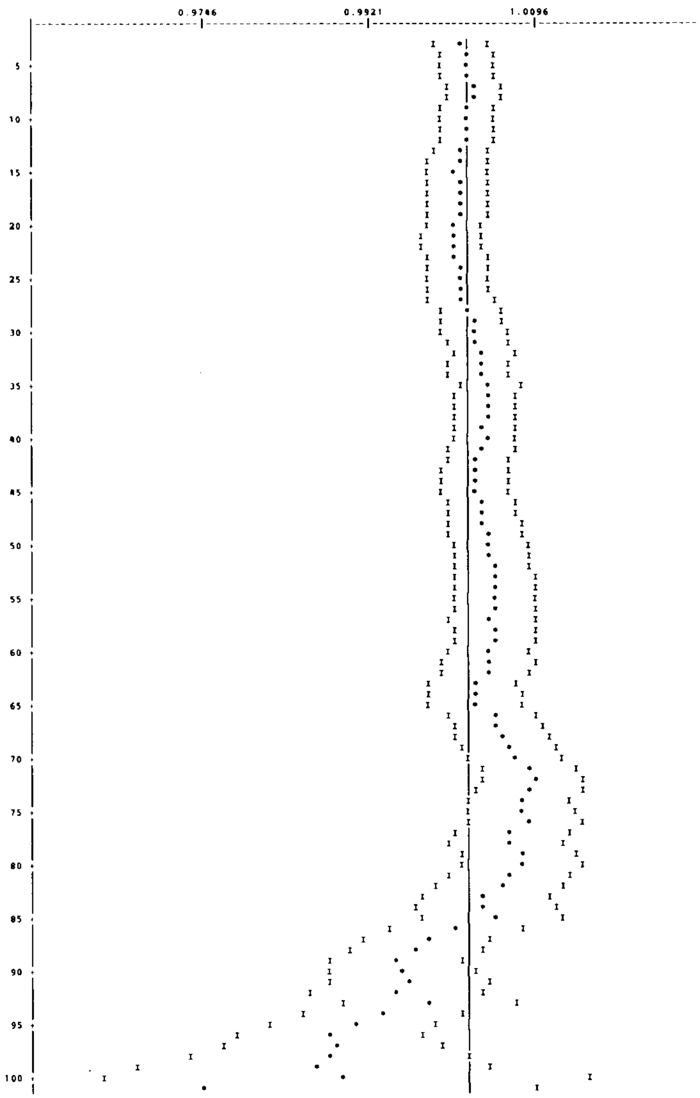


Fig. B.3 (continued)

TABLE 3 (CAS14)

RAFFETY AND MALHALCEO U(2)F4-2 UNREFLECTED (CASE 14)

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0028

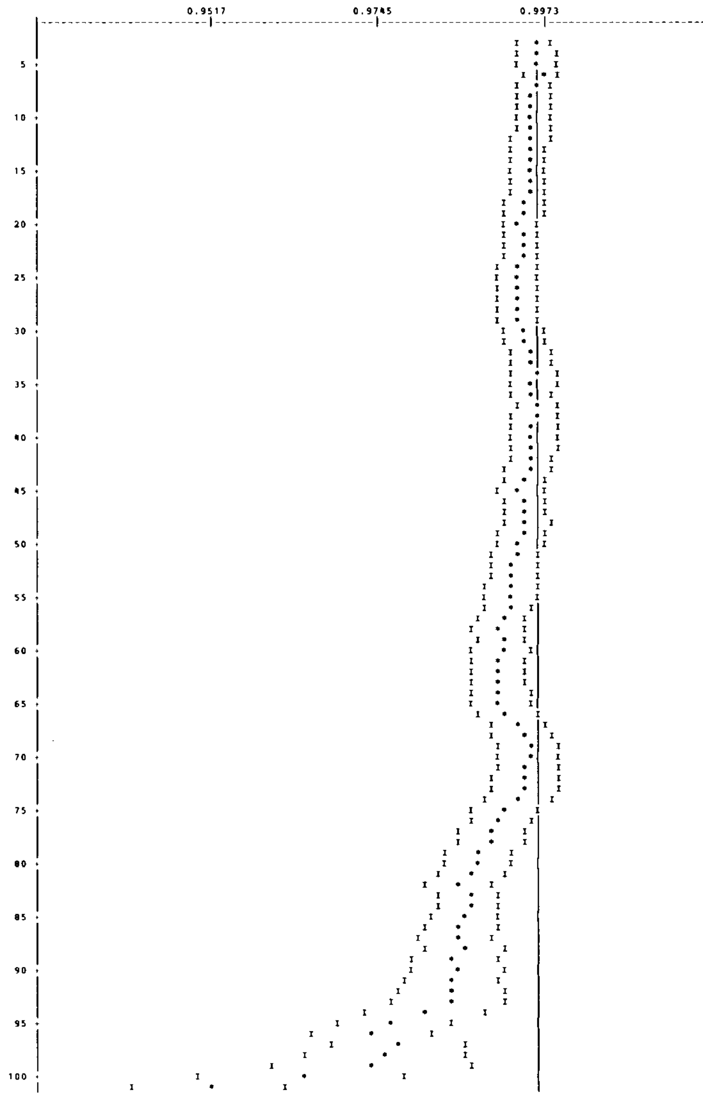


RAFFETY AND MALHALCEO U(2)F4-2 UNREFLECTED (CASE 14)

TABLE 3 (CAS15)

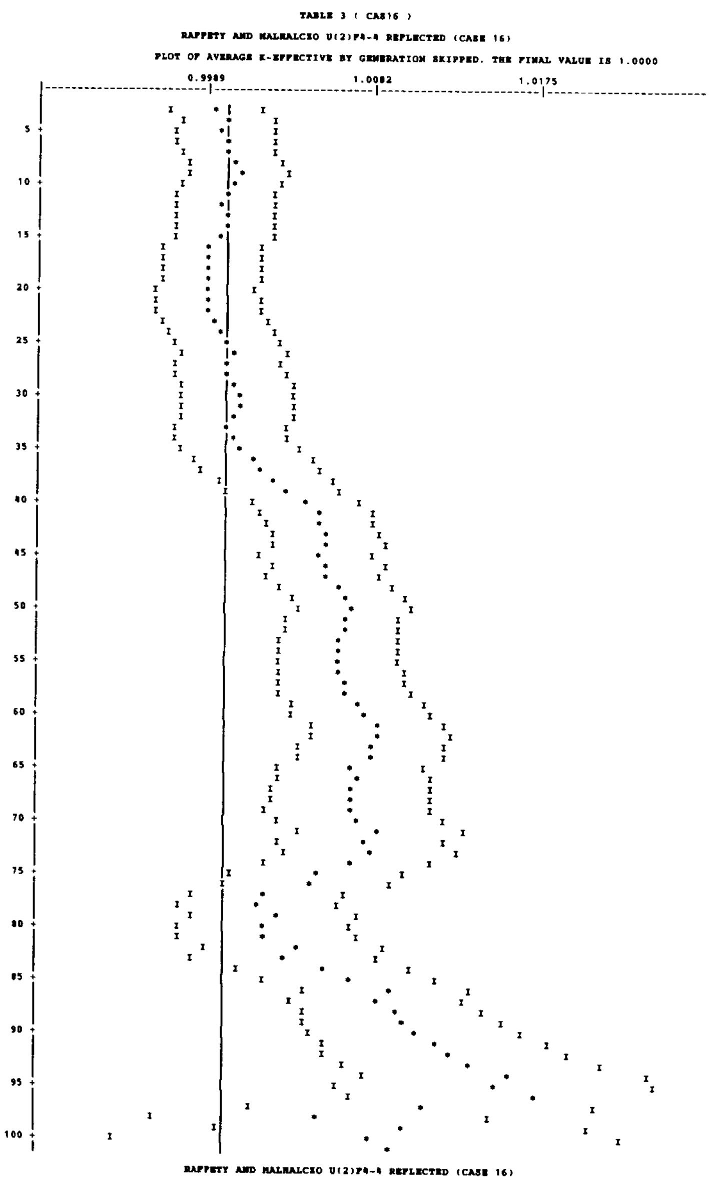
RAFFETY AND MALHALCEO U(2)F4-3 REFLECTED (CASE 15)

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 0.9967



RAFFETY AND MALHALCEO U(2)F4-3 REFLECTED (CASE 15)

Fig. B.3 (continued)



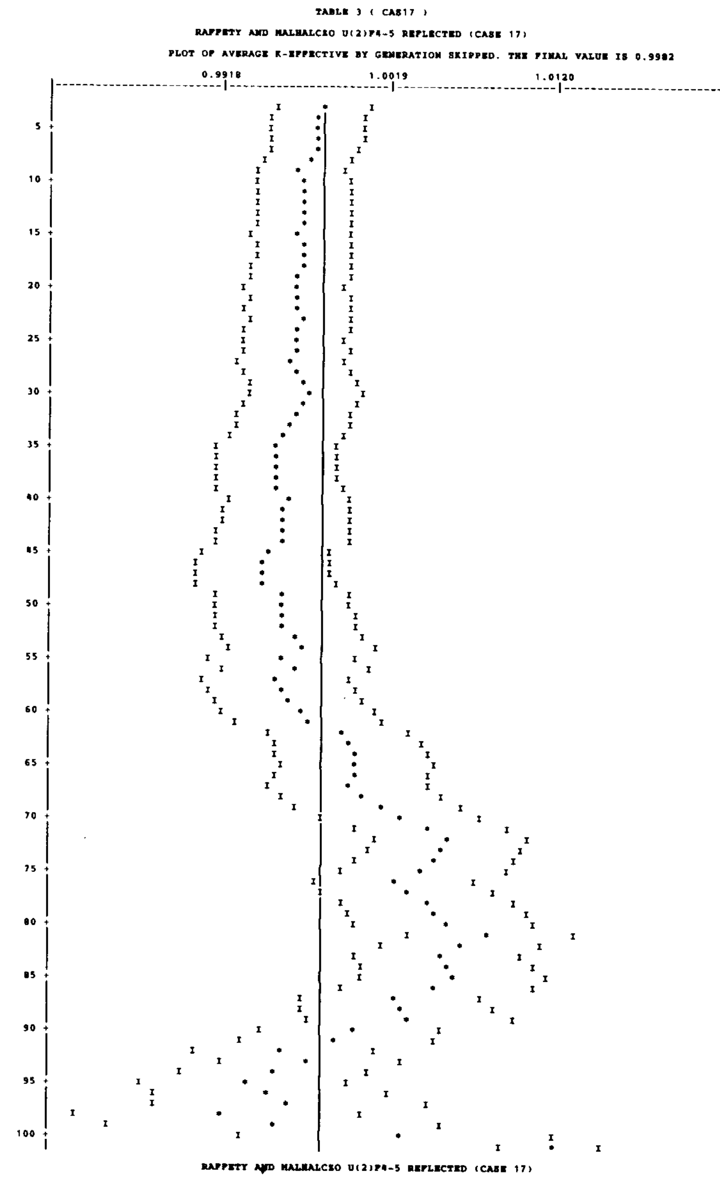
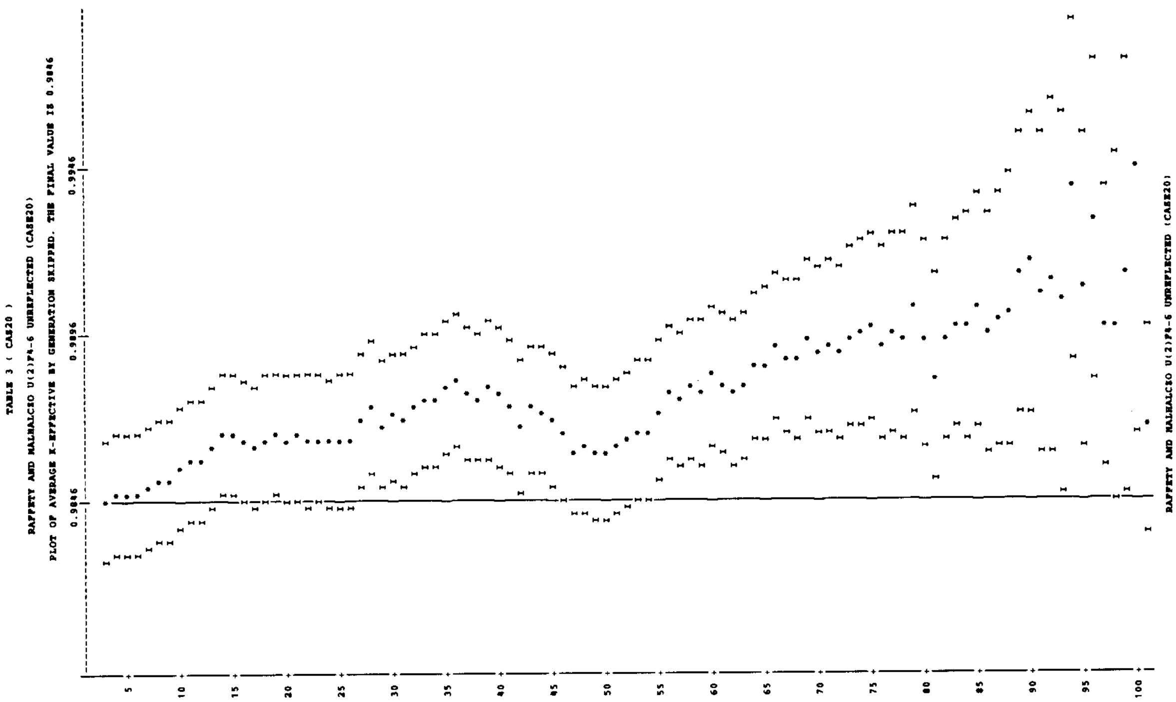


Fig. B.3 (continued)



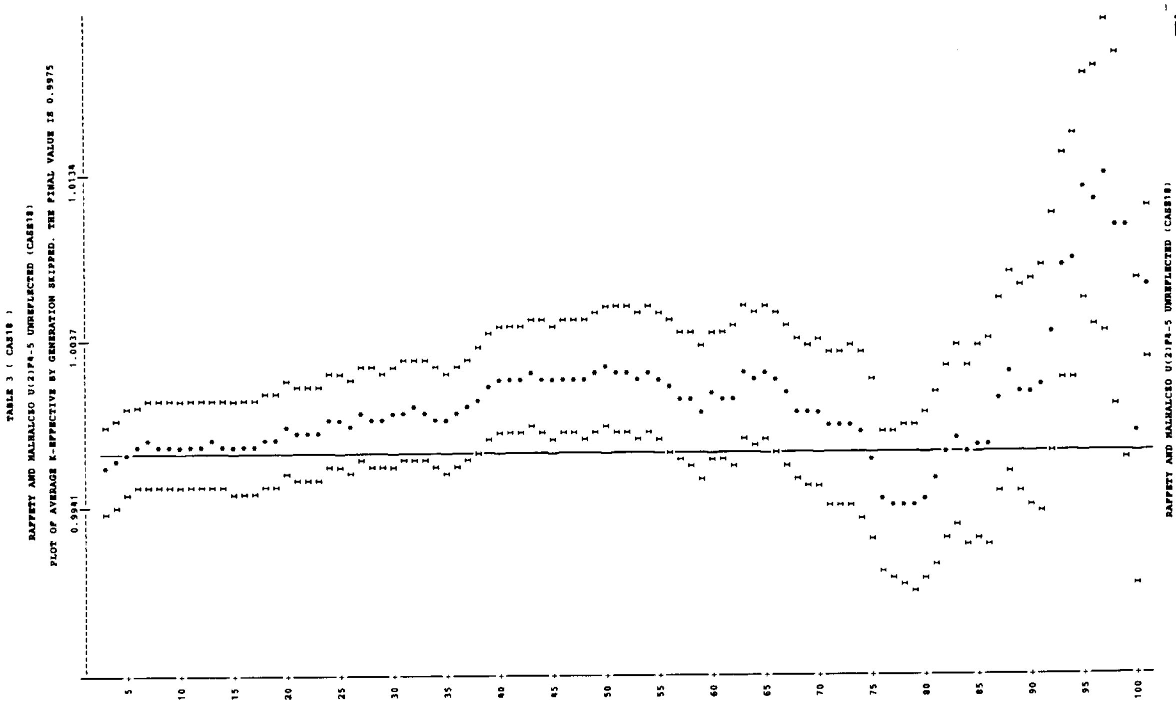
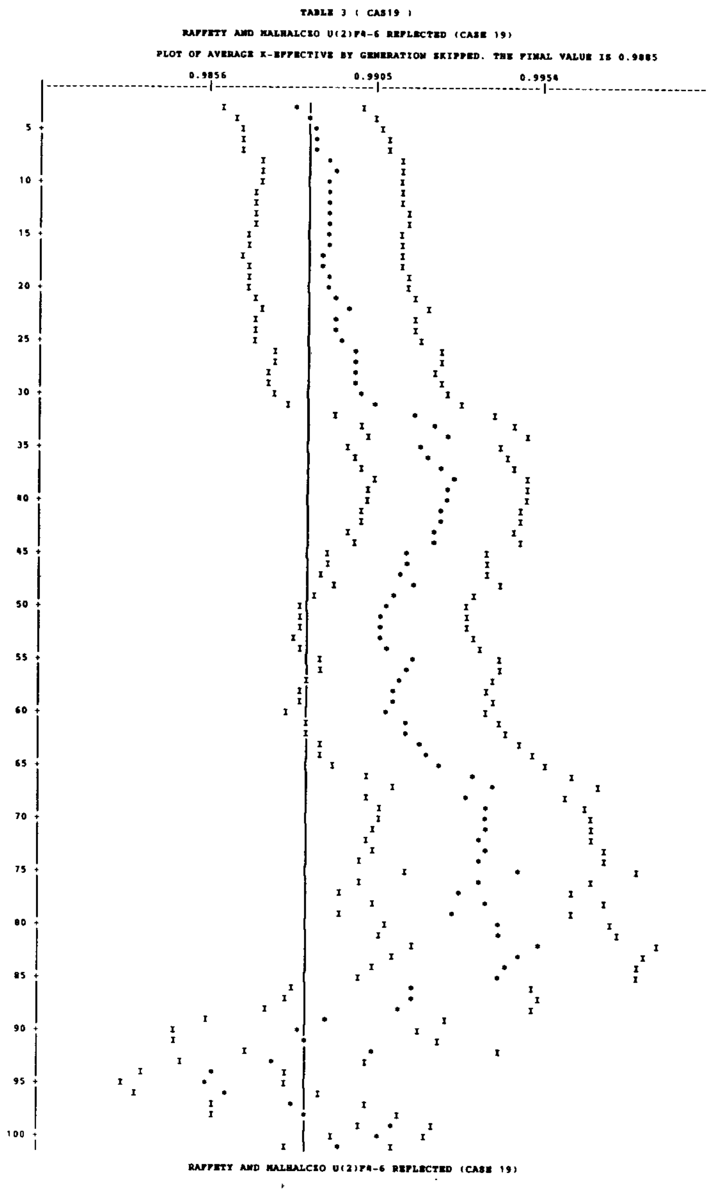


Fig. B.3 (continued)



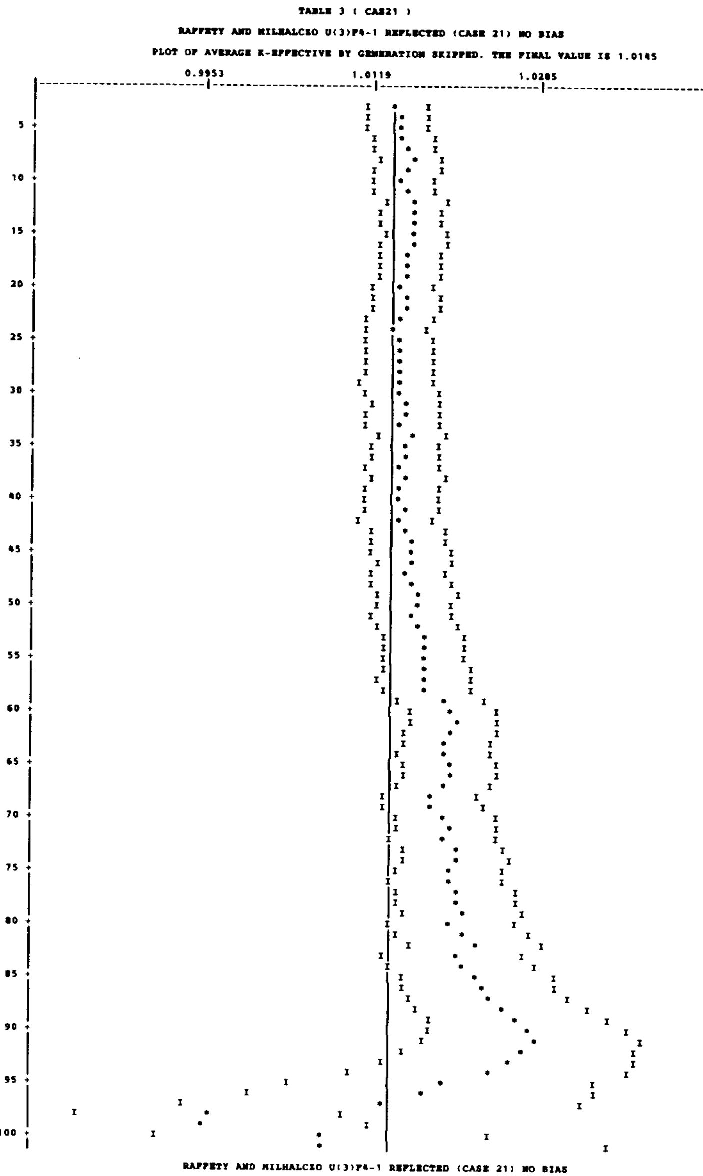
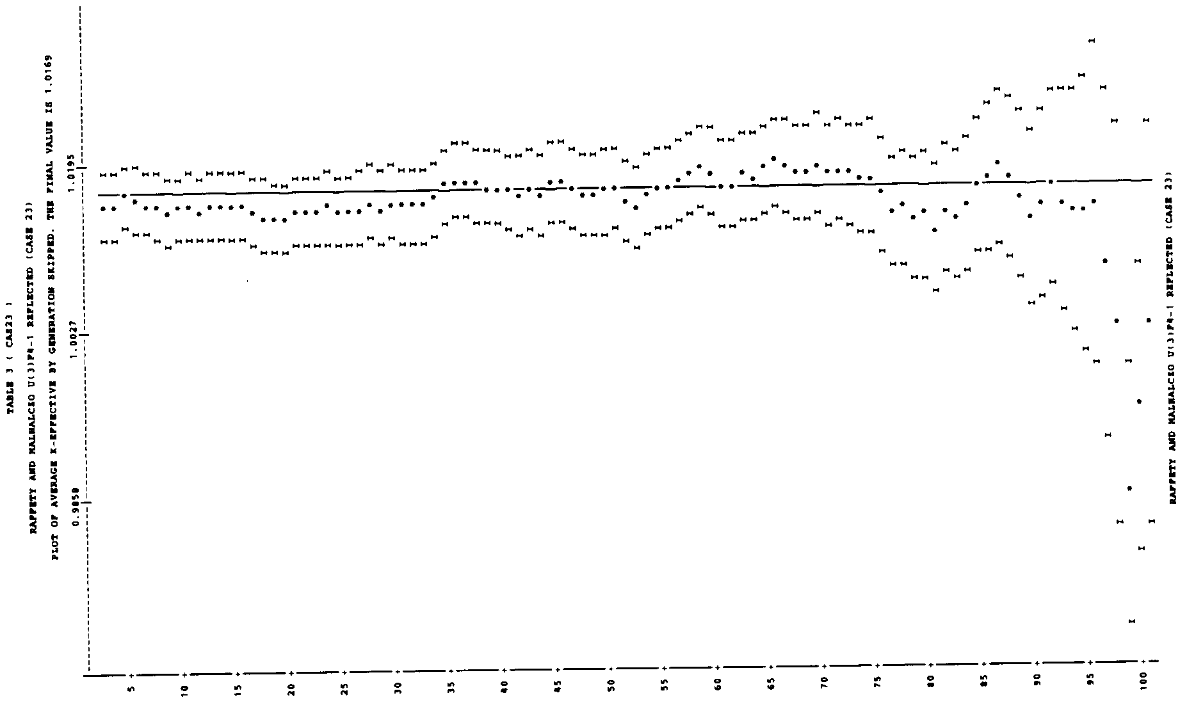


Fig. B.3 (continued)



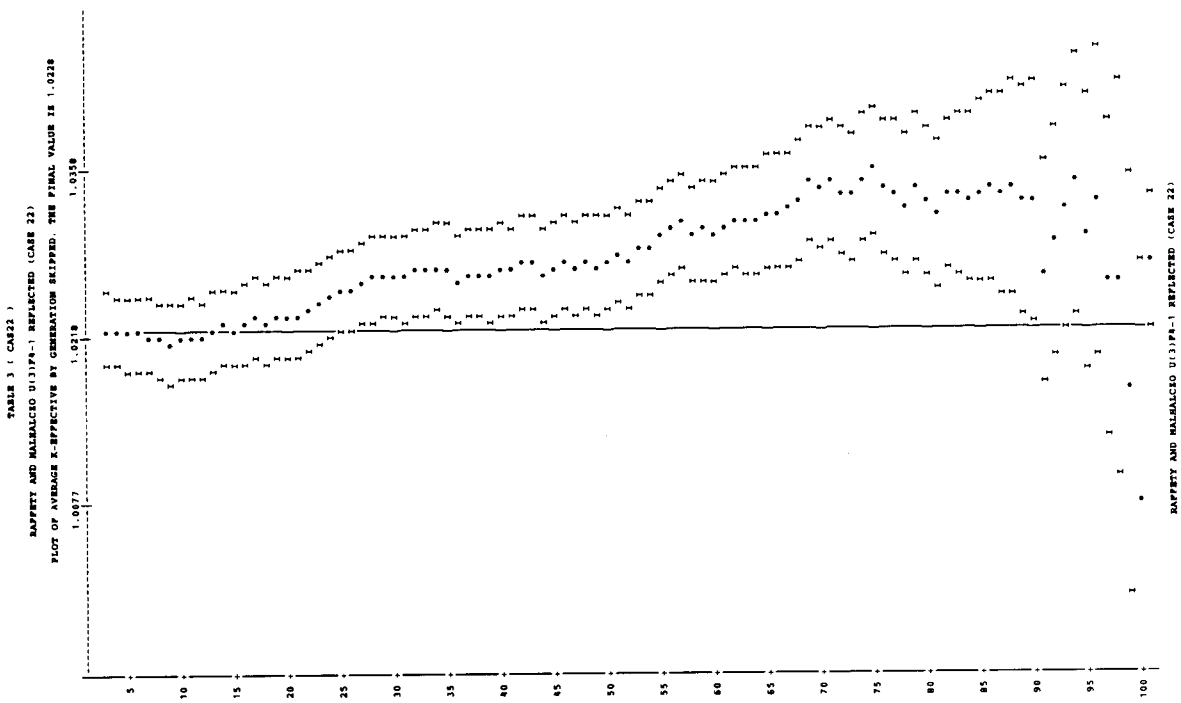
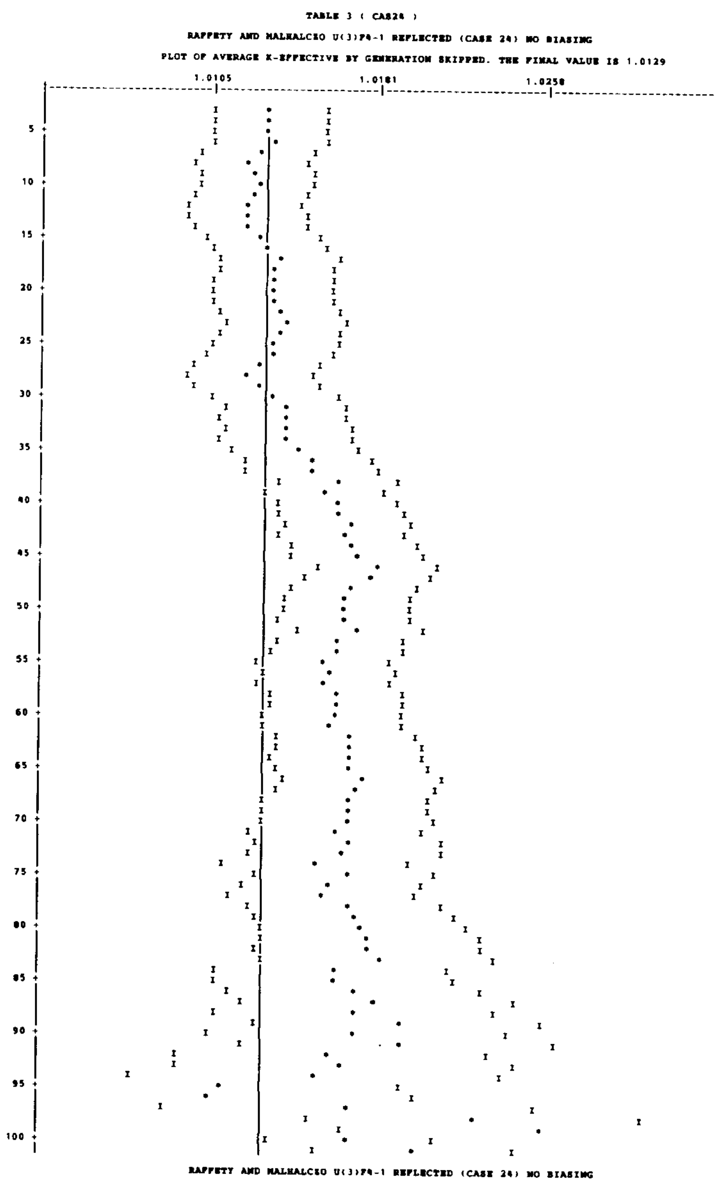


Fig. B.3 (continued)



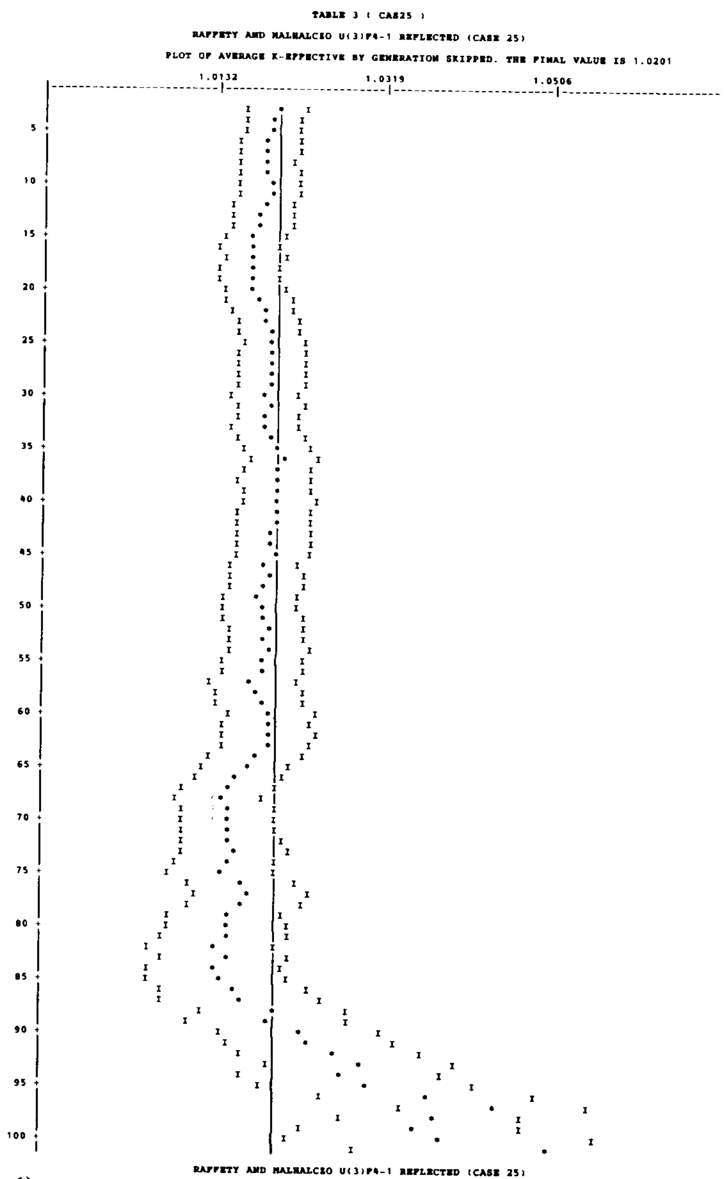
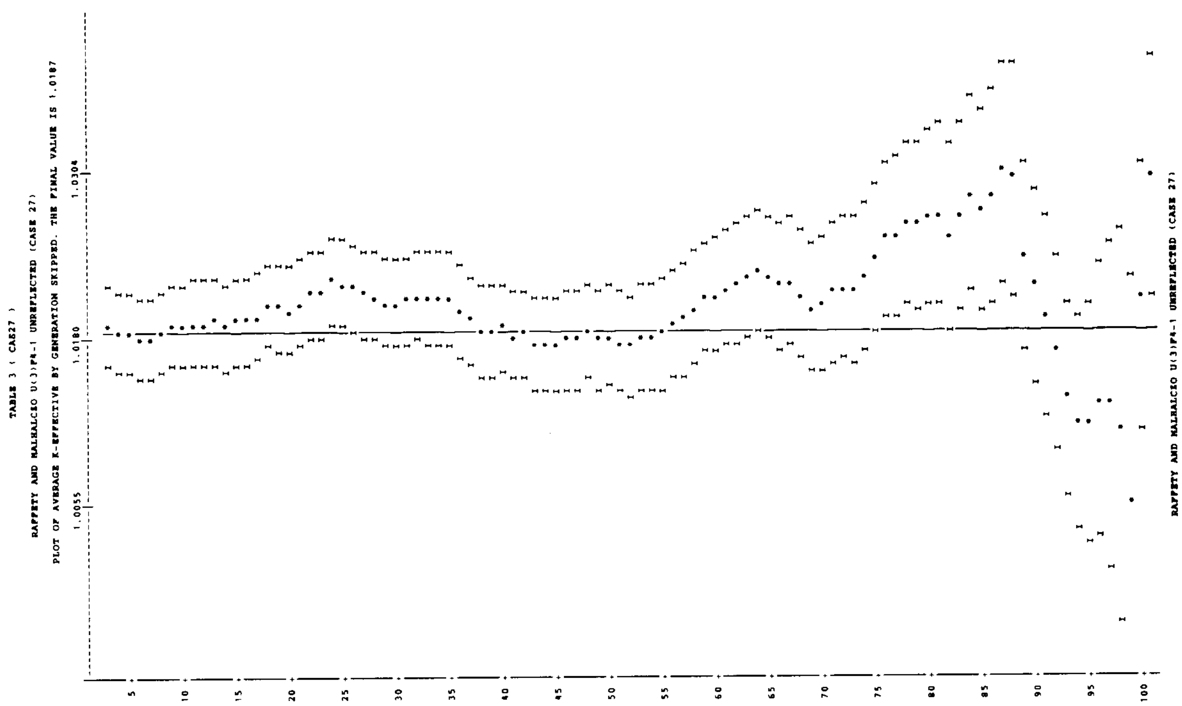


Fig. B.3 (continued)



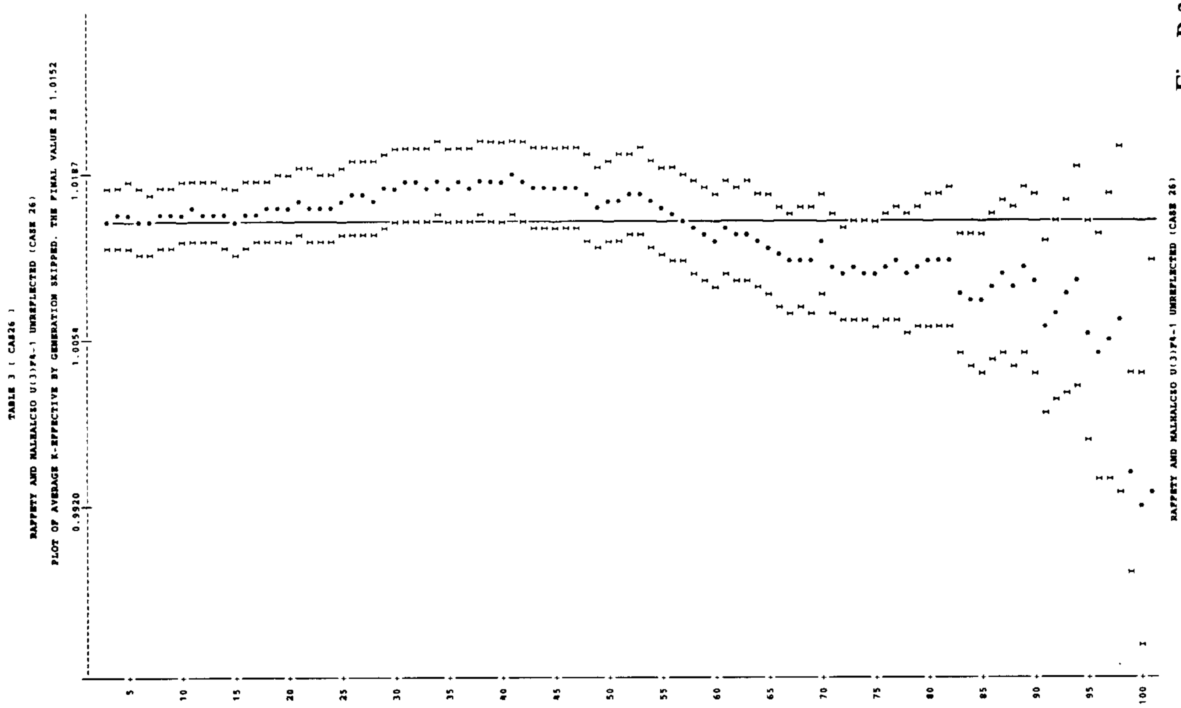
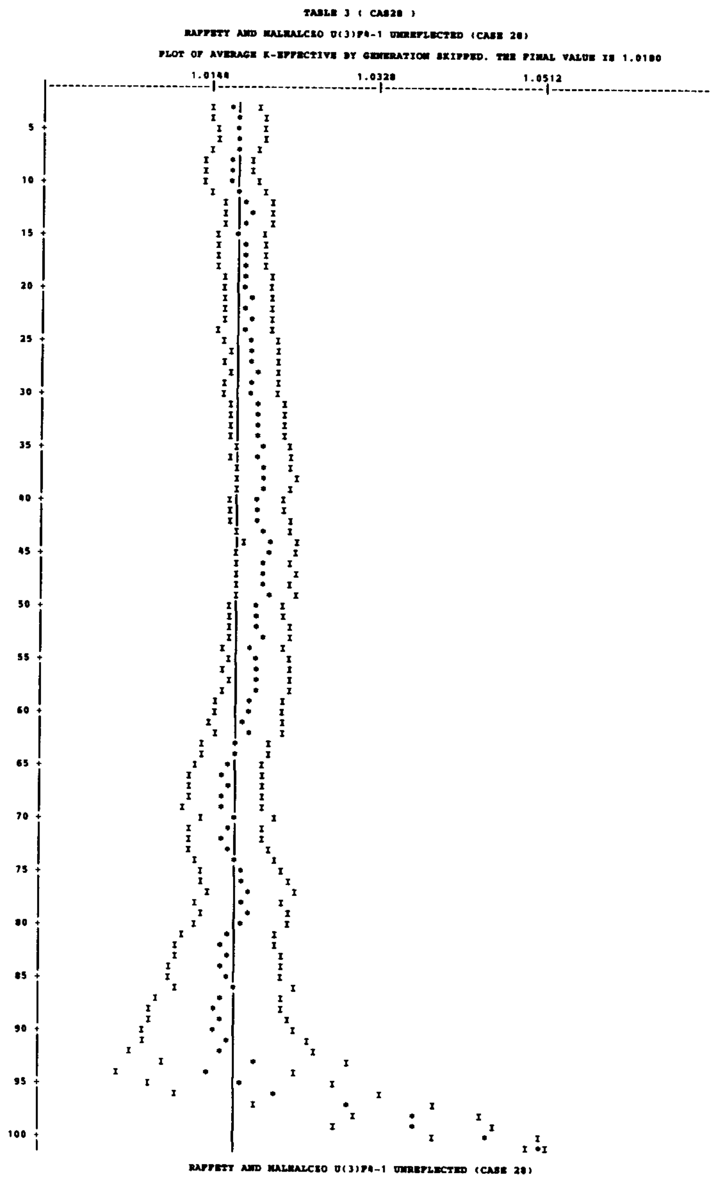


Fig. B.3 (continued)



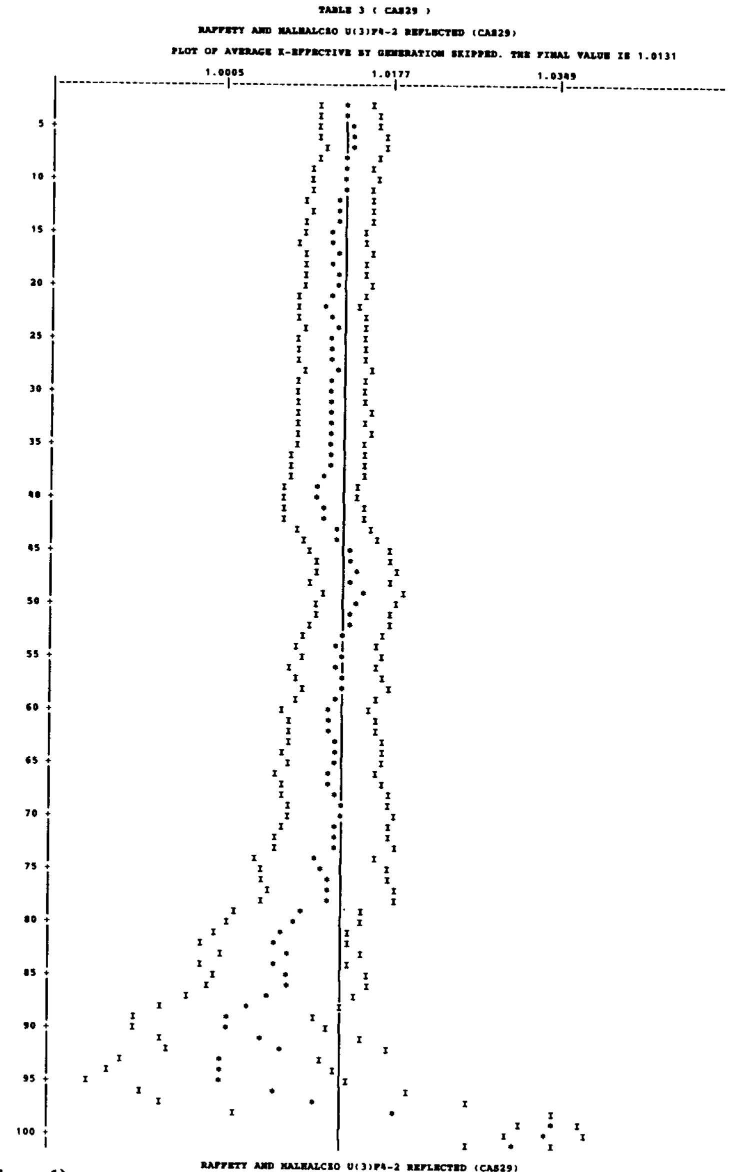
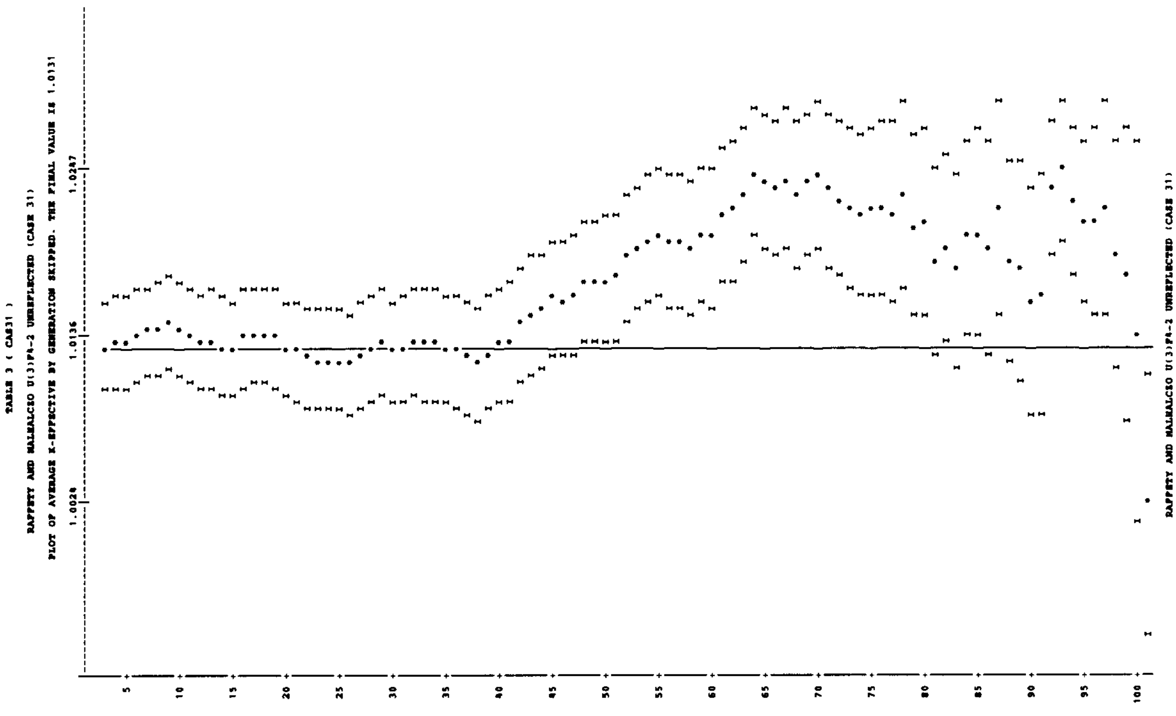


Fig. B.3 (continued)



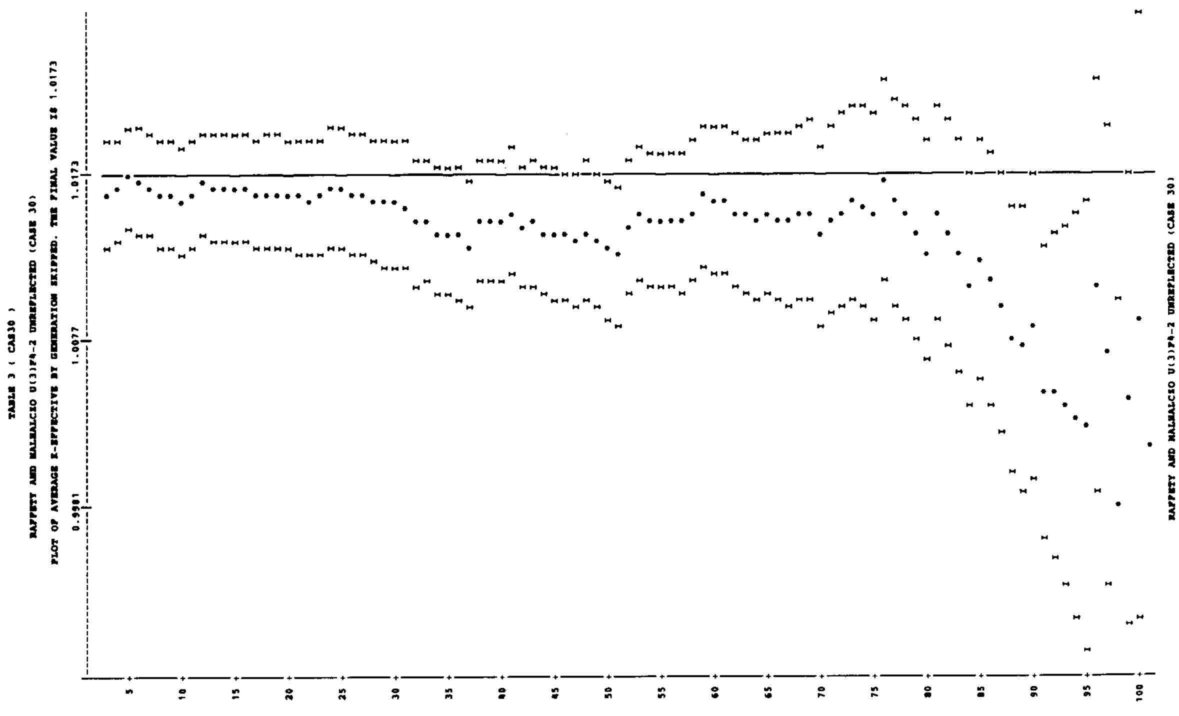
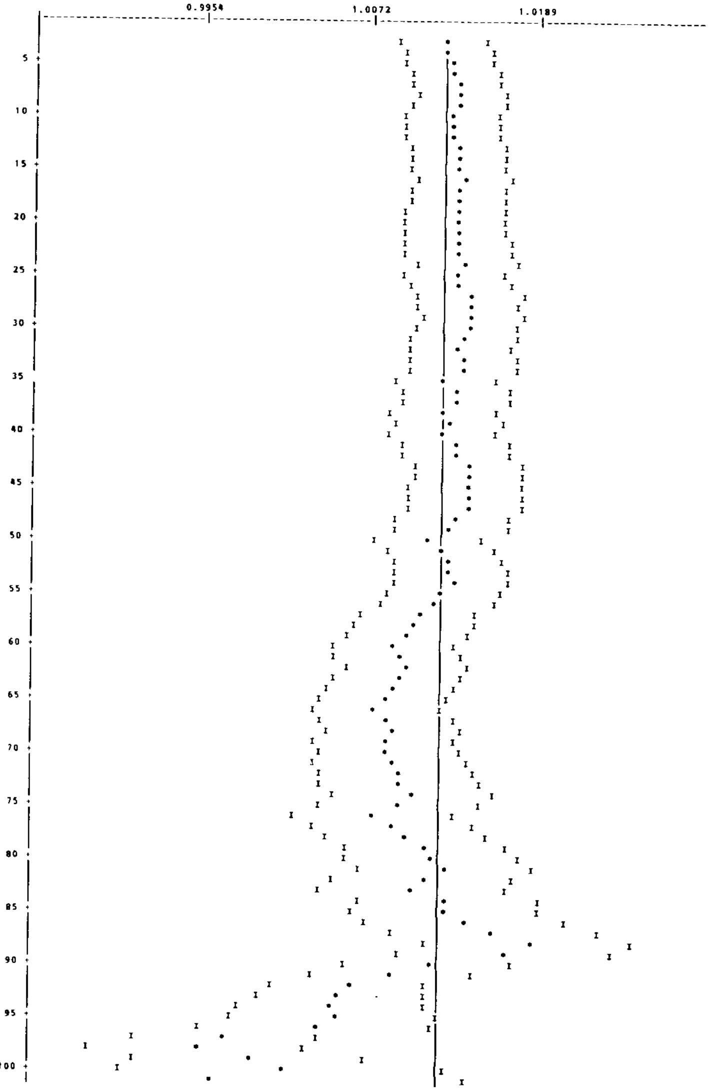


Fig. B.3 (continued)

TABLE 3 (CAS32)

RAFFETY AND MALHALCSO U(3)F4-2 UNREFLECTED (CASE 32)

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0124

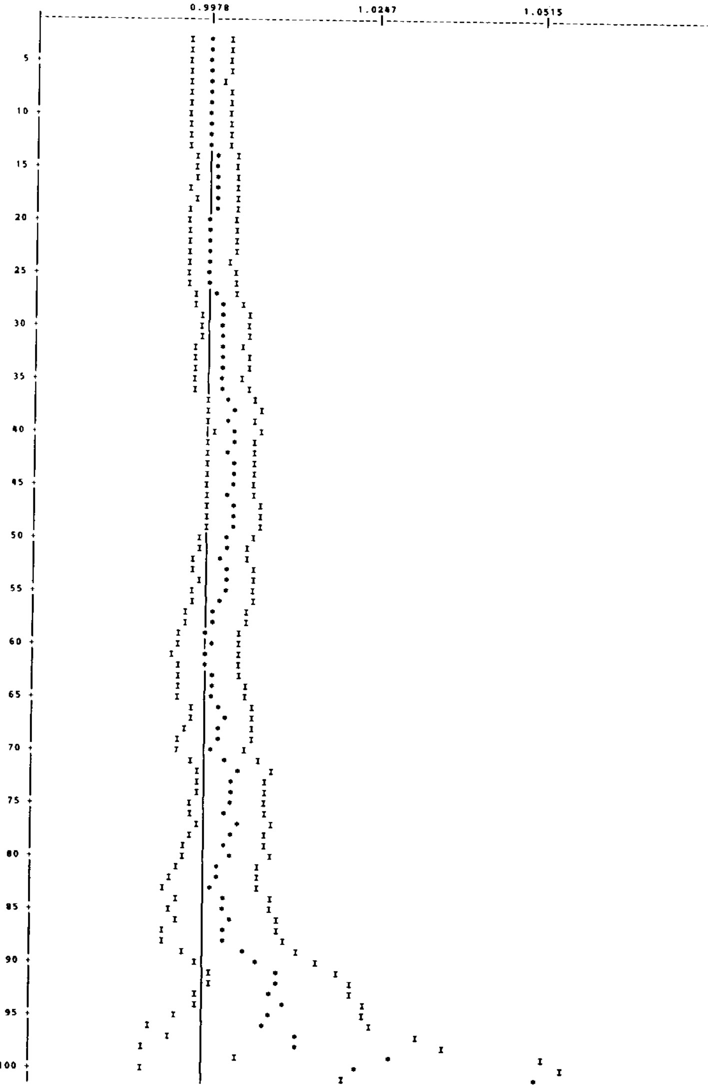


RAFFETY AND MALHALCSO U(3)F4-2 UNREFLECTED (CASE 32)

TABLE 3 (CAS33)

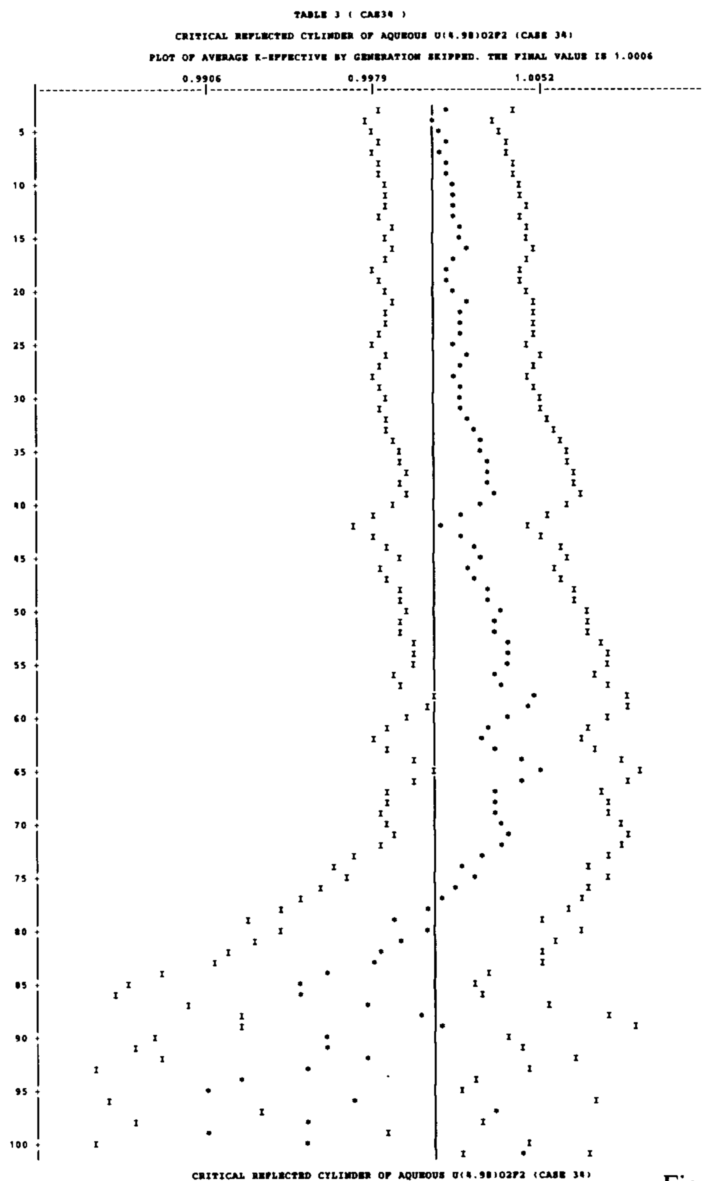
CRITICAL REFLECTED CYLINDER OF AQUEOUS U(4.98)O2F2 (CASE 33)

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 0.9989



CRITICAL REFLECTED CYLINDER OF AQUEOUS U(4.98)O2F2 (CASE 33)

Fig. B.3 (continued)



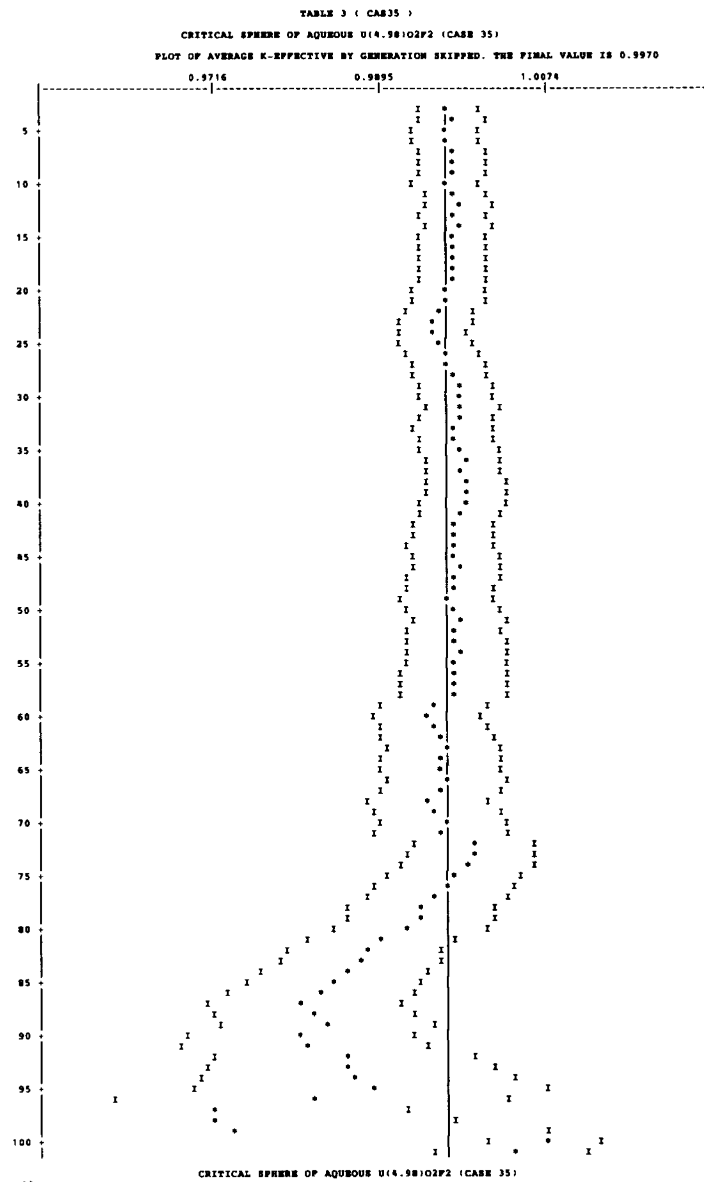


Fig. B.3 (continued)

TABLE 3 (CAS36)

CRITICAL CYLINDER OF AQUEOUS U(4.98)O2F2 (CASE 36)

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0023

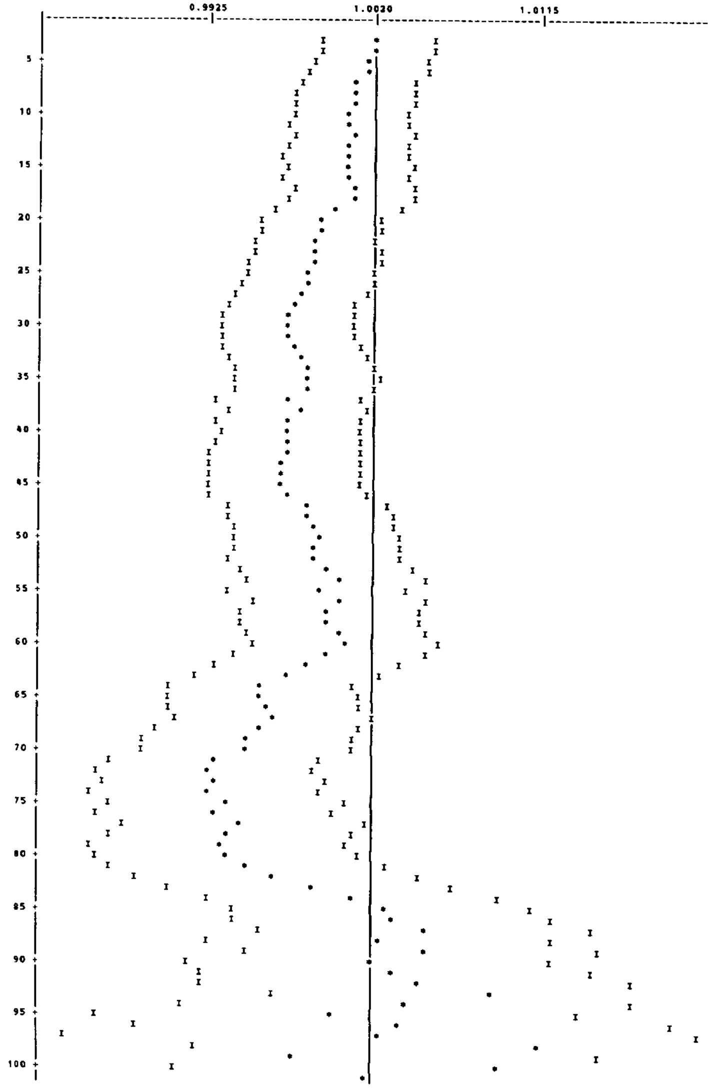


TABLE 3 (CAR01)

ROCKY FLATS CRITICALS NUREG/CR-1071 EXPERIMENT NUMBER 1 (27 GROUP)

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0081

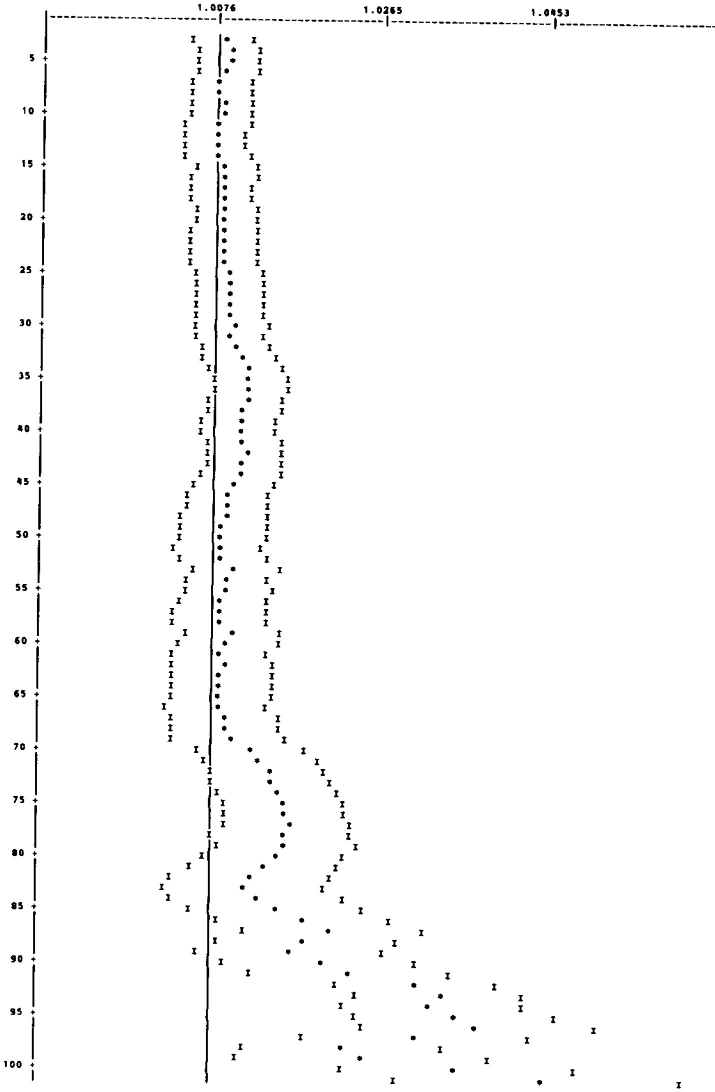
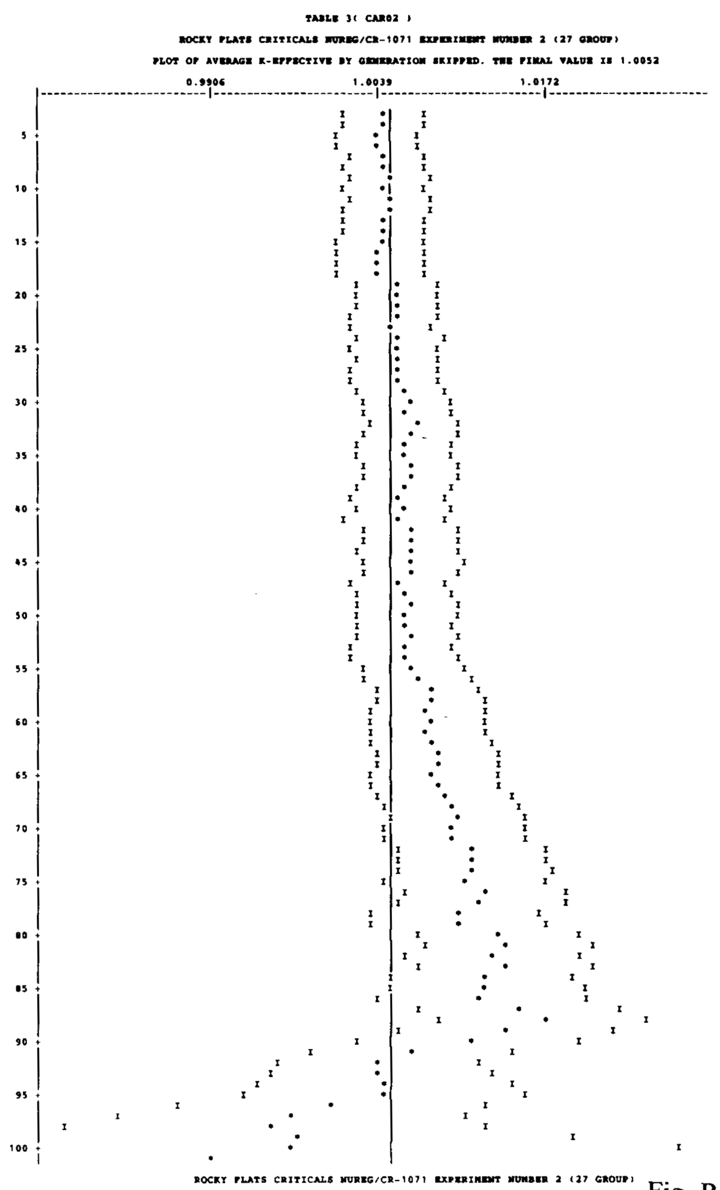


Fig. B.3 (continued)



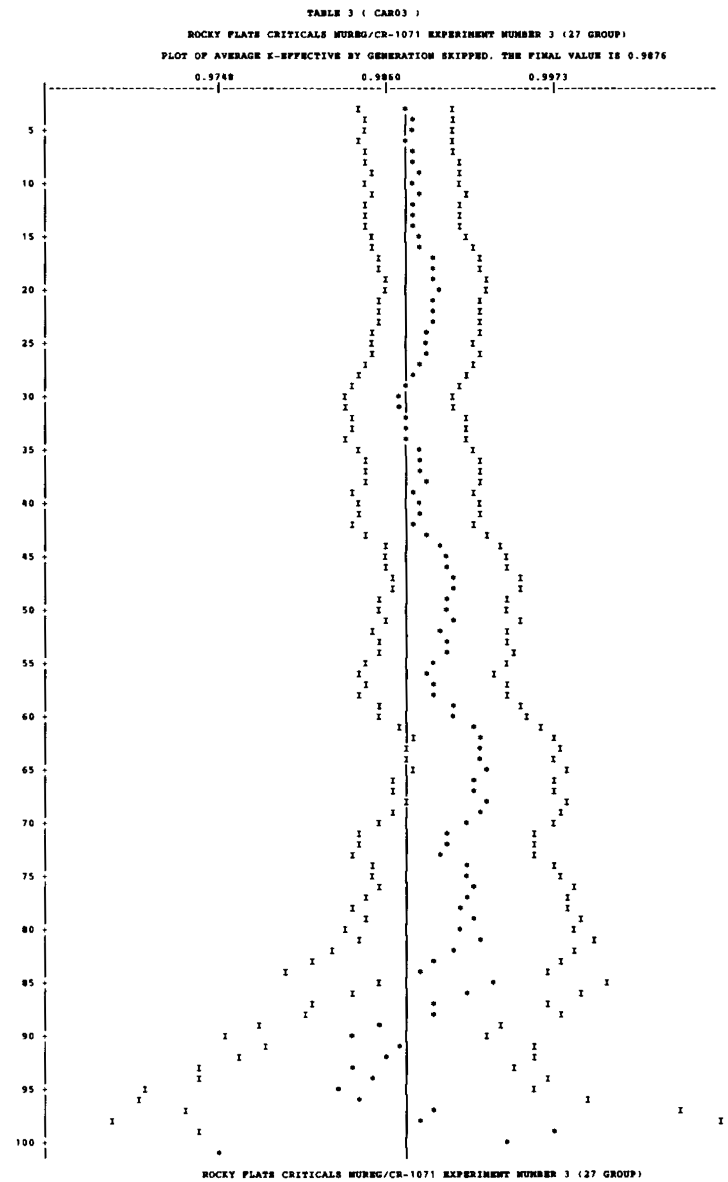
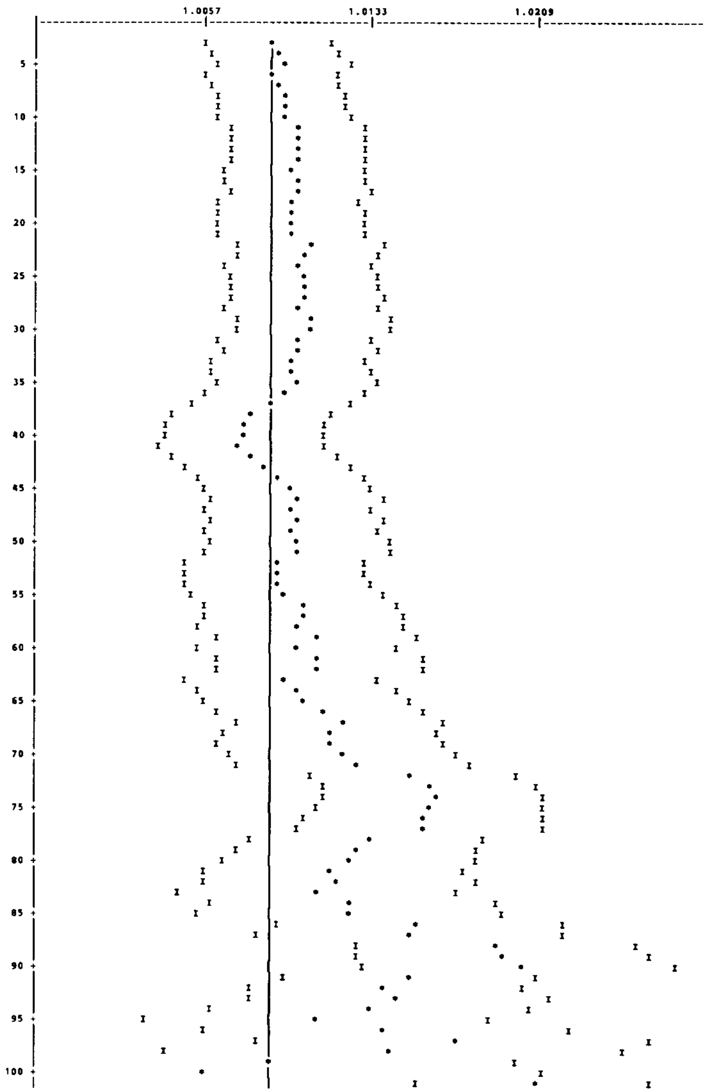


Fig. B.3 (continued)

TABLE 3 (CAR04)

ROCKY FLATS CRITICALS NUREG/CR-1071 EXPERIMENT NUMBER 13 (27 GROUP)

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0089

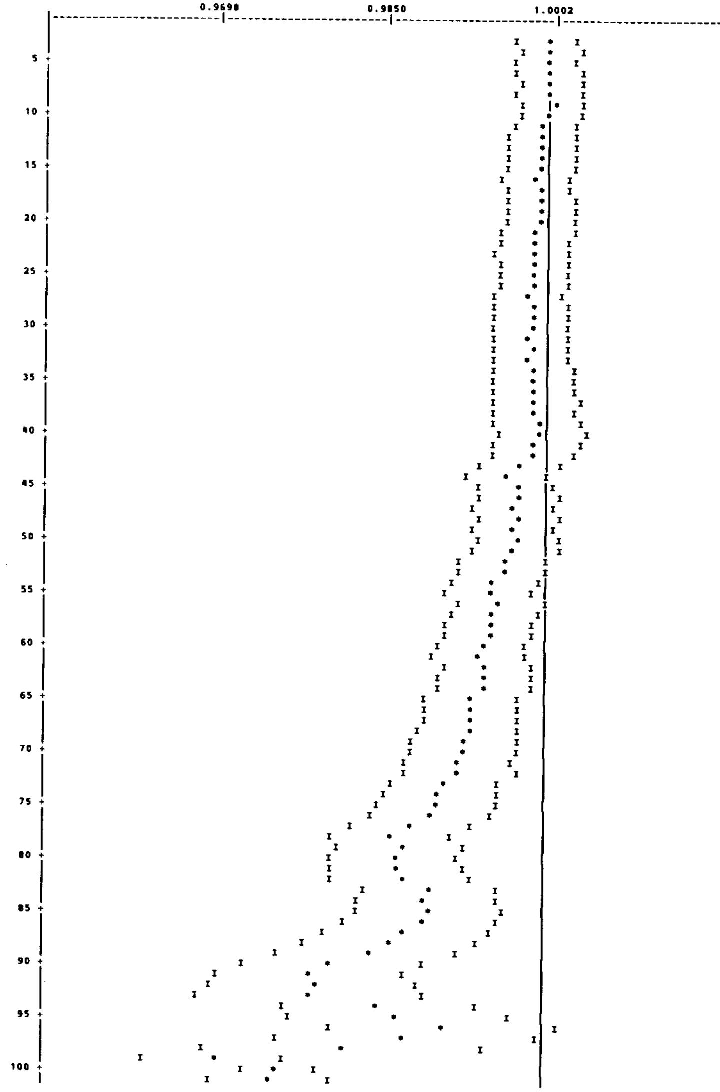


ROCKY FLATS CRITICALS NUREG/CR-1071 EXPERIMENT NUMBER 13 (27 GROUP)

TABLE 3 (CAR05)

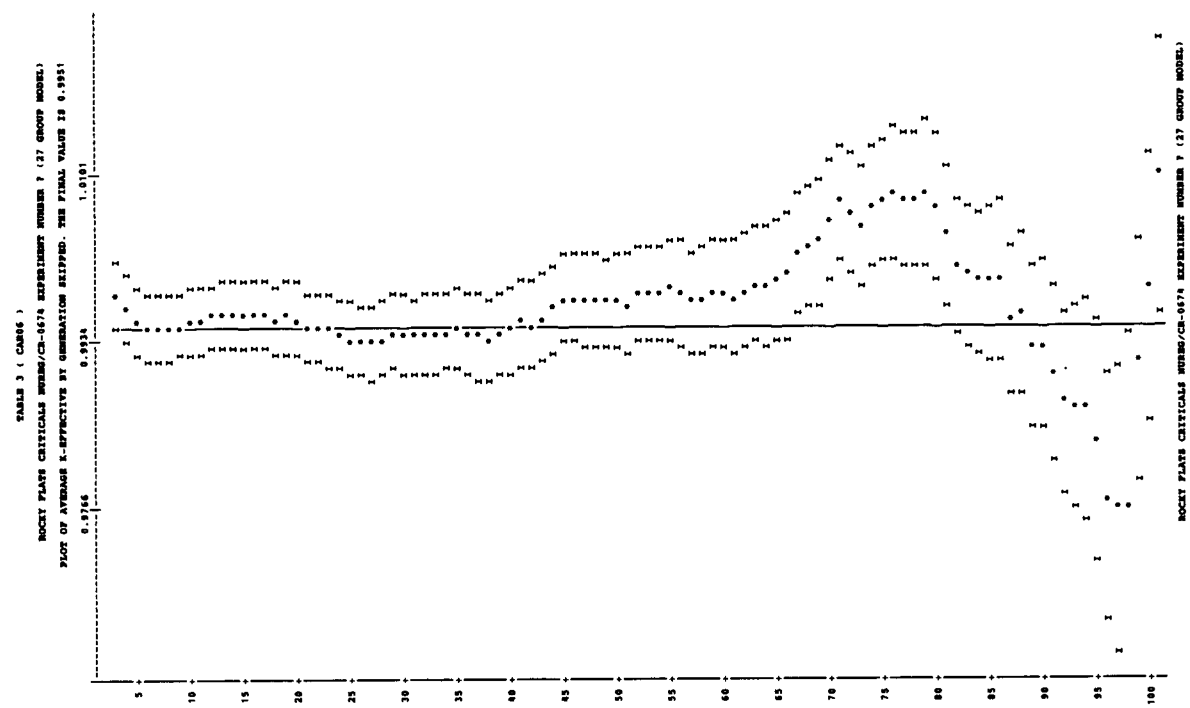
ROCKY FLATS CRITICALS NUREG/CR-1071 EXPERIMENT NUMBER 15 (27 GROUP)

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 0.9998



ROCKY FLATS CRITICALS NUREG/CR-1071 EXPERIMENT NUMBER 15 (27 GROUP)

Fig. B.3 (continued)



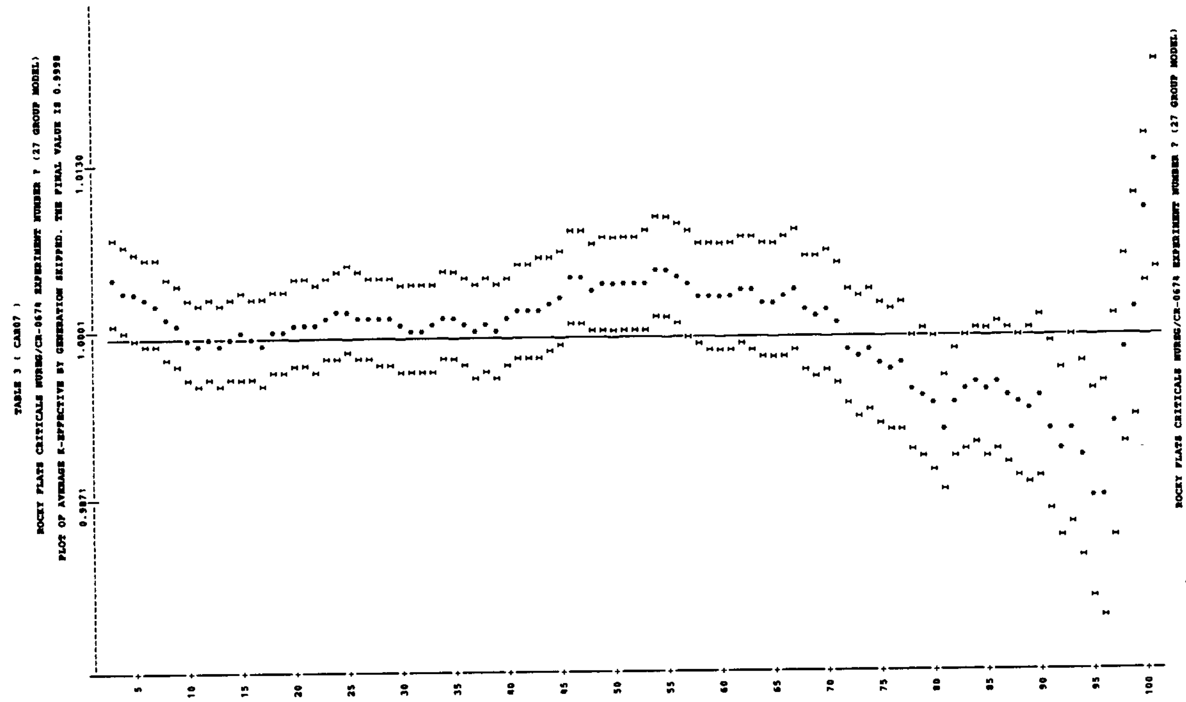
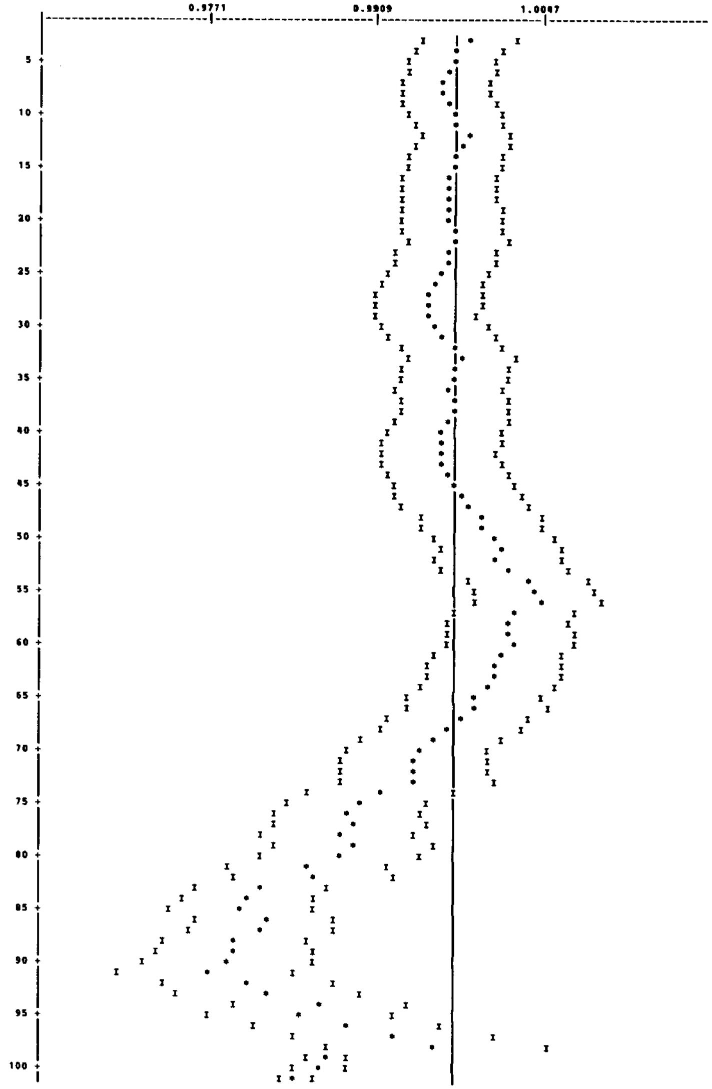


Fig. B.3 (continued)

TABLE 3 (CAR08)

ROCKY FLATS CRITICALS NUREG/CR-0674 EXPERIMENT NUMBER 7 (27 GROUP MODEL)

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 0.9980

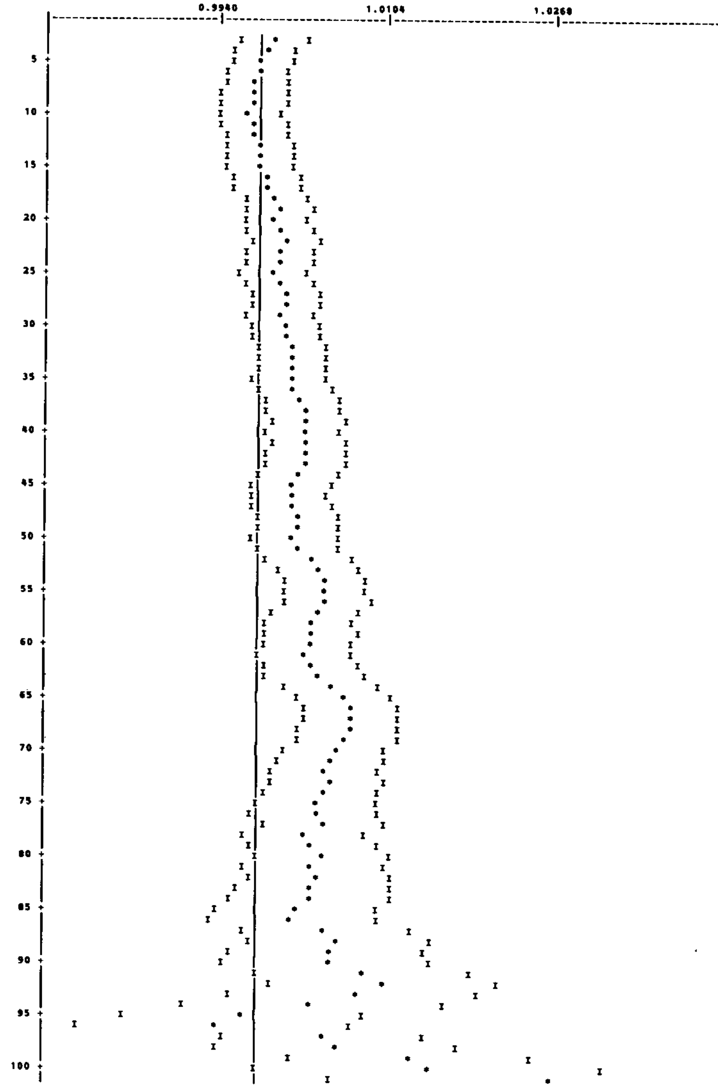


ROCKY FLATS CRITICALS NUREG/CR-0674 EXPERIMENT NUMBER 7 (27 GROUP MODEL)

TABLE 3 (CAR09)

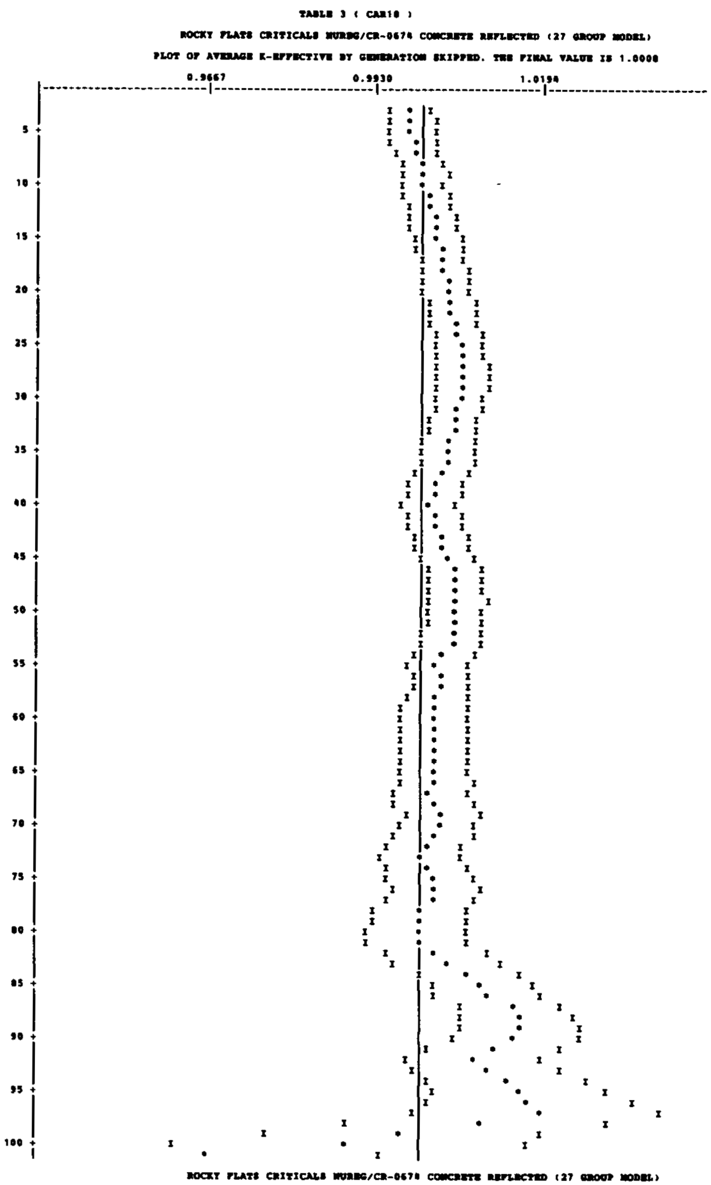
ROCKY FLATS CRITICALS NUREG/CR-0674 EXPERIMENT NUMBER 2 (27 GROUP MODEL)

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 0.9983



ROCKY FLATS CRITICALS NUREG/CR-0674 EXPERIMENT NUMBER 2 (27 GROUP MODEL)

Fig. B.3 (continued)



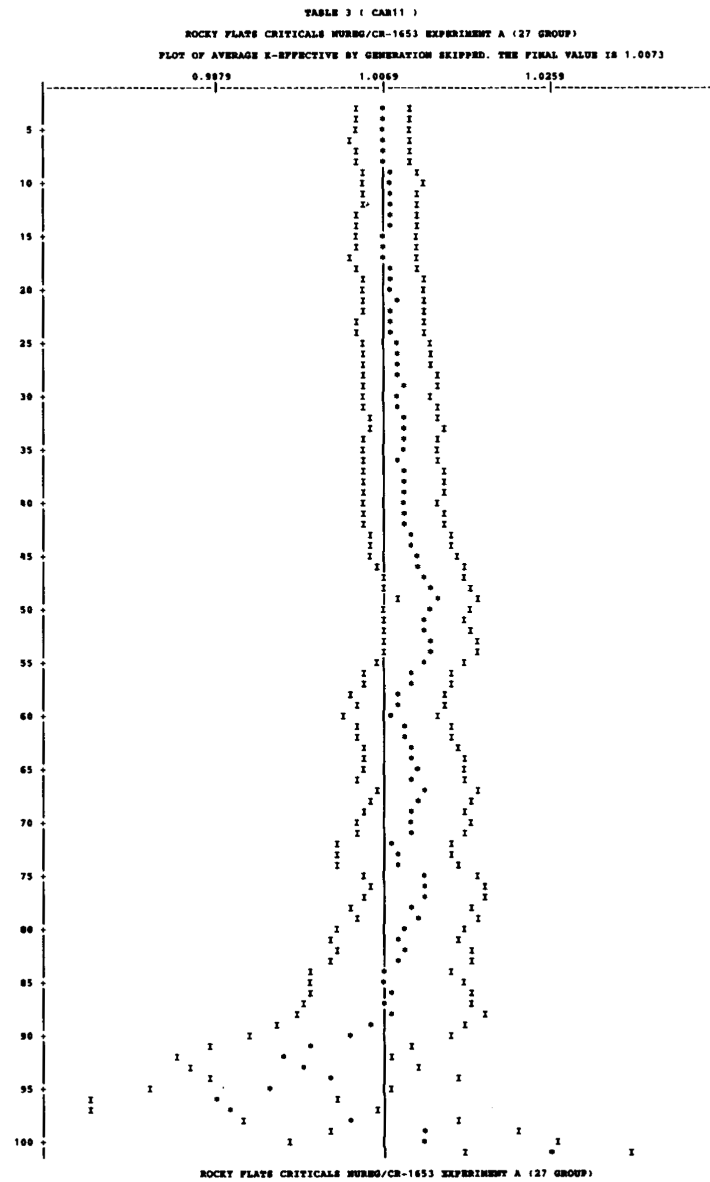
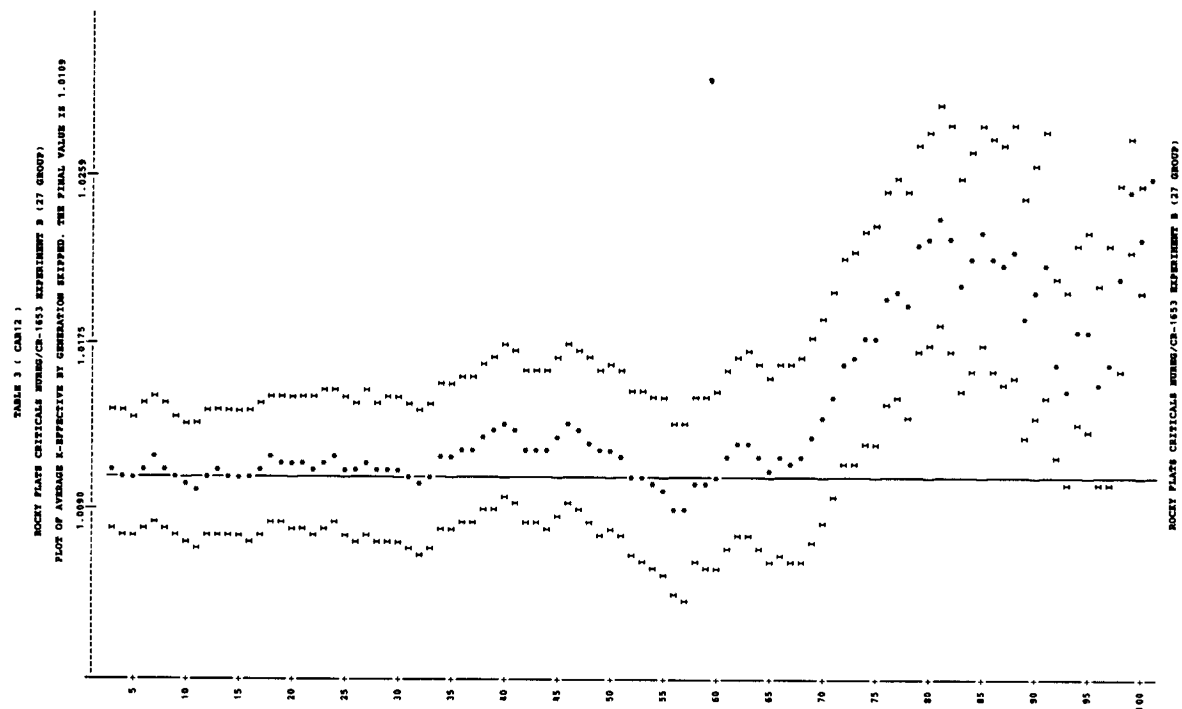


Fig. B.3 (continued)



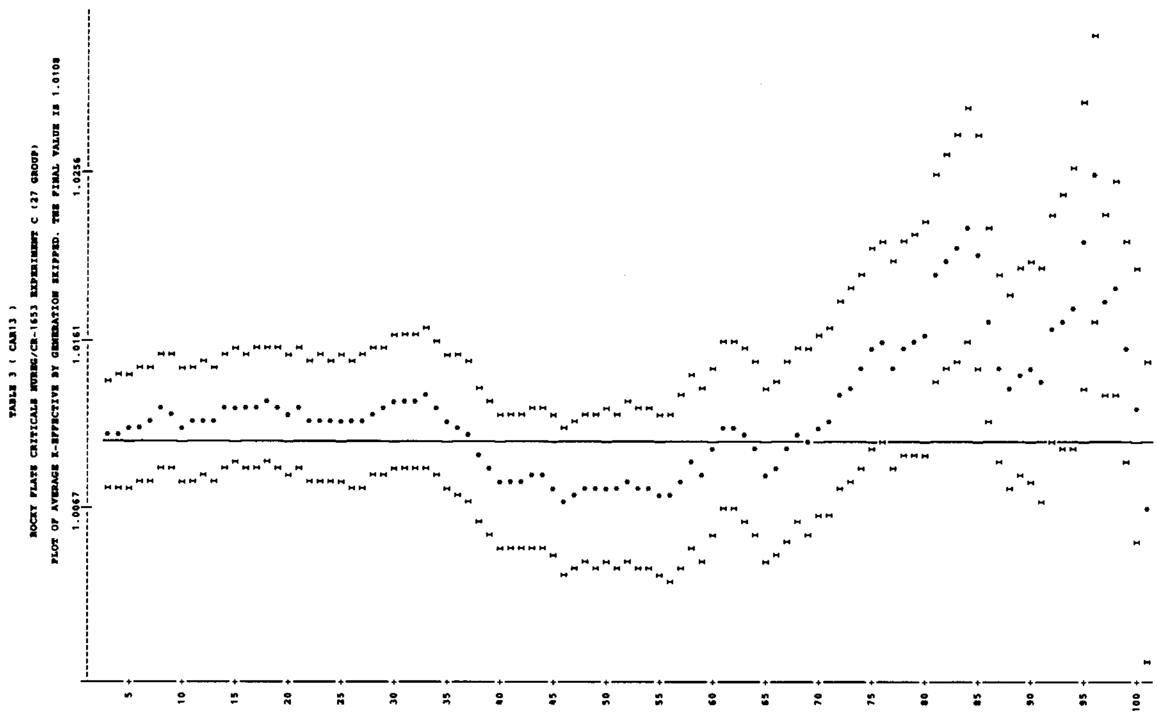
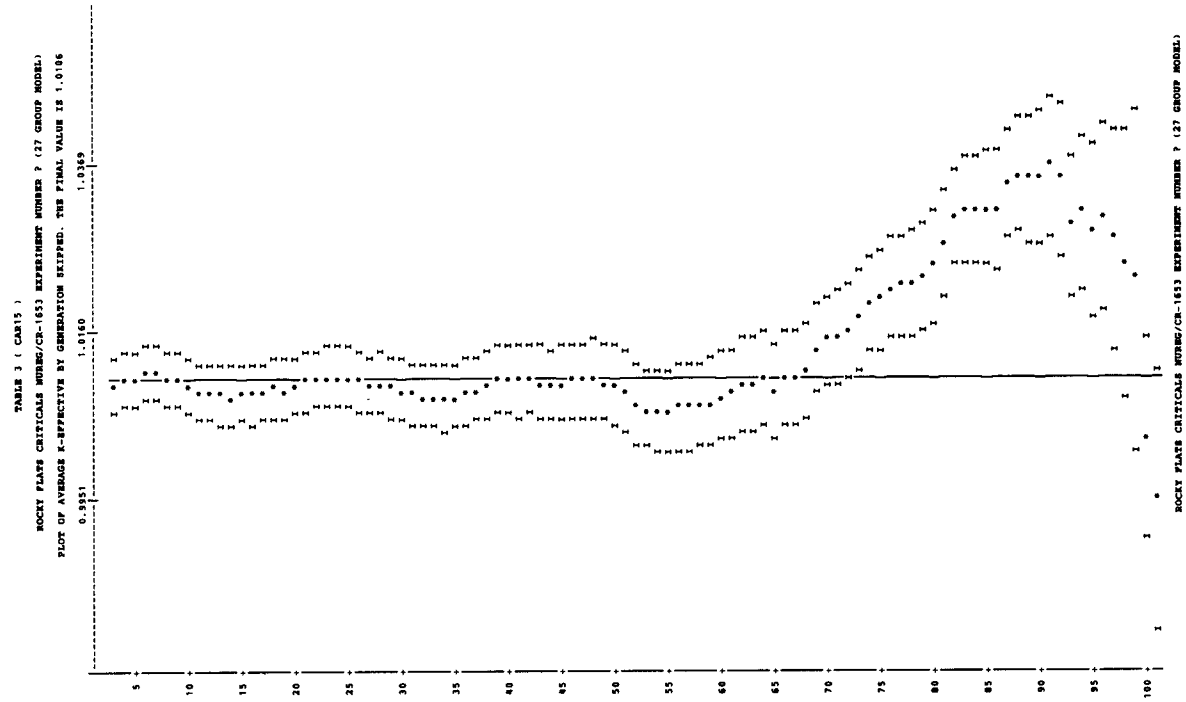


Fig. B.3 (continued)



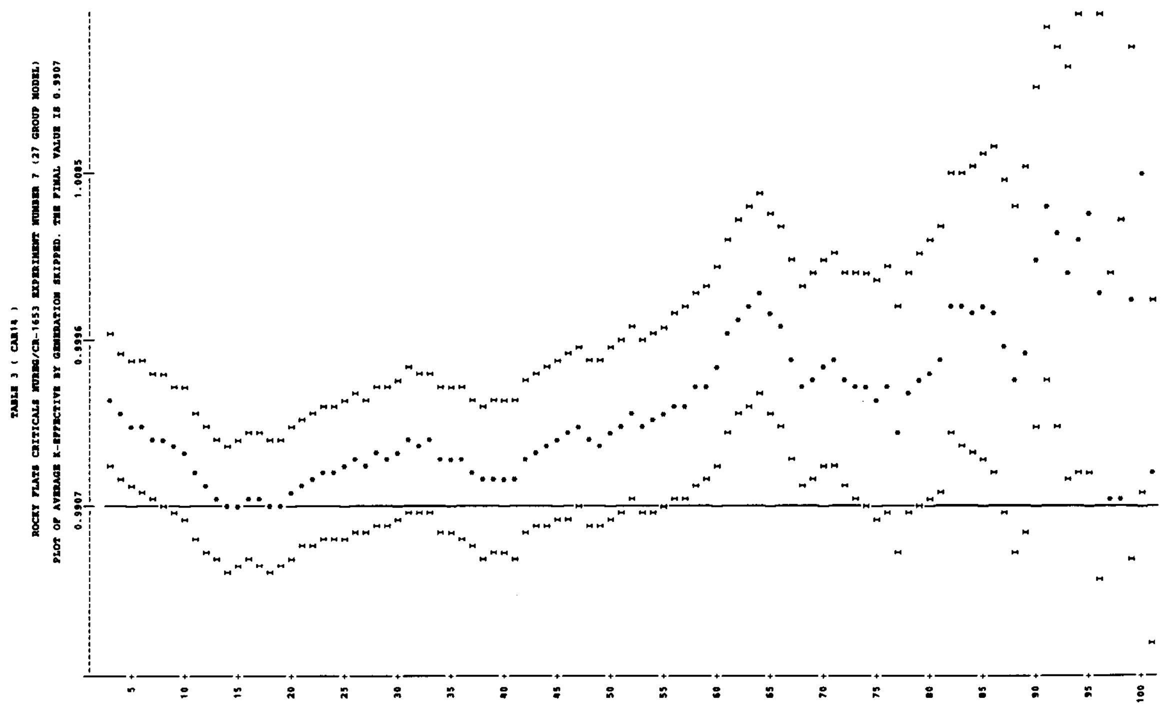
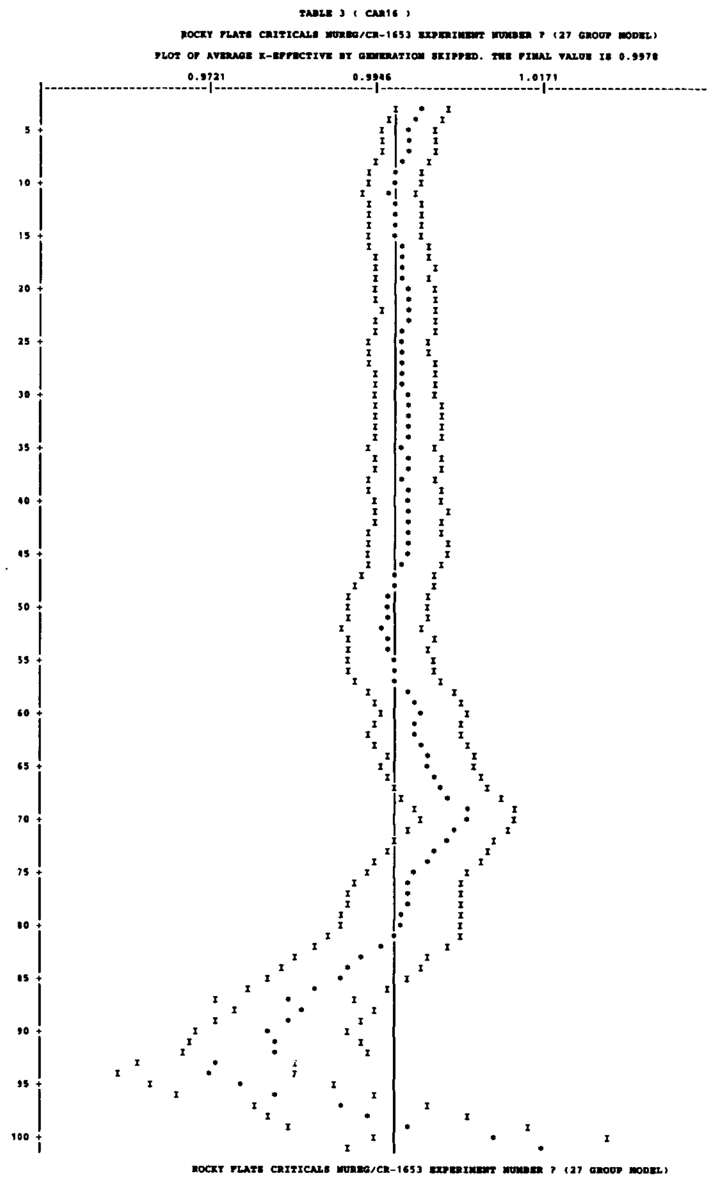


Fig. B.3 (continued)



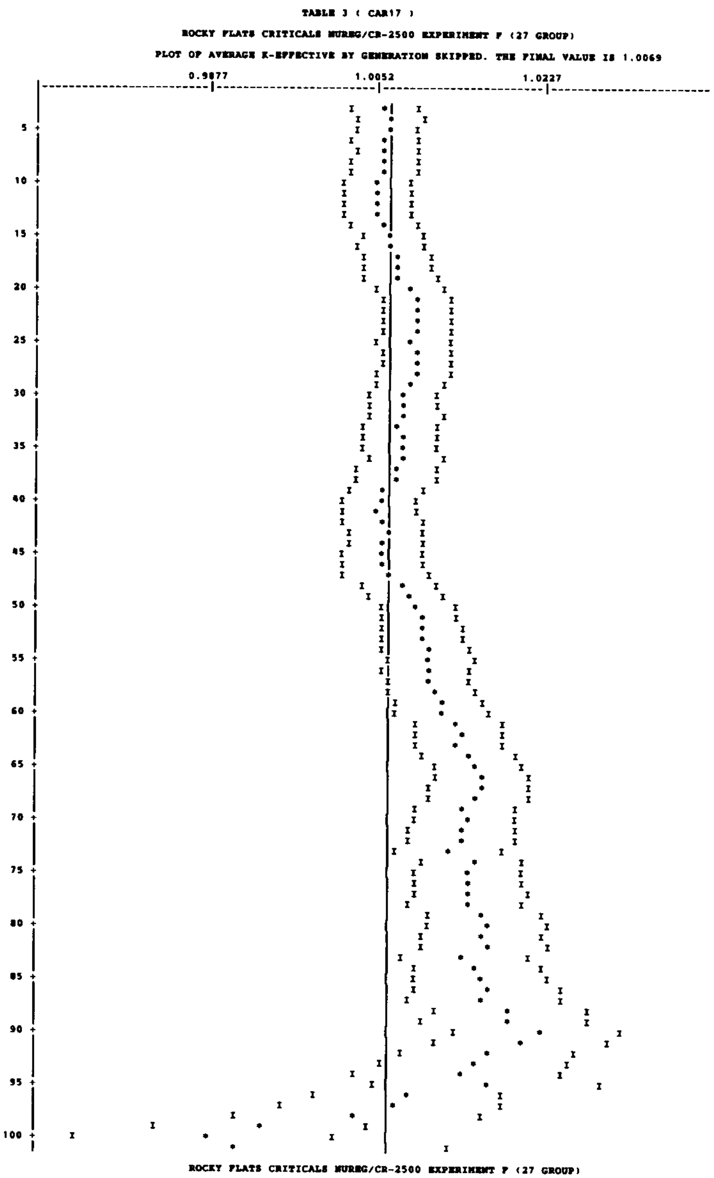
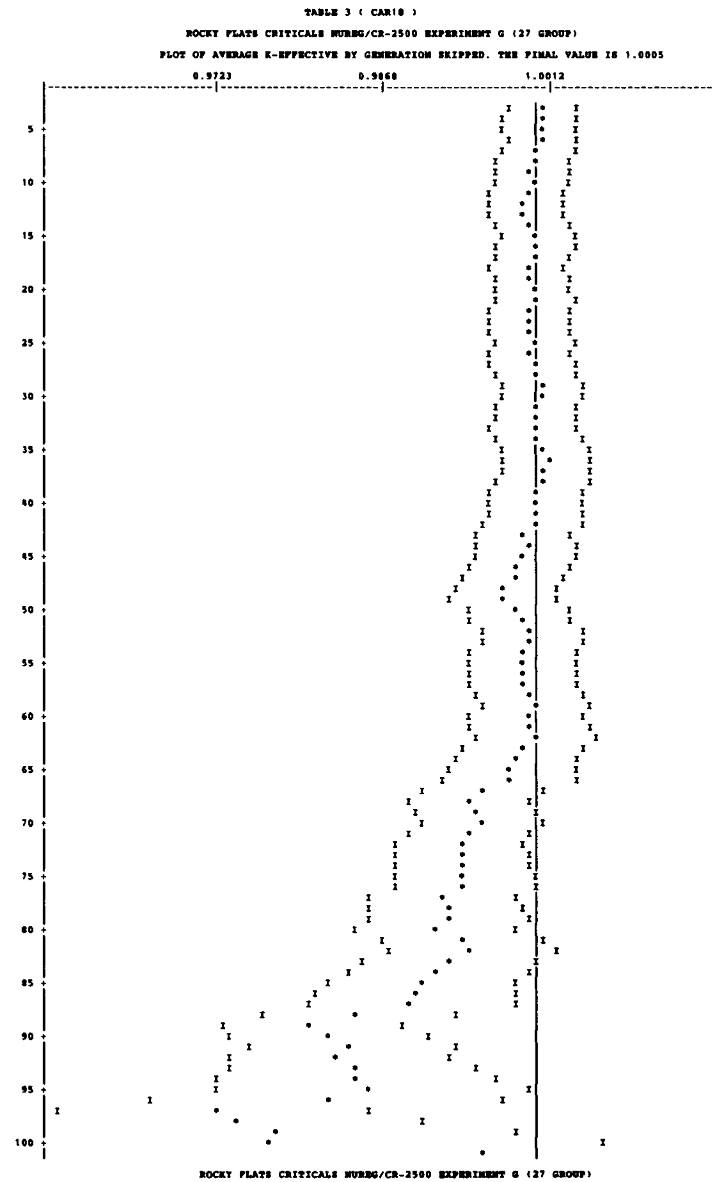


Fig. B.3 (continued)



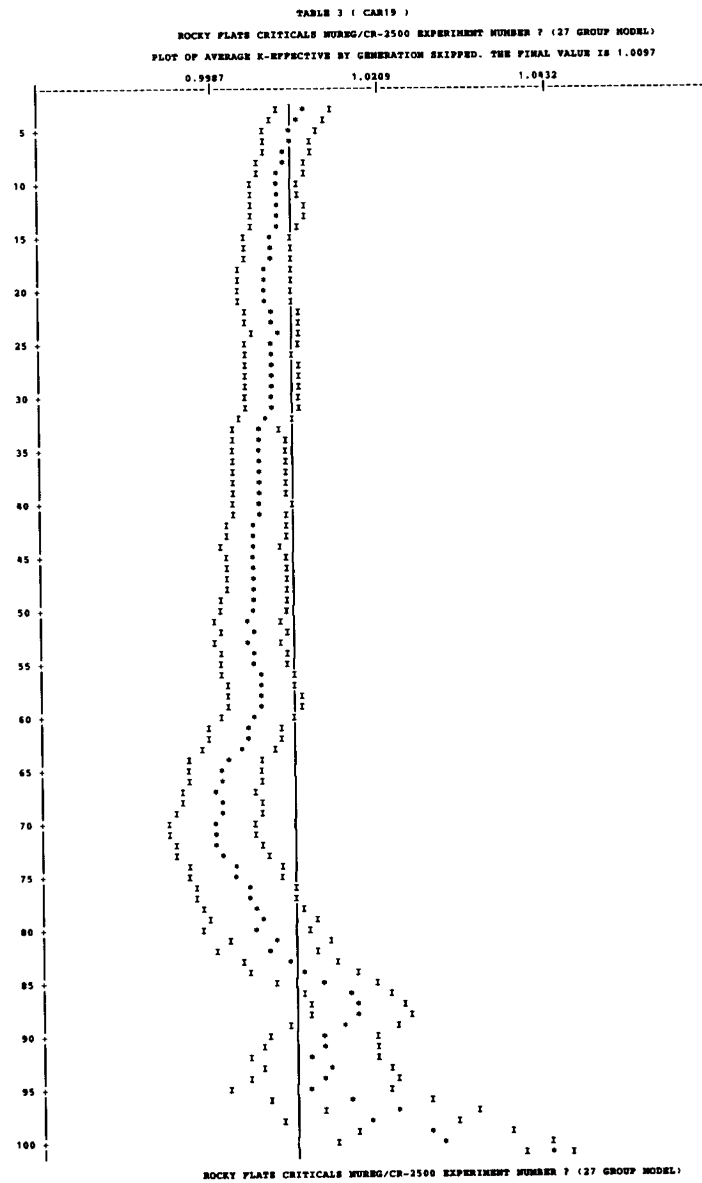


Fig. B.3 (continued)

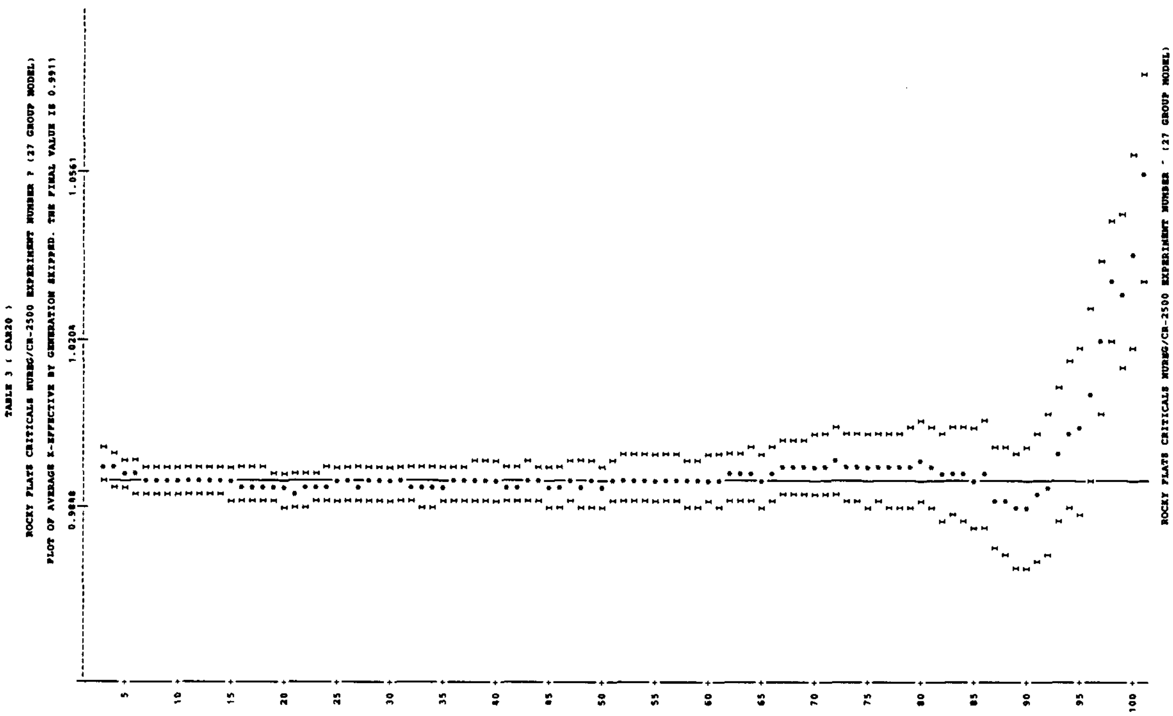
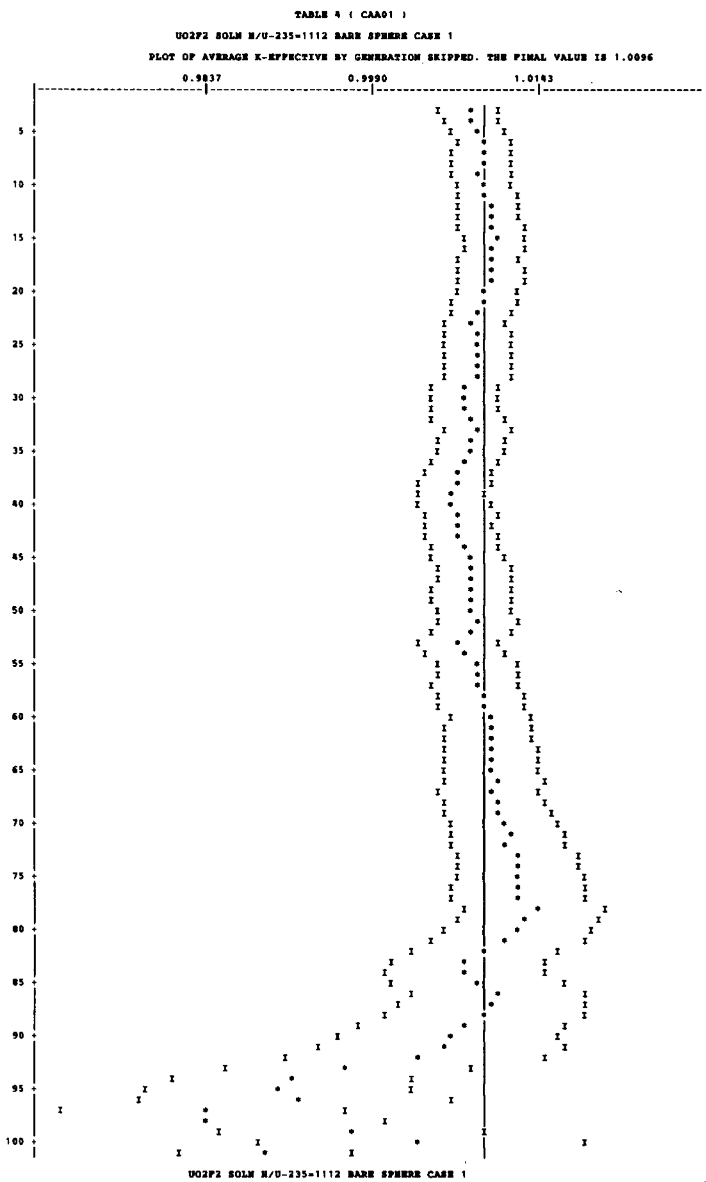


Fig. B.3 (continued)



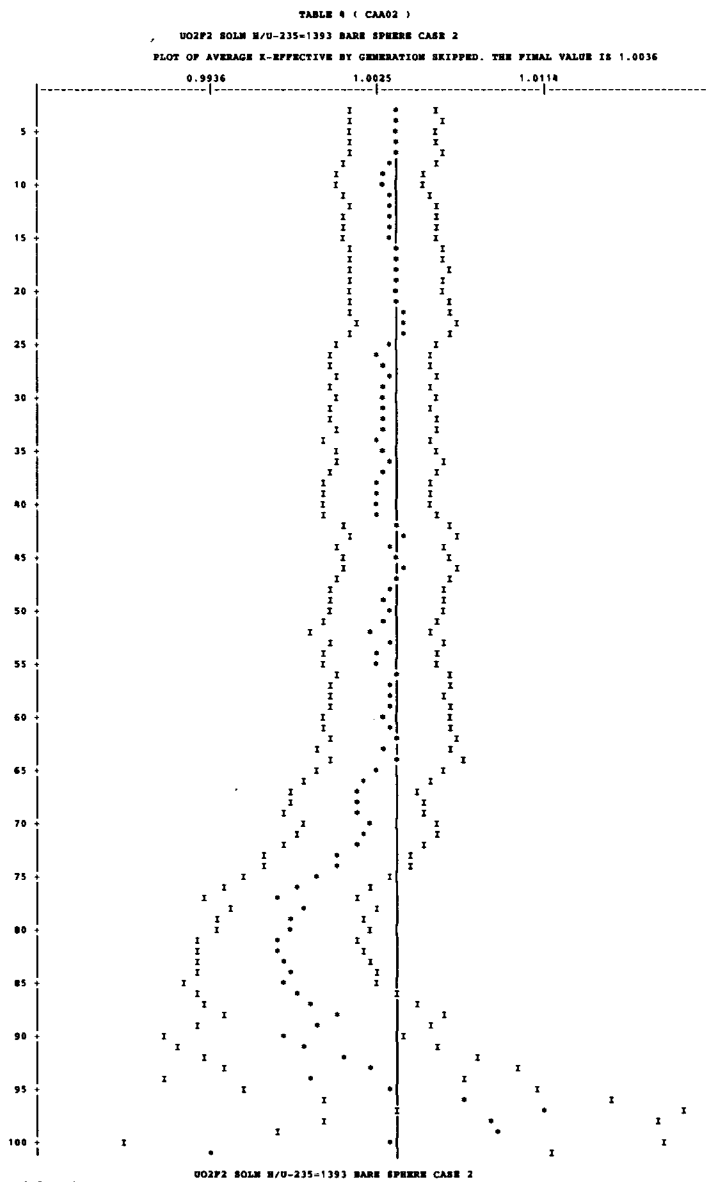
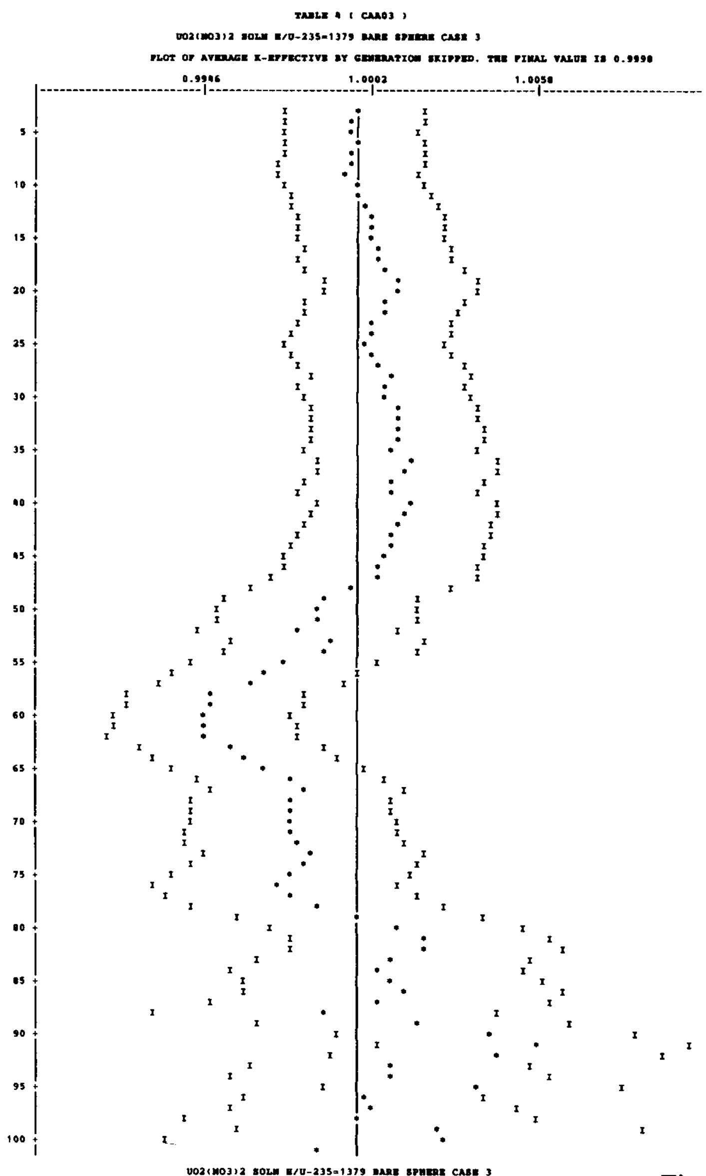


Fig. B.4. Plots for Table 4.



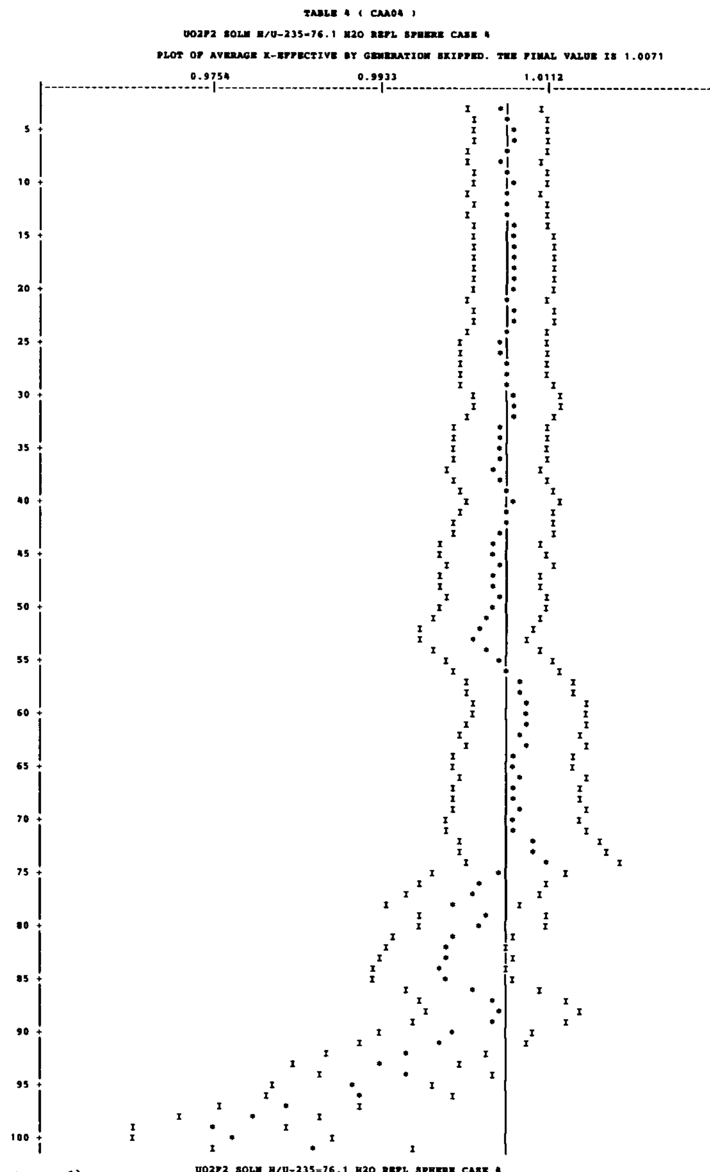
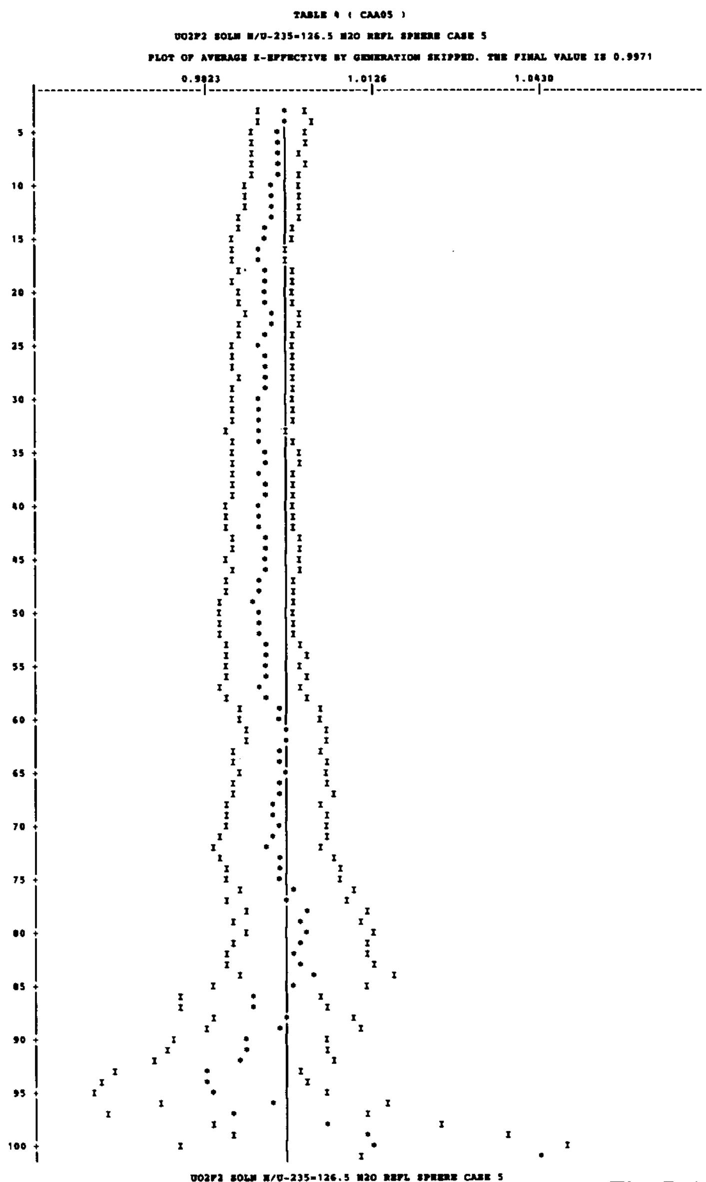


Fig. B.4 (continued)



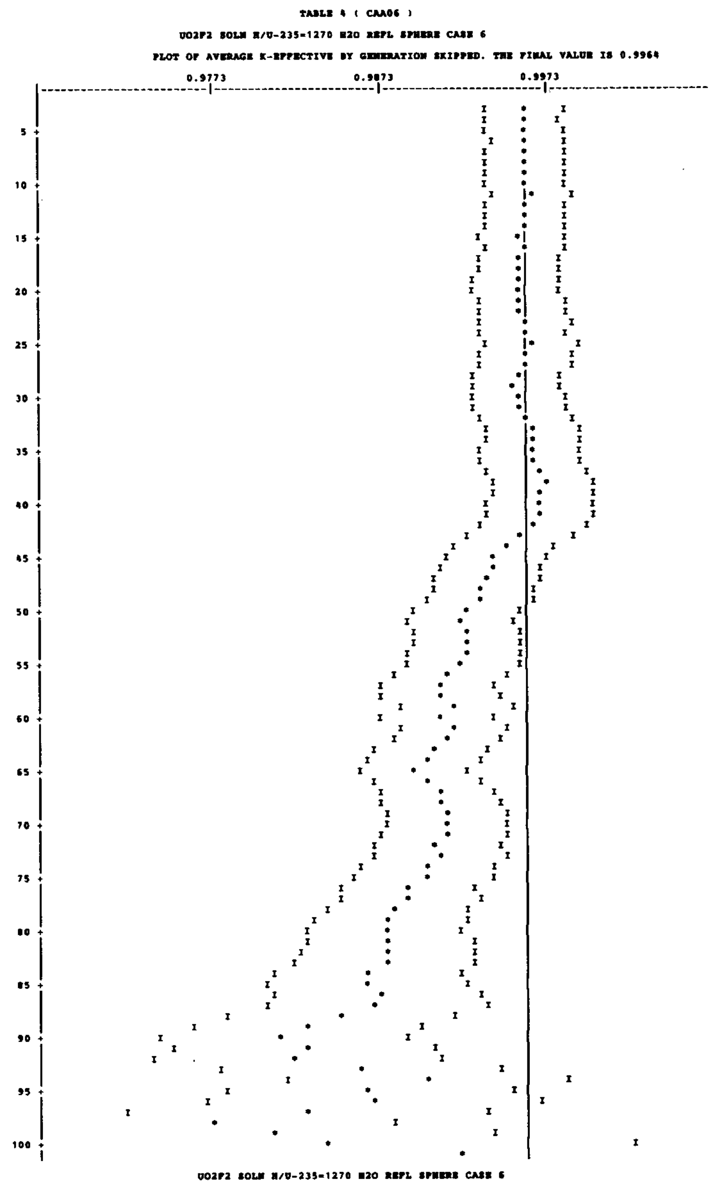
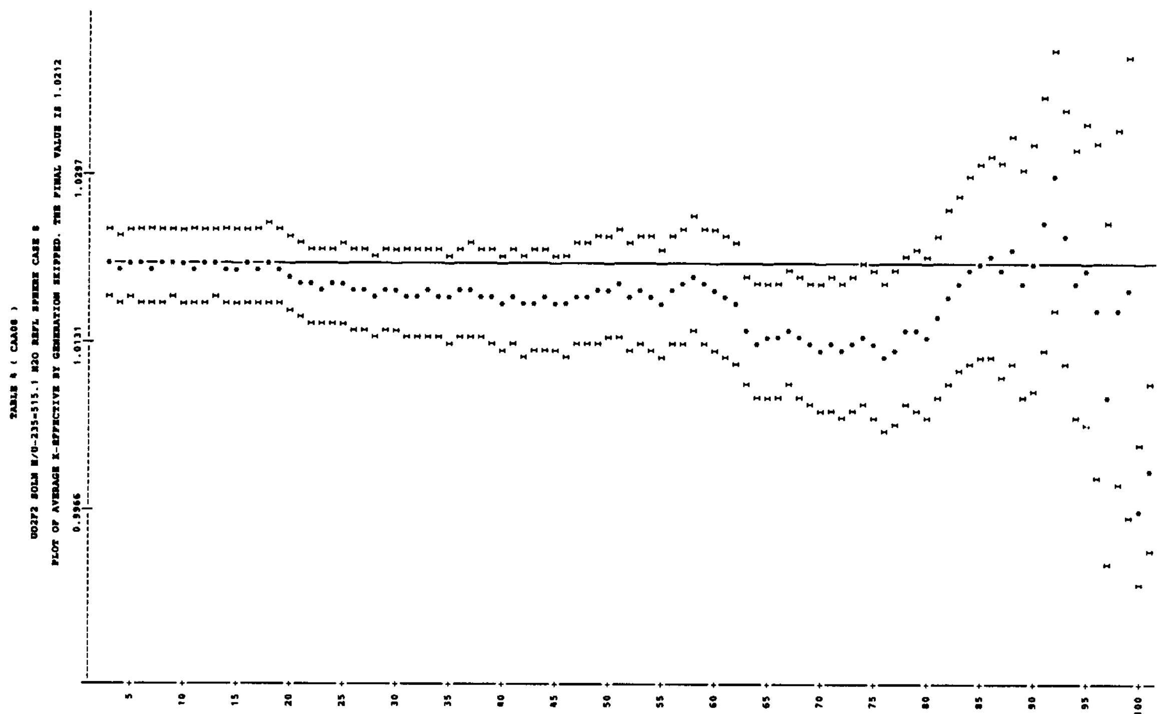
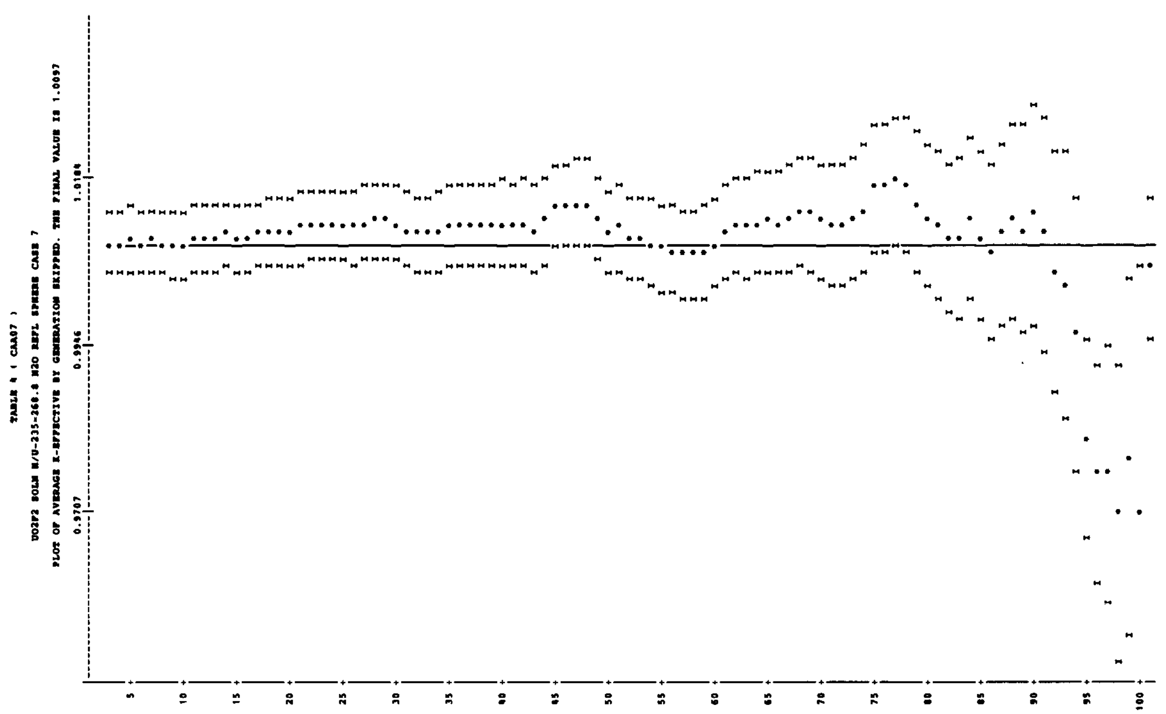


Fig. B.4 (continued)





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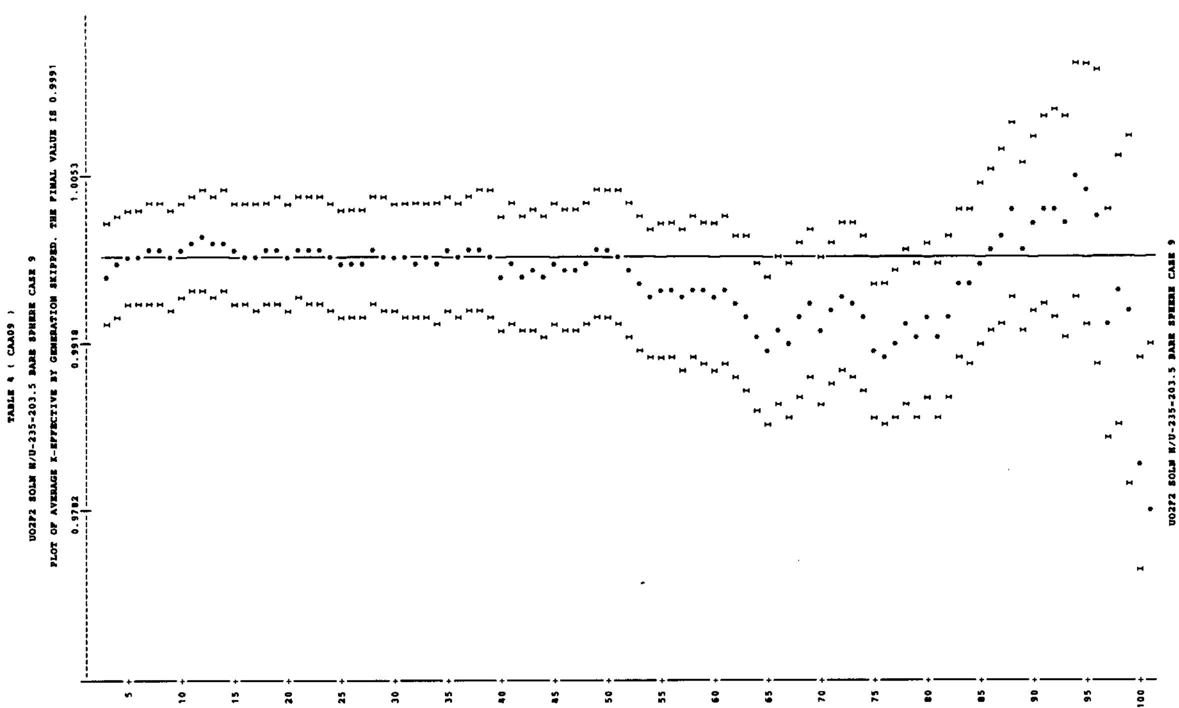


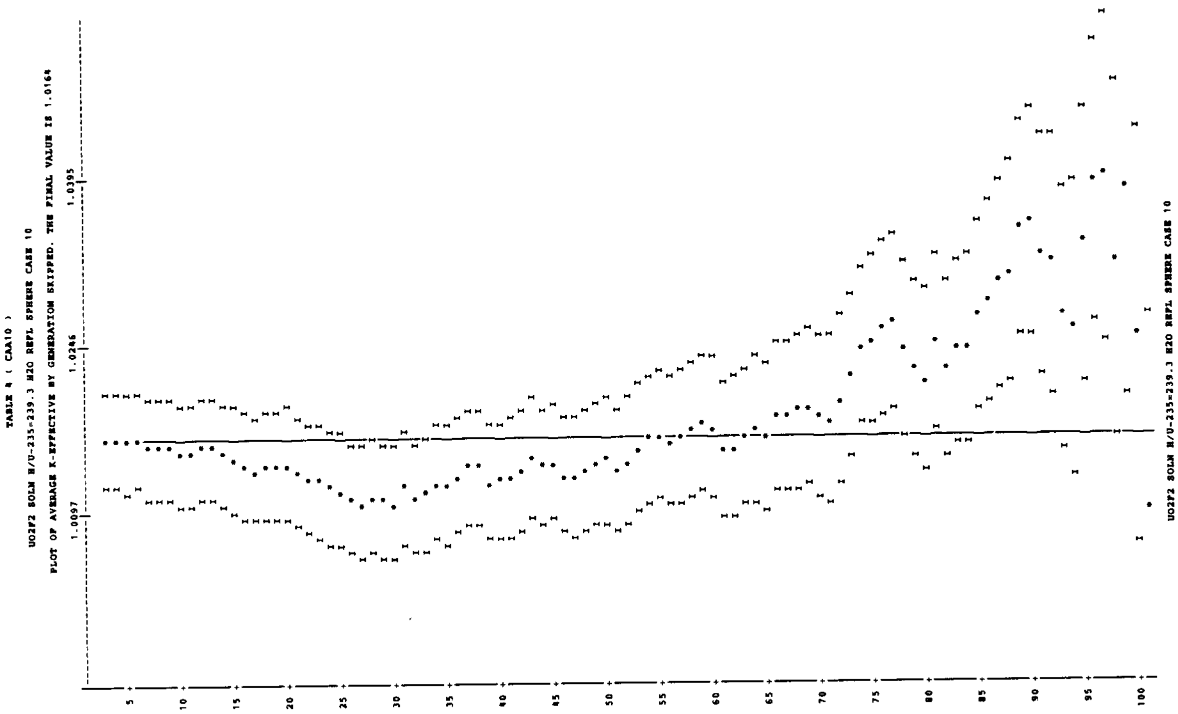
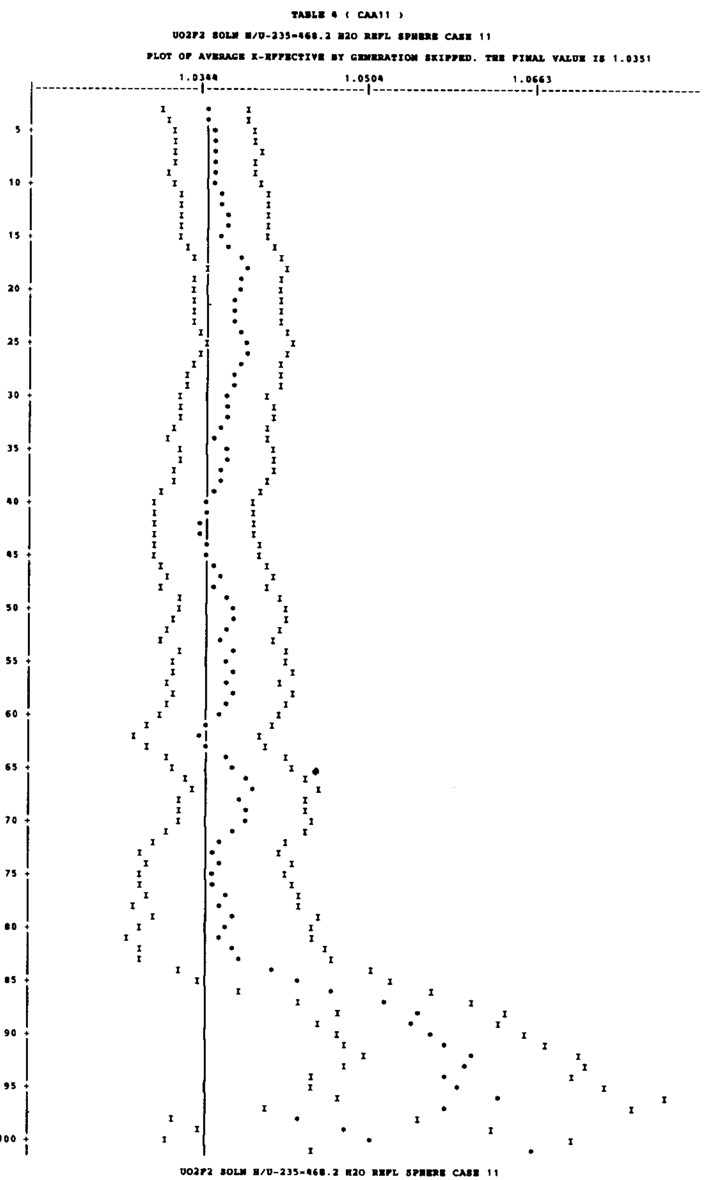


Fig. B.4 (continued)



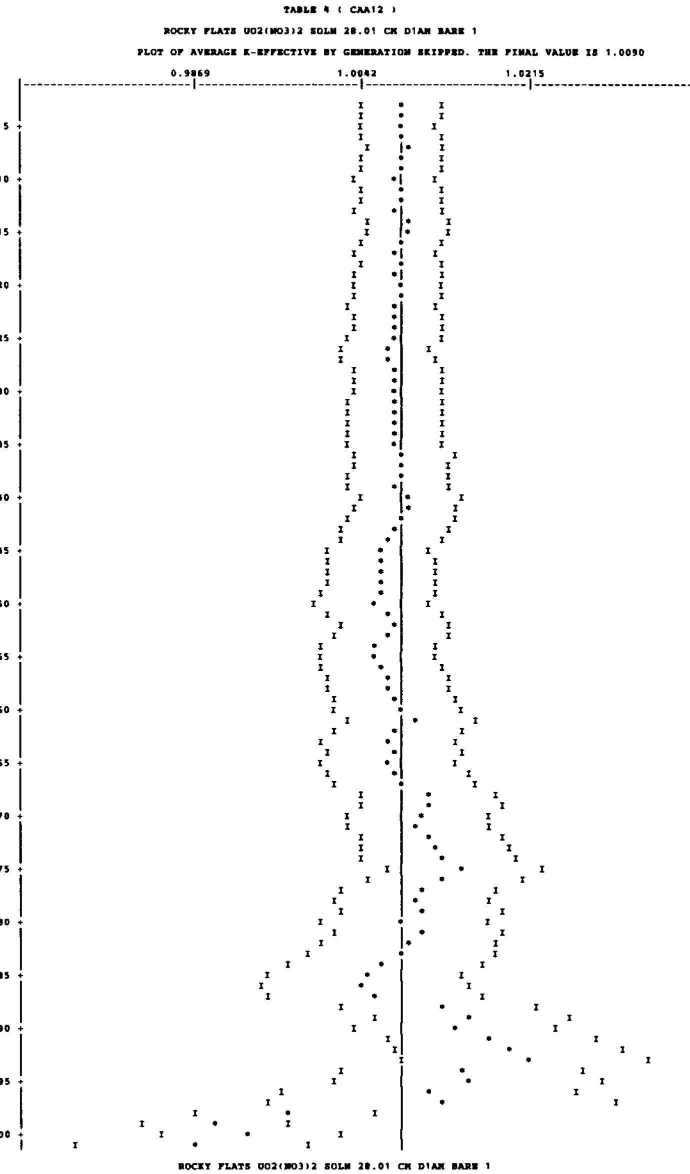
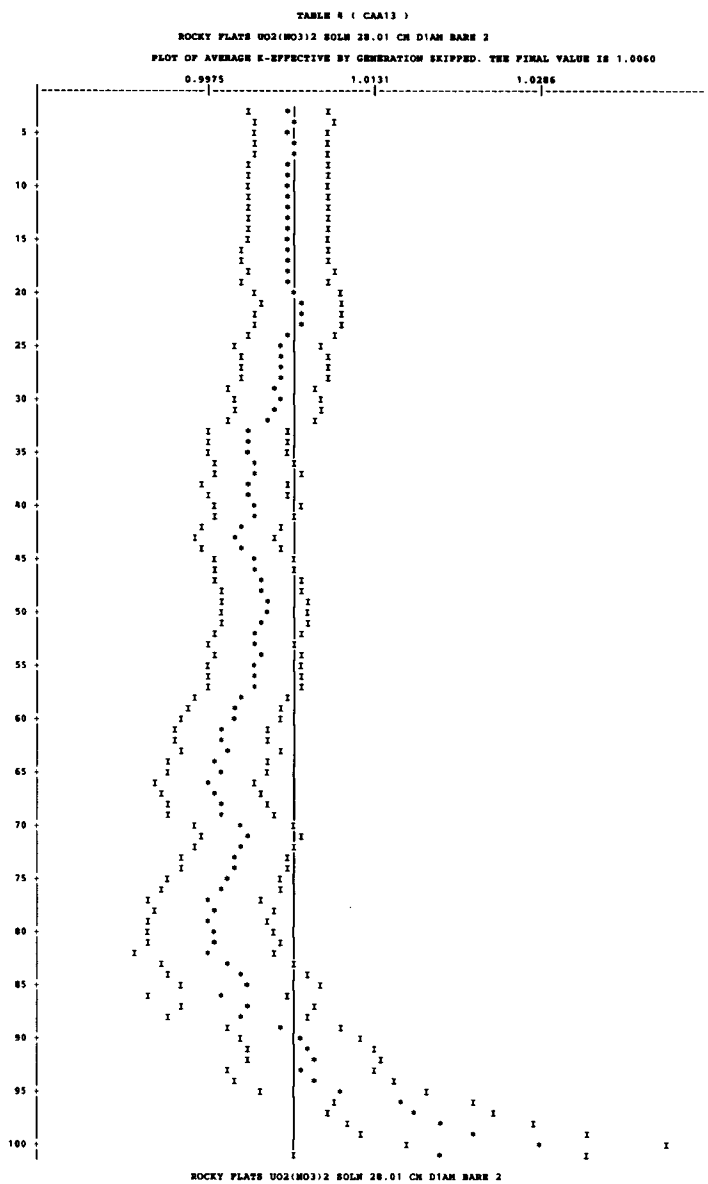


Fig. B.4 (continued)



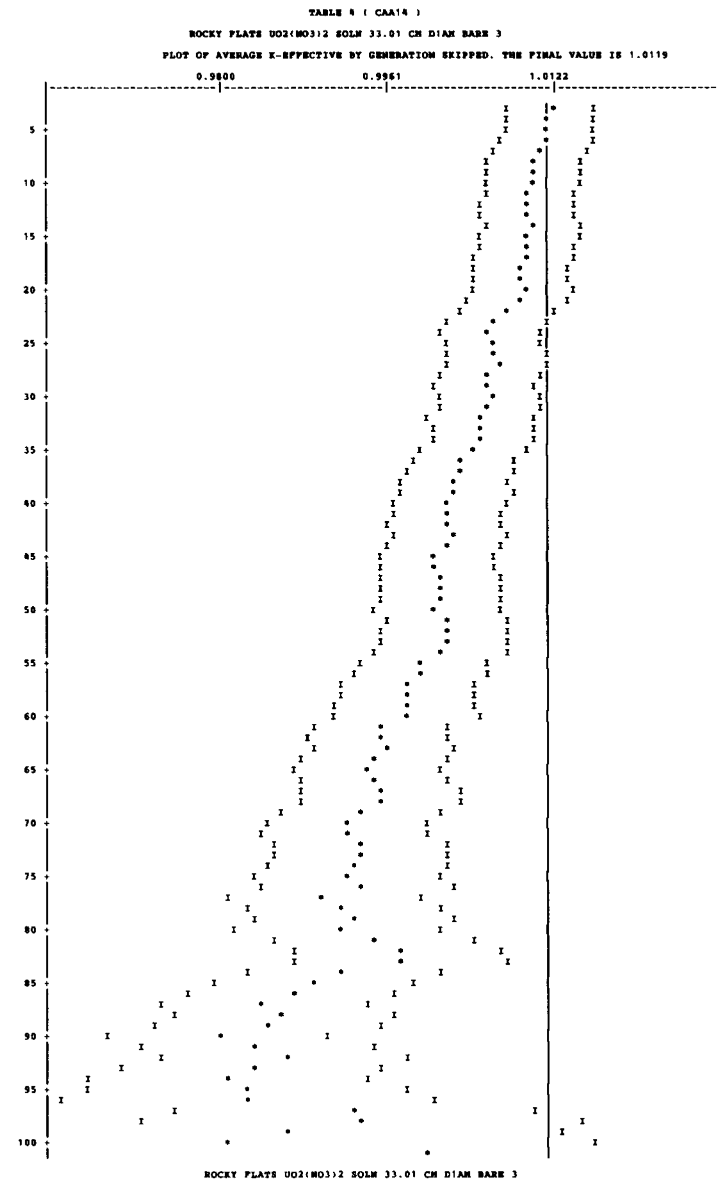


Fig. B.4 (continued)

TABLE 4 (CAA15)
ROCKY FLATS UO2(NO3)2 SOLN 33.01 CM DIAM BARE 4
PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0027

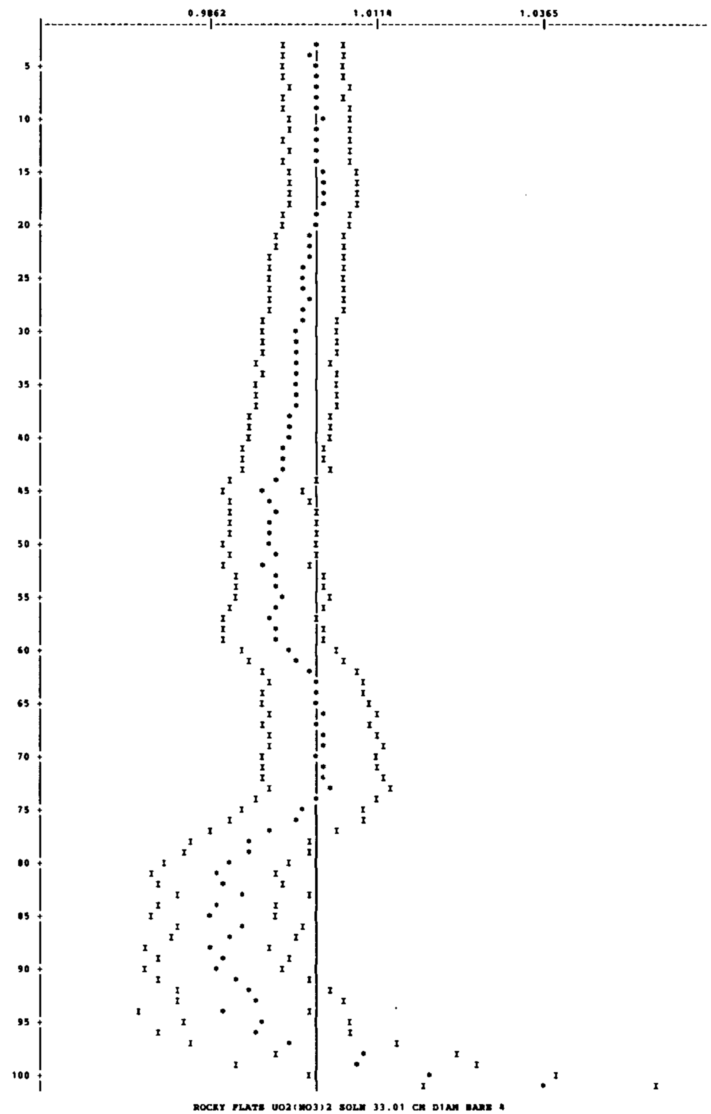


TABLE 4 (CAA16)
ROCKY FLATS UO2(NO3)2 SOLN 33.01 CM DIAM BARE 5
PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0024

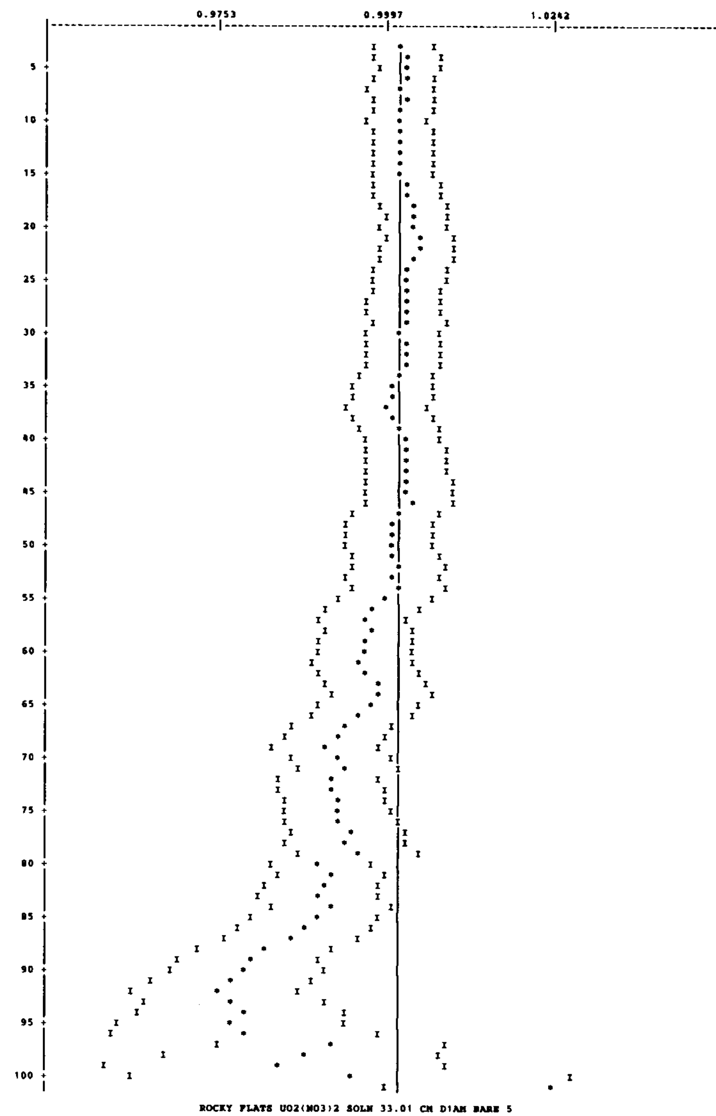
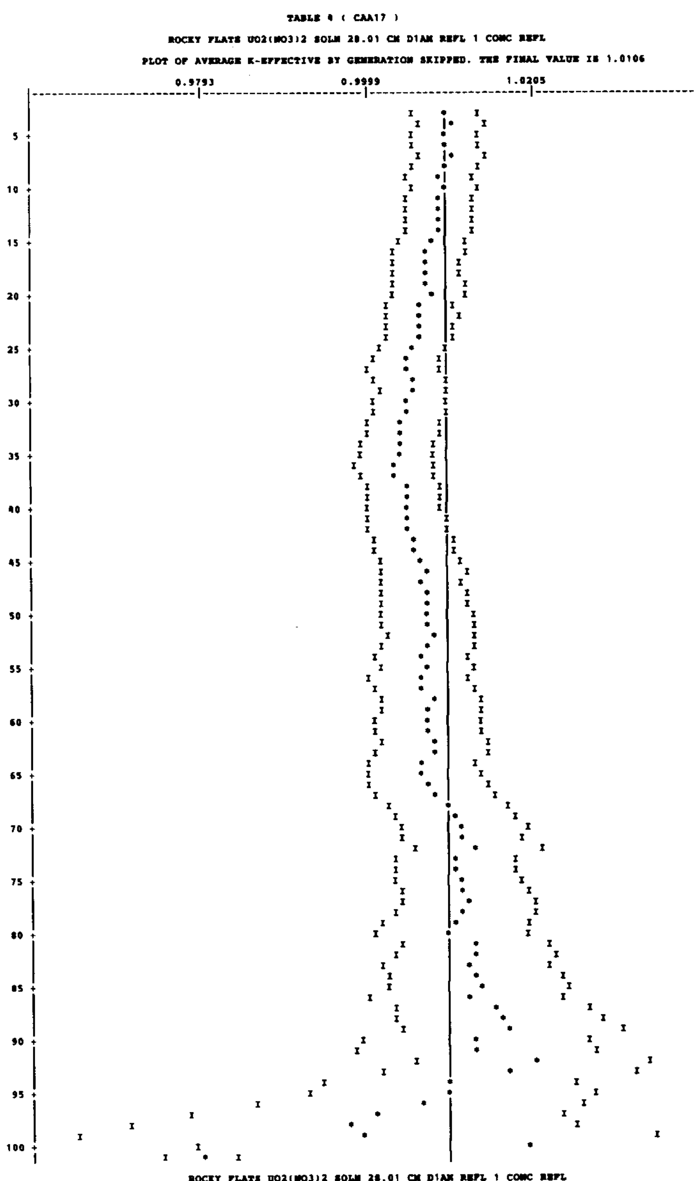


Fig. B.4 (continued)



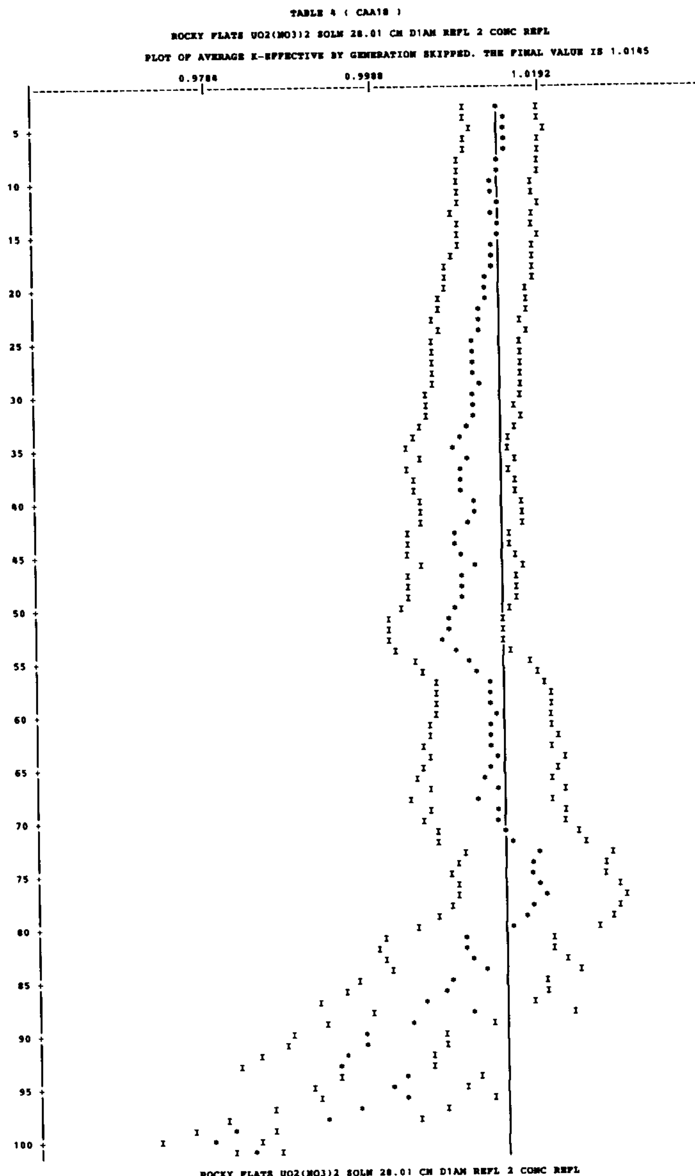
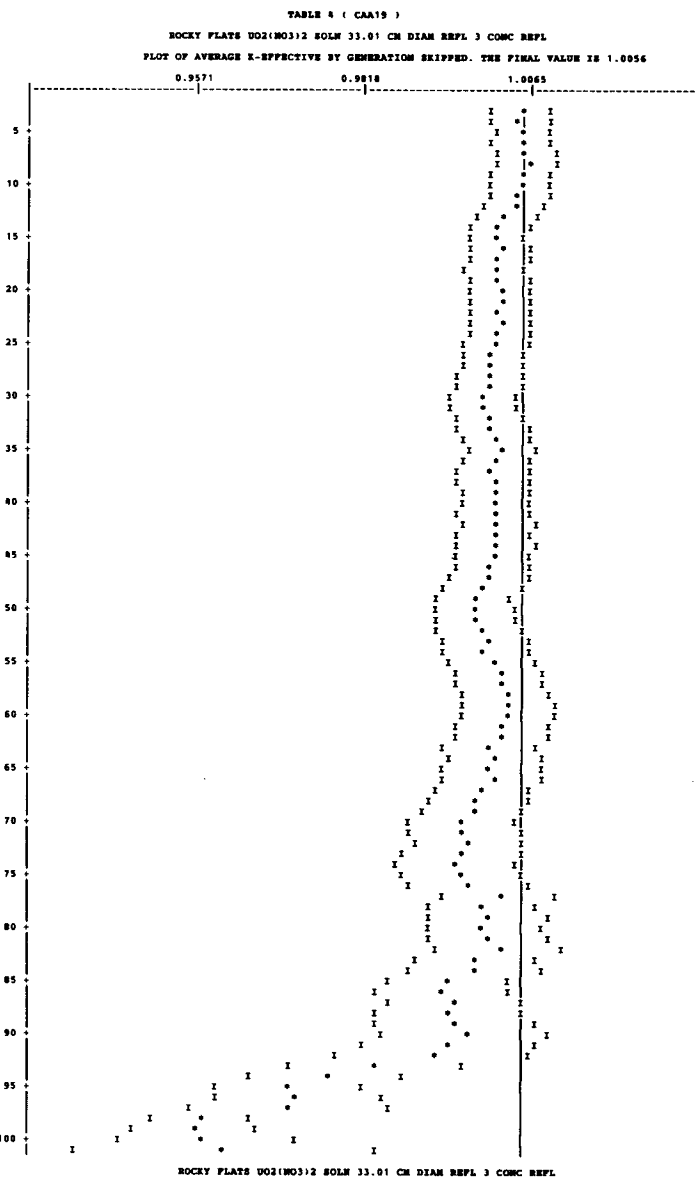


Fig. B.4 (continued)



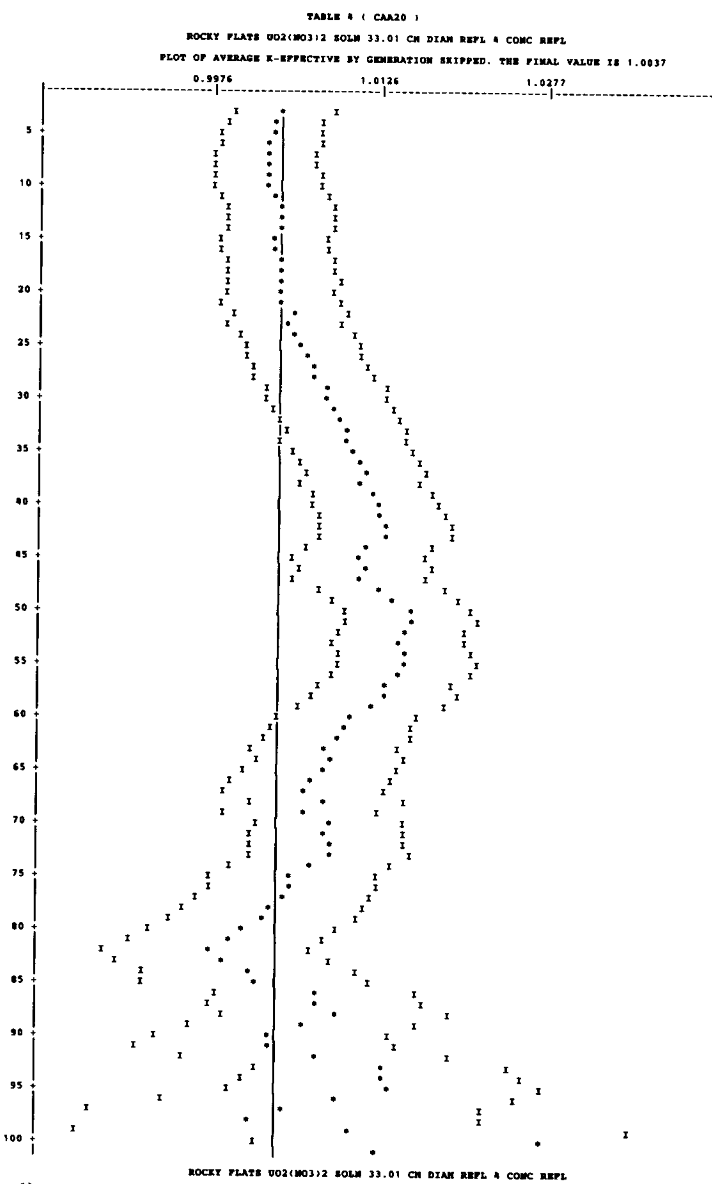


Fig. B.4 (continued)

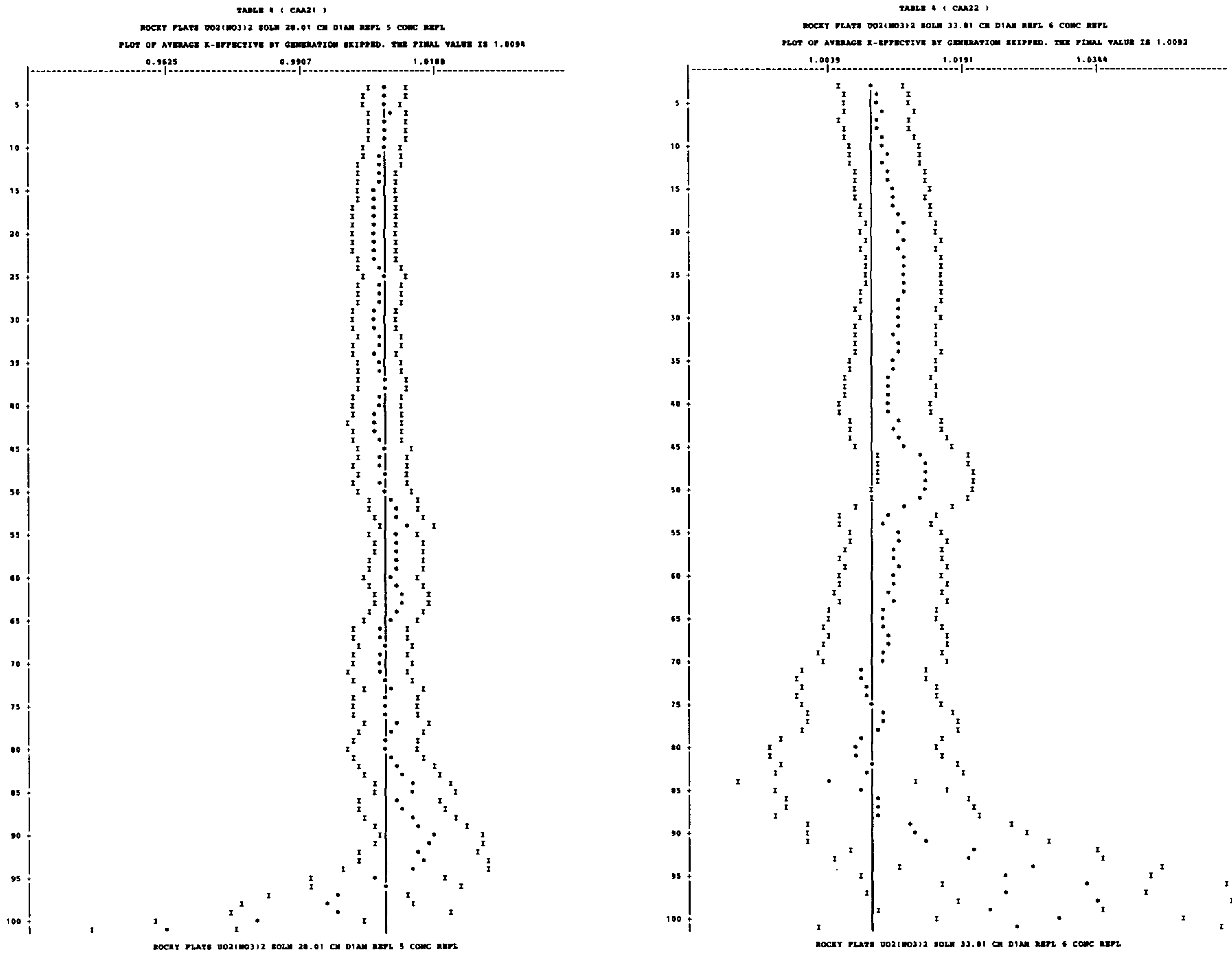
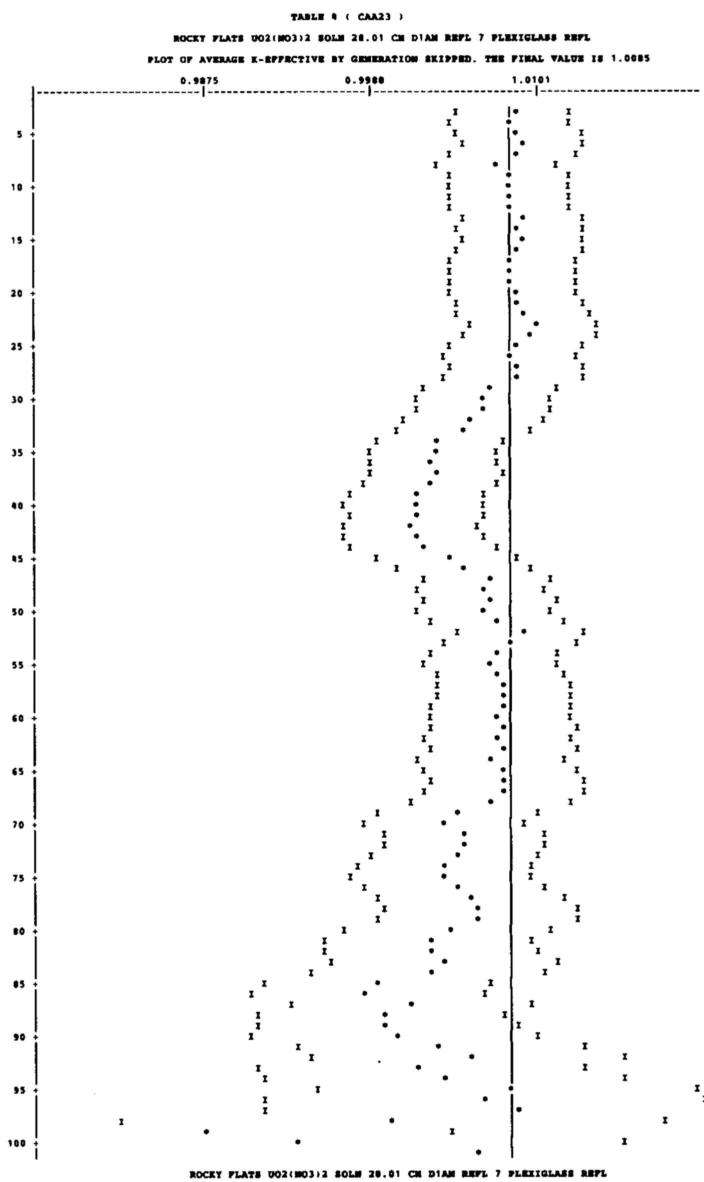


Fig. B.4 (continued)



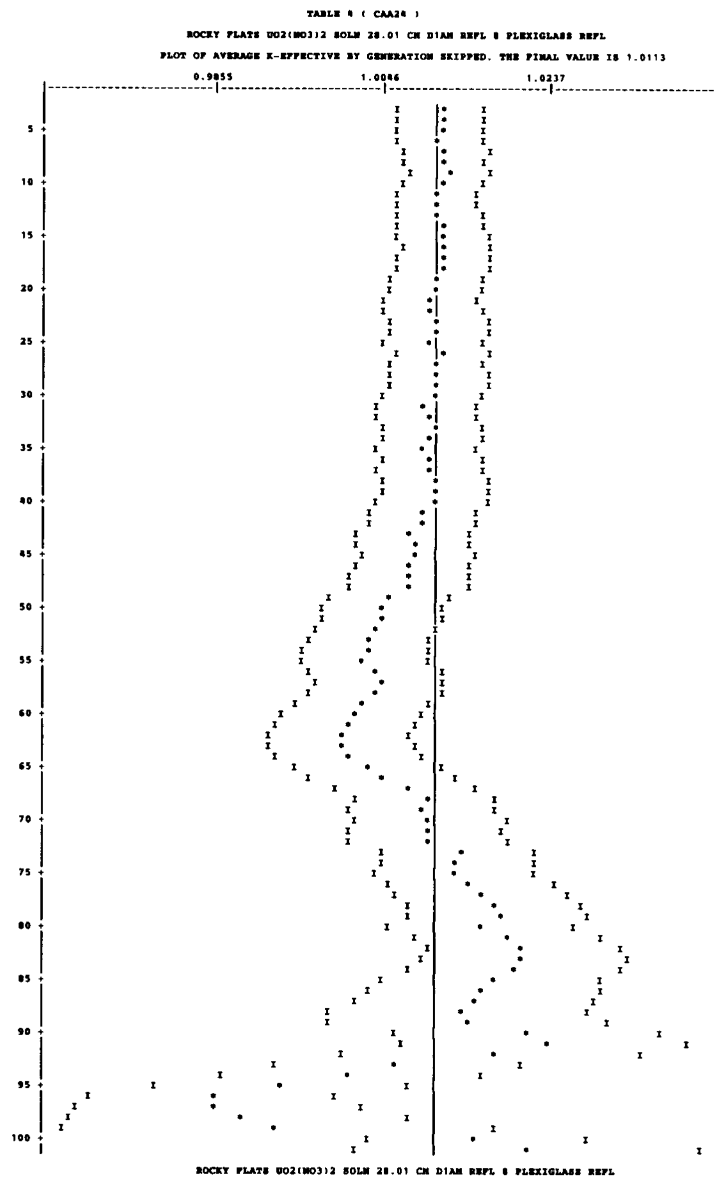
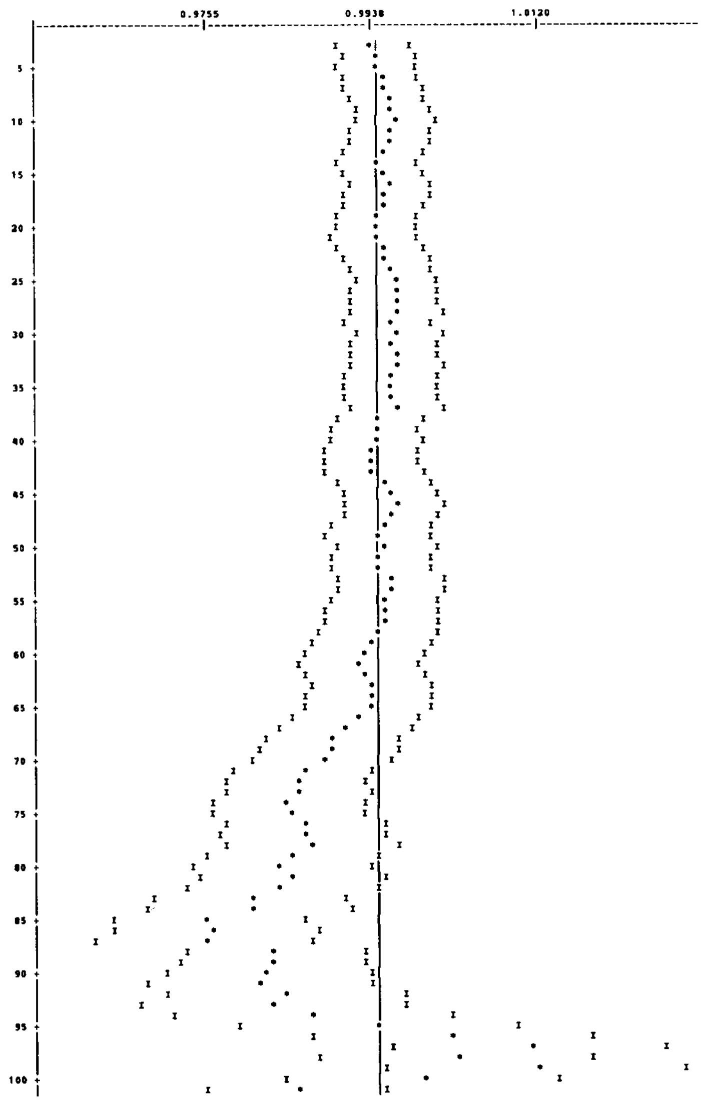


Fig. B.4 (continued)

TABLE 4 (CAA25)

ROCKY FLATS UO2(NO3)2 SOLN 33.01 CM DIAM REFL 9 PLEXIGLASS REFL

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 0.9947

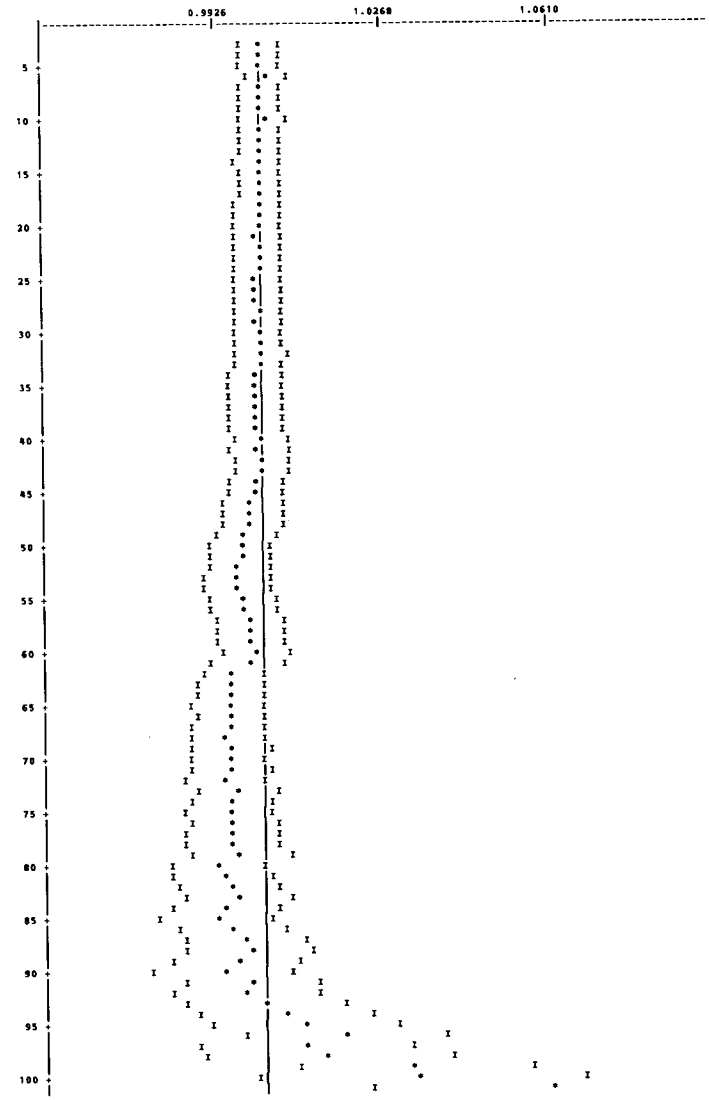


ROCKY FLATS UO2(NO3)2 SOLN 33.01 CM DIAM REFL 9 PLEXIGLASS REFL

TABLE 4 (CAA26)

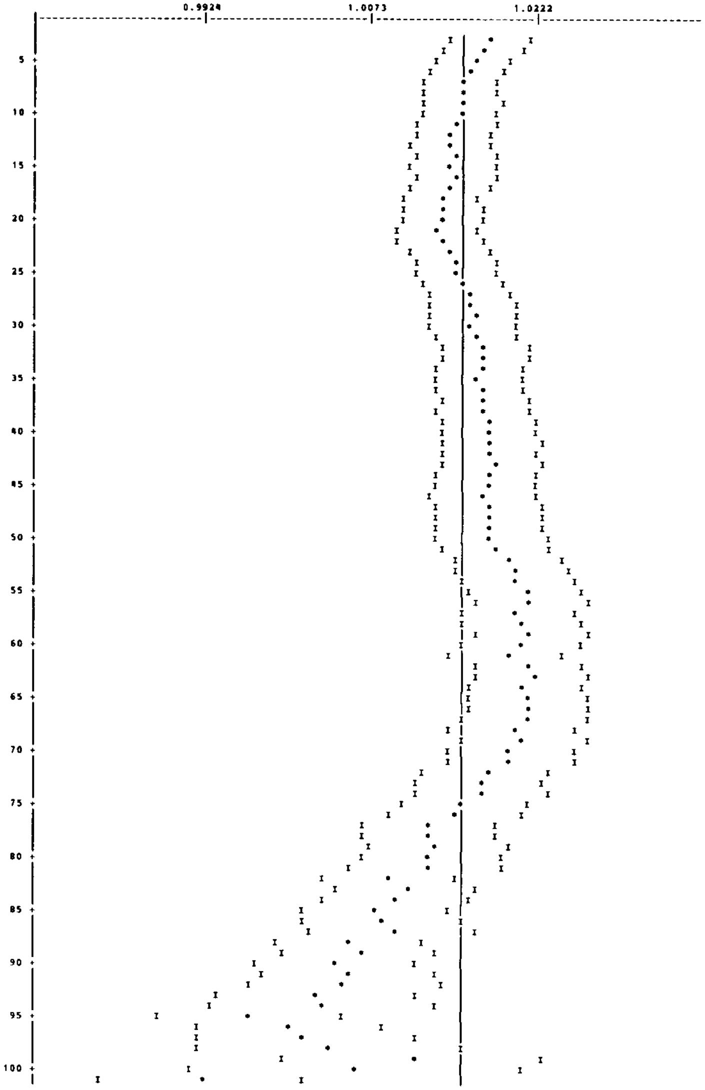
ROCKY FLATS UO2(NO3)2 SOLN 33.01 CM DIAM REFL 10 PLEXIGLASS REFL

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0033



ROCKY FLATS UO2(NO3)2 SOLN 33.01 CM DIAM REFL 10 PLEXIGLASS REFL

Fig. B.4 (continued)



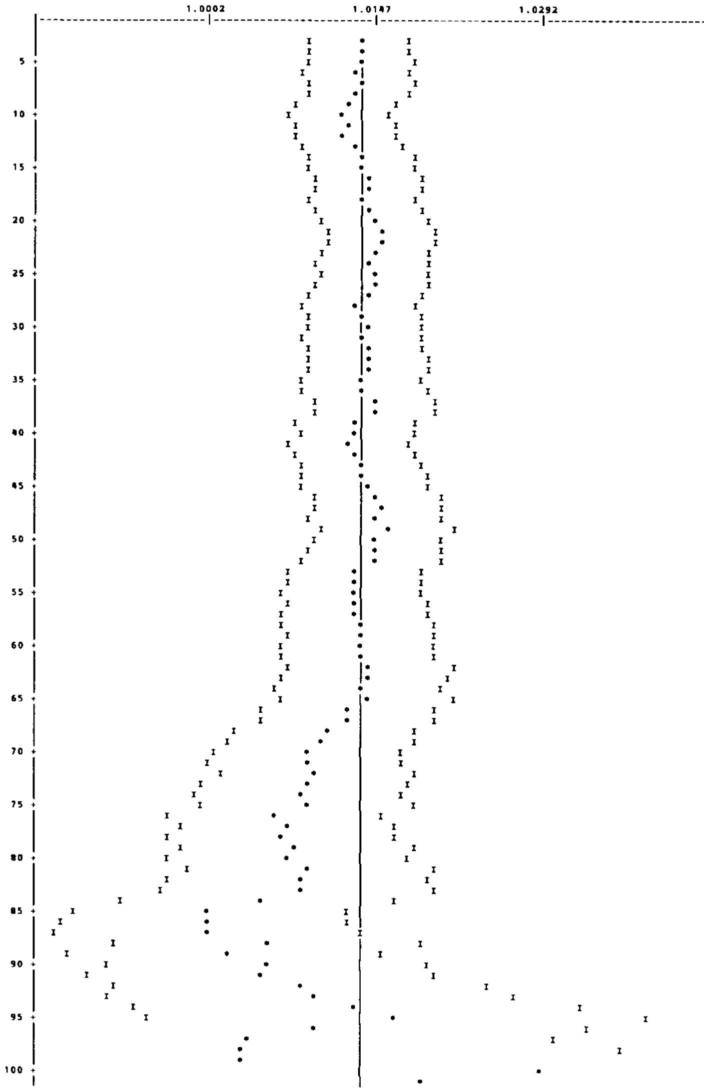


Fig. B.4 (continued)

TABLE 4 (CAA29)
ROCKY FLATS UO2(NO3)2 SOLN 21.12 CM DIAM 4X4 ARRAY CONC REFL
PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0046

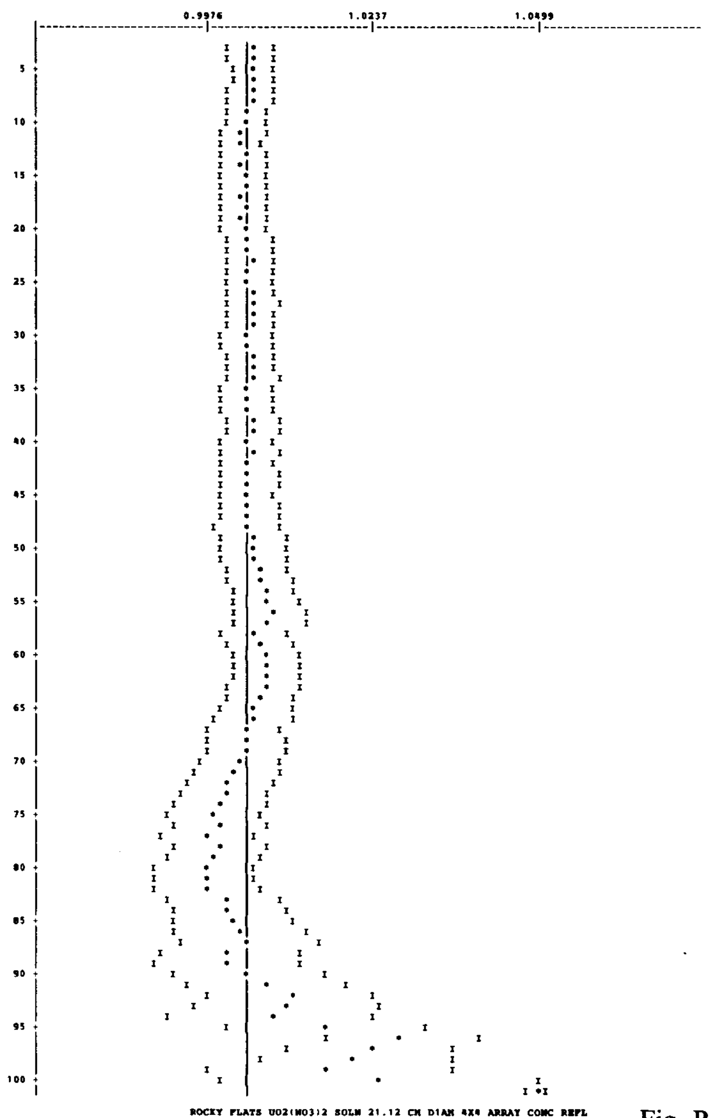


TABLE 4 (CAA30)
ROCKY FLATS UO2(NO3)2 SOLN 21.12 CM DIAM 4X4 ARRAY CONC REFL C2
PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0061

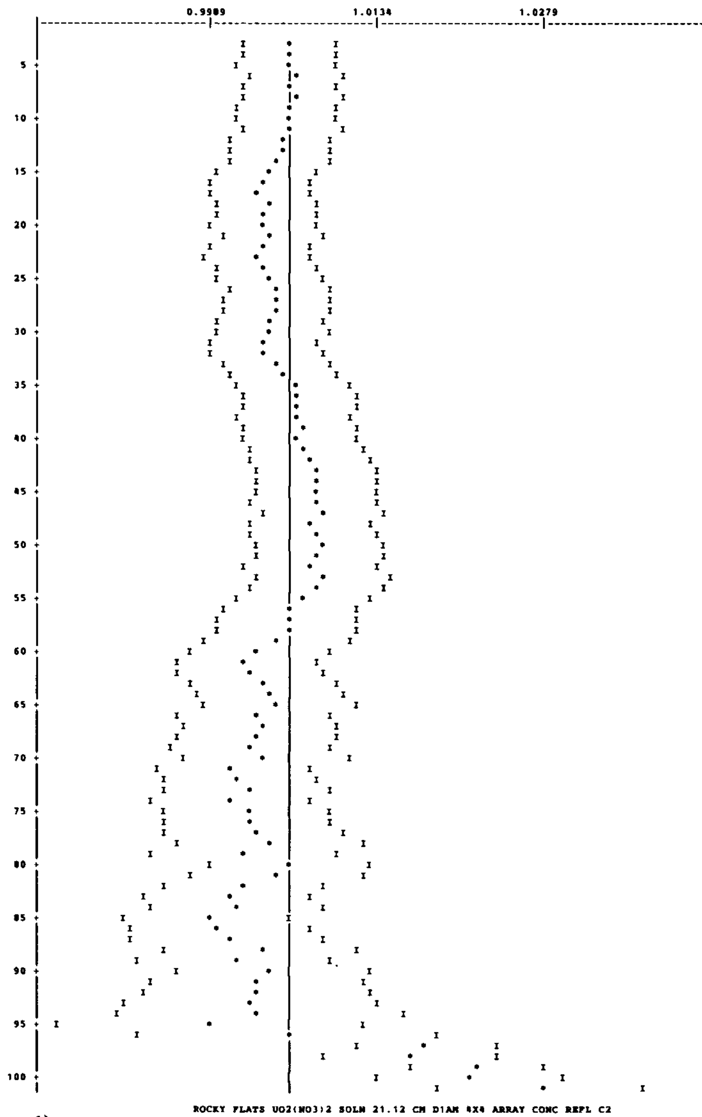
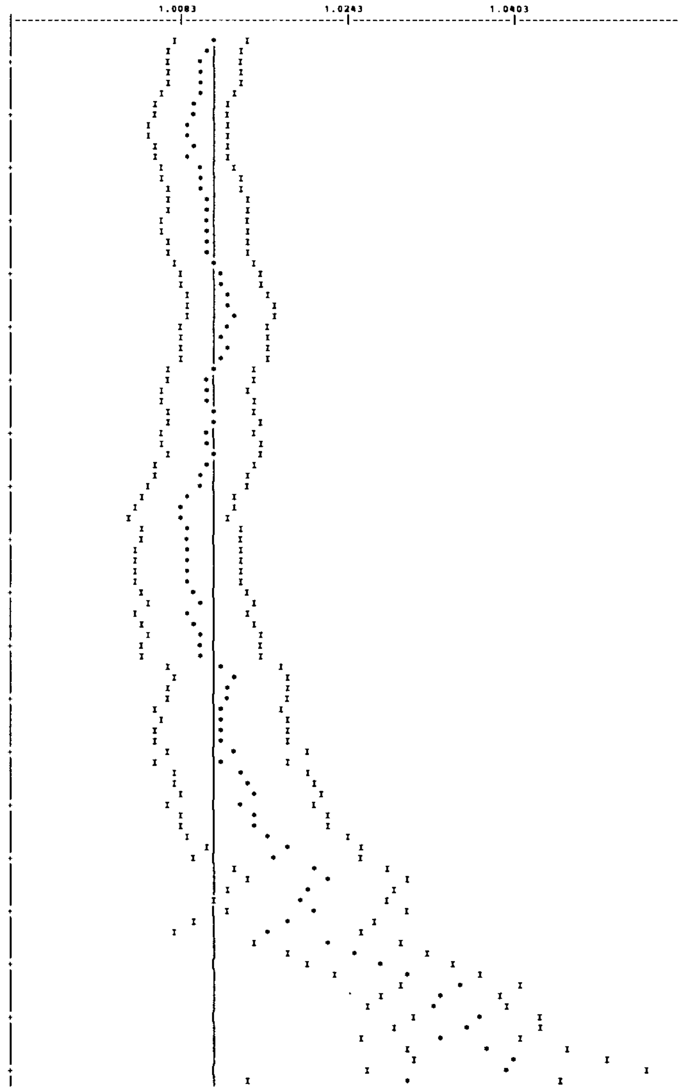


Fig. B.4 (continued)

TABLE 4 (CAA31)

ROCKY FLATS UO2(NO3)2 SOLN 16.12 CM DIAM 4X4 ARRAY CONC REFL C3

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0119

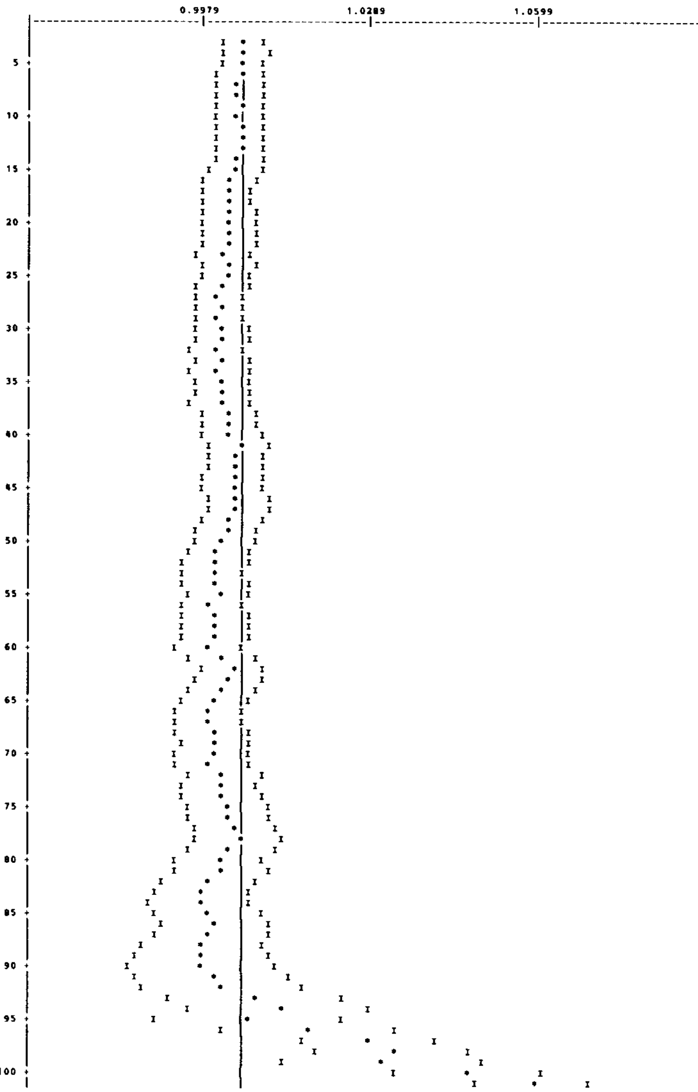


ROCKY FLATS UO2(NO3)2 SOLN 16.12 CM DIAM 4X4 ARRAY CONC REFL C3

TABLE 4 (CAA32)

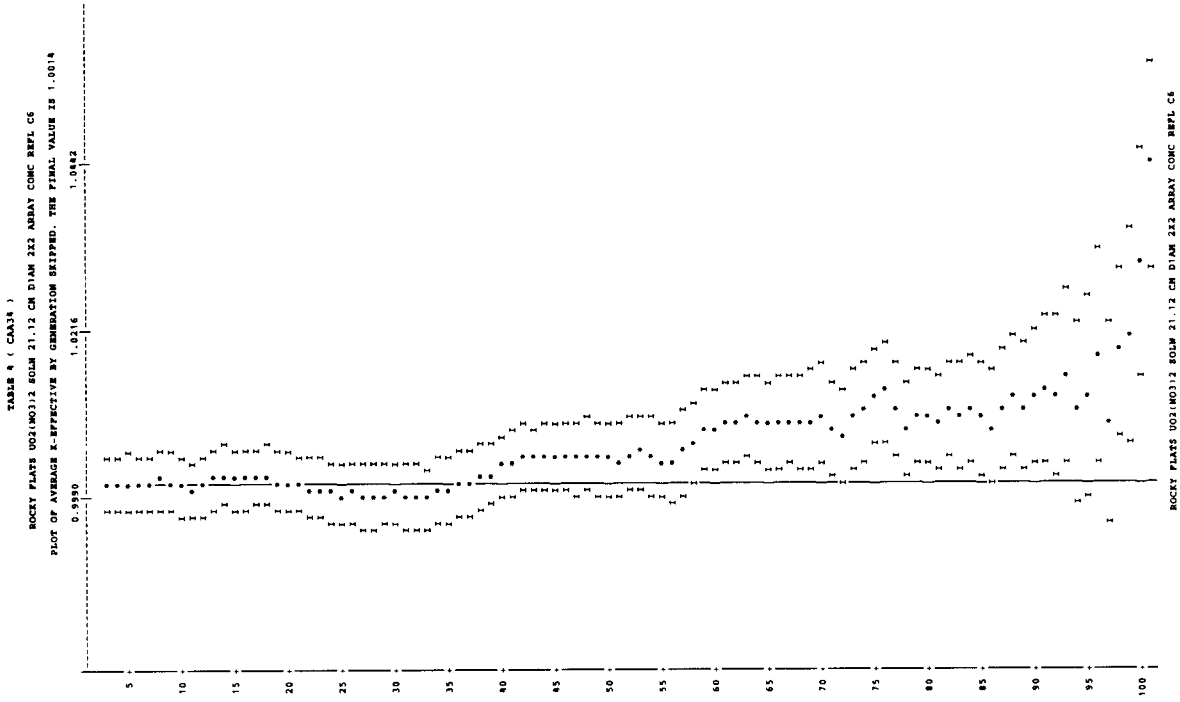
ROCKY FLATS UO2(NO3)2 SOLN 16.12 CM DIAM 4X4 ARRAY CONC REFL C4

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0056



ROCKY FLATS UO2(NO3)2 SOLN 16.12 CM DIAM 4X4 ARRAY CONC REFL C4

Fig. B.4 (continued)



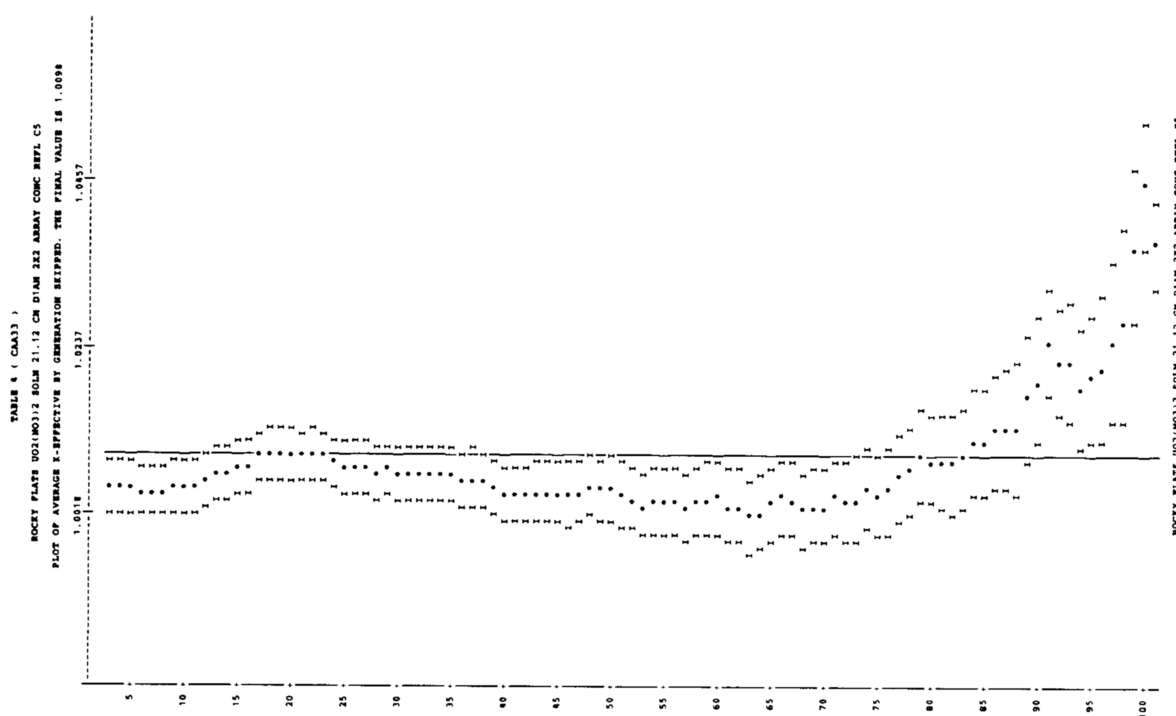
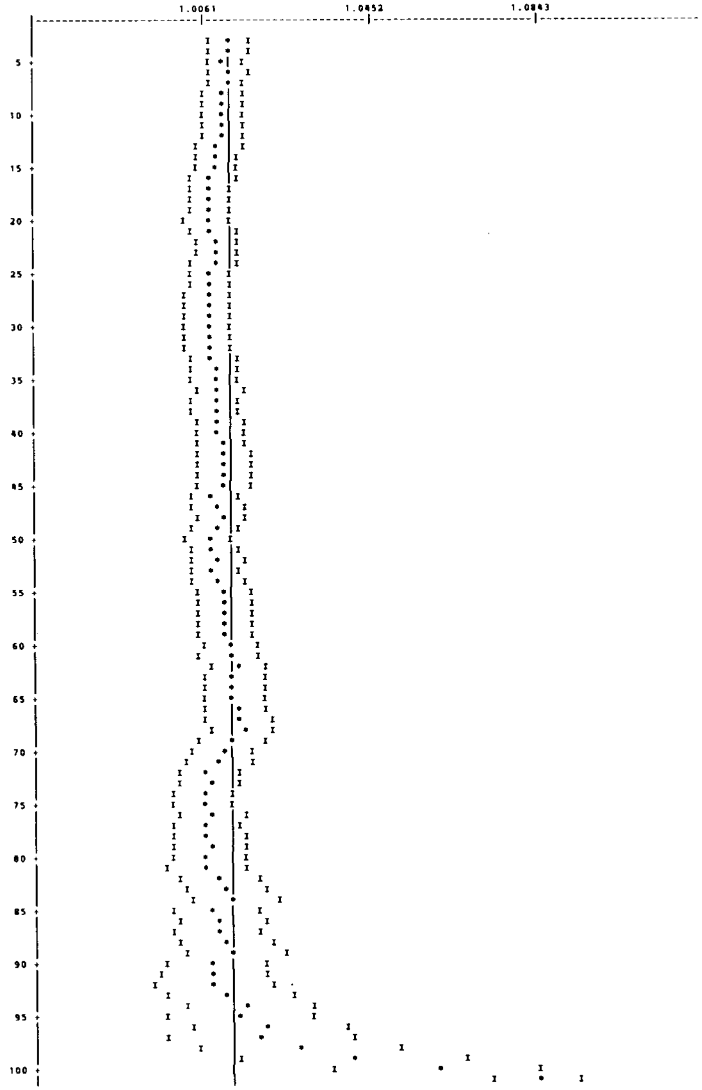


Fig. B.4 (continued)

TABLE 4 (CAA35)

ROCKY FLATS UO2(NO3)2 SOLN 16.12 CM DIAM 2X2 ARRAY CONC REFL C7

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0129

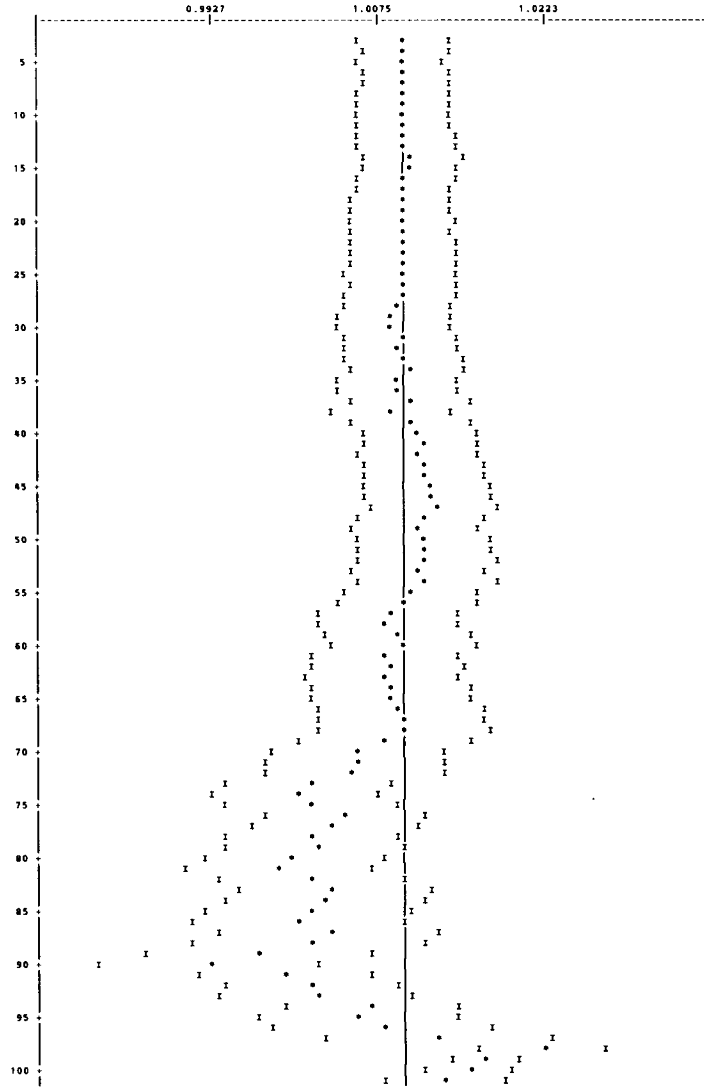


ROCKY FLATS UO2(NO3)2 SOLN 16.12 CM DIAM 2X2 ARRAY CONC REFL C7

TABLE 4 (CAA36)

ROCKY FLATS UO2(NO3)2 SOLN 16.12 CM DIAM 2X4 ARRAY CONC REFL C8

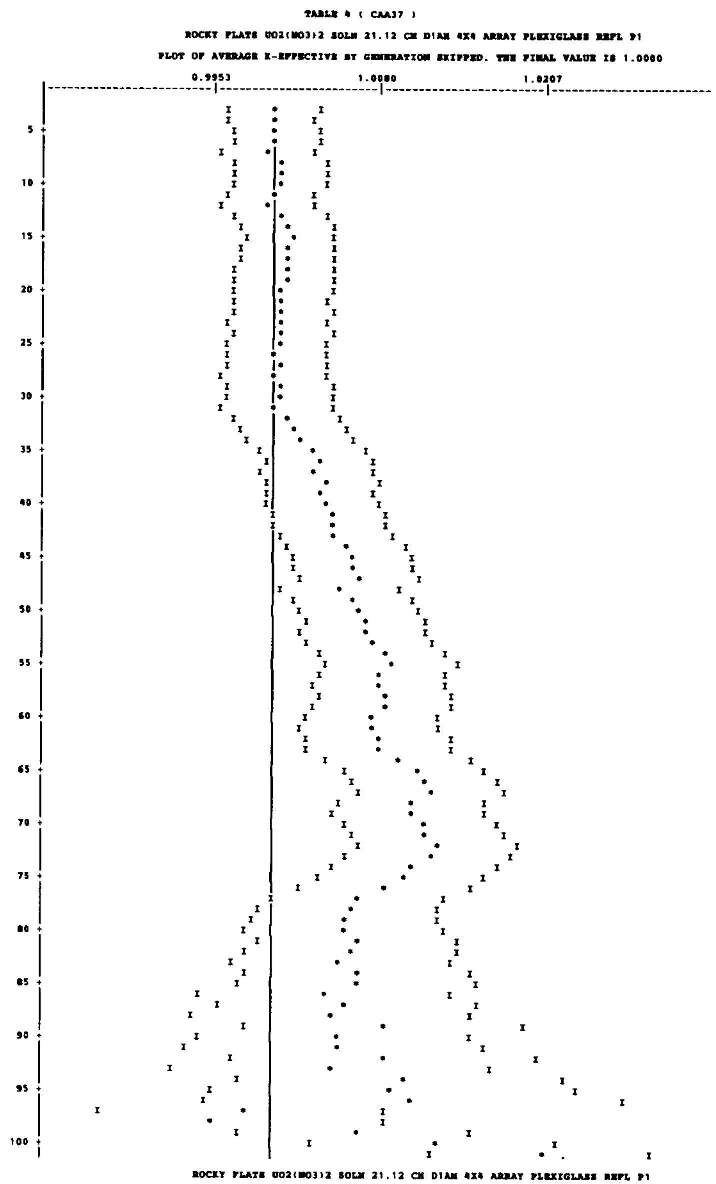
PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0099



ROCKY FLATS UO2(NO3)2 SOLN 16.12 CM DIAM 2X4 ARRAY CONC REFL C8

Fig. B.4 (continued)

Table 4 plots (cont.)



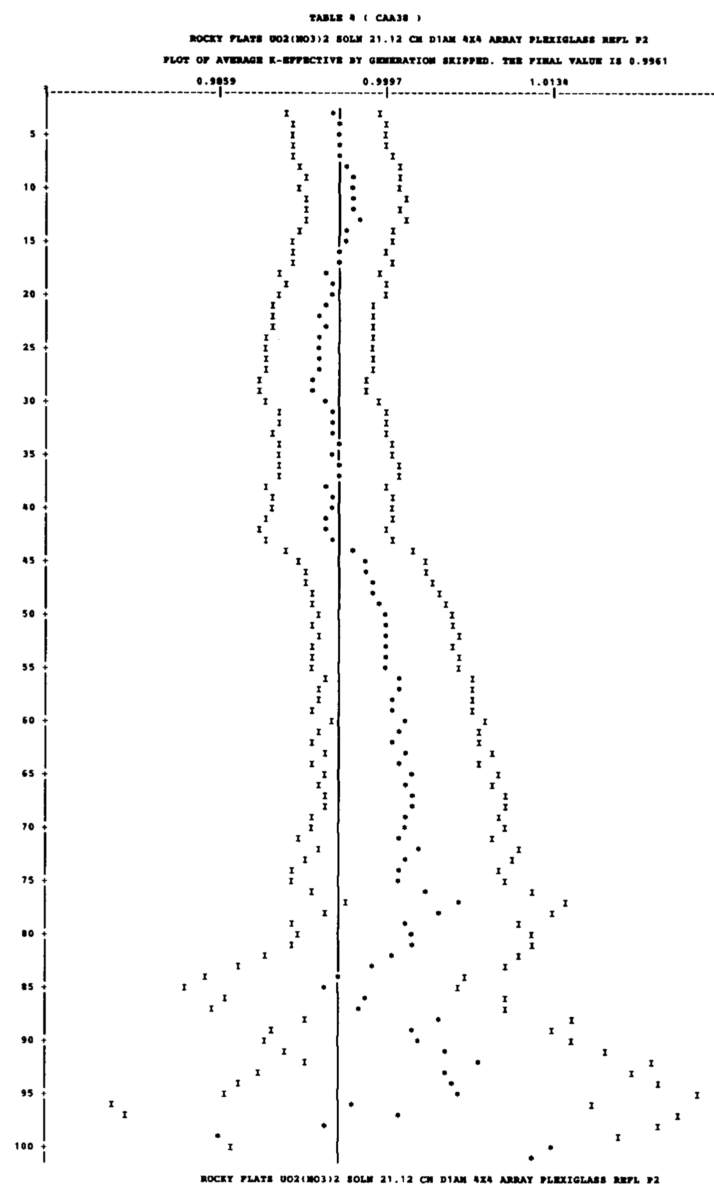
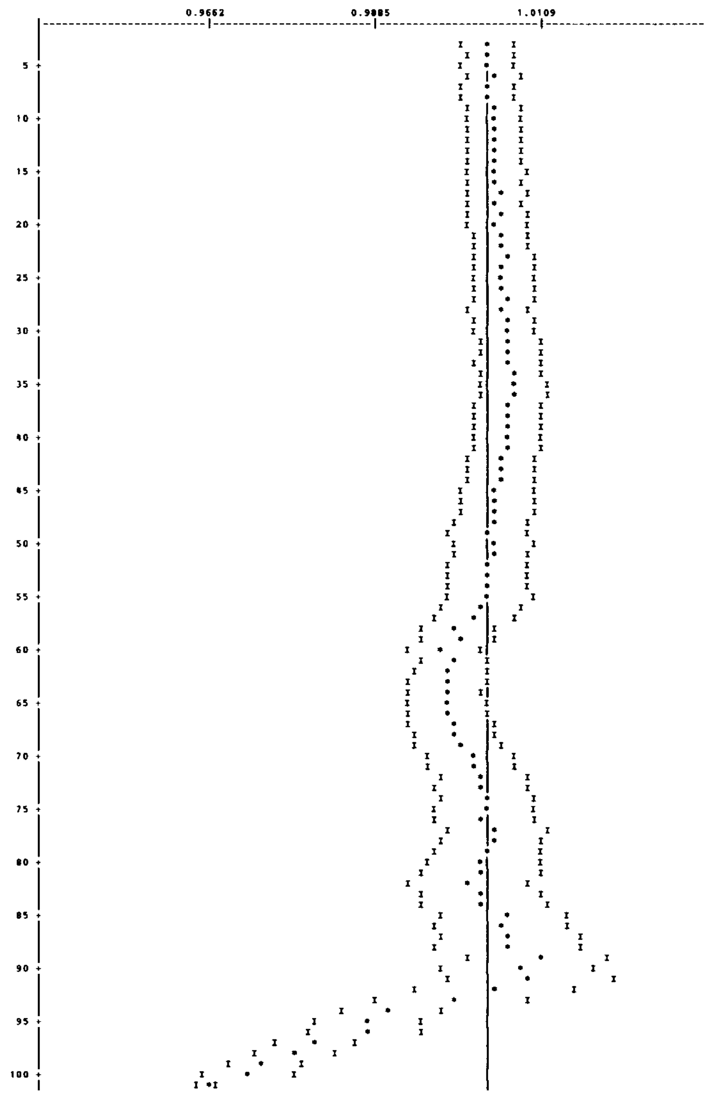


Fig. B.4 (continued)

TABLE 4 (CAA39)

ROCKY FLATS UO2(NO3)2 SOLN 16.12 CM DIAM 4X4 ARRAY PLEXIGLASS REFL P3

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0045

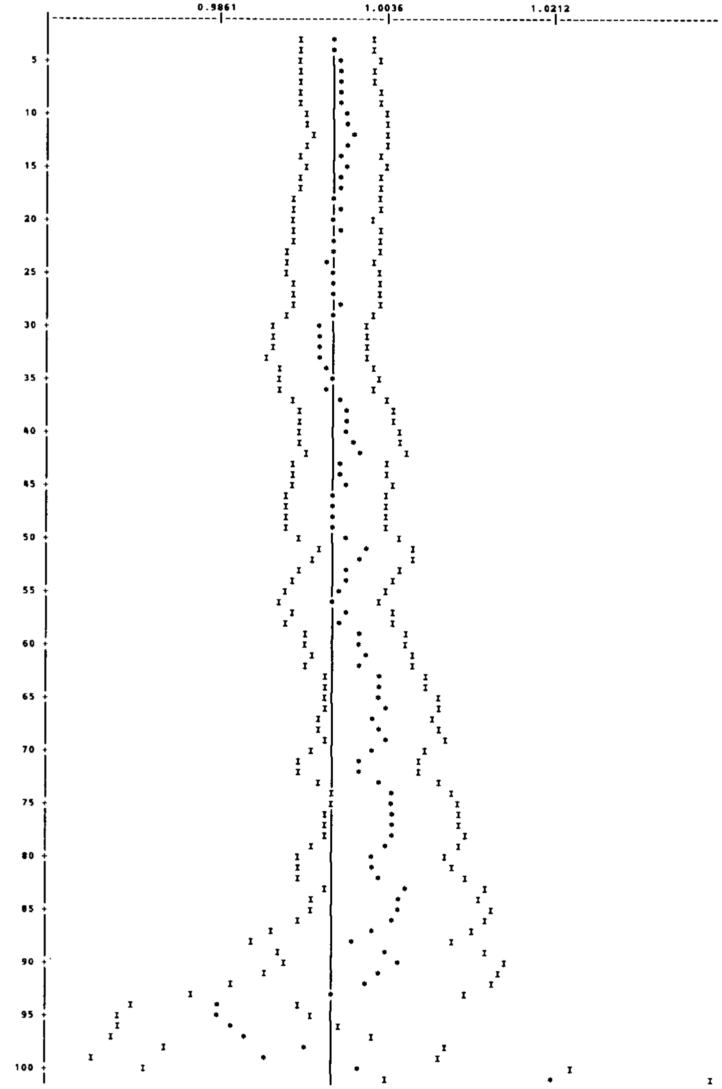


ROCKY FLATS UO2(NO3)2 SOLN 16.12 CM DIAM 4X4 ARRAY PLEXIGLASS REFL P3

TABLE 4 (CAA40)

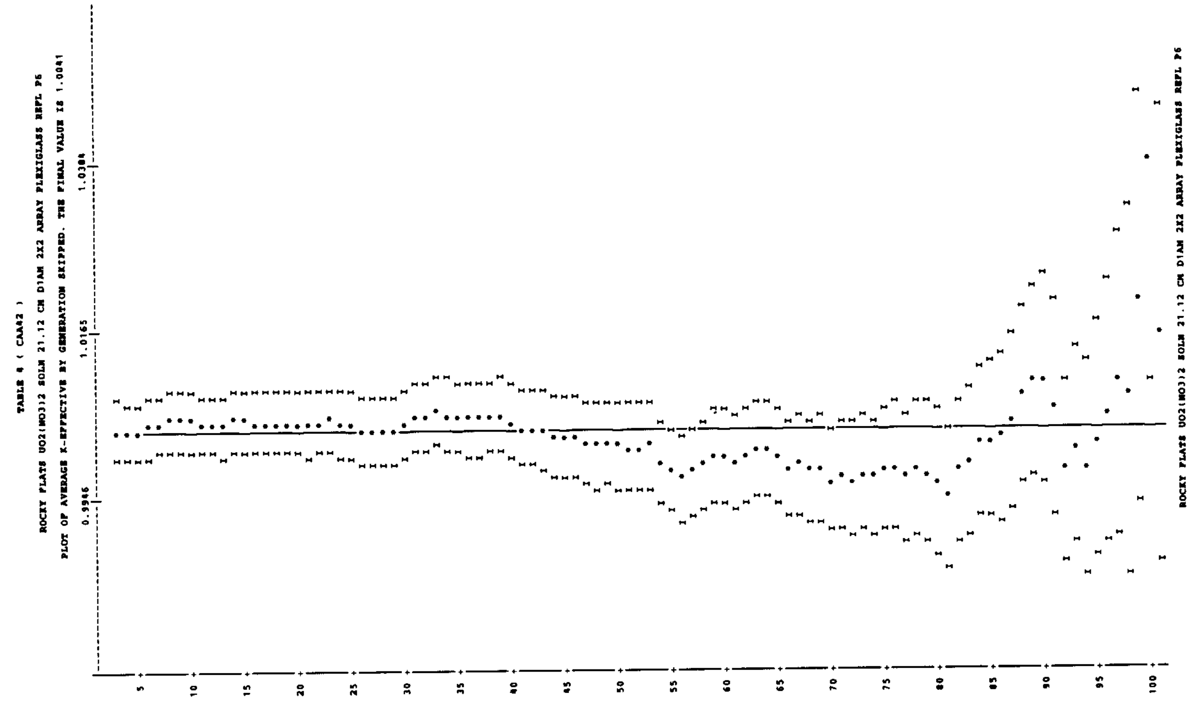
ROCKY FLATS UO2(NO3)2 SOLN 16.12 CM DIAM 4X4 ARRAY PLEXIGLASS REFL P4

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 0.9985



ROCKY FLATS UO2(NO3)2 SOLN 16.12 CM DIAM 4X4 ARRAY PLEXIGLASS REFL P4

Fig. B.4 (continued)



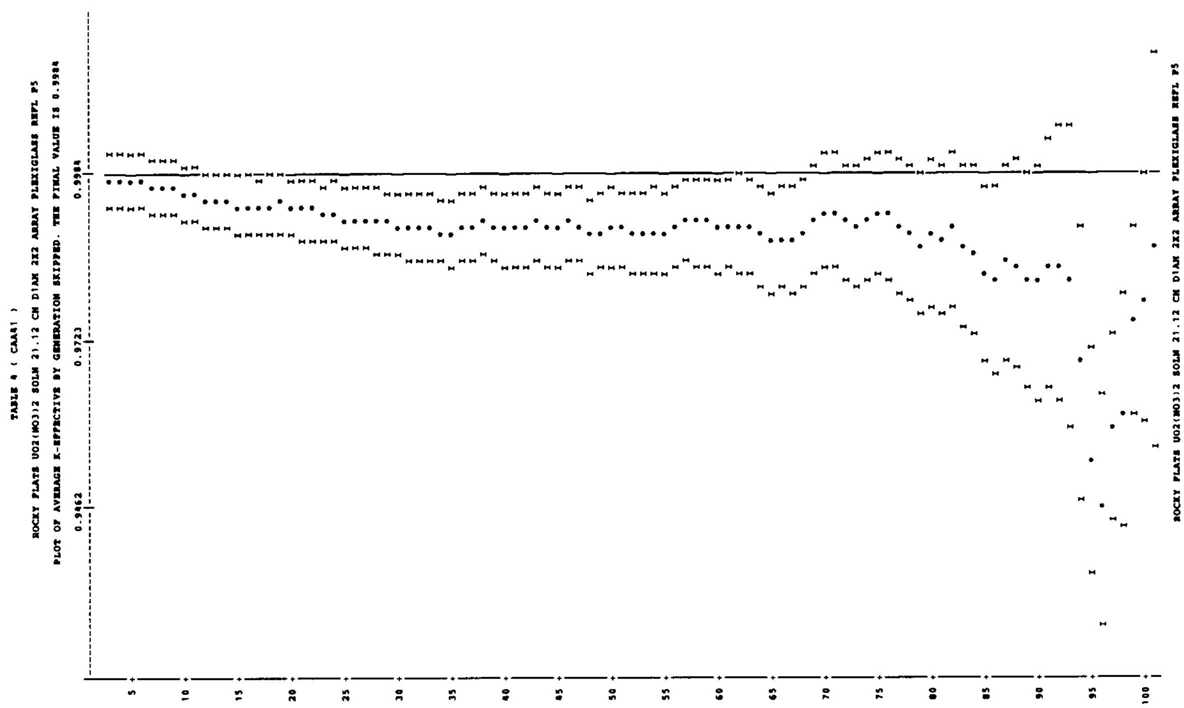
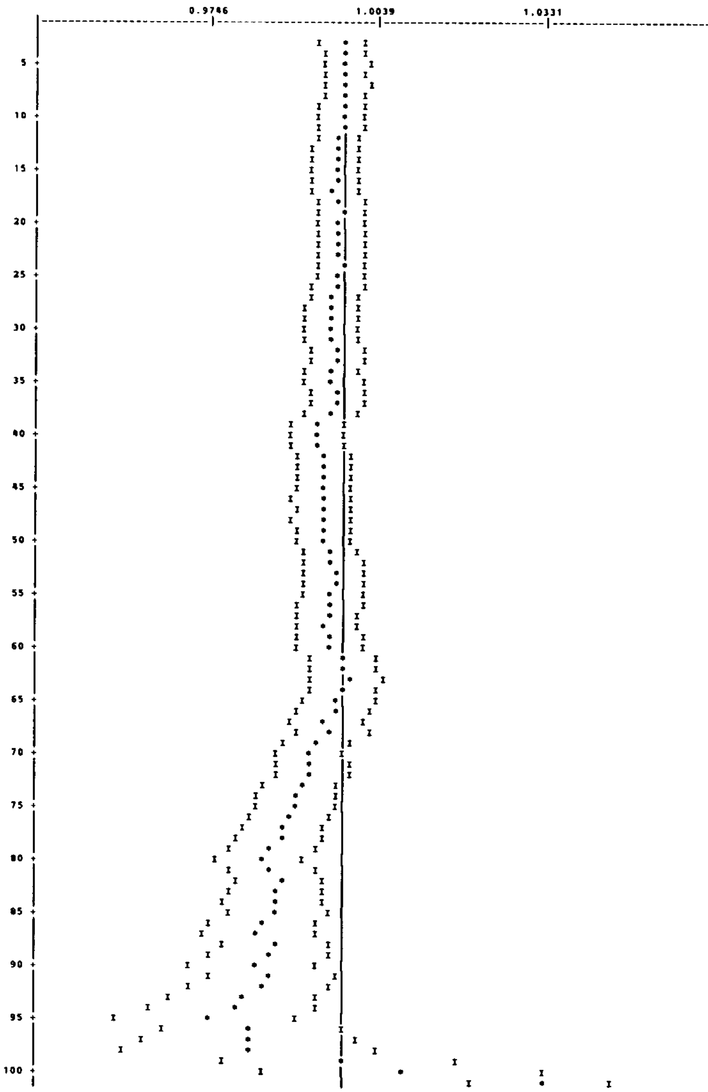


Fig. B.4 (continued)

TABLE 4 (CAA43)

ROCKY FLATS UO2(NO3)2 SOLN 16.12 CM DIAM 3X2 ARRAY PLEXIGLASS REFL P7

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 0.9982



ROCKY PLATS UO2(NO3)2 SOLN 16.12 CM DIAM 3X2 ARRAY PLEXIGLASS REFL P7

Fig. B.4 (continued)

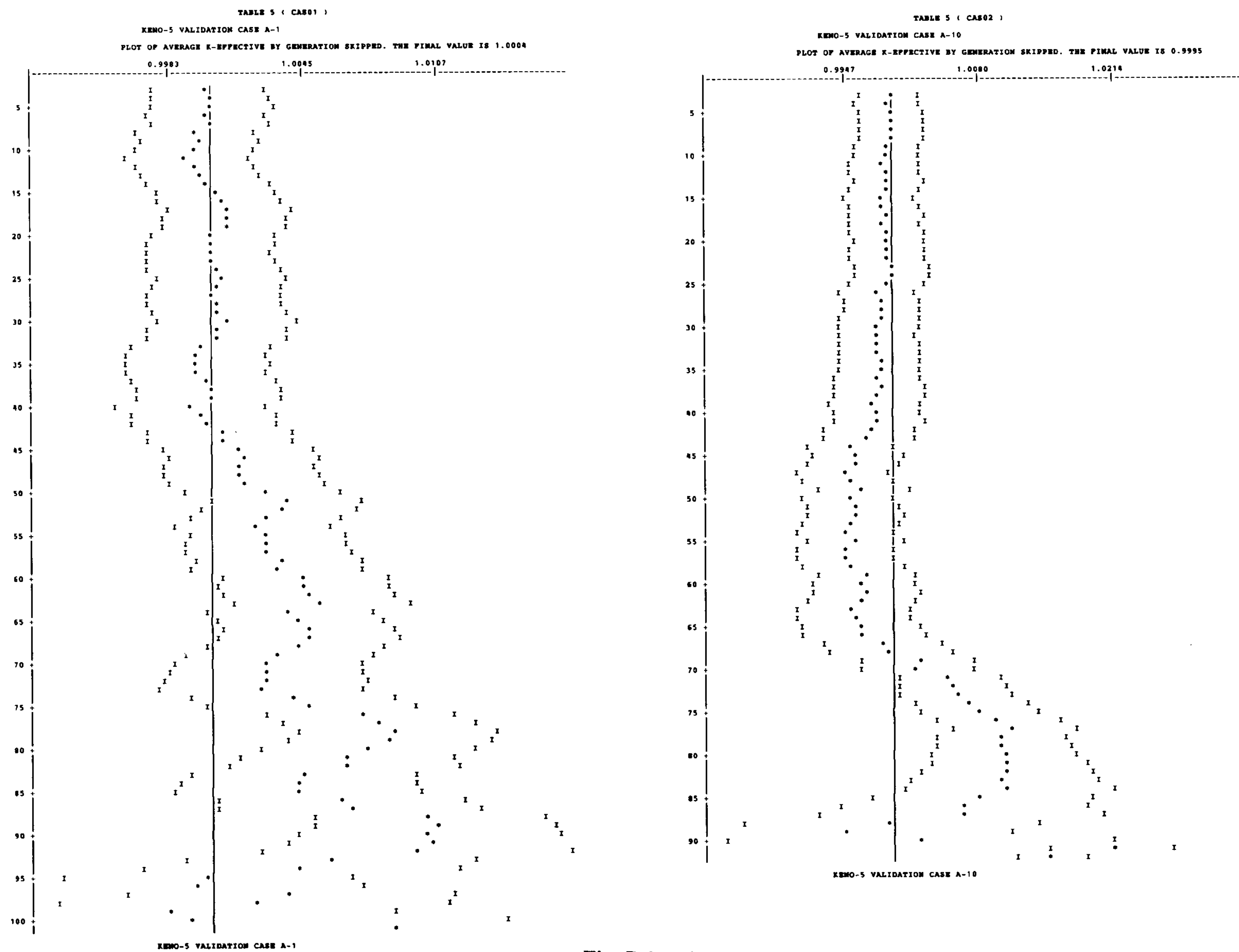
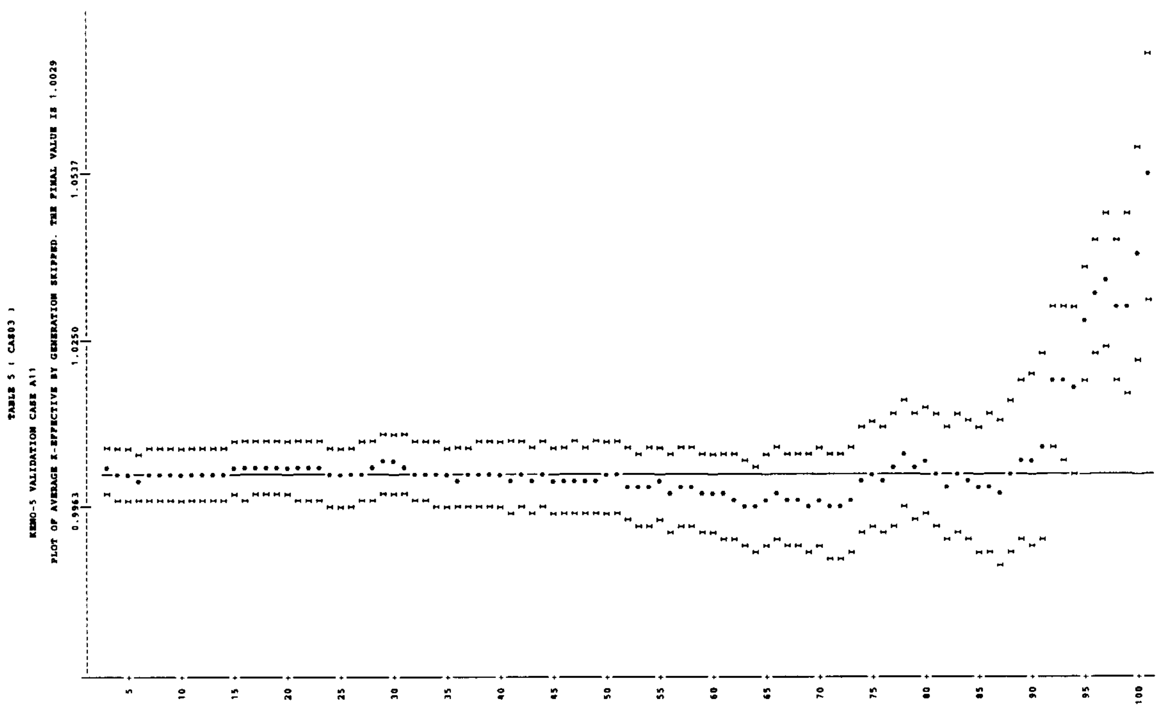


Fig. B.5. Plots for Table 5.



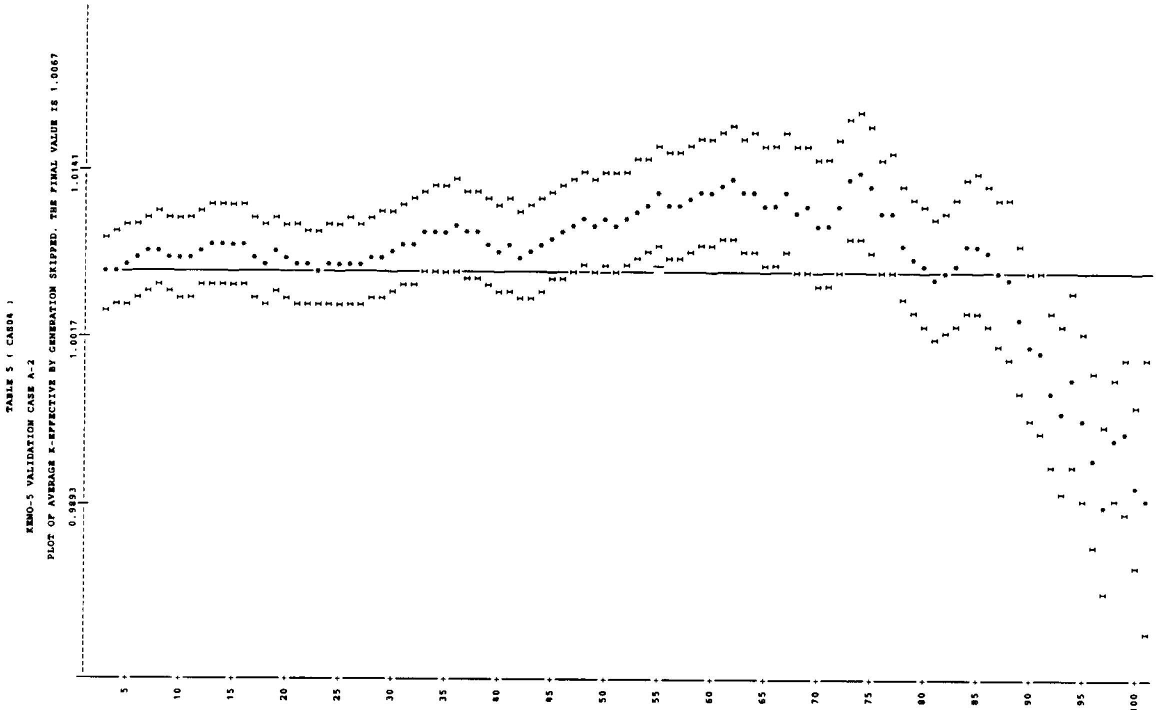
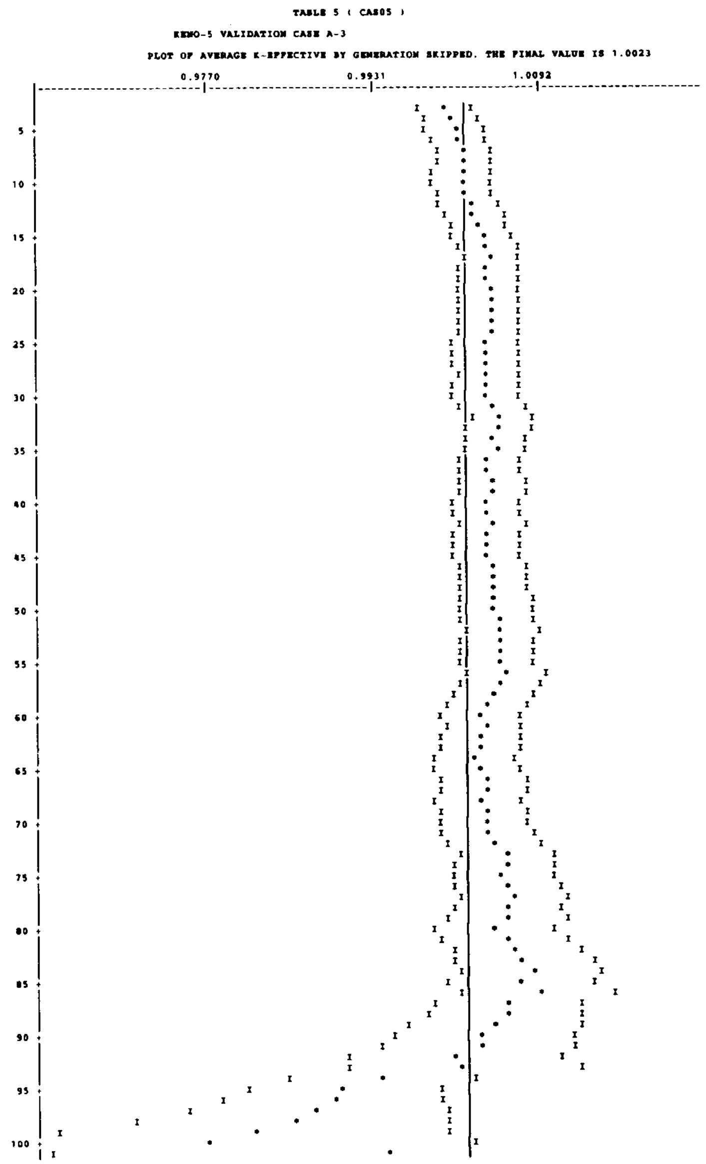


Fig. B.5 (continued)



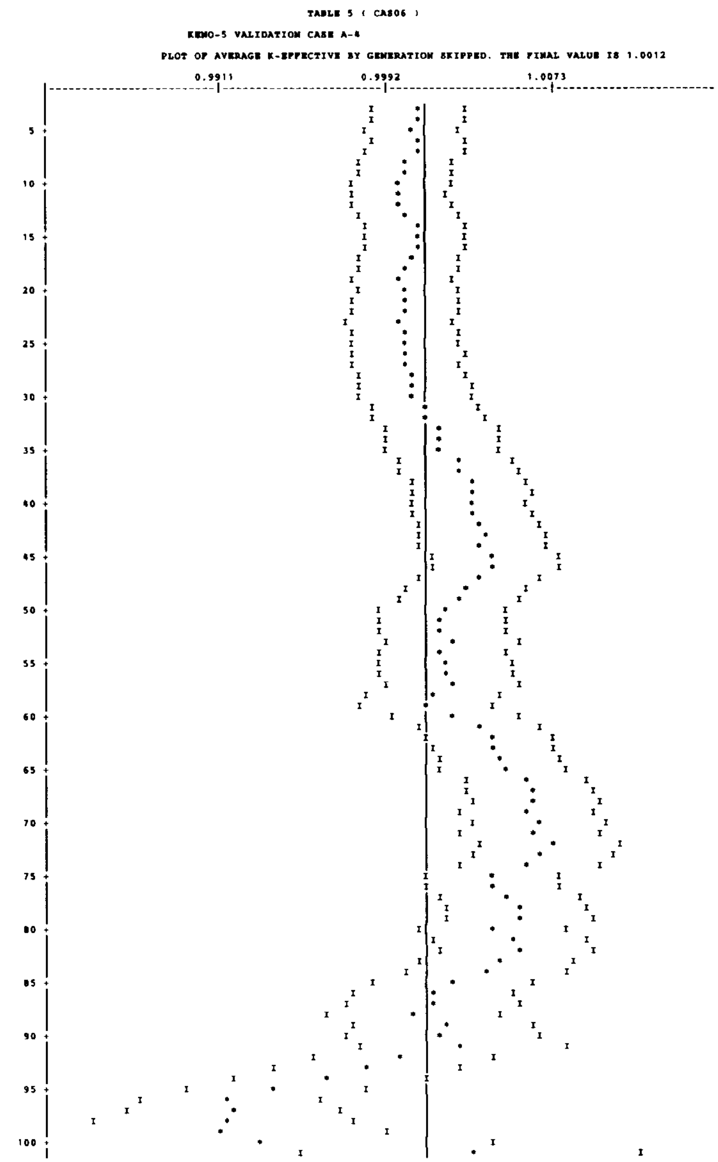
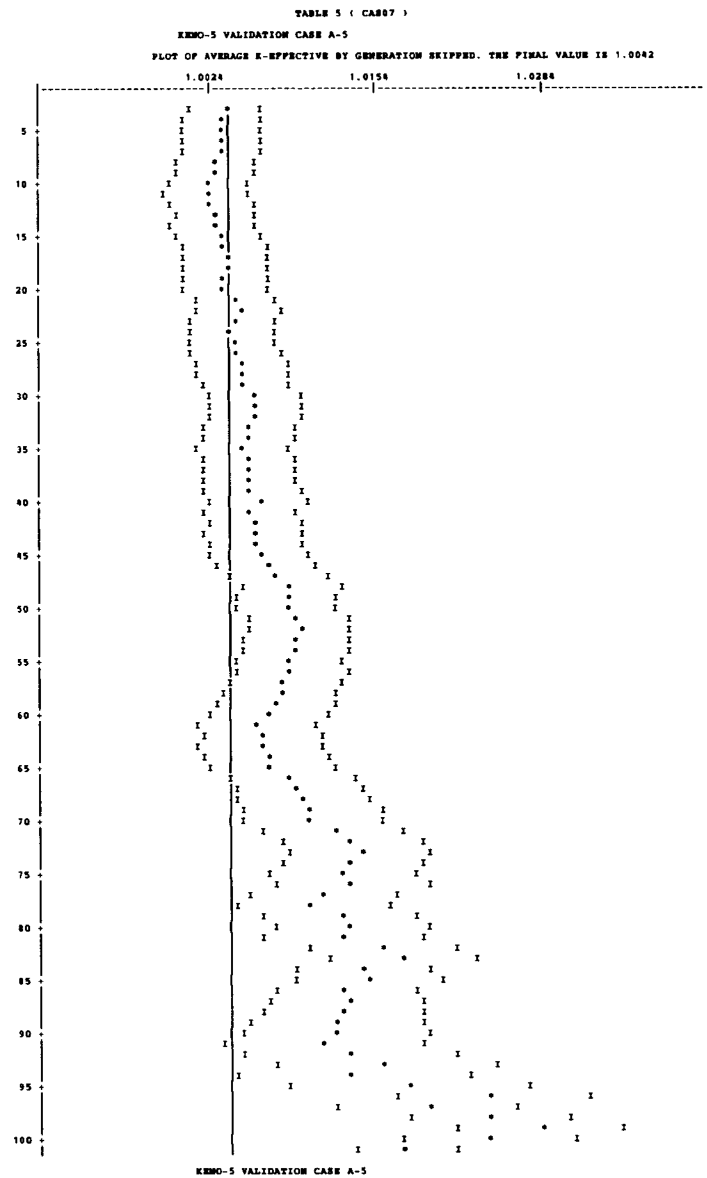


Fig. B.5 (continued)



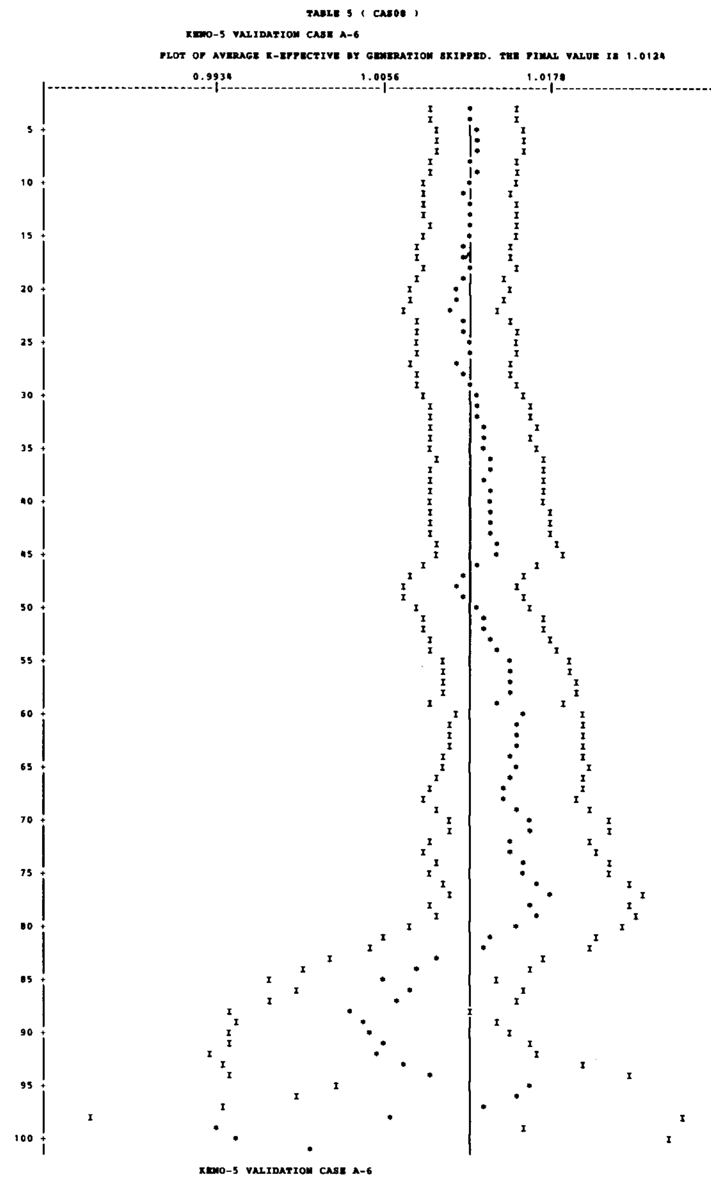
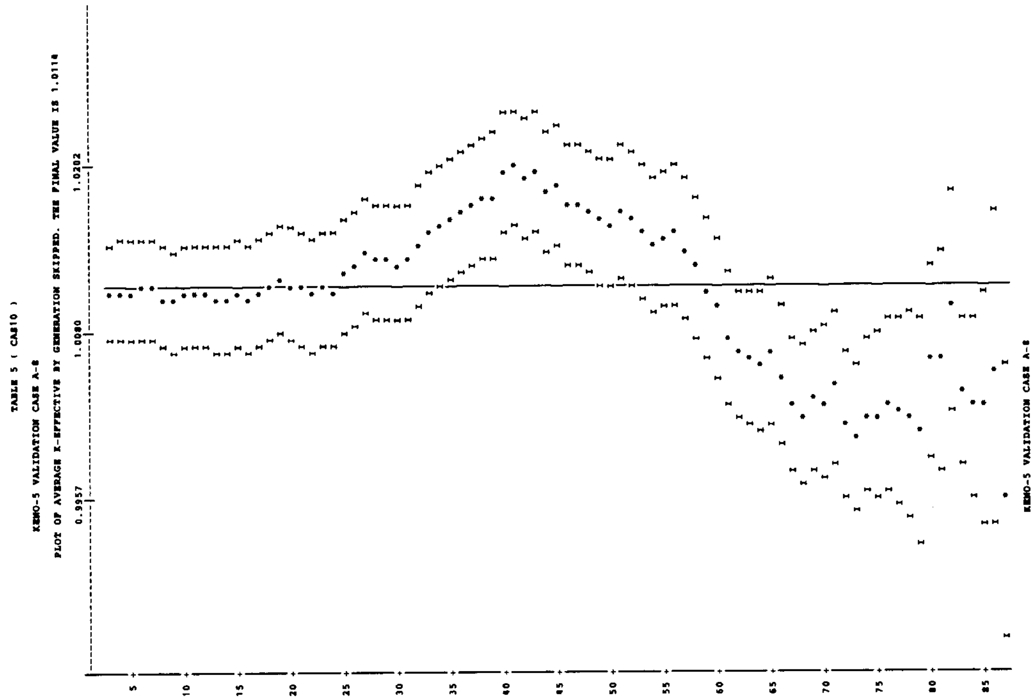


Fig. B.5 (continued)



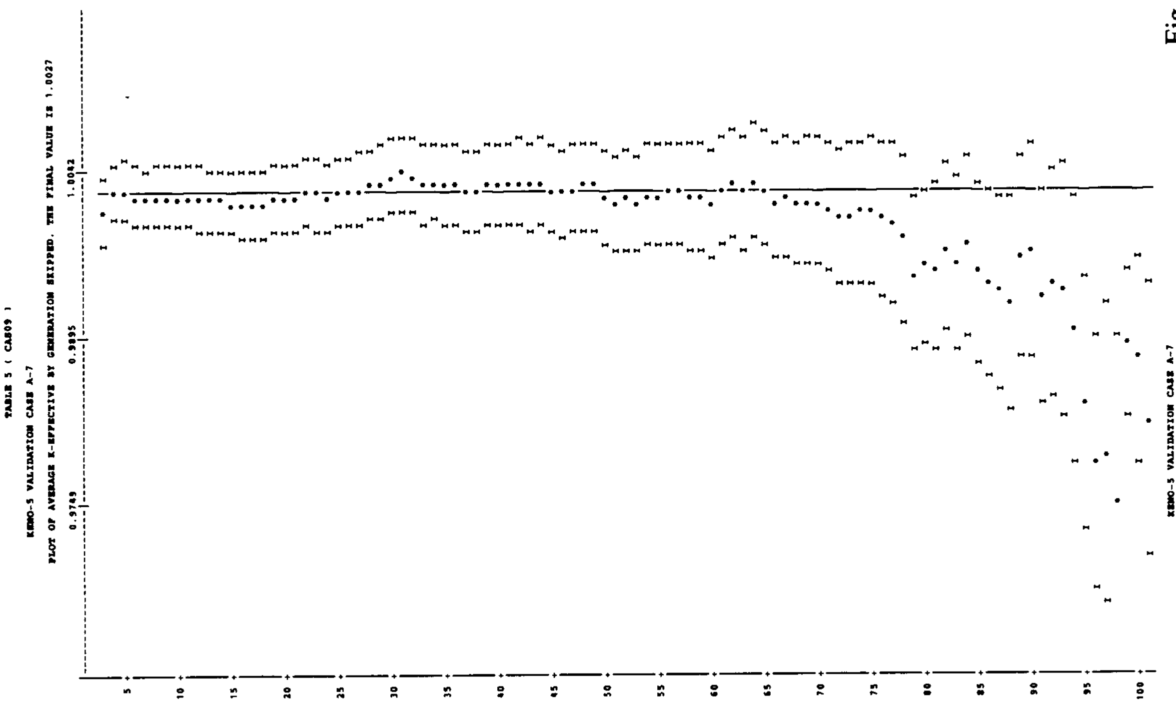


Fig. B.5 (continued)

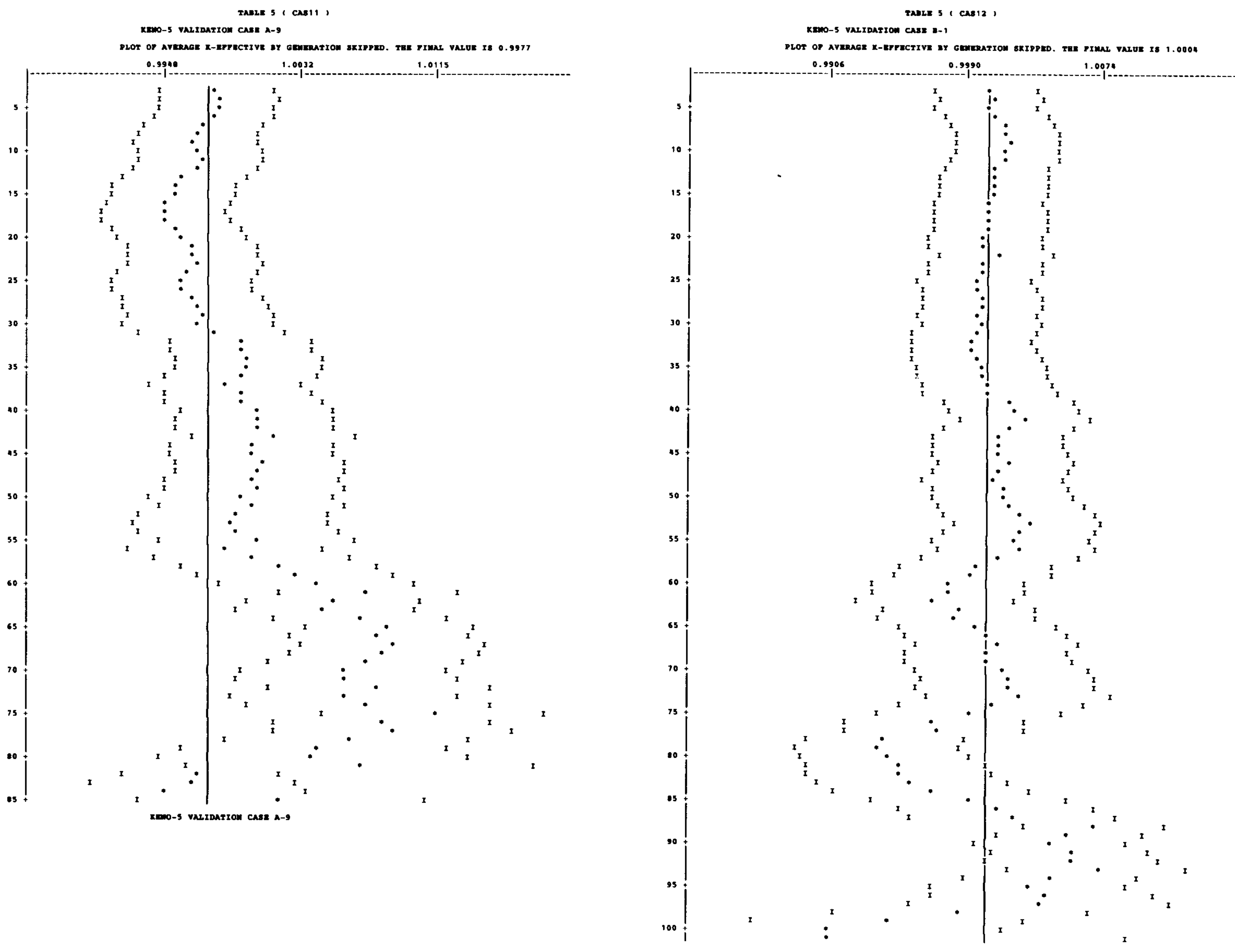
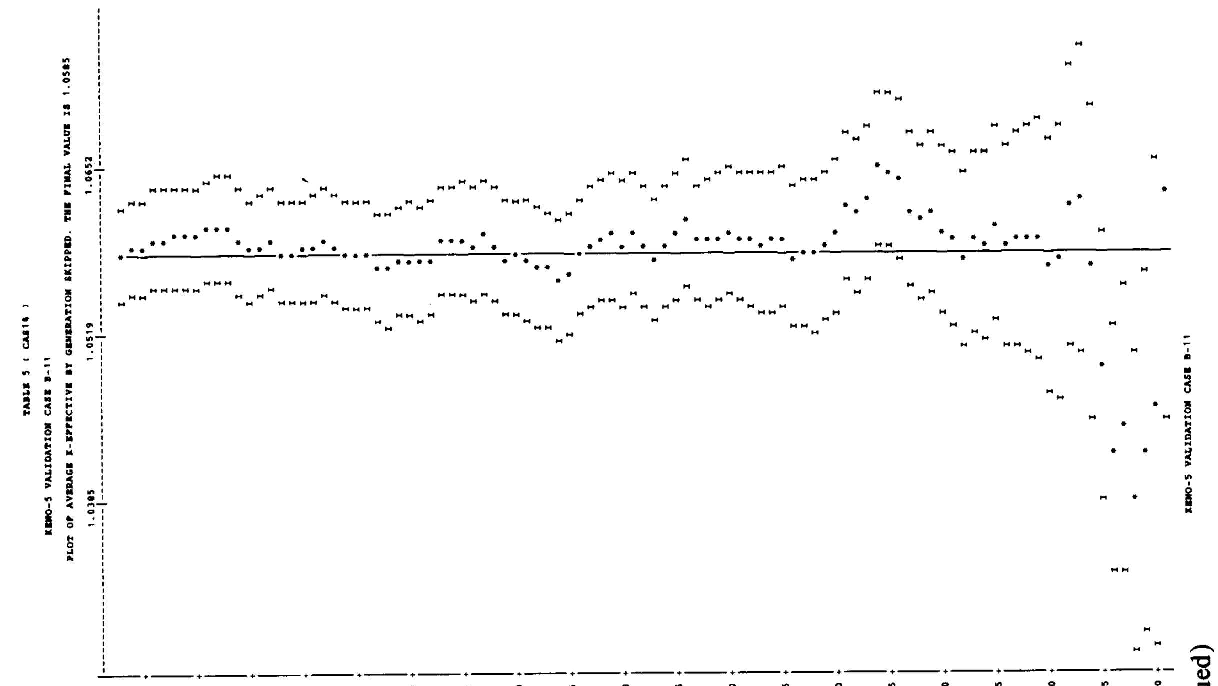


Fig. B.5 (continued)



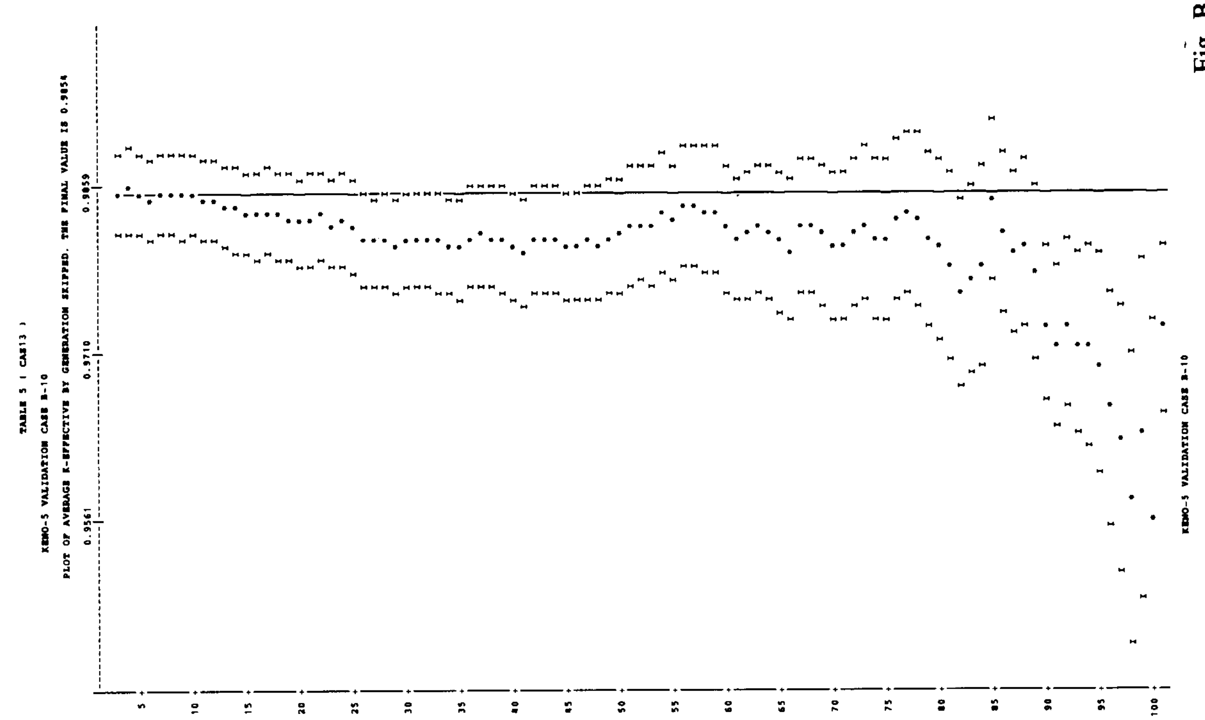
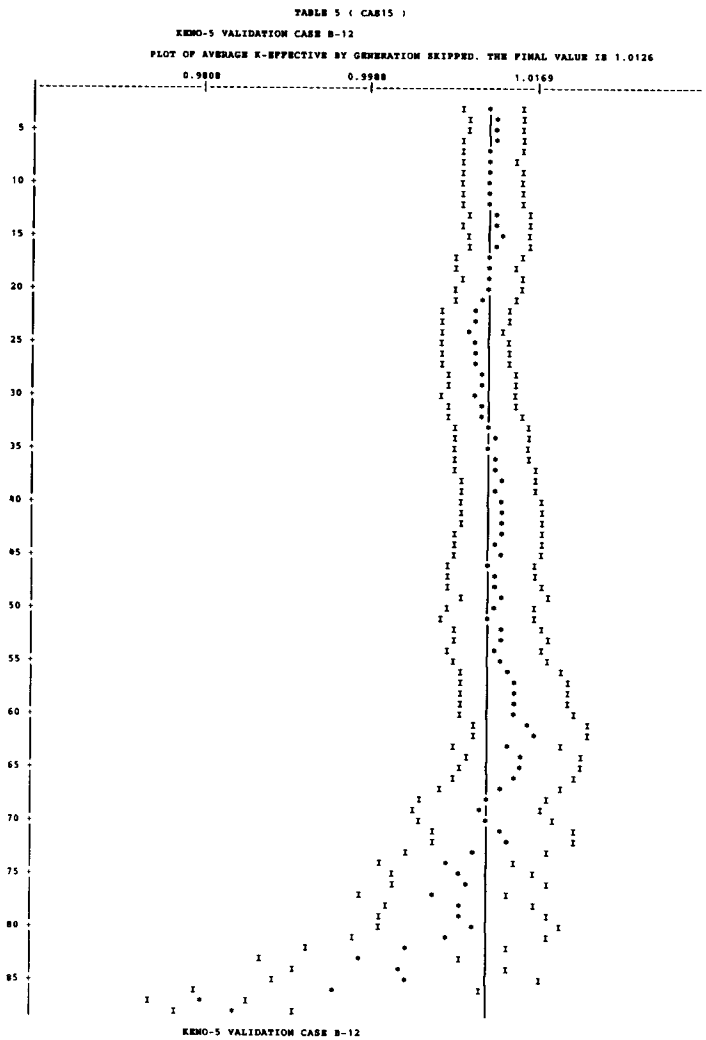


Fig. B.5 (continued)



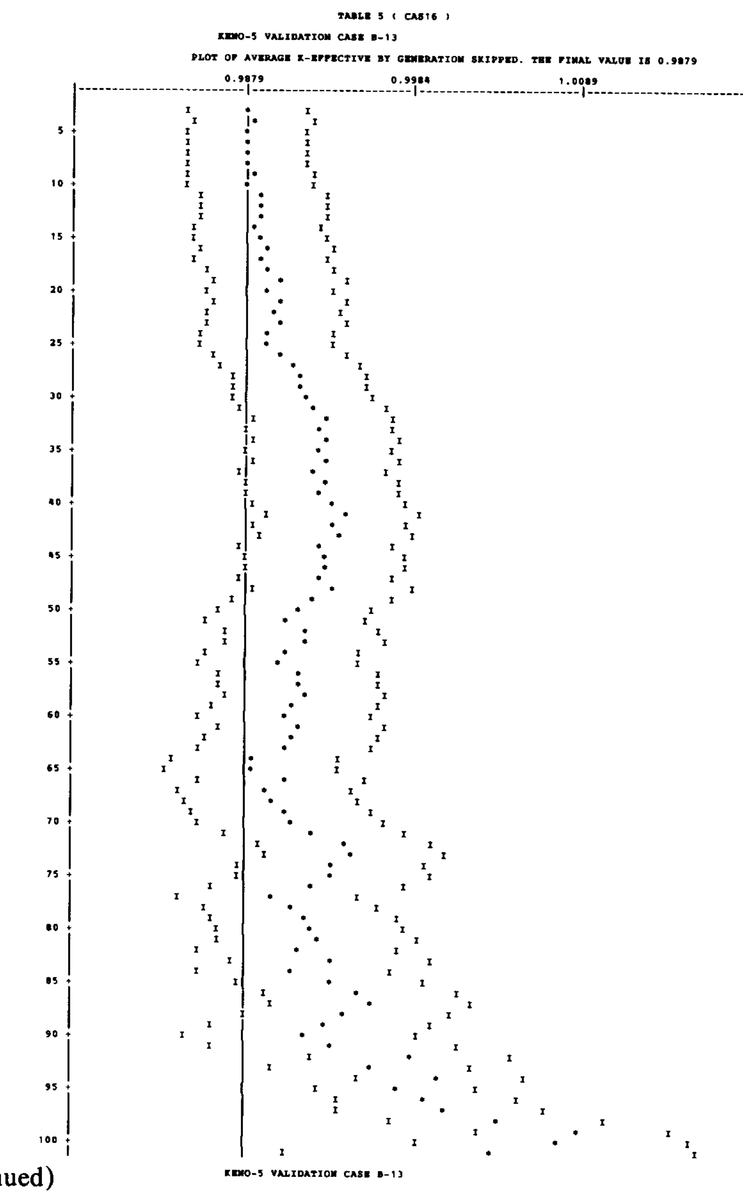
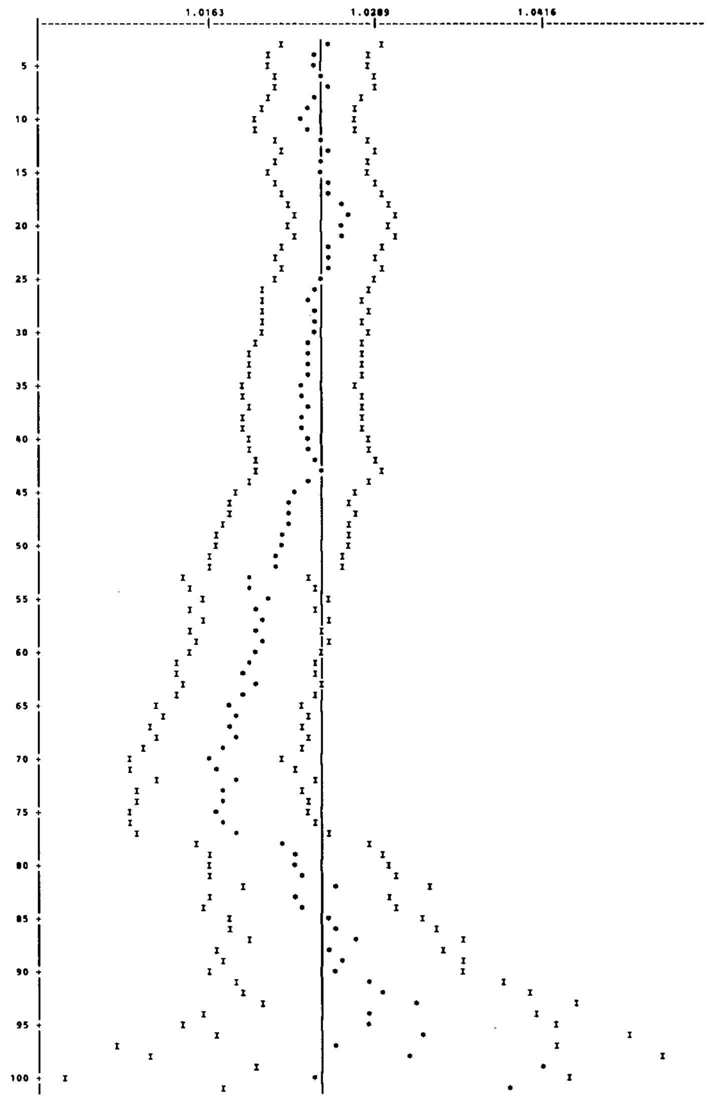


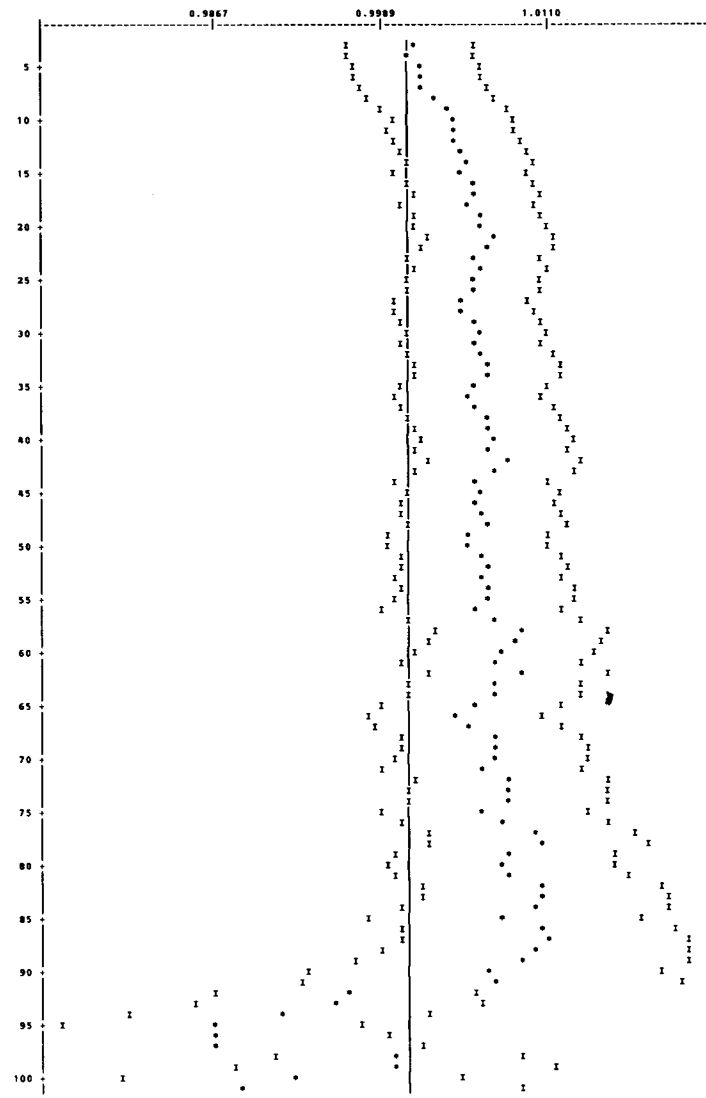
Fig. B.5 (continued)

TABLE 5 (CASE17)
KENO-5 VALIDATION CASE B-14
PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0250



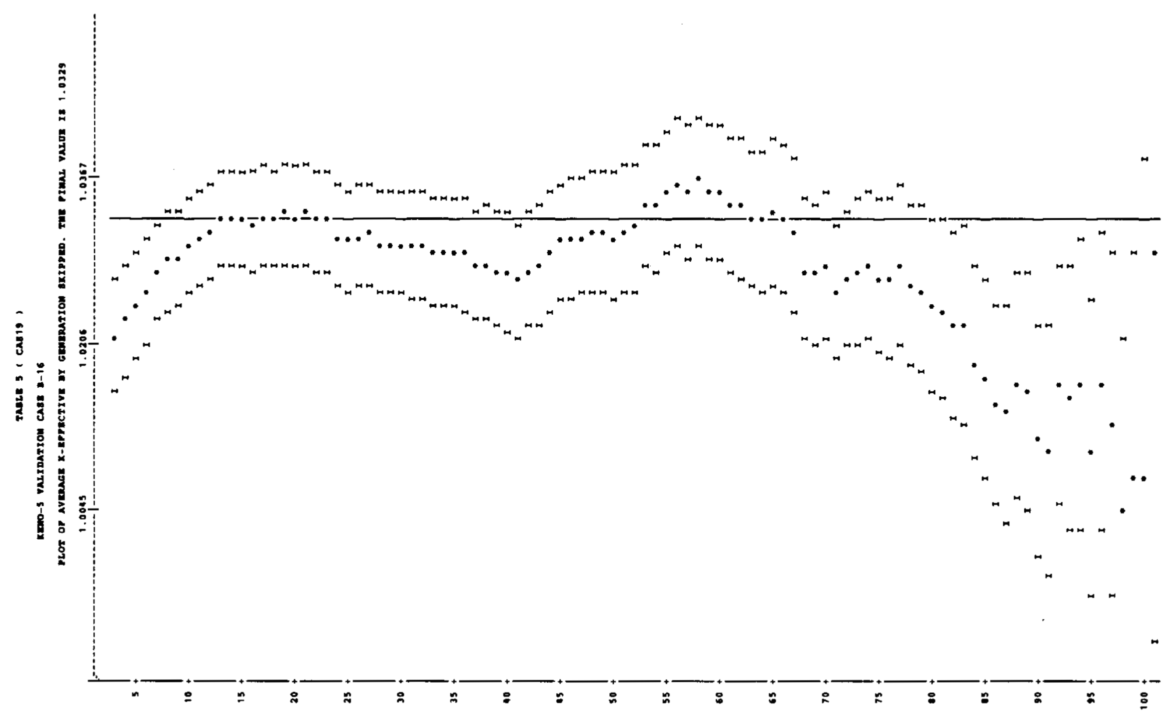
KENO-5 VALIDATION CASE B-14

TABLE 5 (CASE18)
KENO-5 VALIDATION CASE B-15
PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0010



KENO-5 VALIDATION CASE B-15

Fig. B.5 (continued)



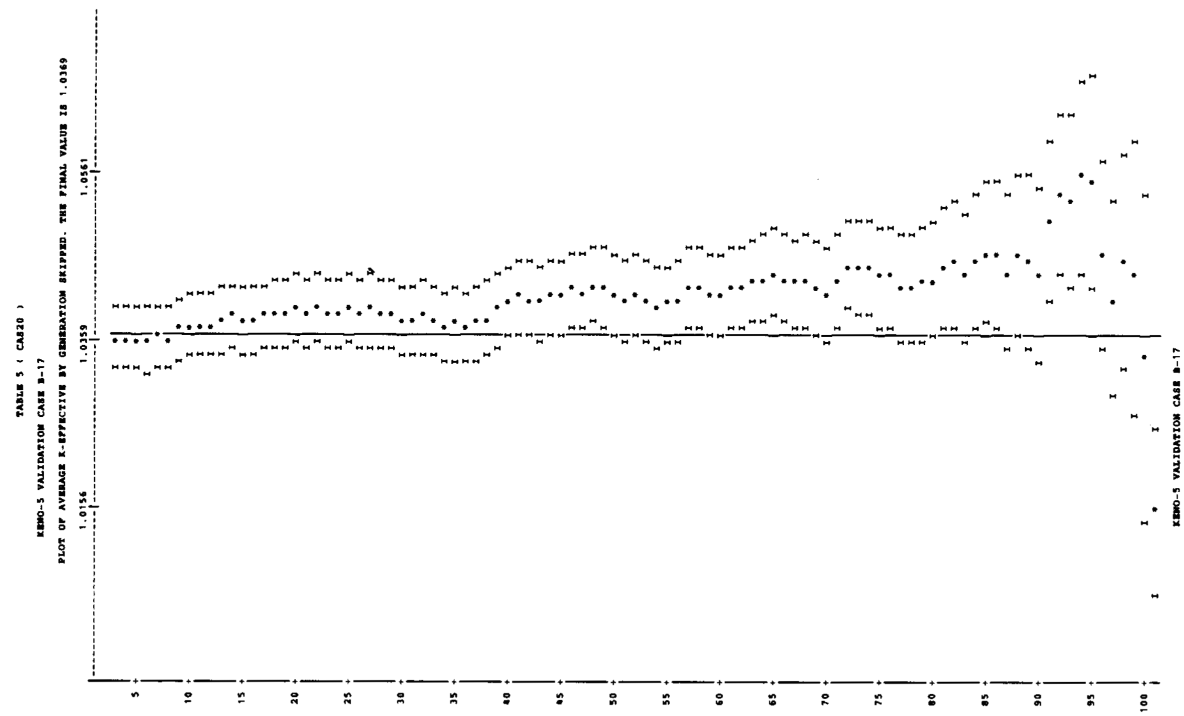
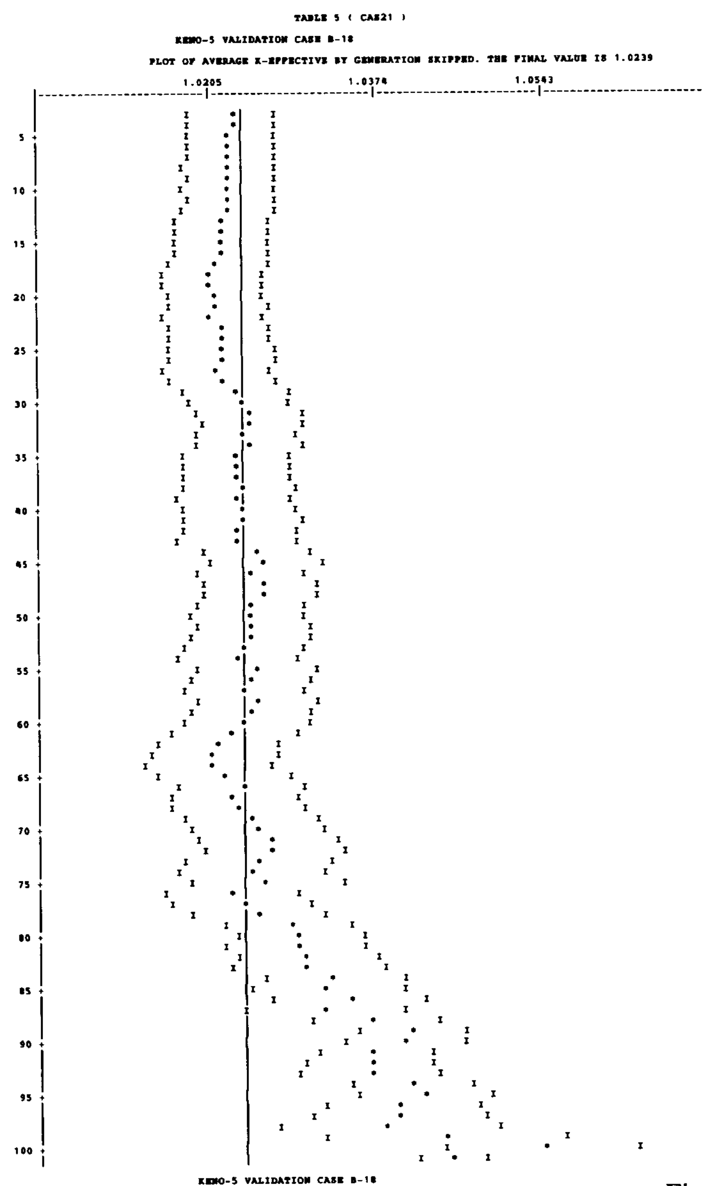


Fig. B.5 (continued)



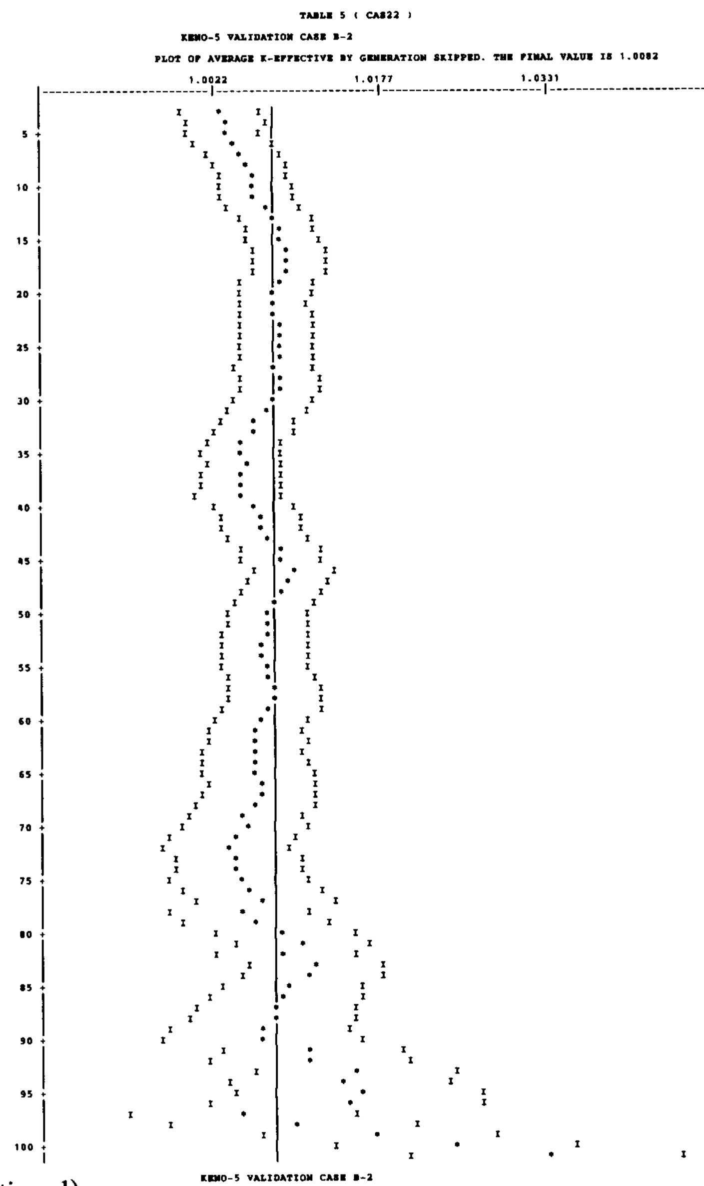
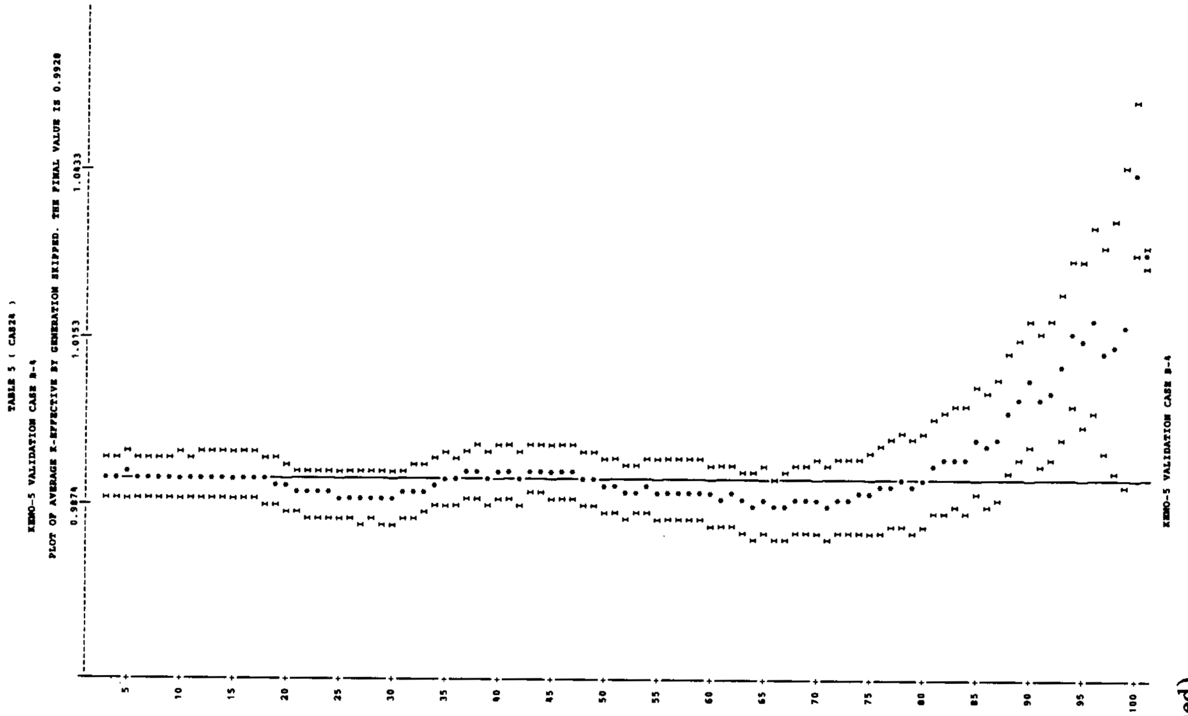


Fig. B.5 (continued)



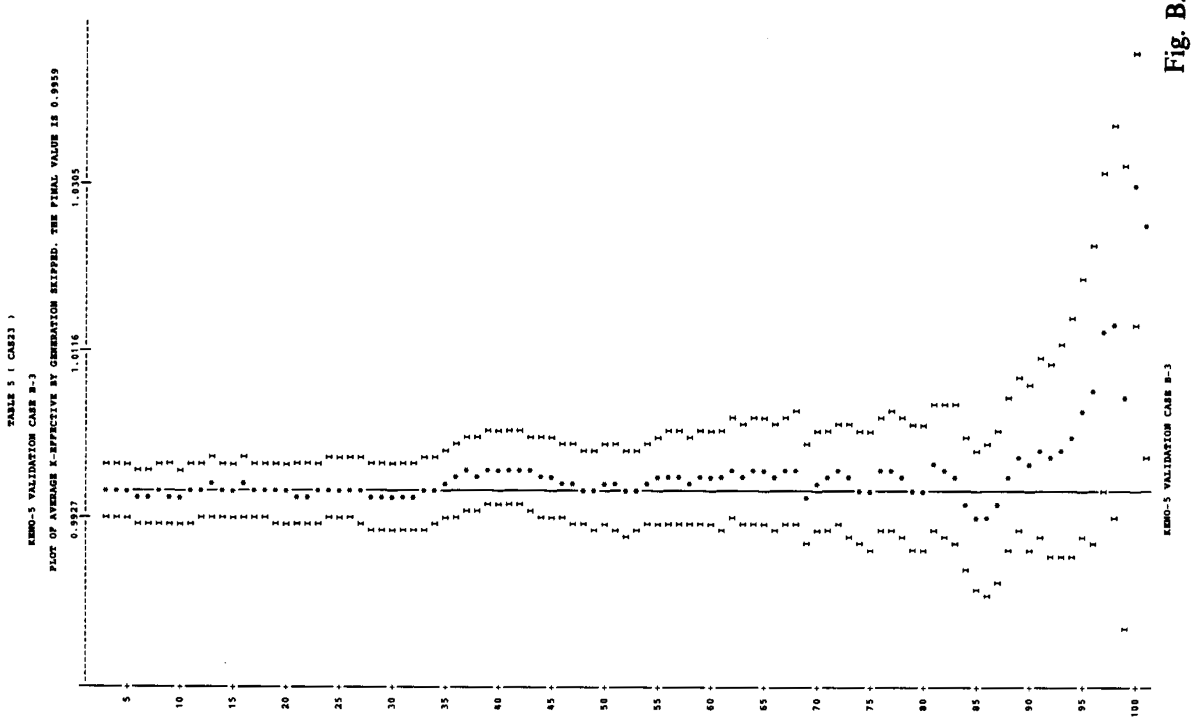
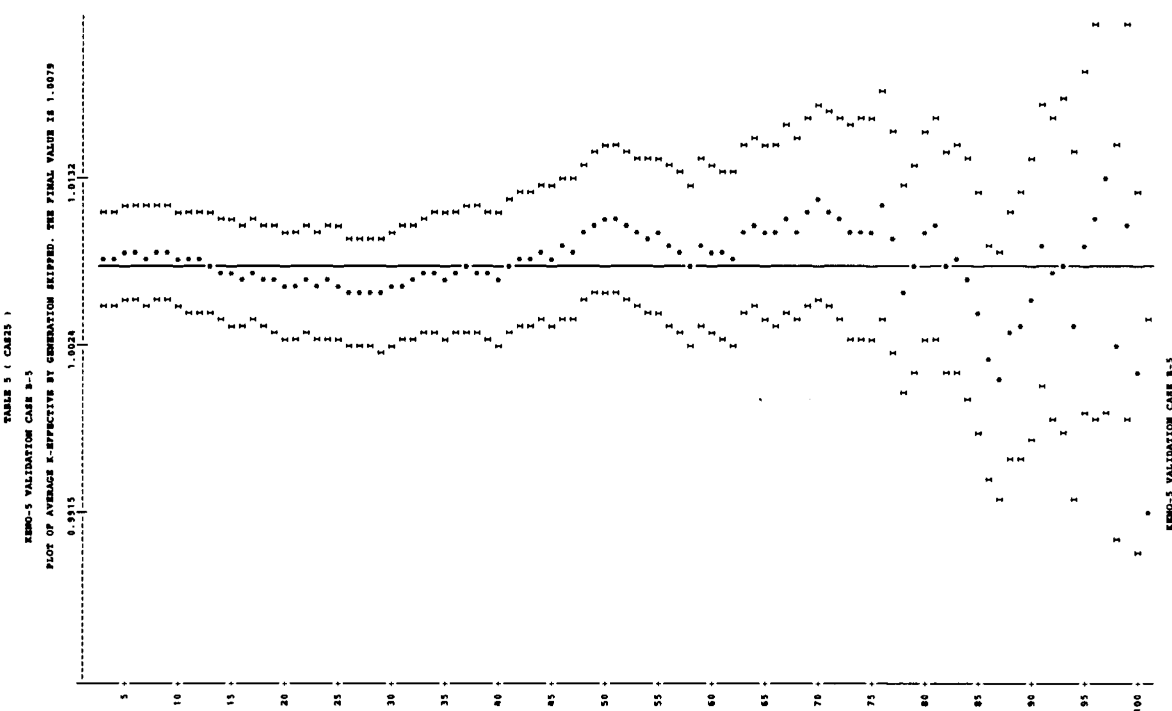


Fig. B.5 (continued)



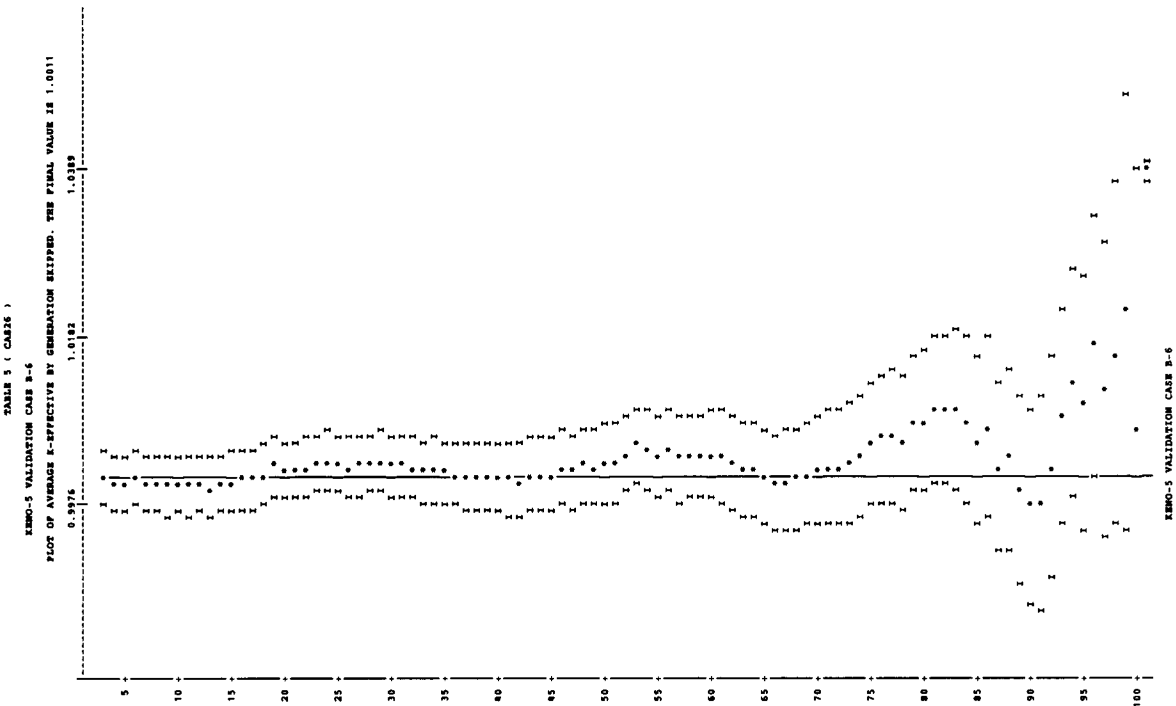


Fig. B.5 (continued)

TABLE 5 (CAS27)

KENO-5 VALIDATION CASE B-7

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0083

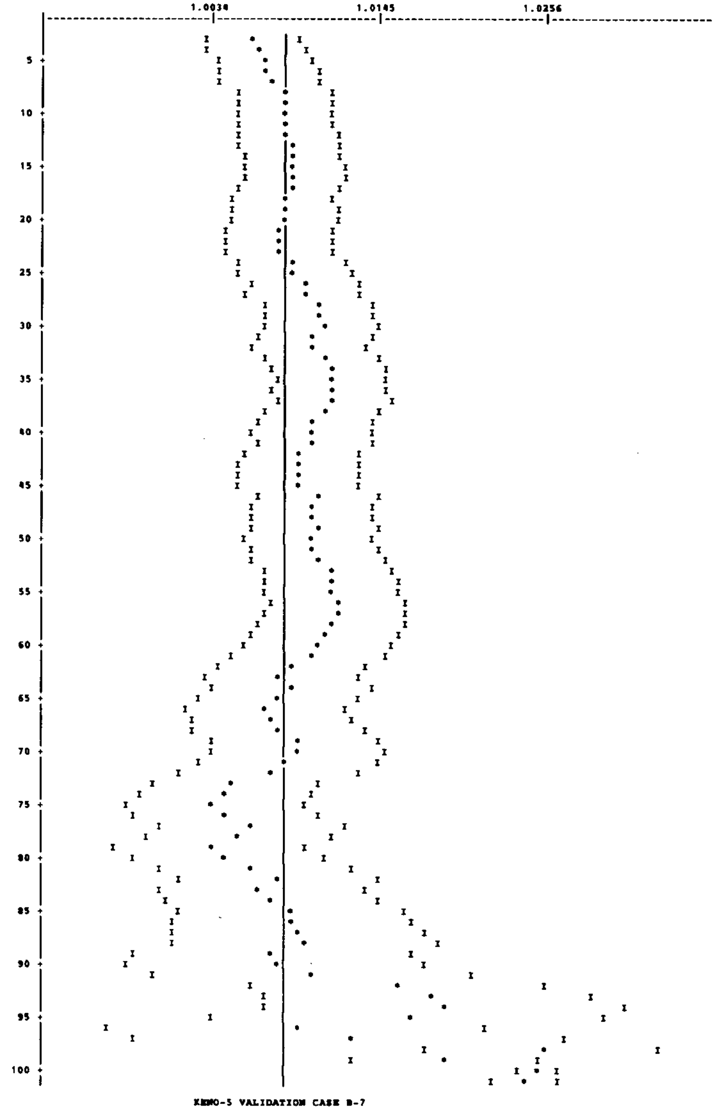


TABLE 5 (CAS28)

KENO-5 VALIDATION CASE B-8

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0102

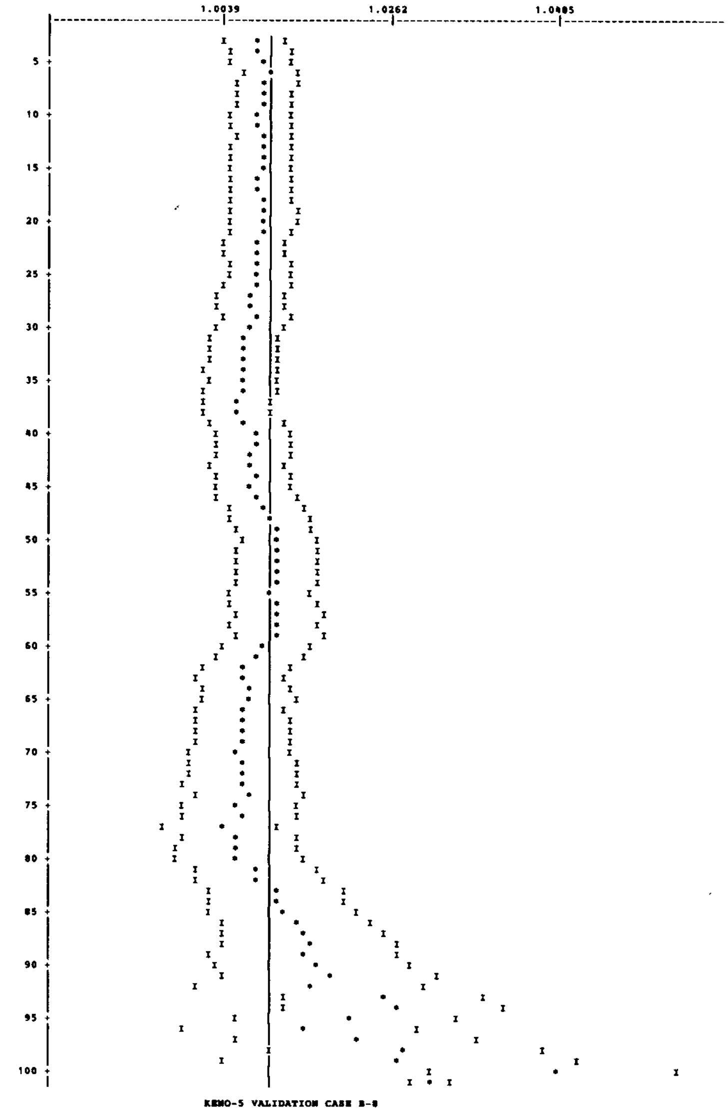
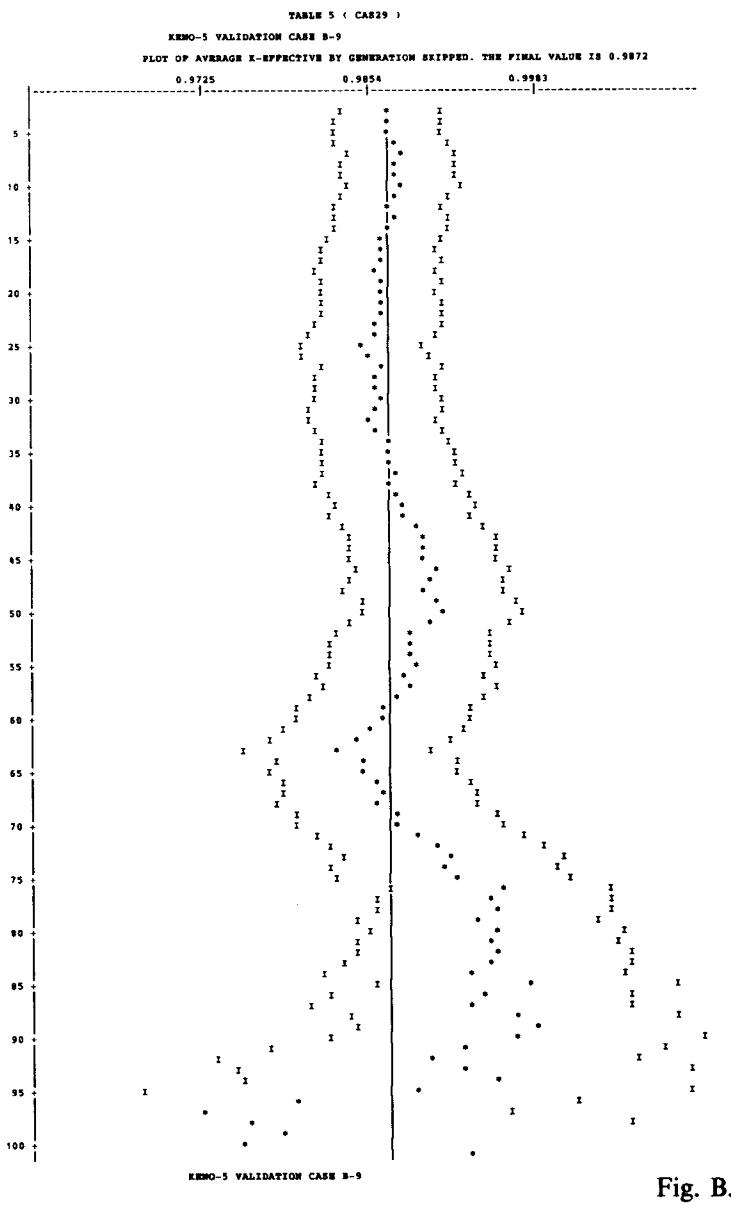


Fig. B.5 (continued)



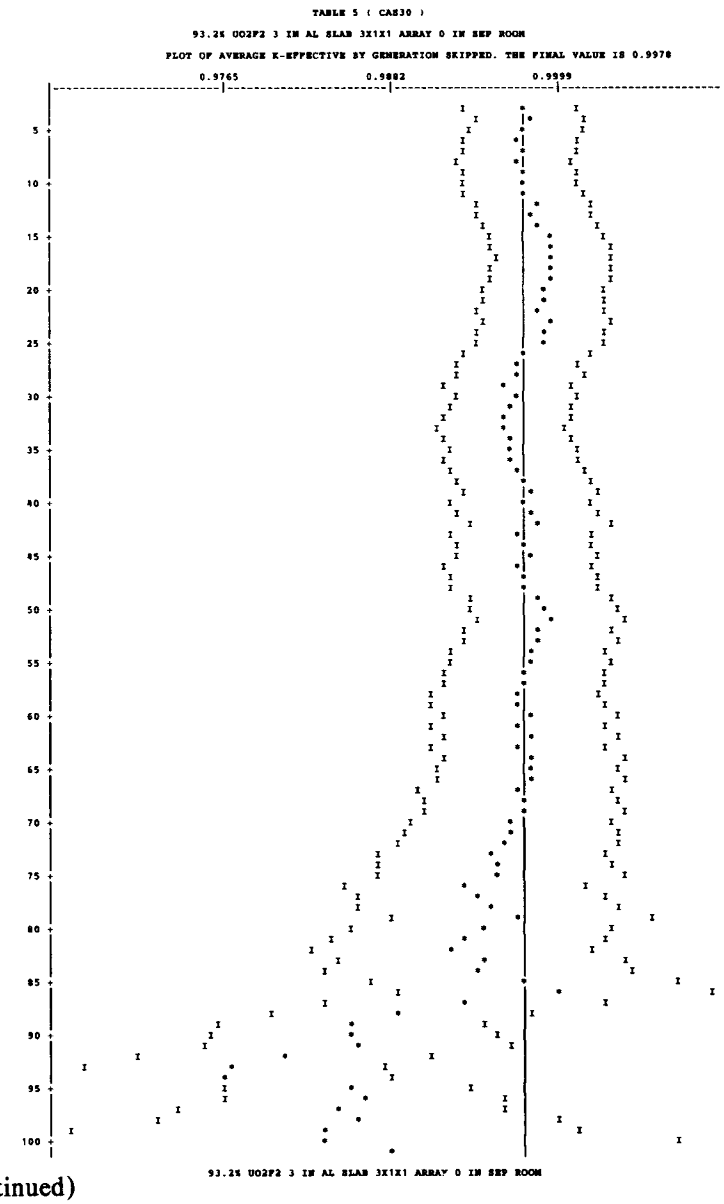
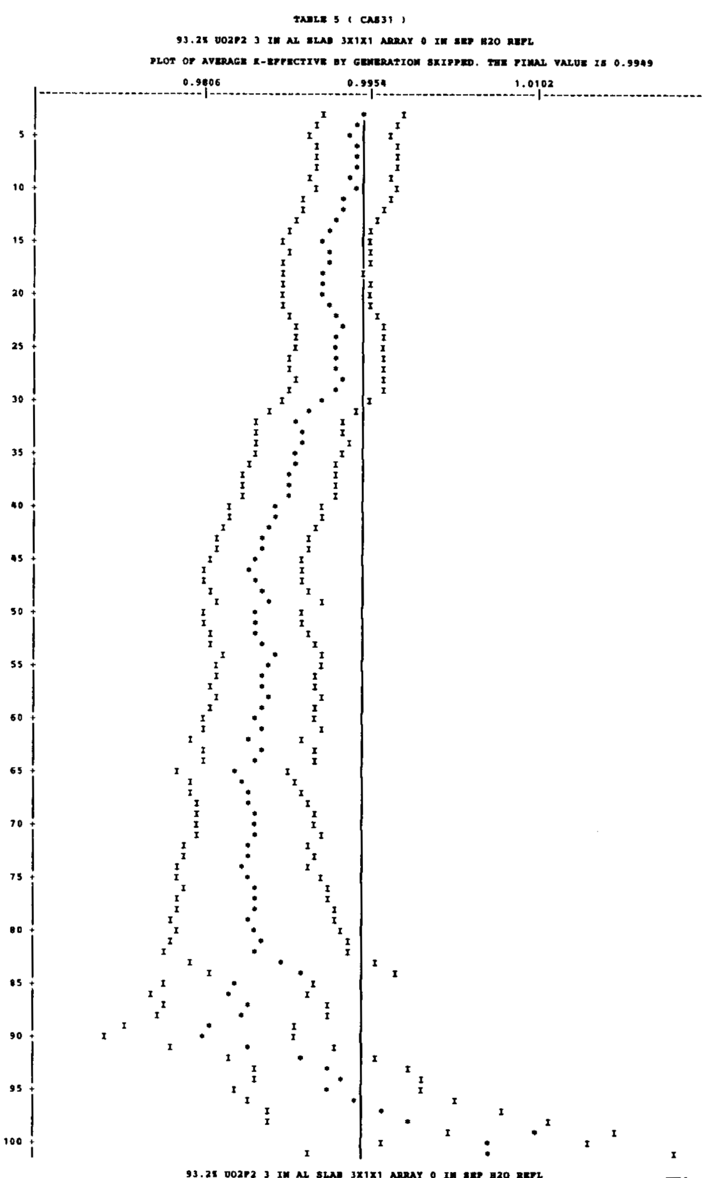


Fig. B.5 (continued)



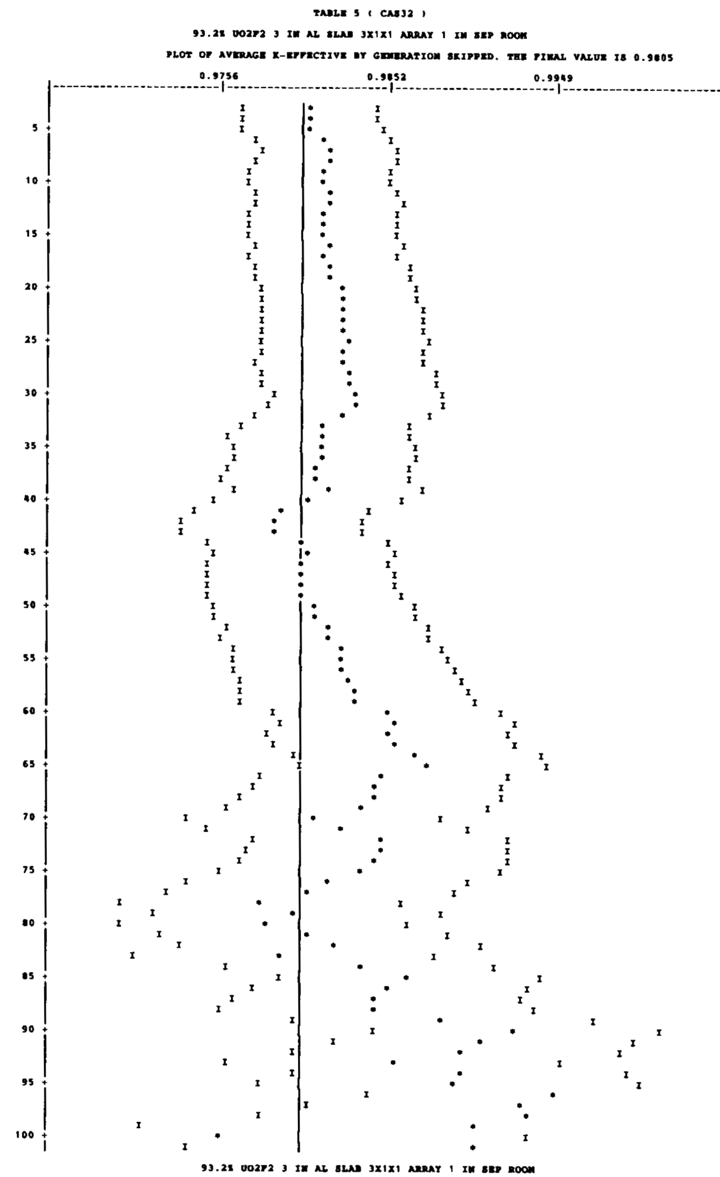
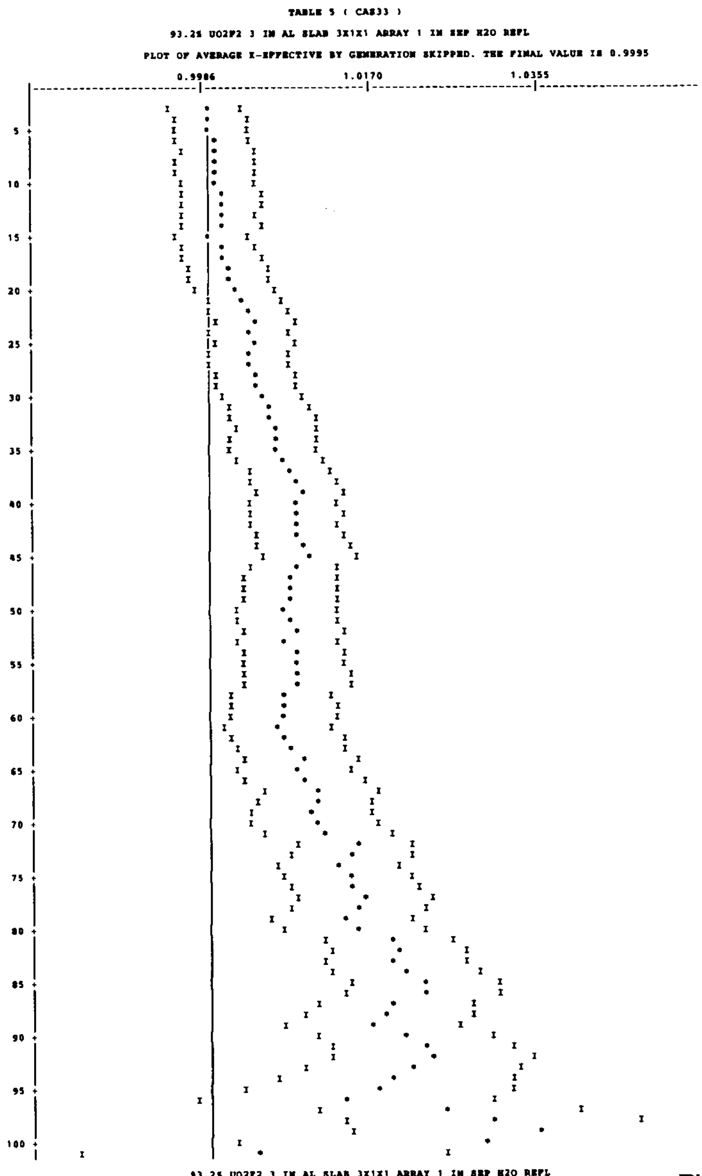


Fig. B.5 (continued)



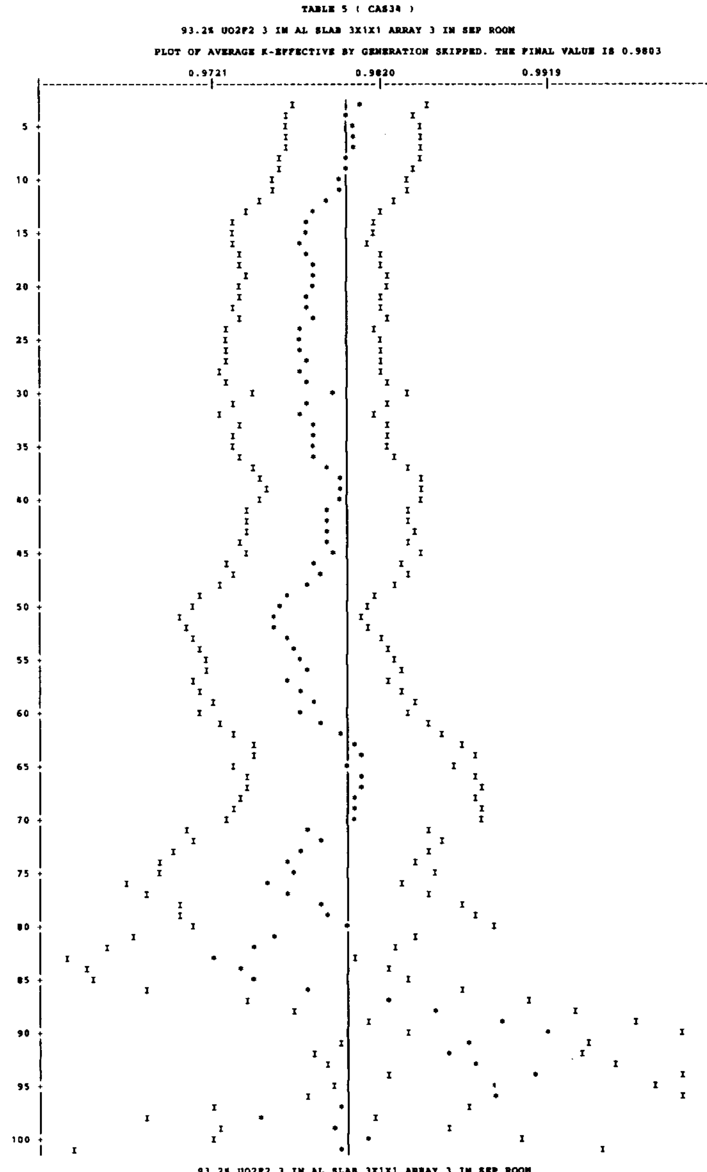
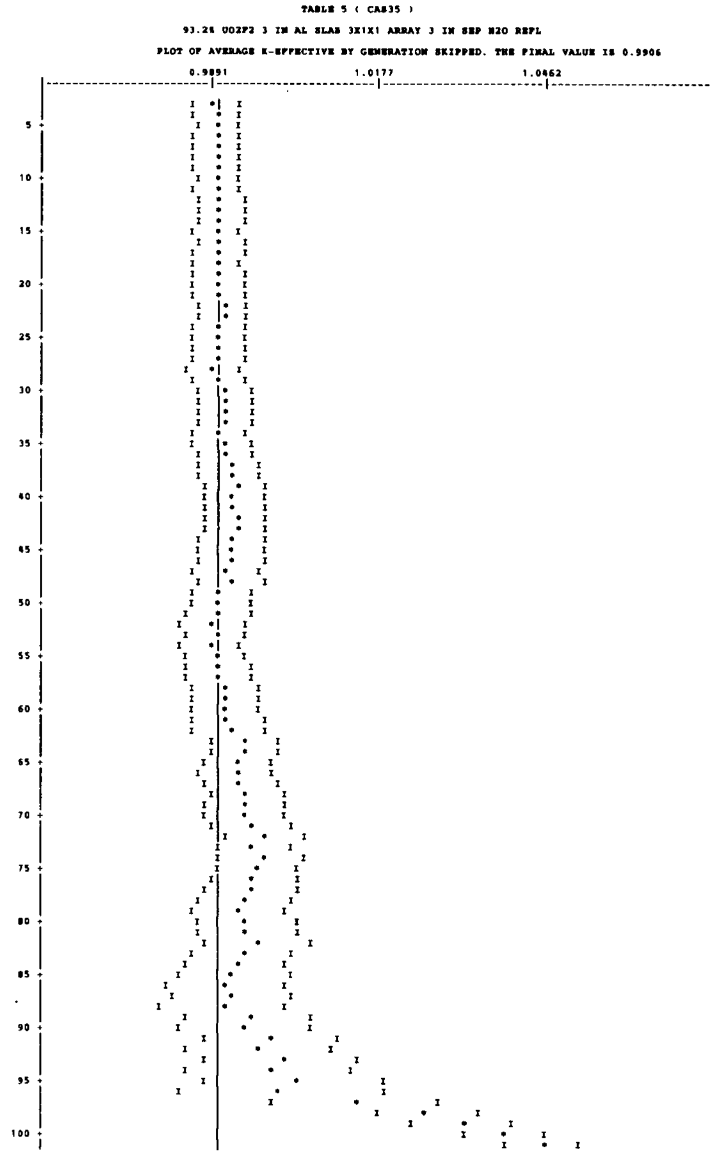


Fig. B.5 (continued)



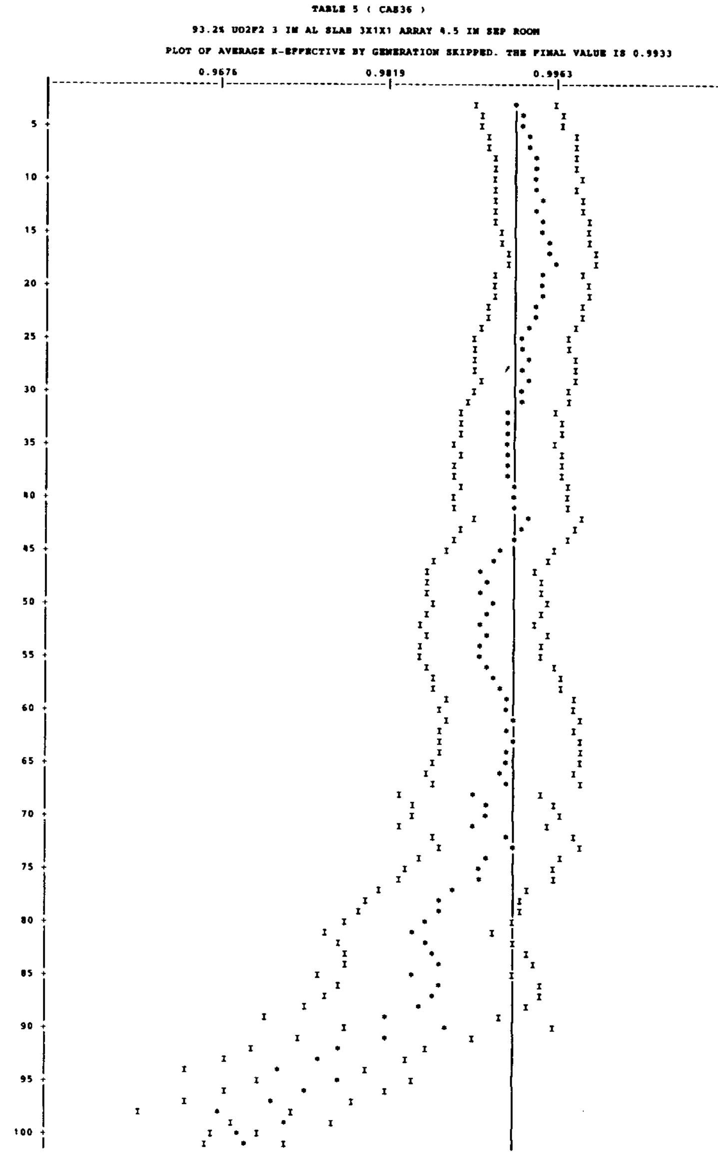


Fig. B.5 (continued)

TABLE 5 (CAS37)

93.2% UO2F2 3 IN AL SLAB 3X1X1 ARRAY 4.5 IN SEP H2O REFL

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0030

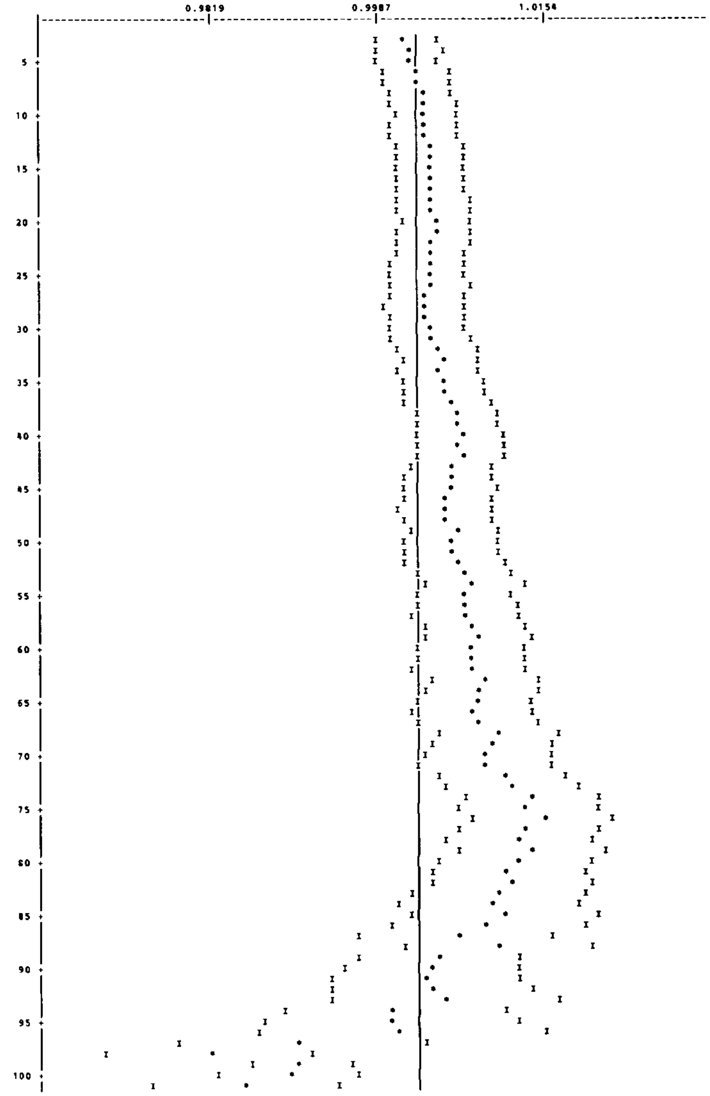


TABLE 5 (CAS38)

93.2% UO2F2 3 IN AL SLAB 3X1X1 ARRAY 5.5 IN SEP ROOM

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 0.9881

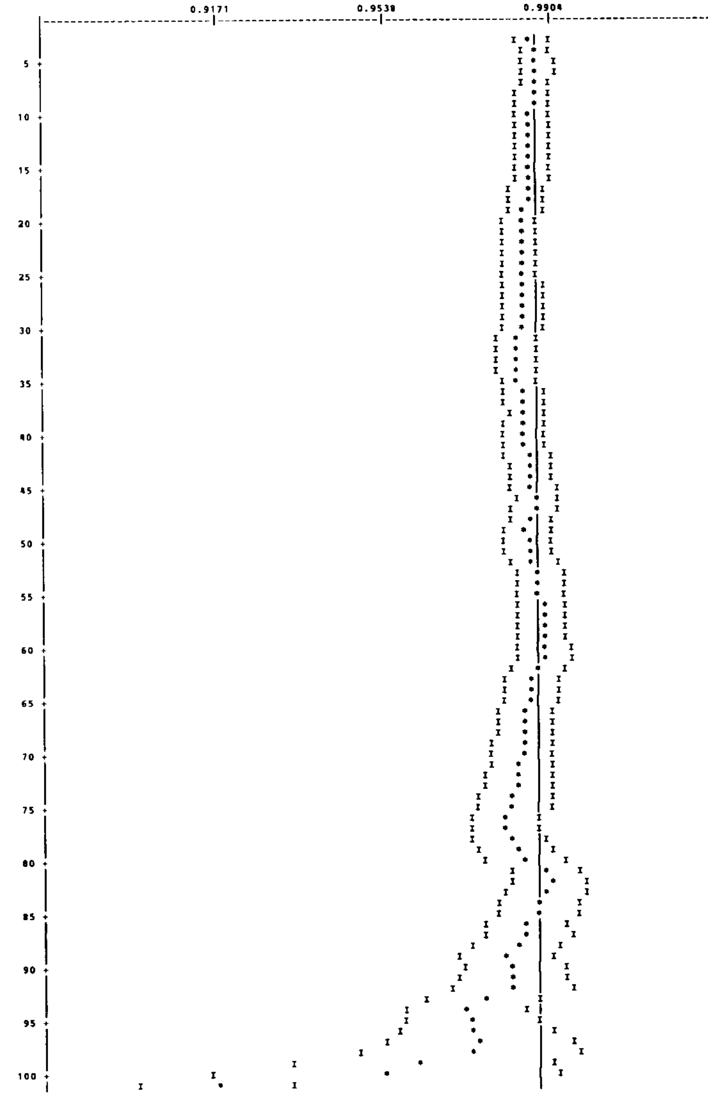
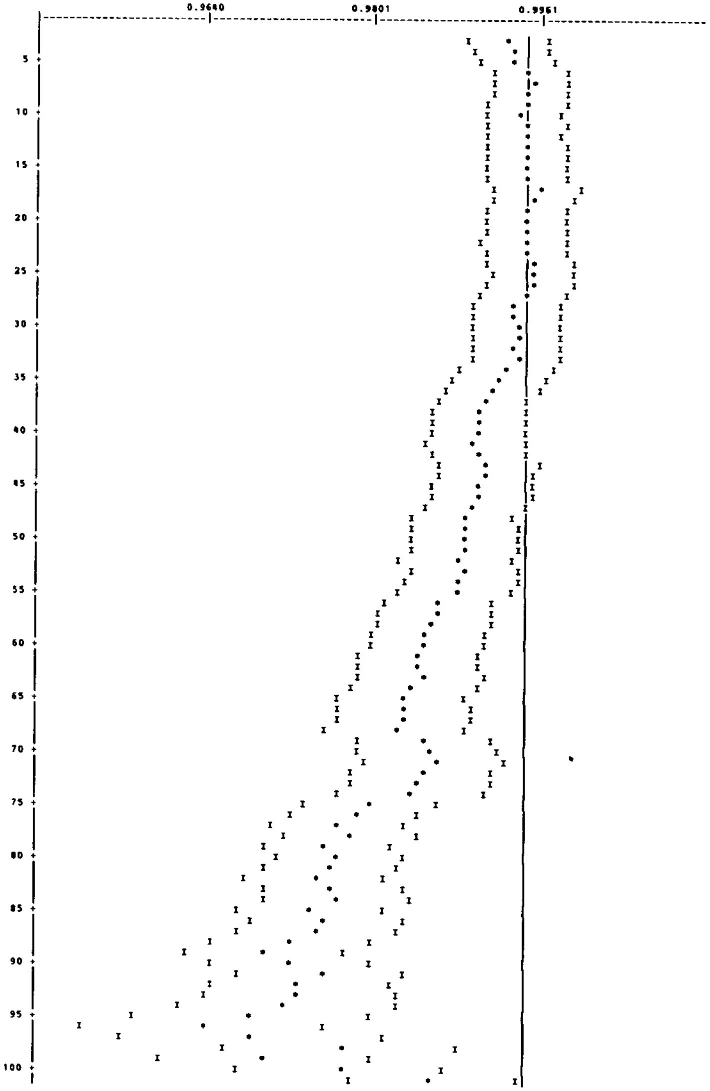


Fig. B.5 (continued)



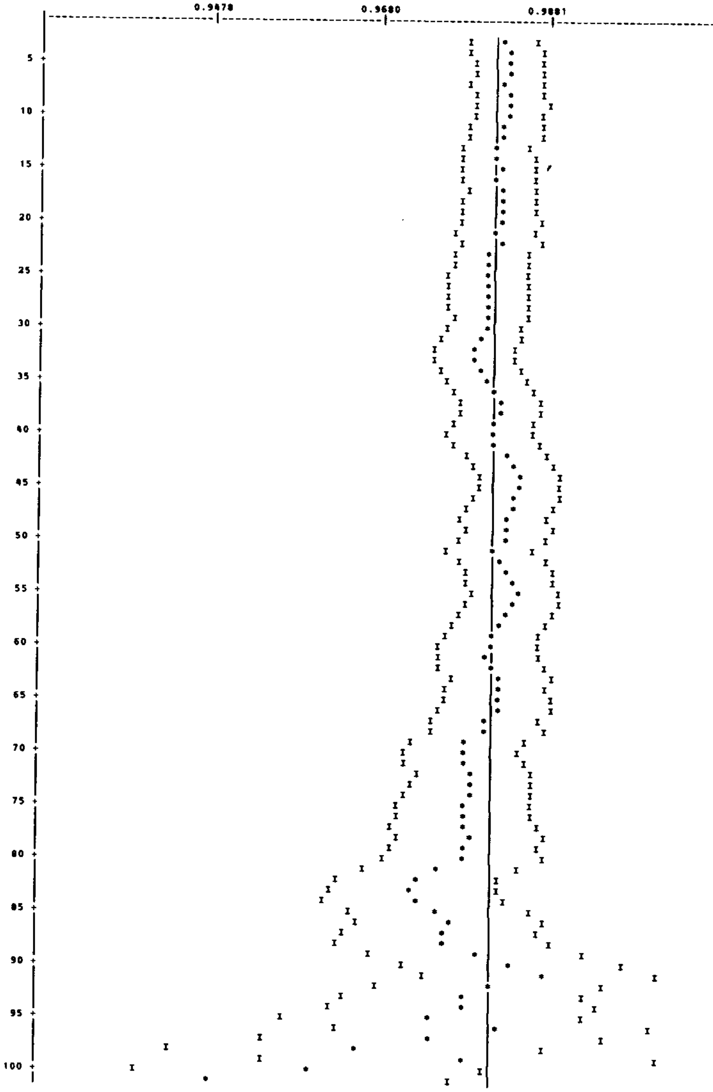
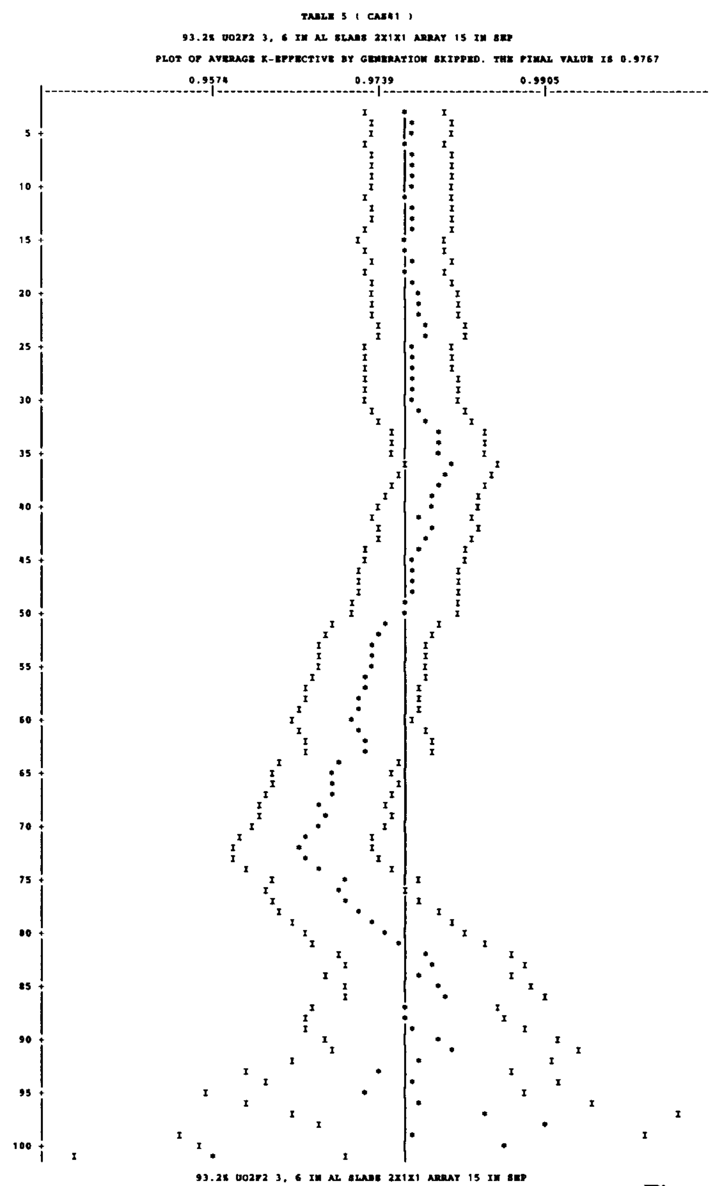


Fig. B.5 (continued)



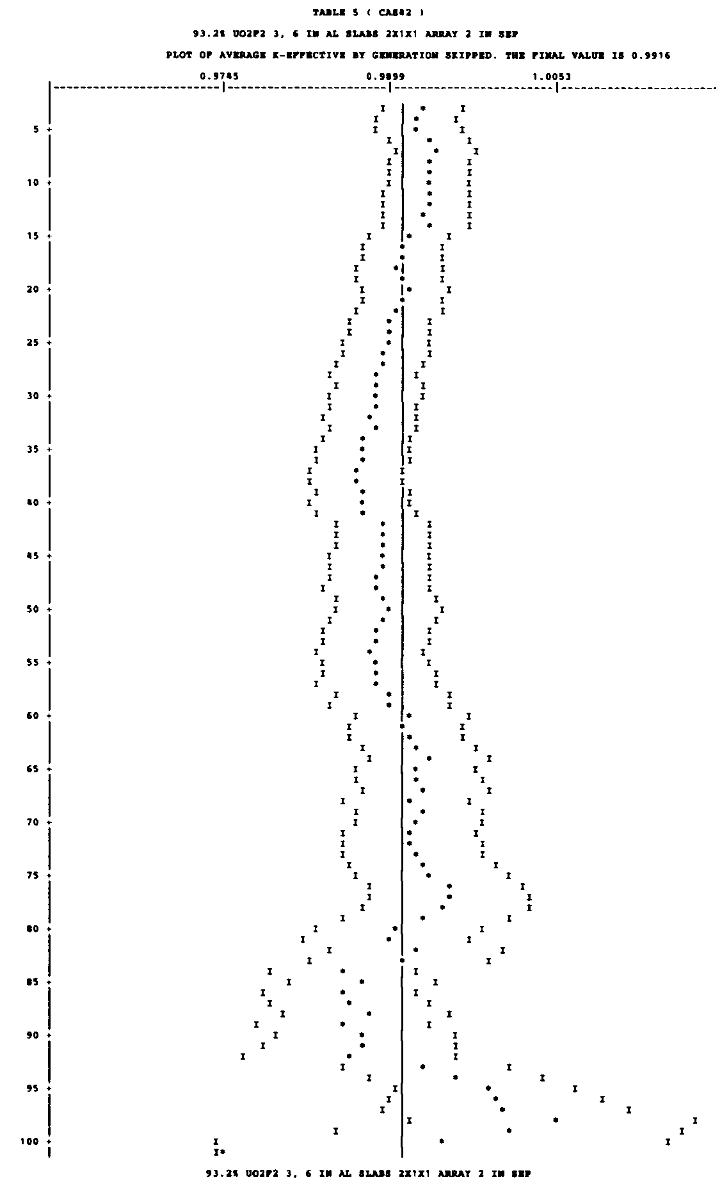
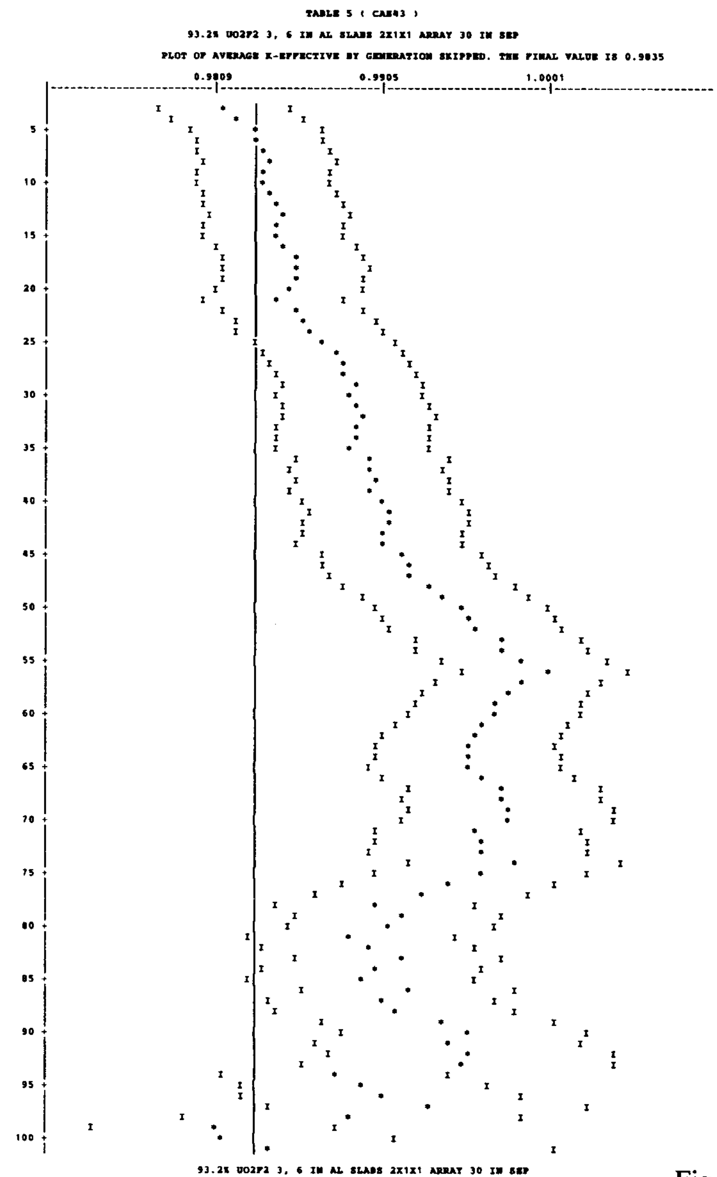


Fig. B.5 (continued)



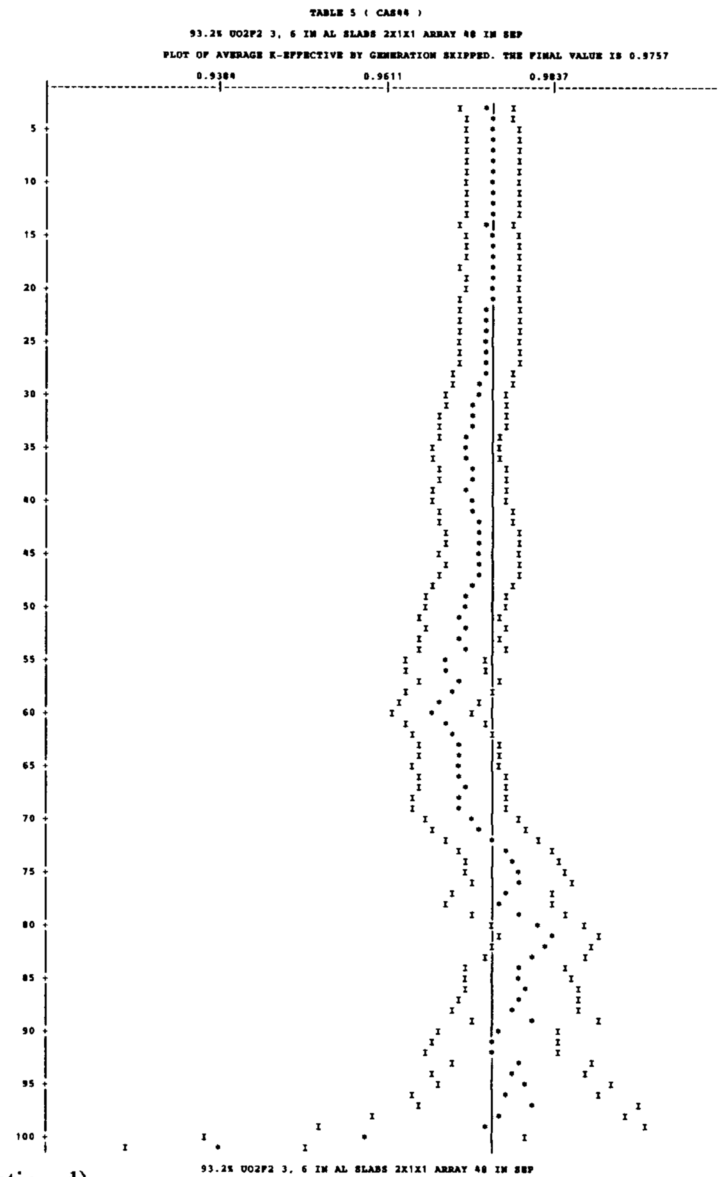
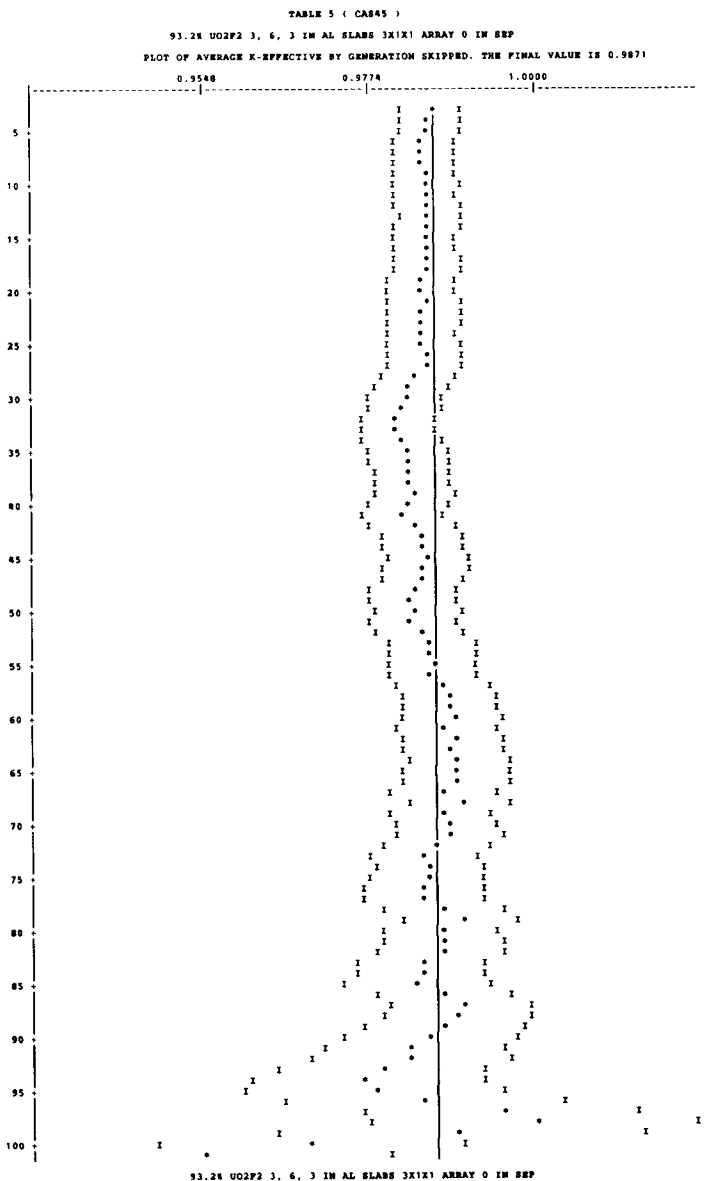


Fig. B.5 (continued)



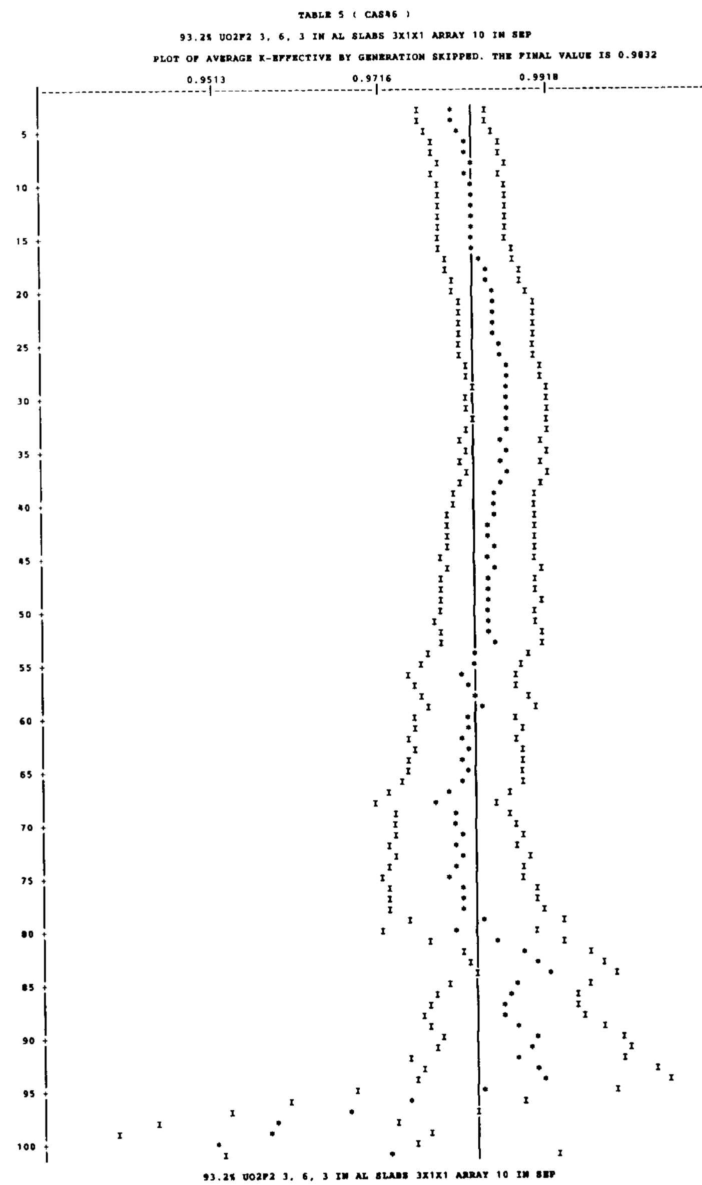


Fig. B.5 (continued)

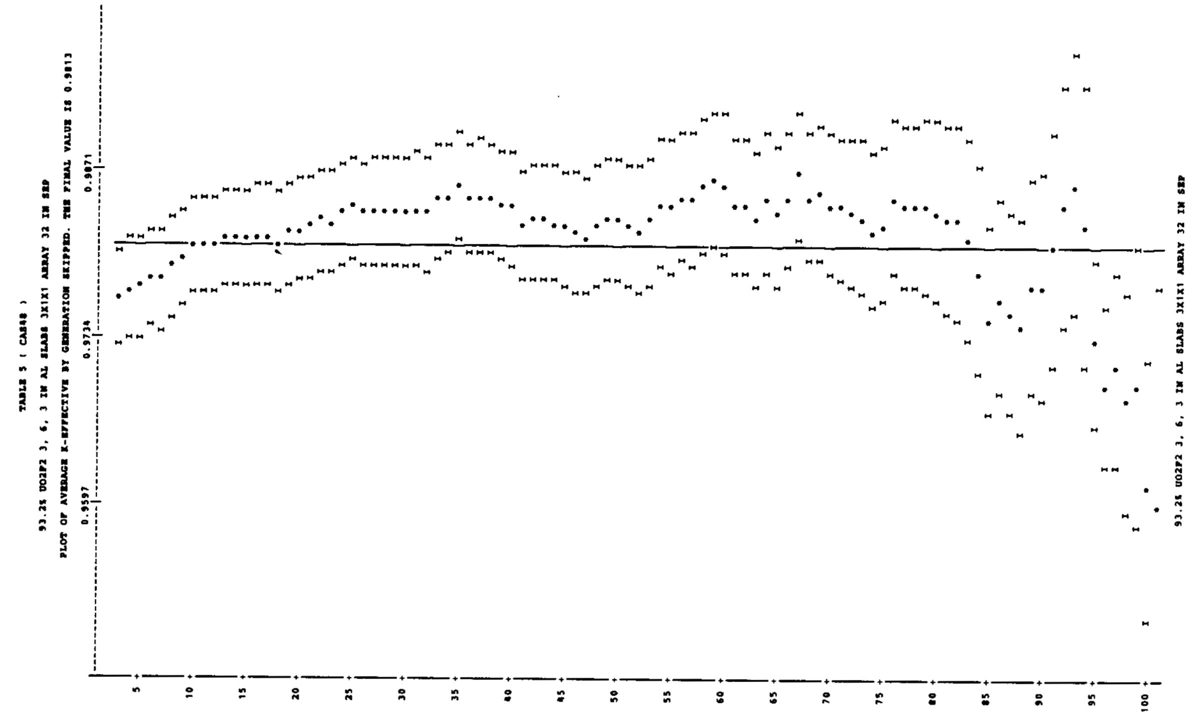


TABLE 5 (CASE48)
93.2% UO2F2 3, 6, 3 IN AL SLABS 3X1X1 ARRAY 32 IN SEP
PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 0.9813
0.9597
0.9734
0.9871
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
93.2% UO2F2 3, 6, 3 IN AL SLABS 3X1X1 ARRAY 32 IN SEP

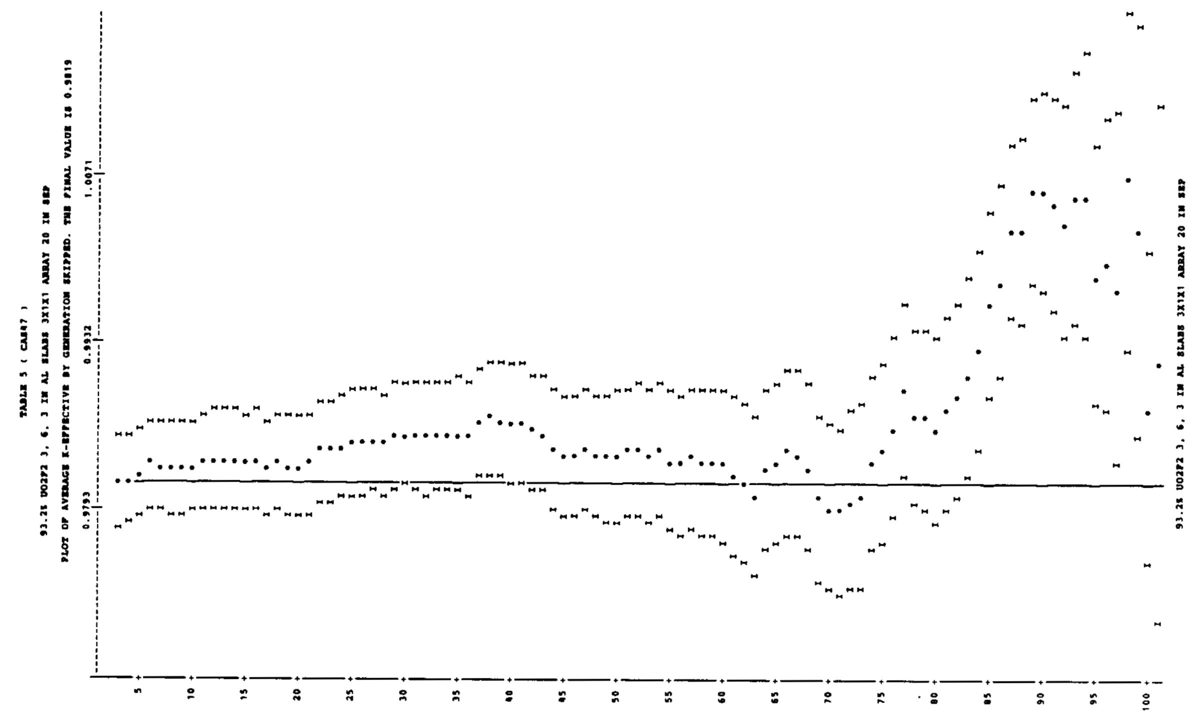
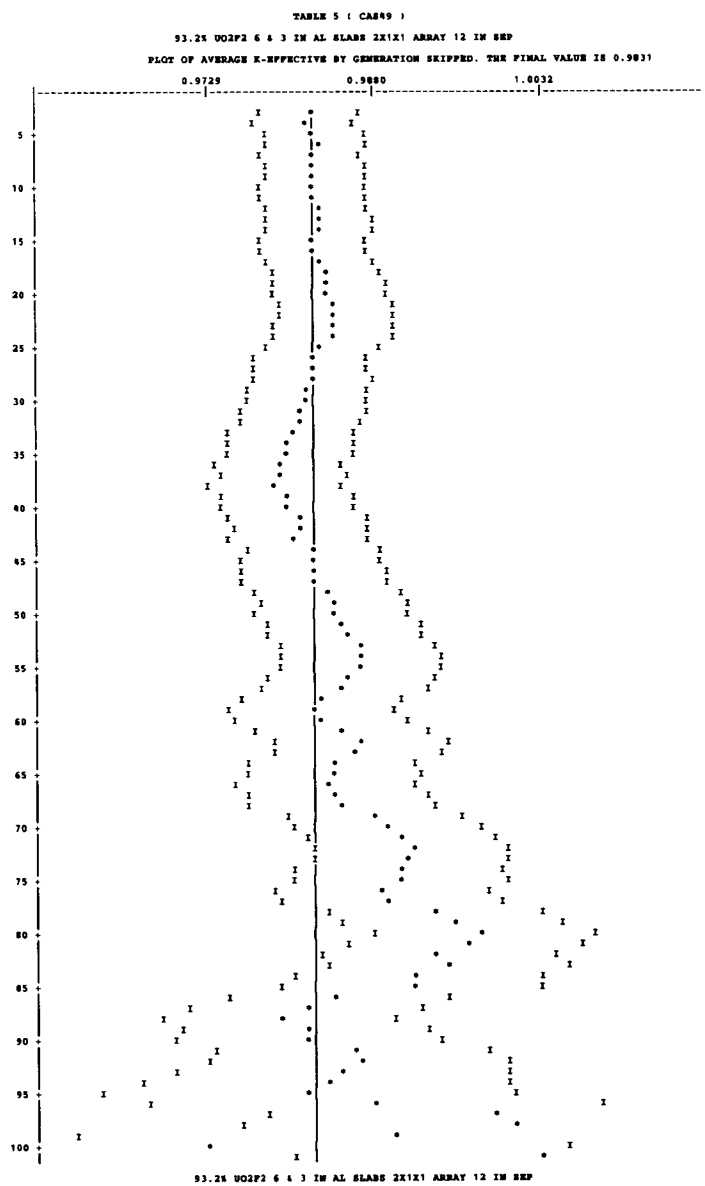


TABLE 5 (CASE47)
93.2% UO2F2 3, 6, 3 IN AL SLABS 3X1X1 ARRAY 20 IN SEP
PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 0.9819
0.9793
0.9932
1.0071
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
93.2% UO2F2 3, 6, 3 IN AL SLABS 3X1X1 ARRAY 20 IN SEP



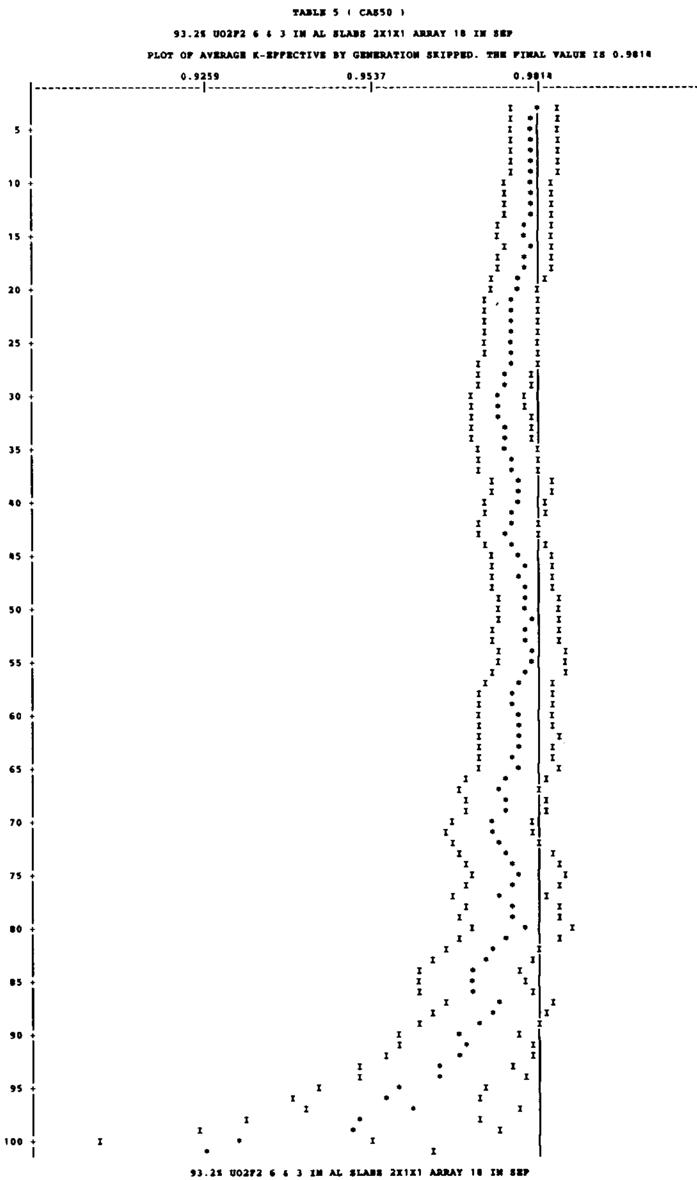
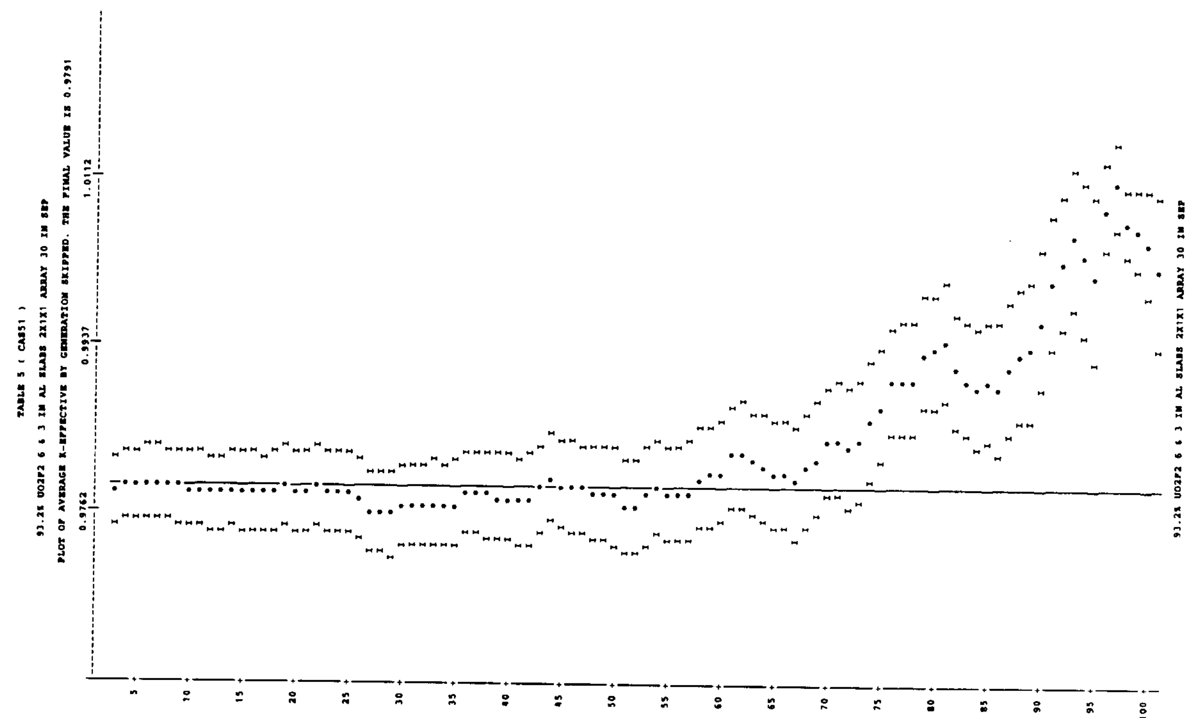


Fig. B.5 (continued)



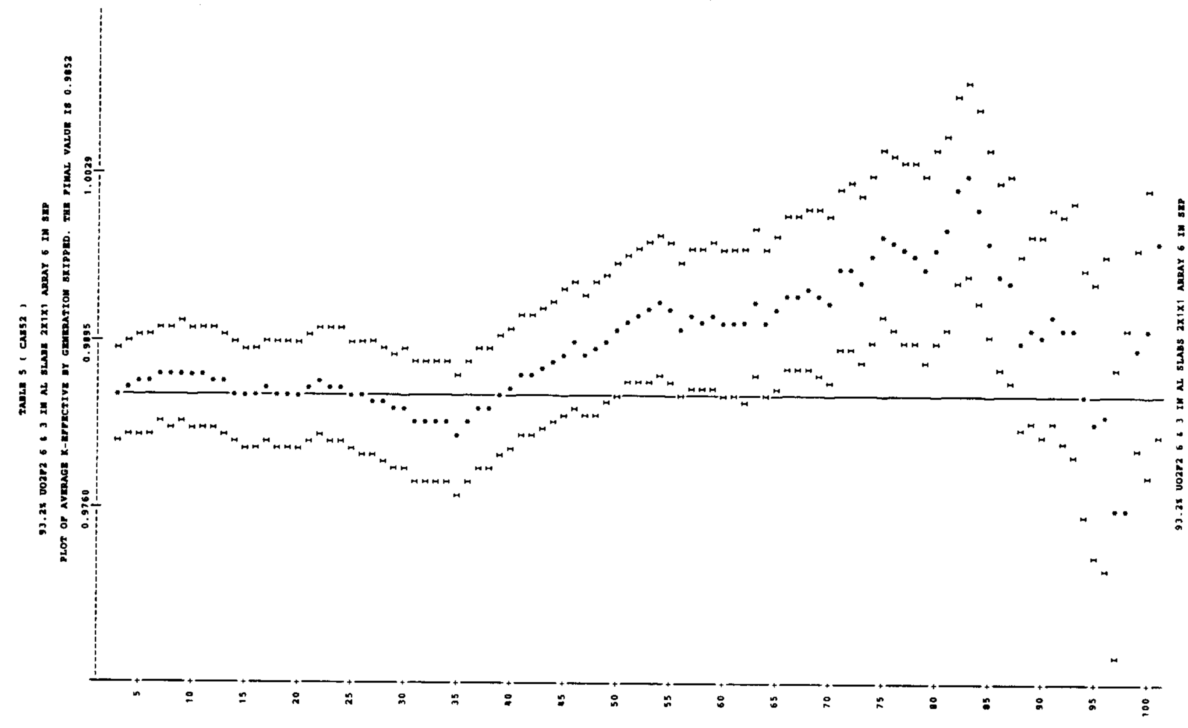


Fig. B.5 (continued)

TABLE 5 (CASE53)
93.2% UO2F2 6 IN AL SLAB 2X1X1 ARRAY 15 IN SEP
PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 0.9884

TABLE 5 (CASE54)
93.2% UO2F2 6 IN AL SLAB 2X1X1 ARRAY 2 IN SEP
PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 0.9831

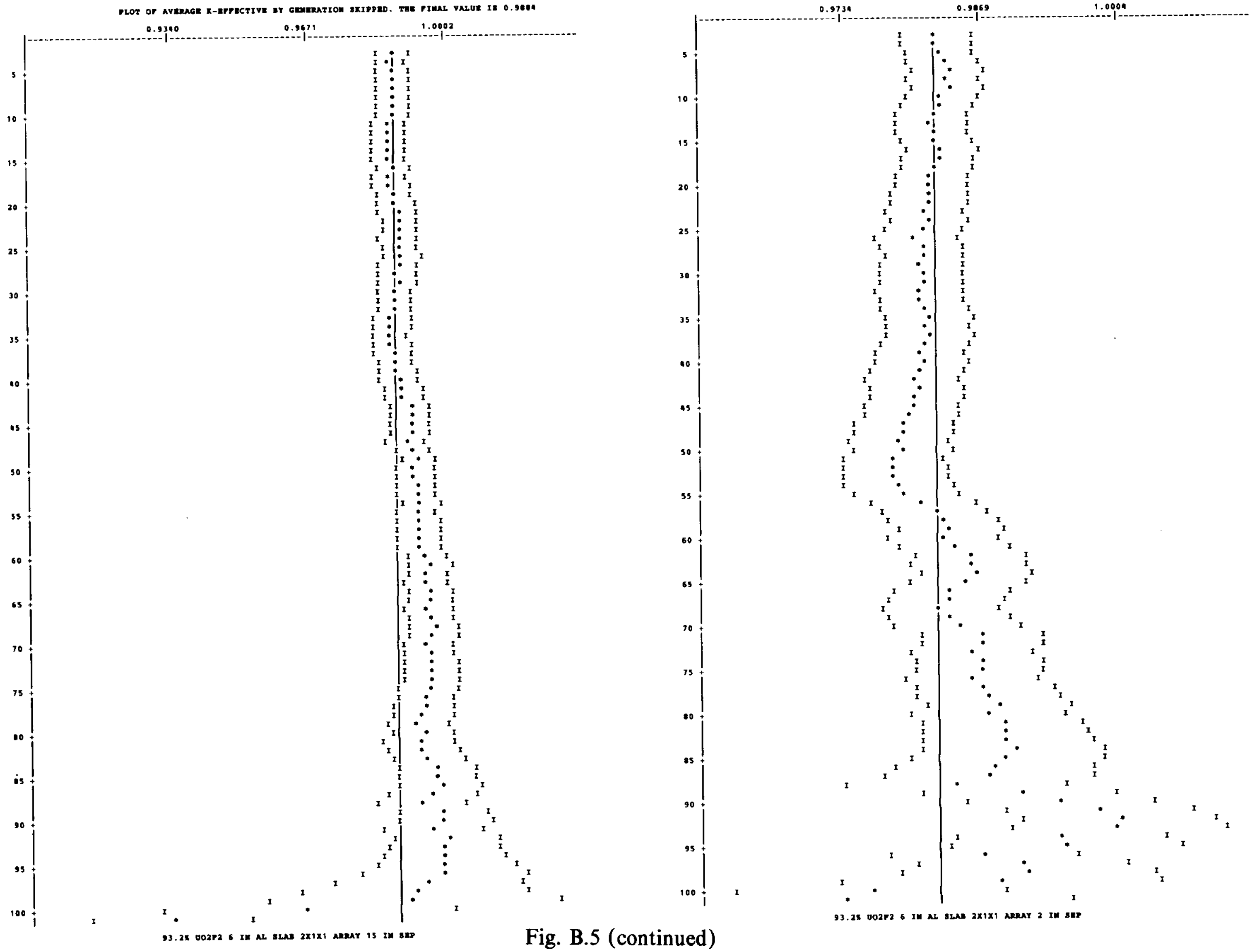
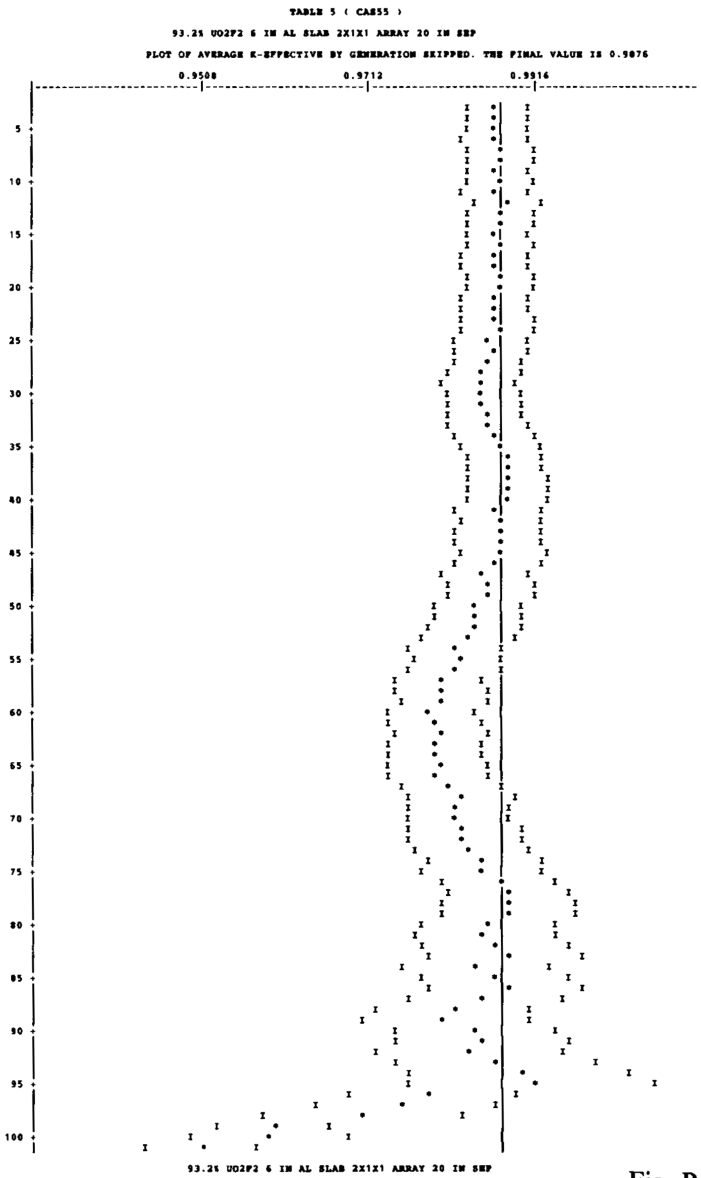


Fig. B.5 (continued)



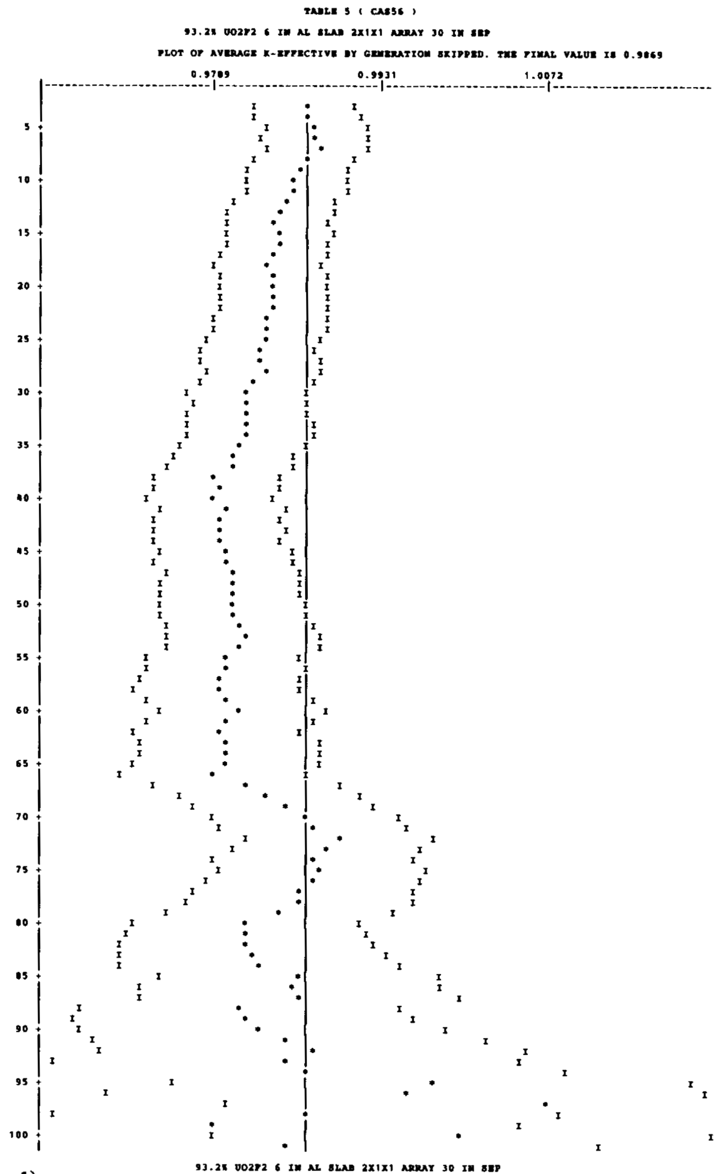
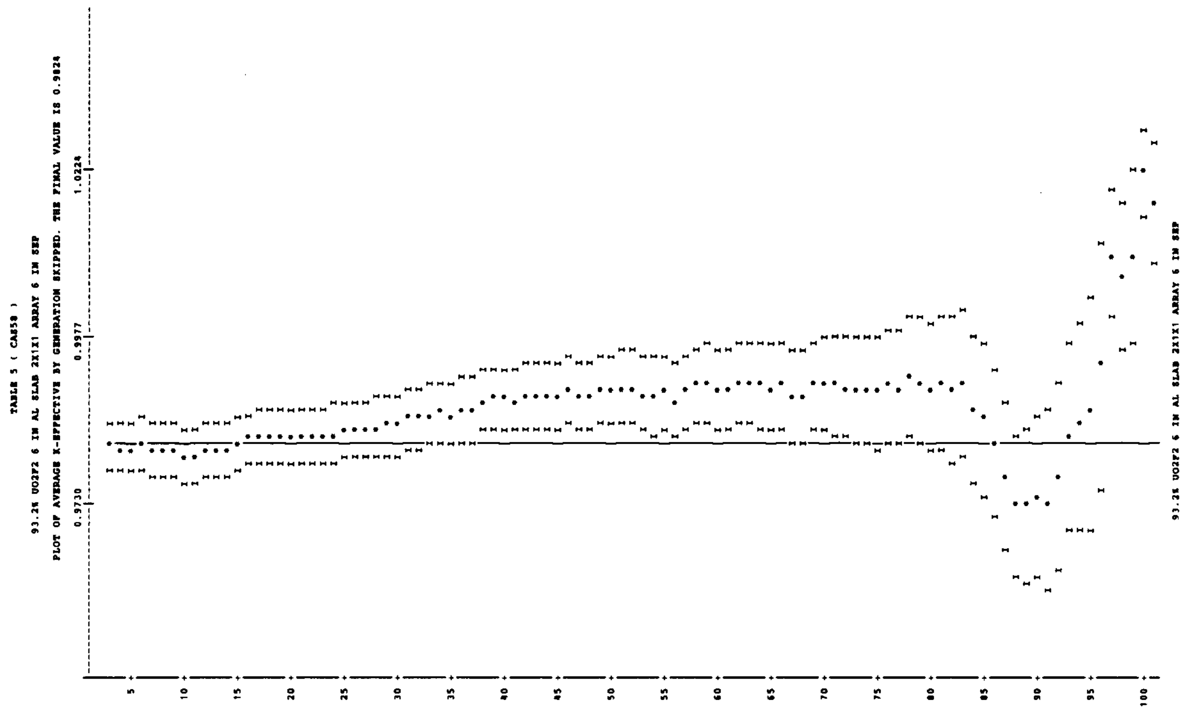


Fig. B.5 (continued)



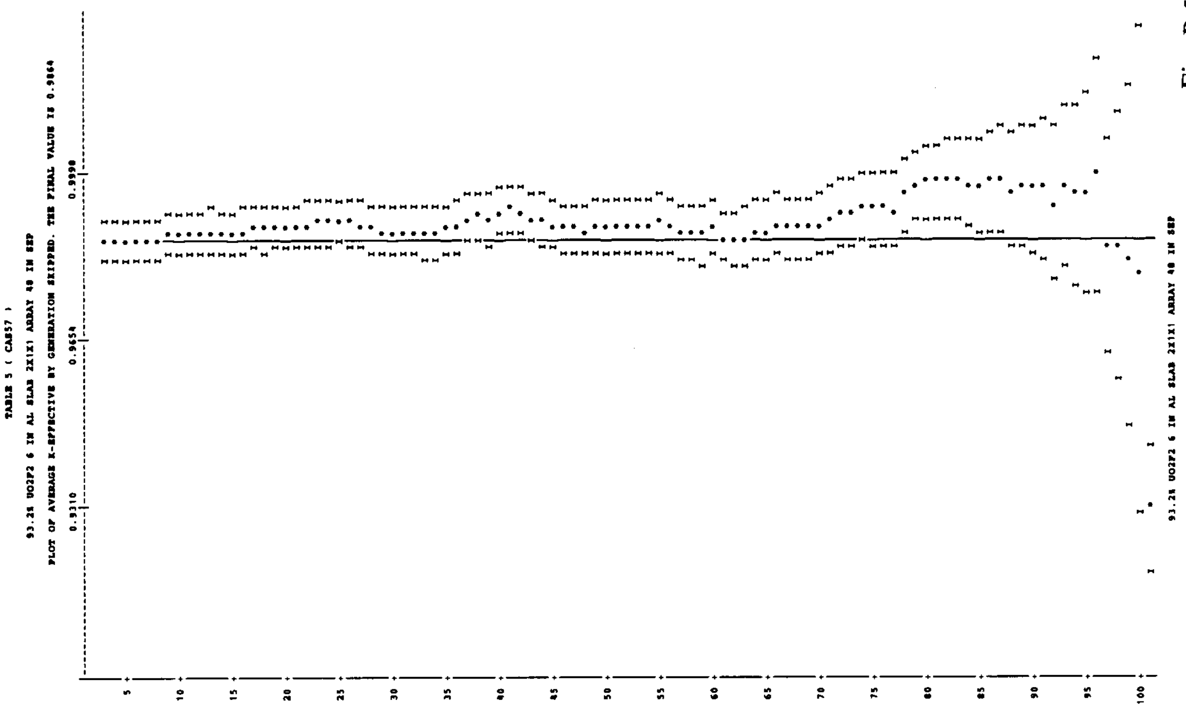
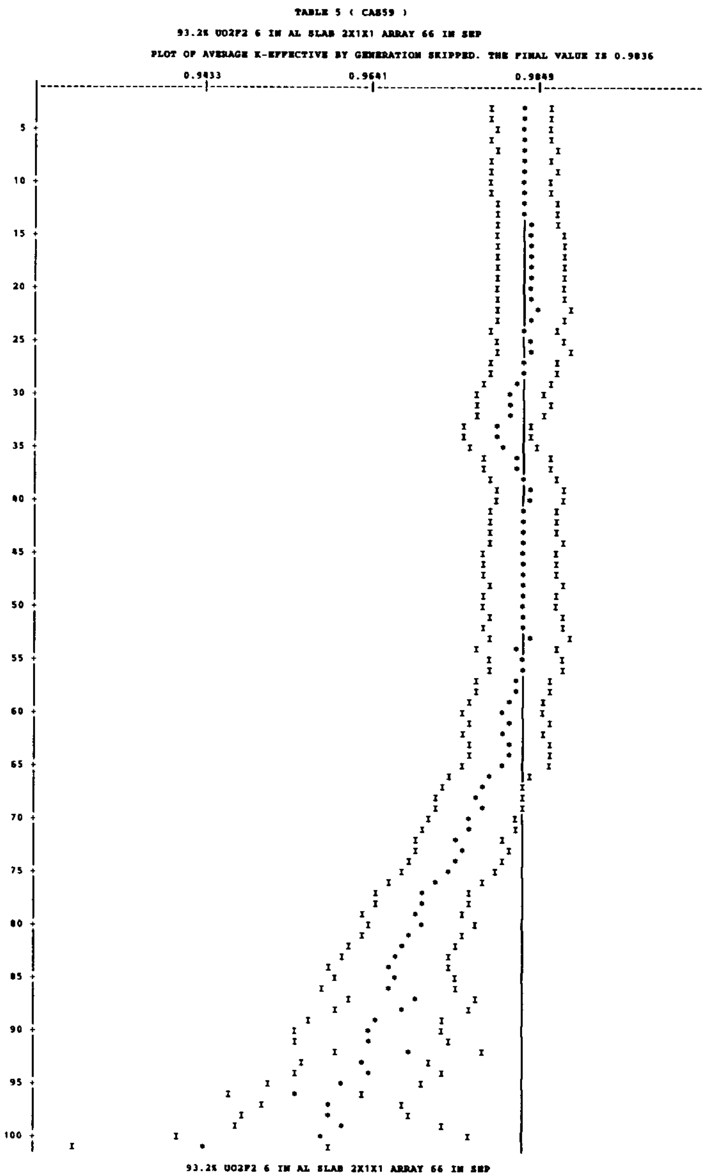


Fig. B.5 (continued)



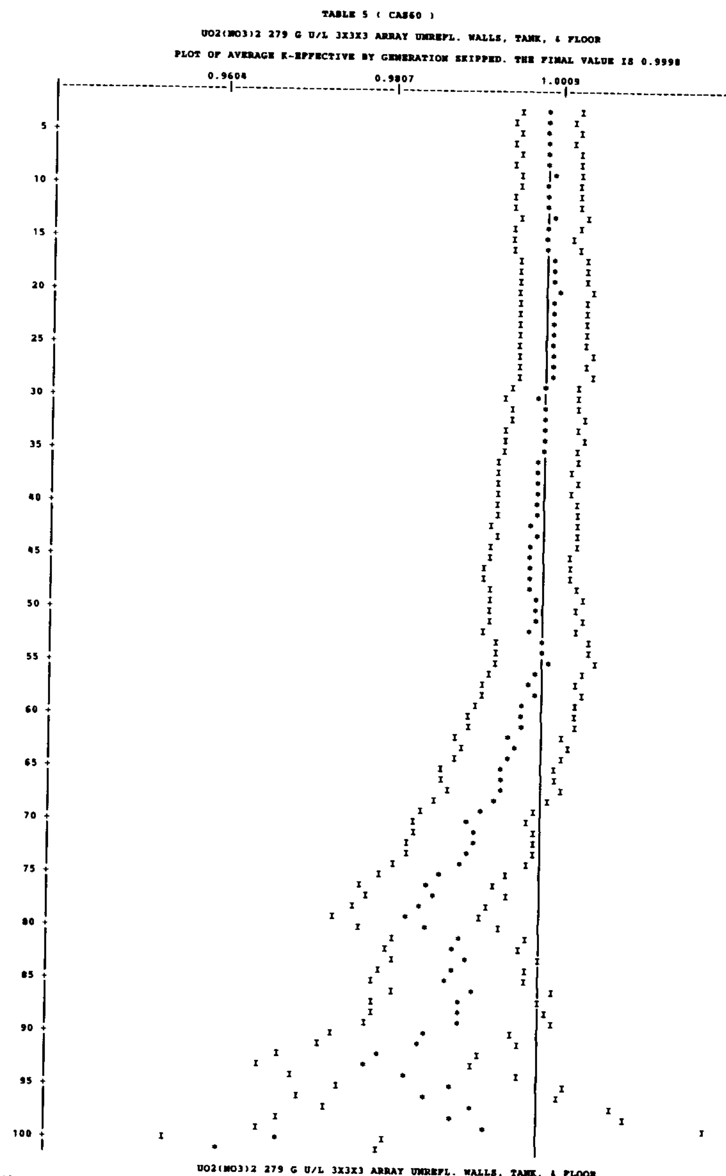
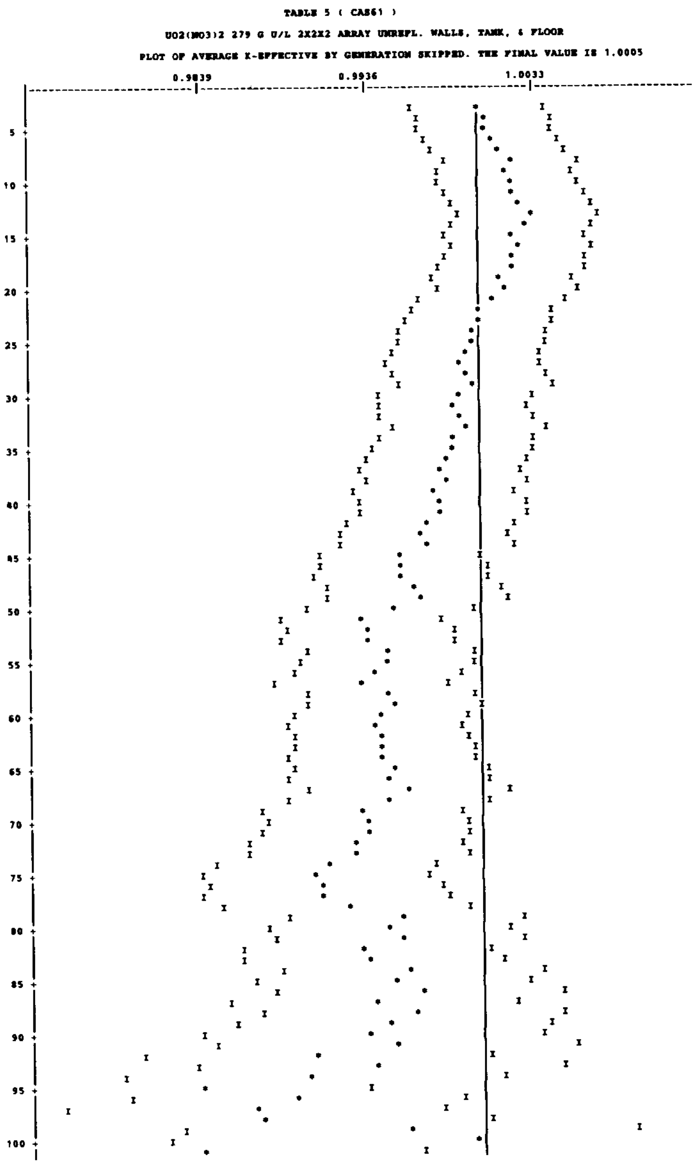


Fig. B.5 (continued)



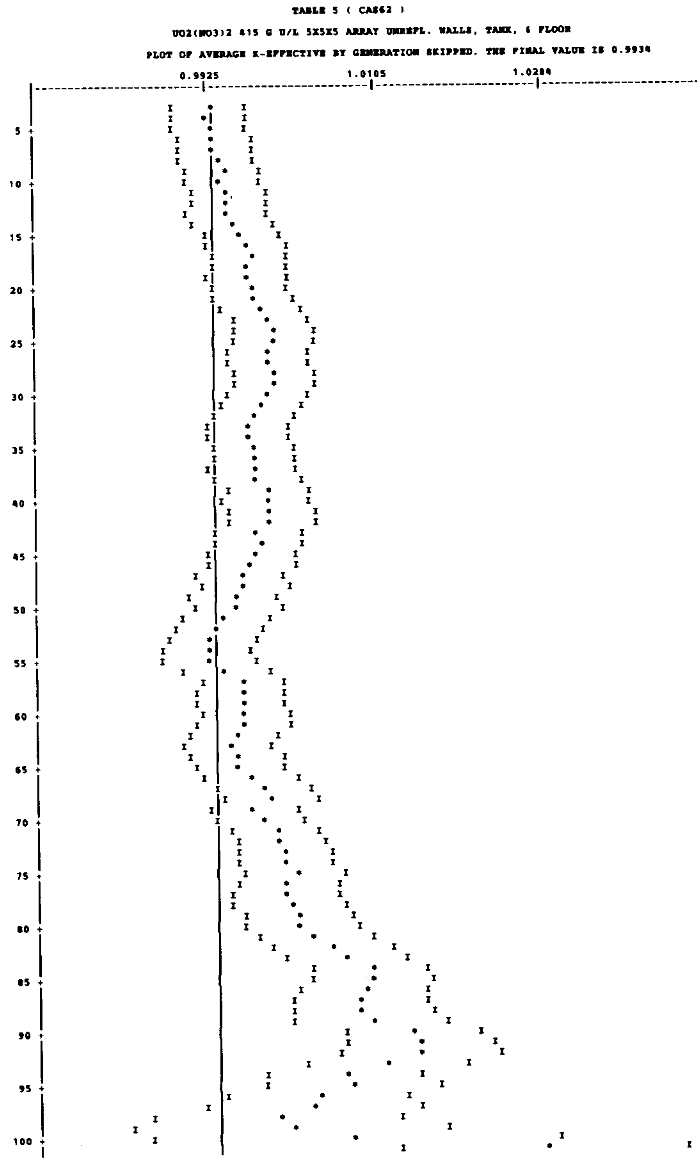
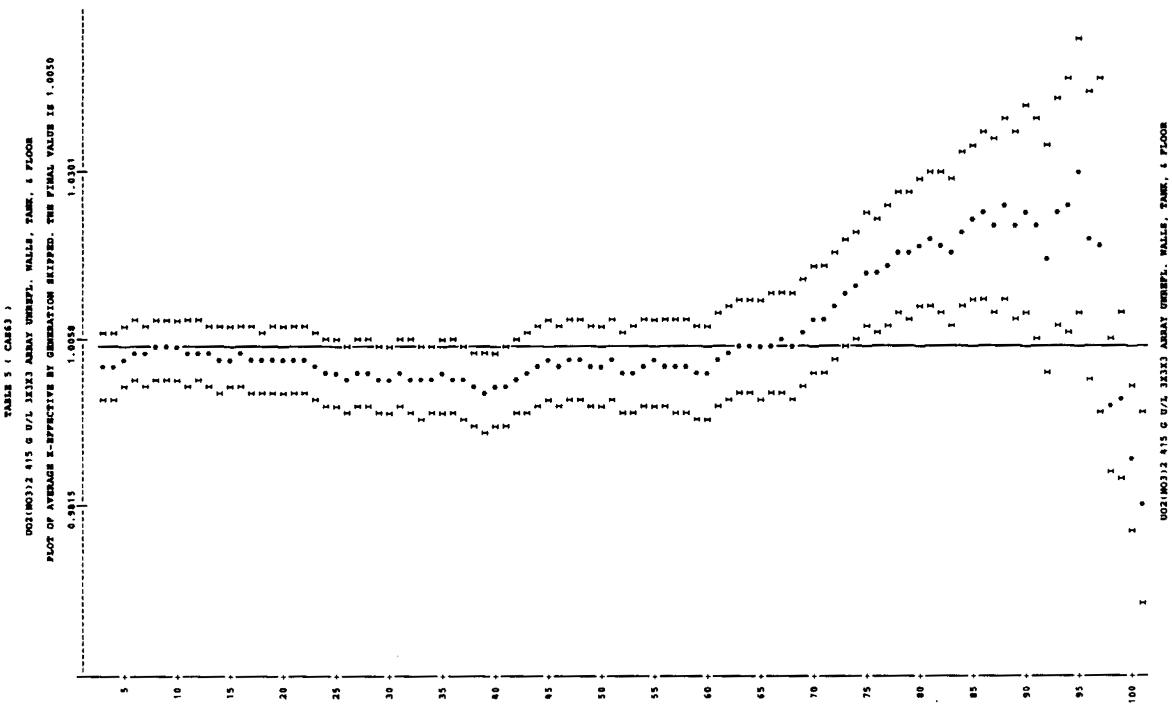


Fig. B.5 (continued)



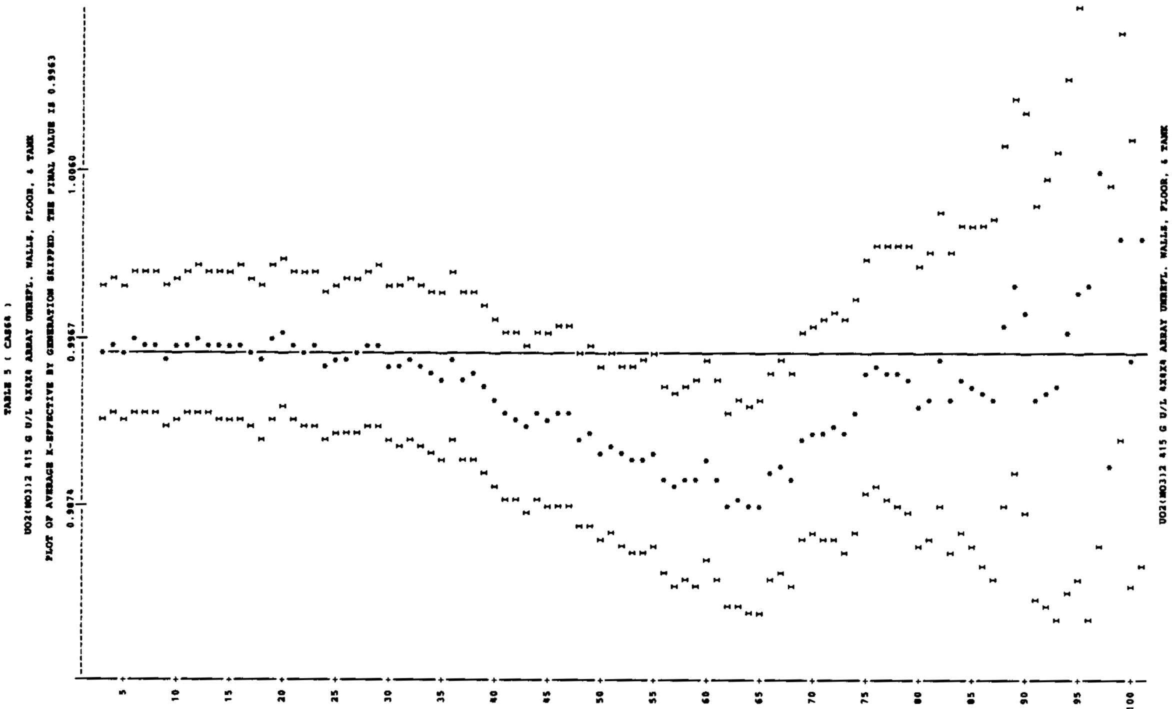
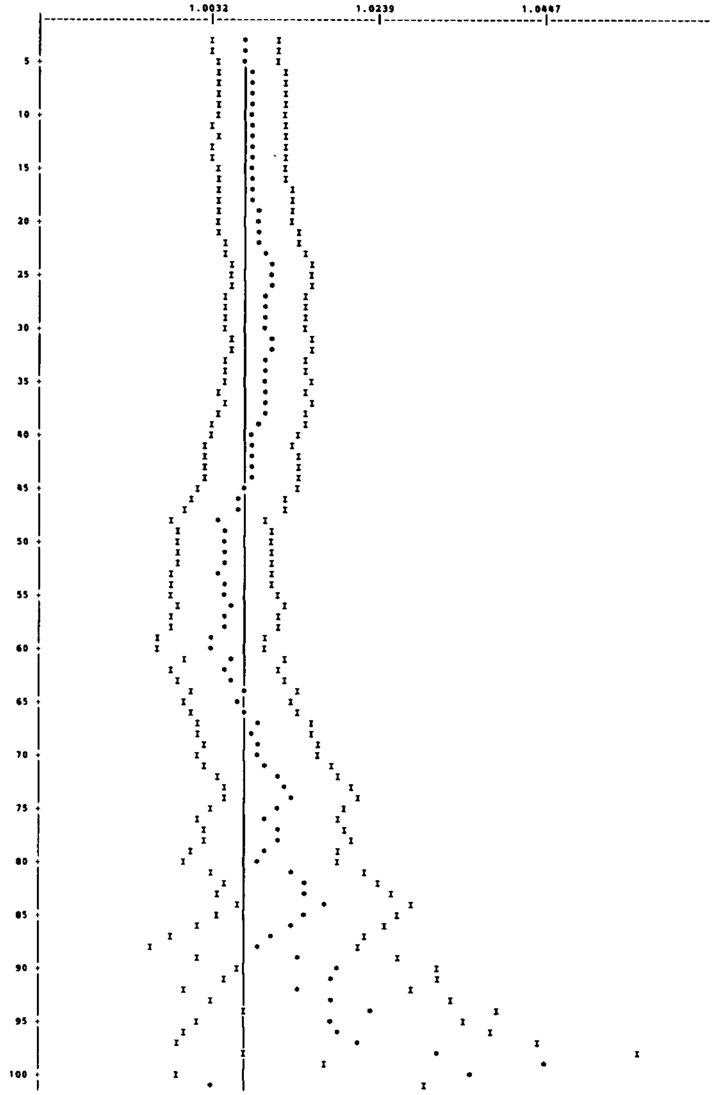


Fig. B.5 (continued)

TABLE 5 (CAS65)

UO2(NO3)2 415 G U/L 2X2X2 ARRAY UNREFL. WALLS, FLOOR, & TANK

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0081

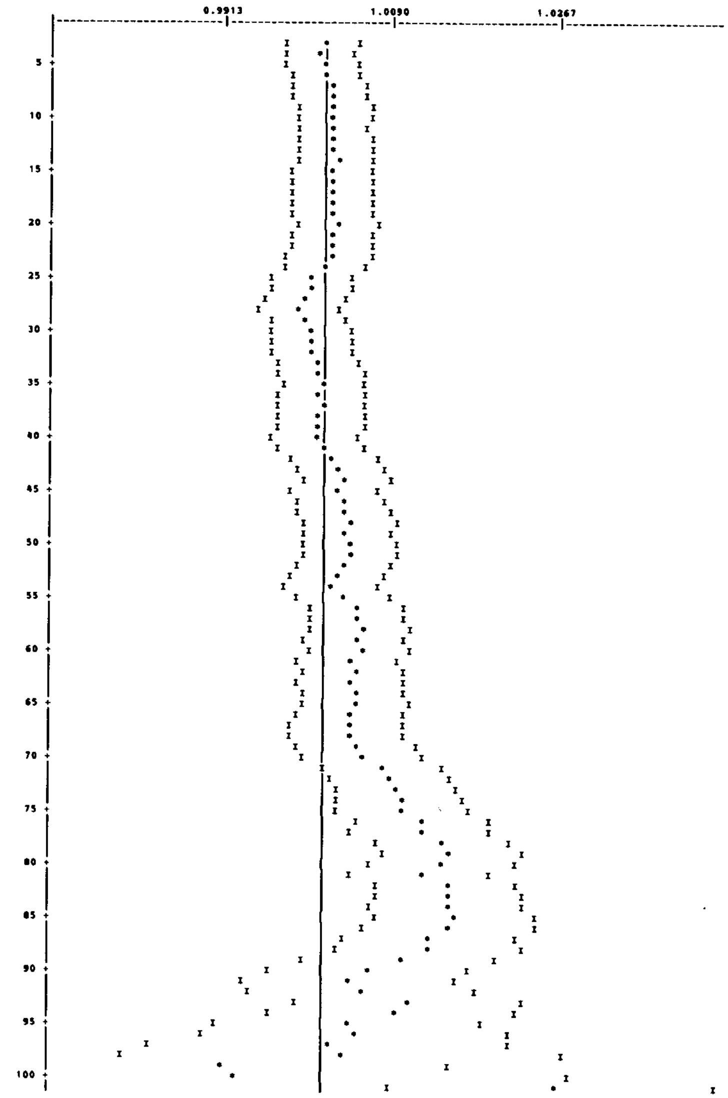


UO2(NO3)2 415 G U/L 2X2X2 ARRAY UNREFL. WALLS, FLOOR, & TANK

TABLE 5 (CAS66)

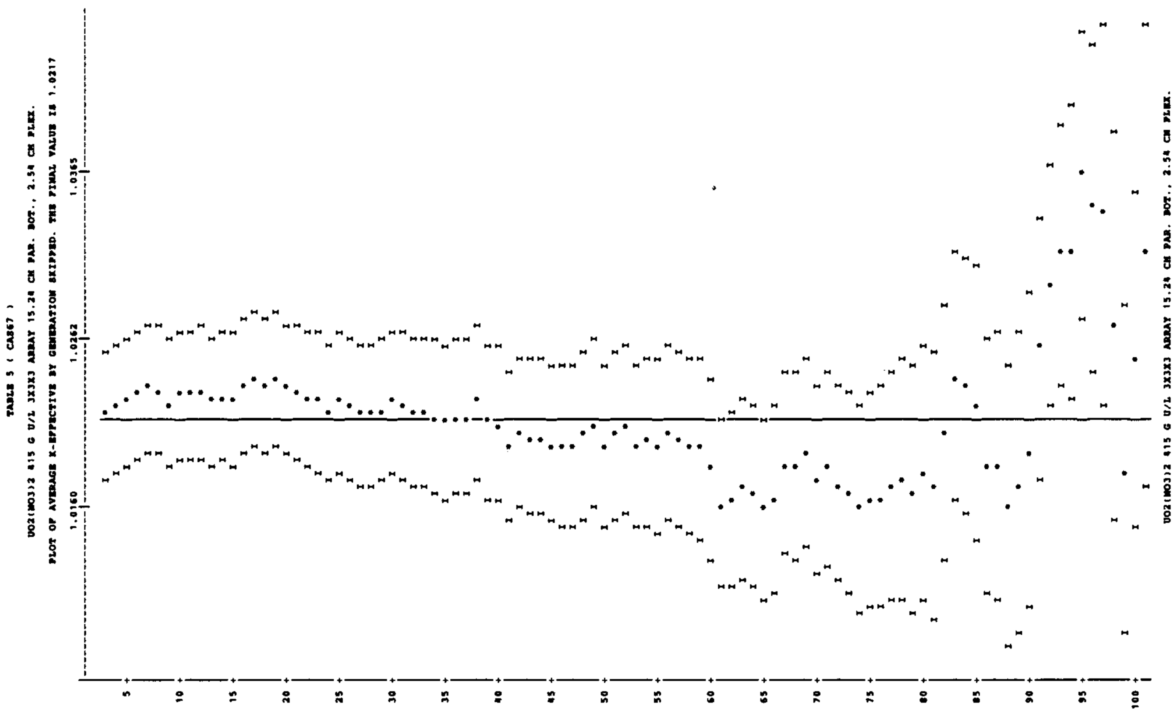
UO2(NO3)2 415 G U/L 3X3X3 ARRAY 15.24 CM PAR. BOT., 1.27 CM PLEX.

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0020



UO2(NO3)2 415 G U/L 3X3X3 ARRAY 15.24 CM PAR. BOT., 1.27 CM PLEX.

Fig. B.5 (continued)



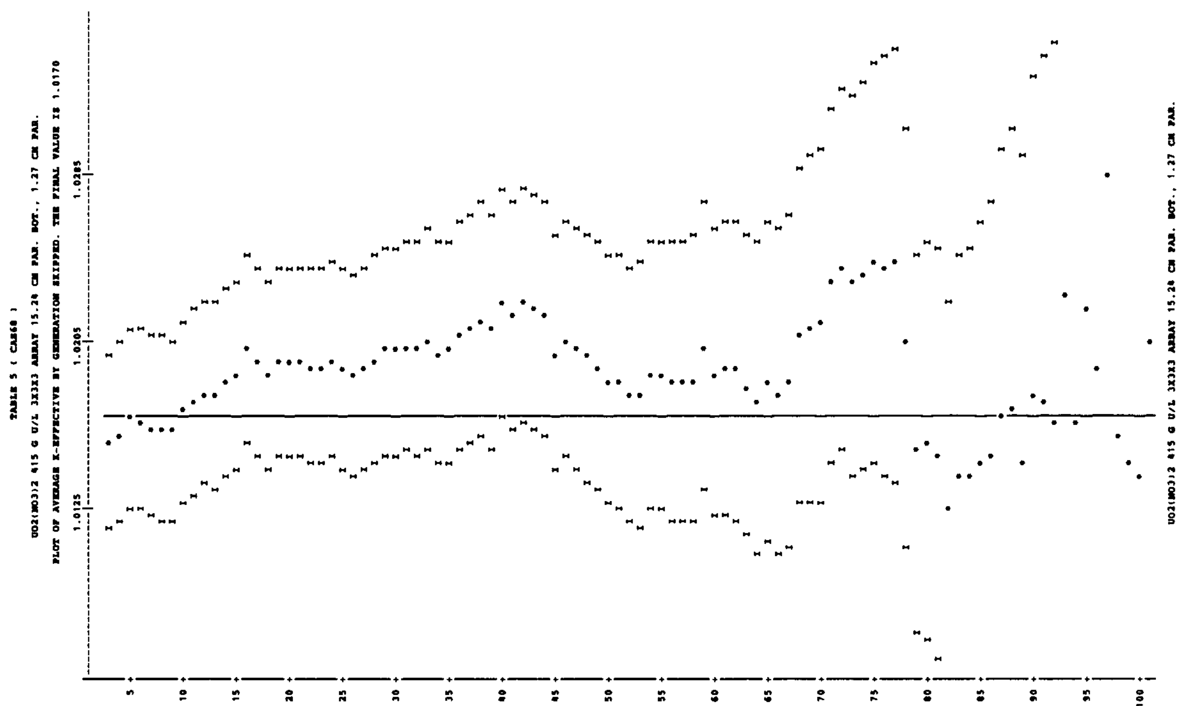
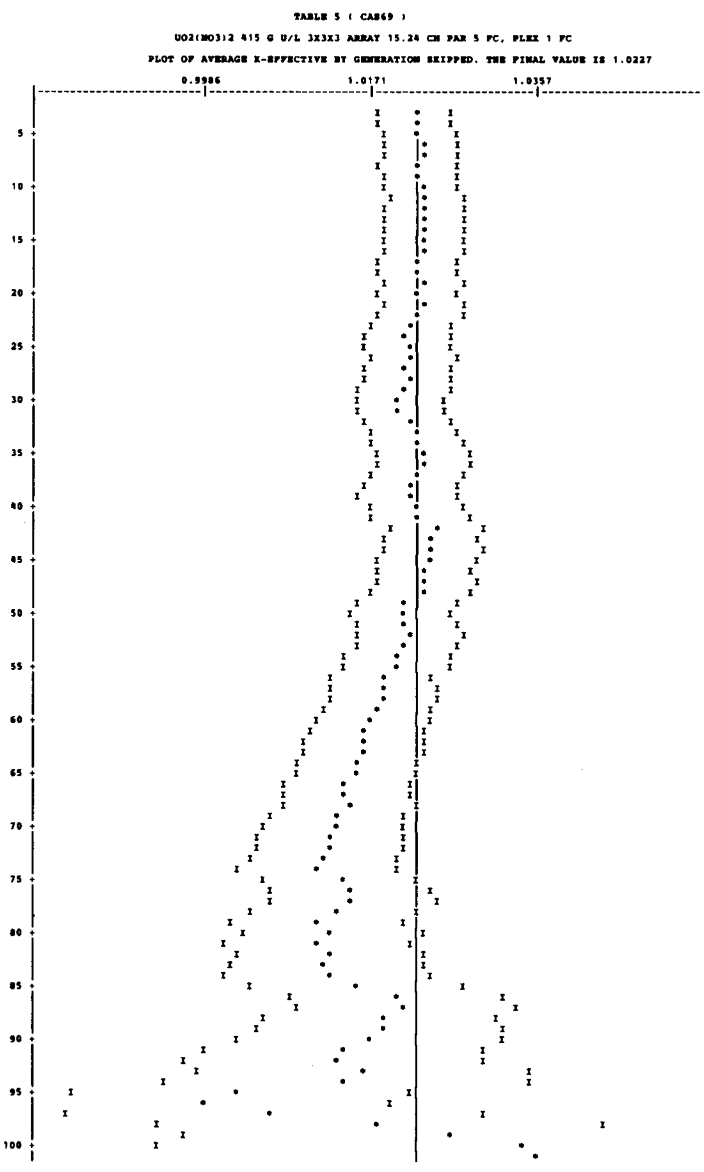


Fig. B.5 (continued)



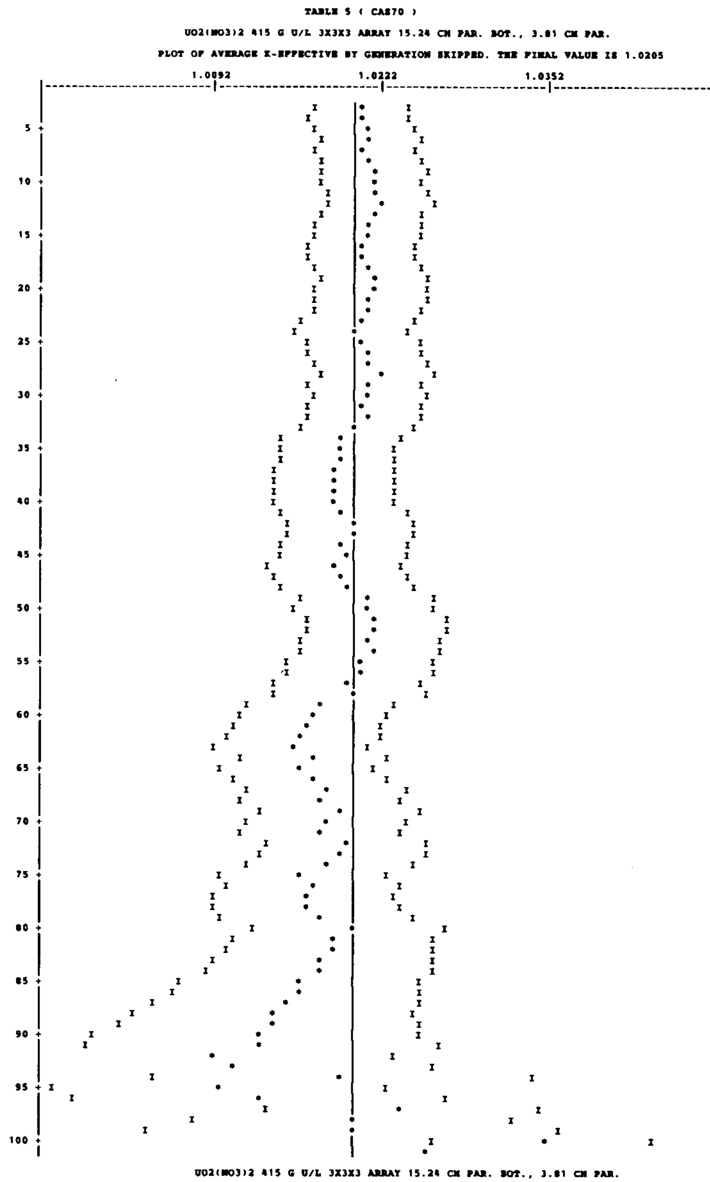
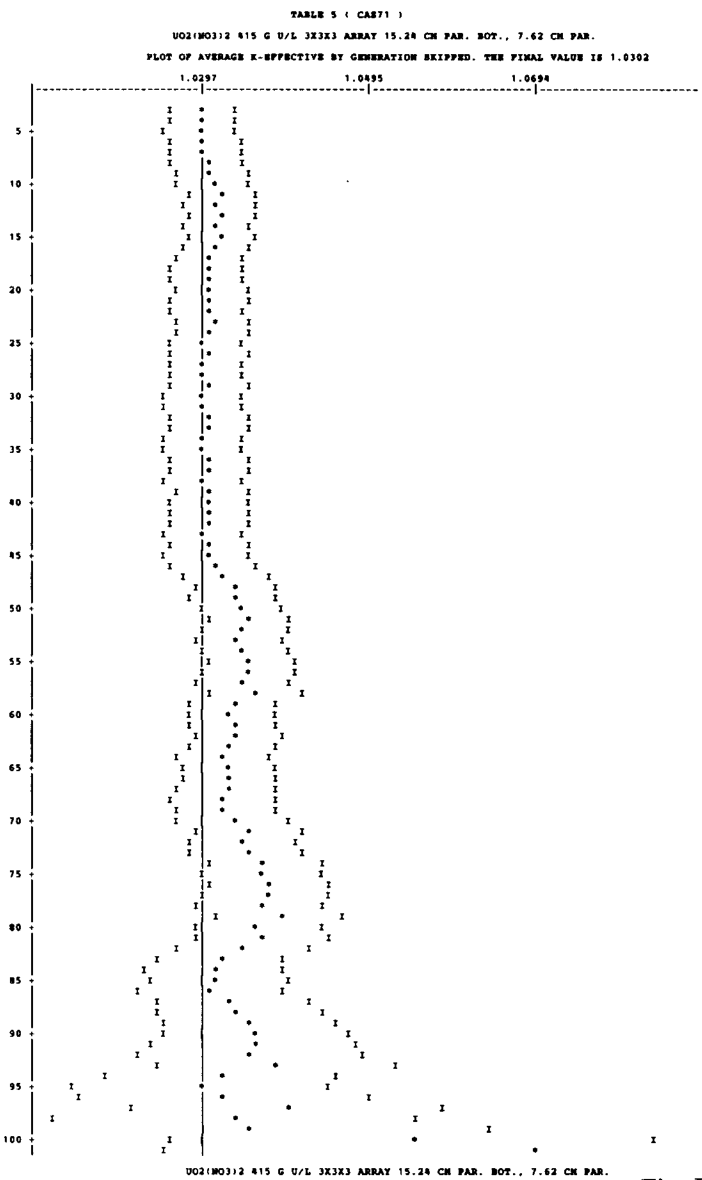


Fig. B.5 (continued)



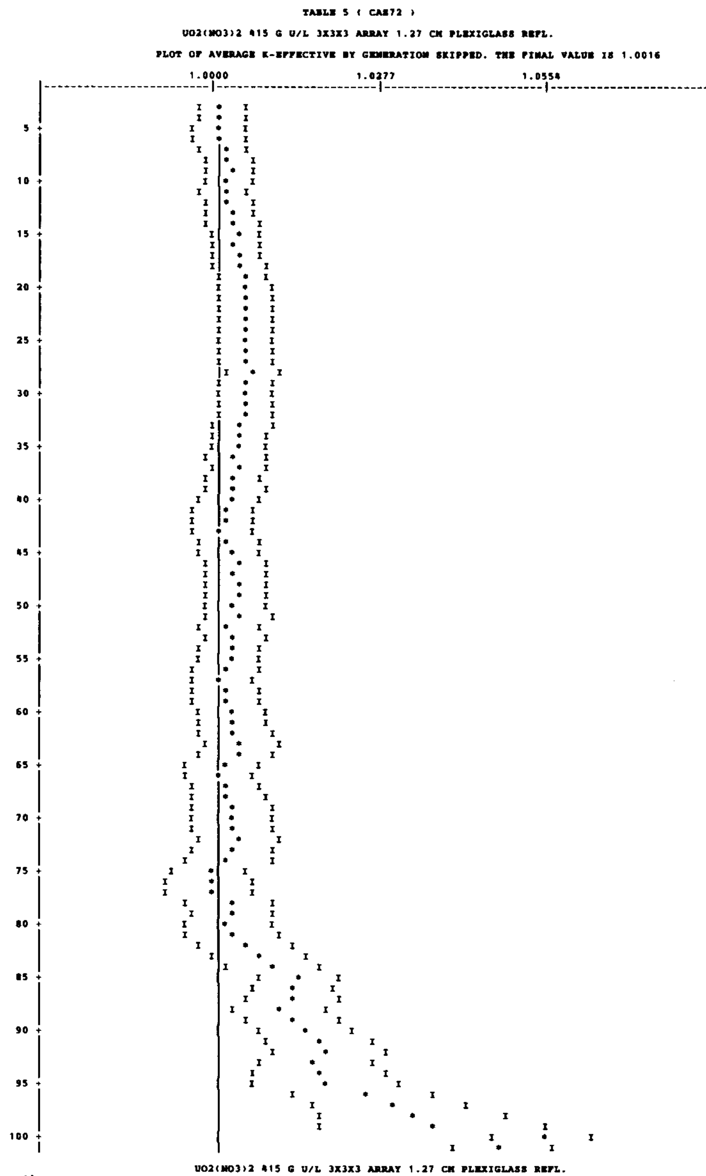
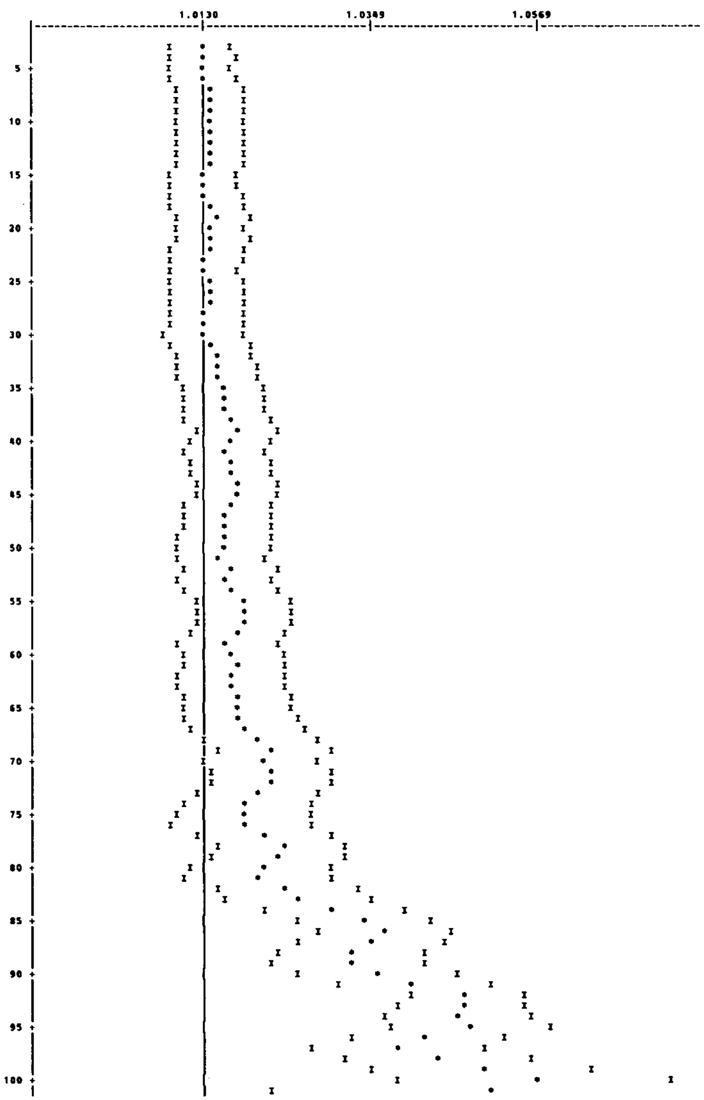


Fig. B.5 (continued)

TABLE 5 (CAS73)

UO2(NO3)2 415 G U/L 3X3X3 ARRAY 1.27 CM PARAFFIN REFL.

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0134

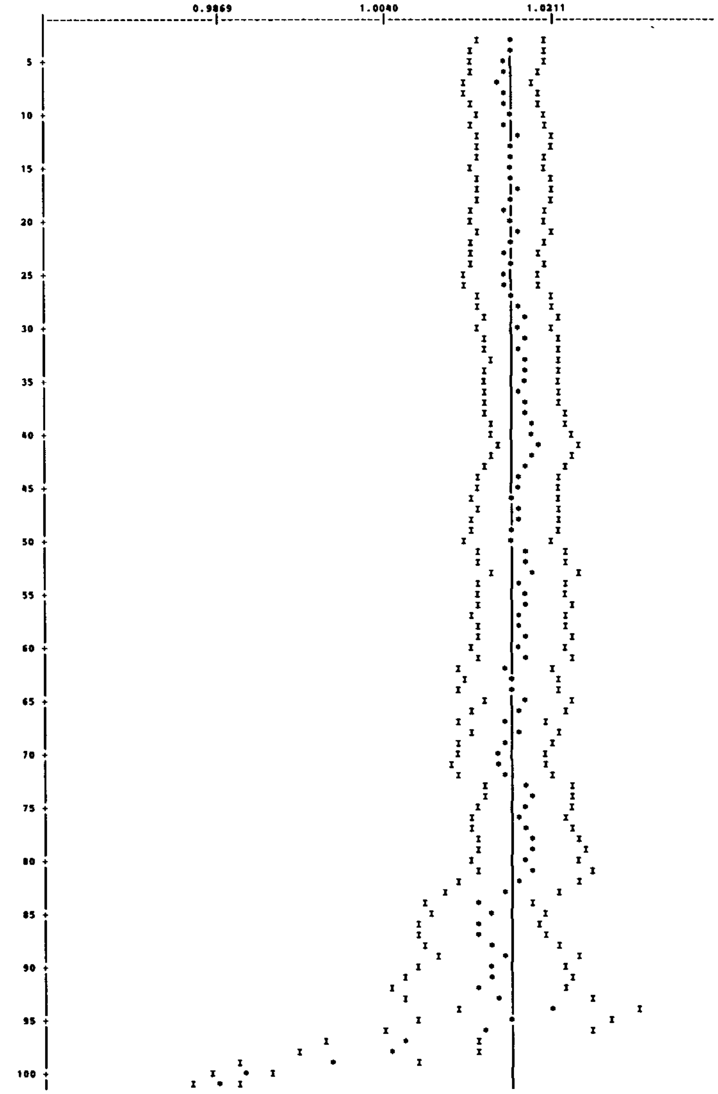


UO2(NO3)2 415 G U/L 3X3X3 ARRAY 1.27 CM PARAFFIN REFL.

TABLE 5 (CAS74)

UO2(NO3)2 415 G U/L 3X3X3 ARRAY 15.24 CM PARAFFIN REFL.

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0172



UO2(NO3)2 415 G U/L 3X3X3 ARRAY 15.24 CM PARAFFIN REFL.

Fig. B.5 (continued)

TABLE 5 (CAS75)

UO2(NO3)2 415 G U/L 3X3X3 ARRAY 3.81 CM PARAFFIN REFL.

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0300

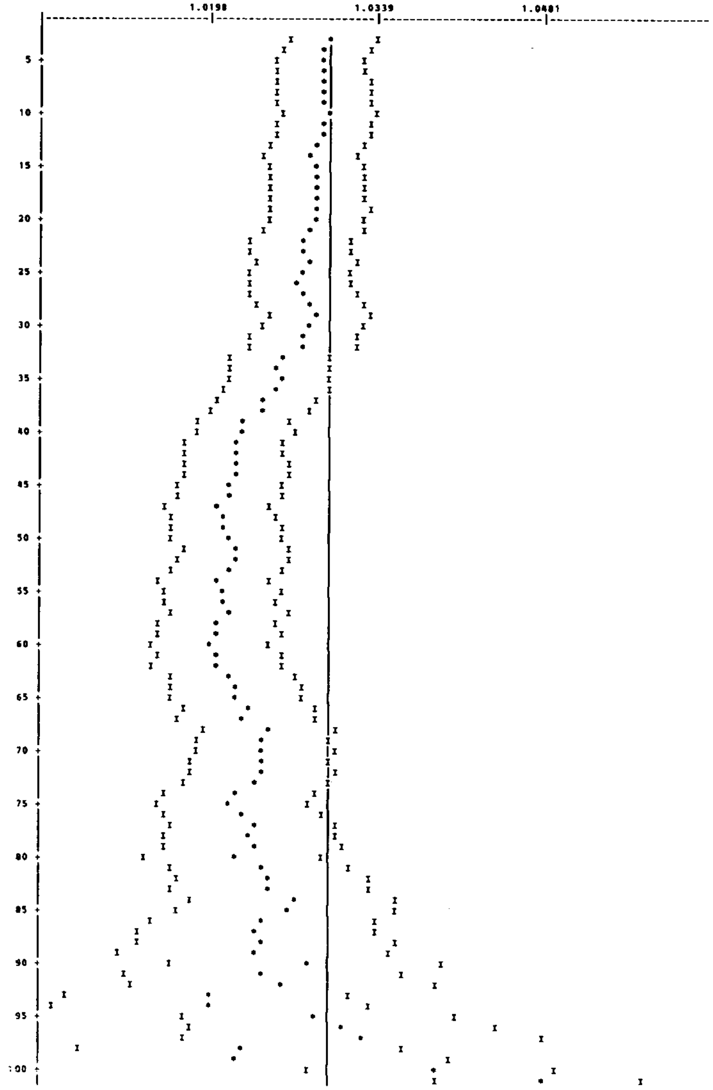


TABLE 5 (CAS76)

UO2(NO3)2 415 G U/L 2X2X2 ARRAY 15.24 CM PAR. BOT., 1.27 CM PLEX.

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0046

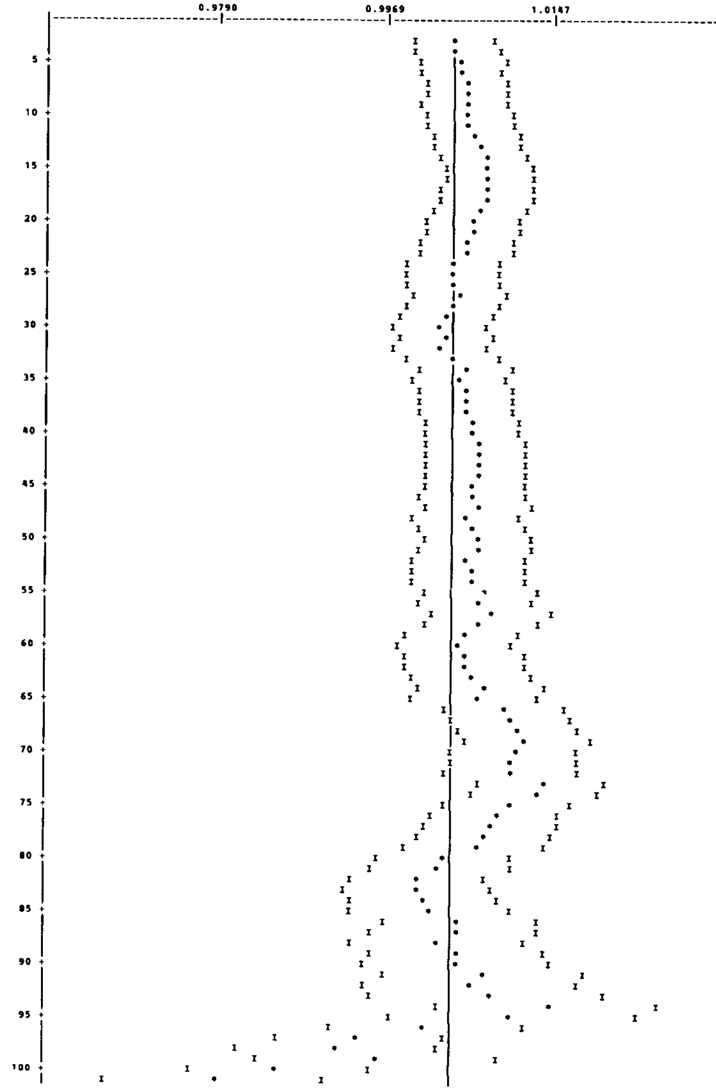
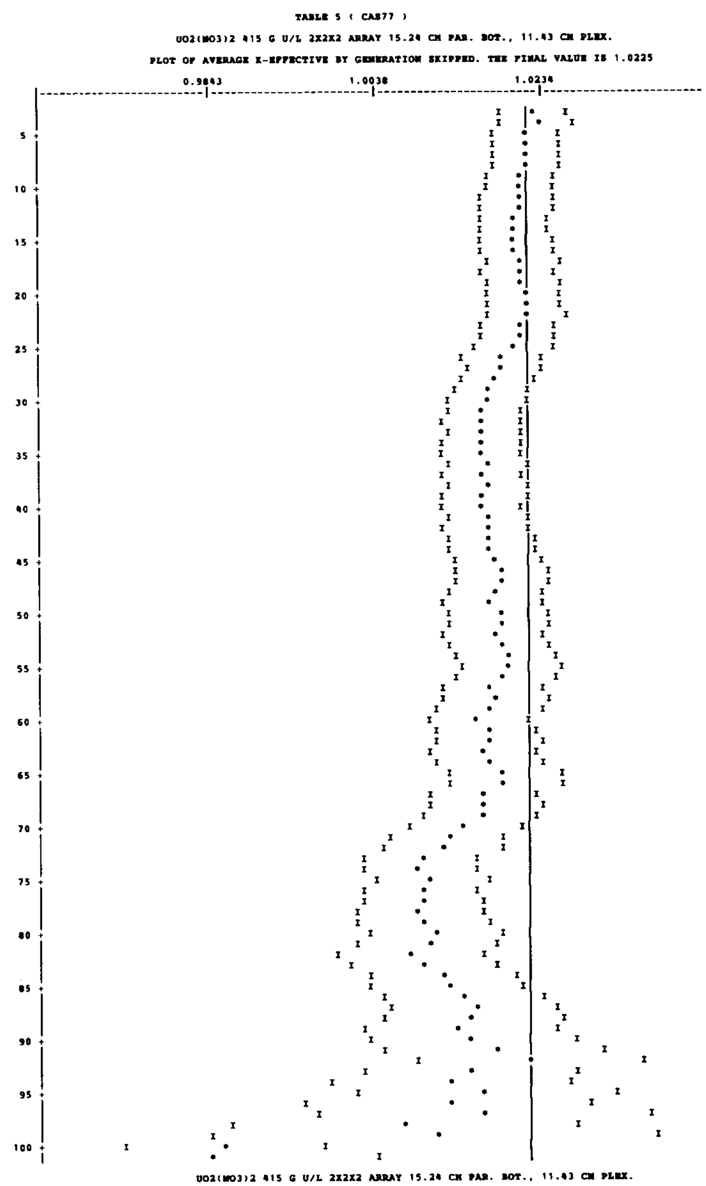


Fig. B.5 (continued)



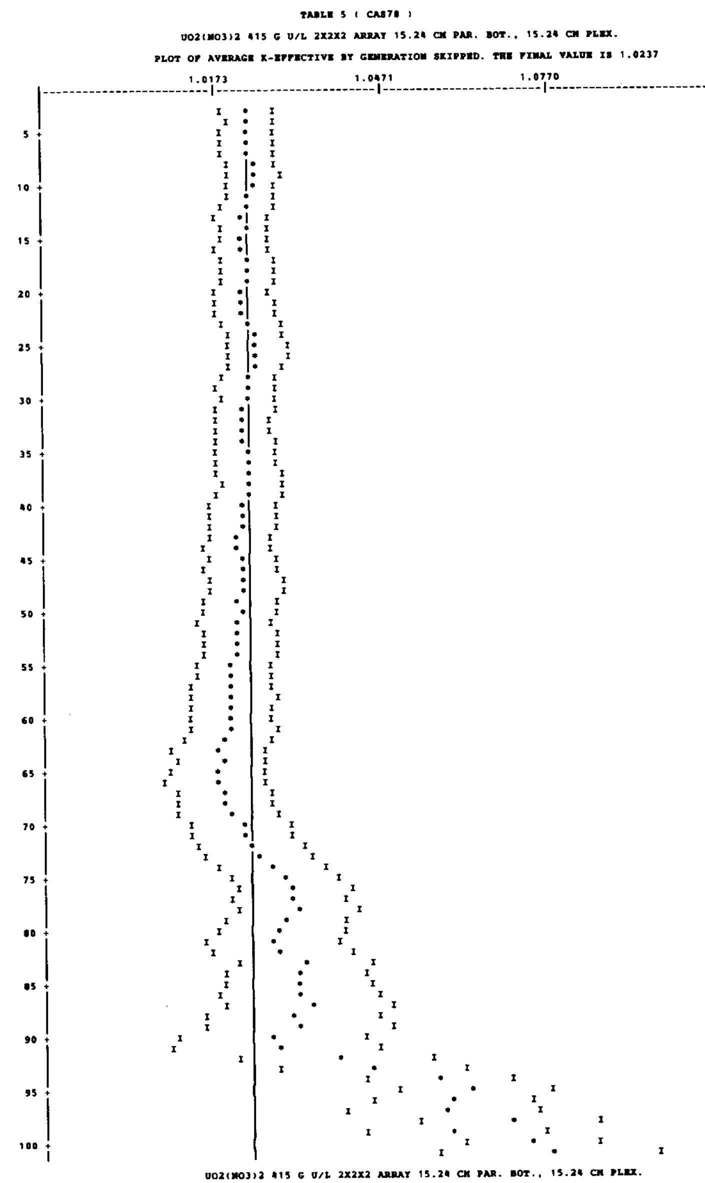
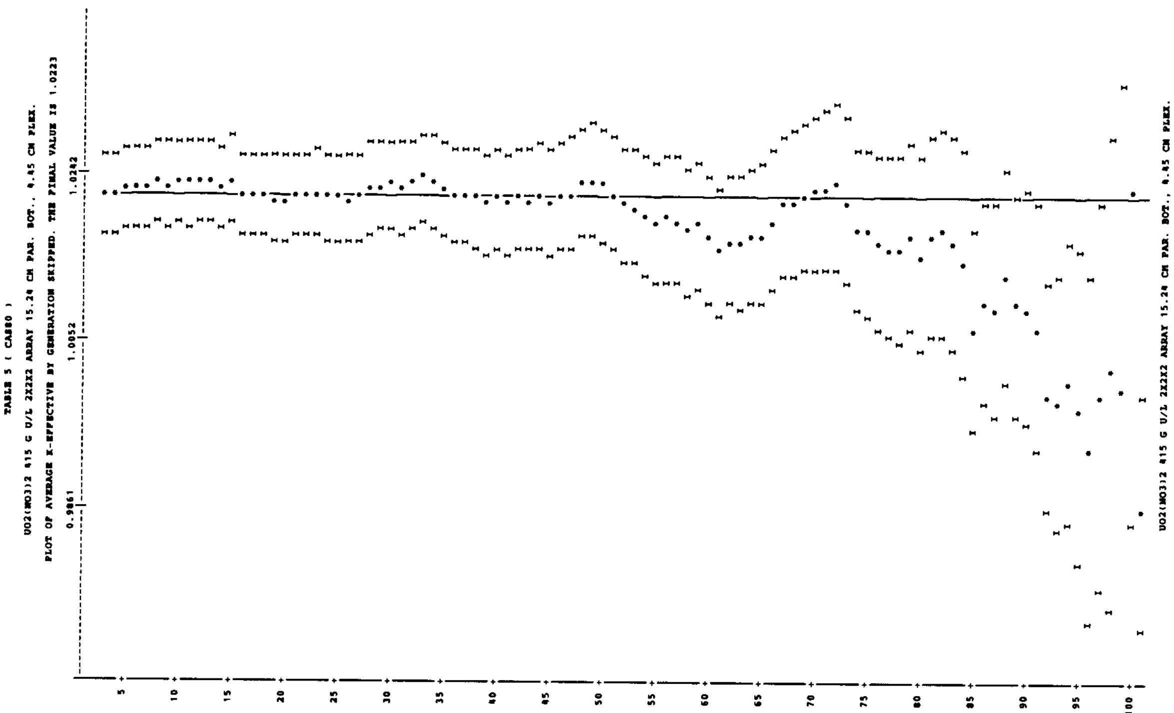


Fig. B.5 (continued)



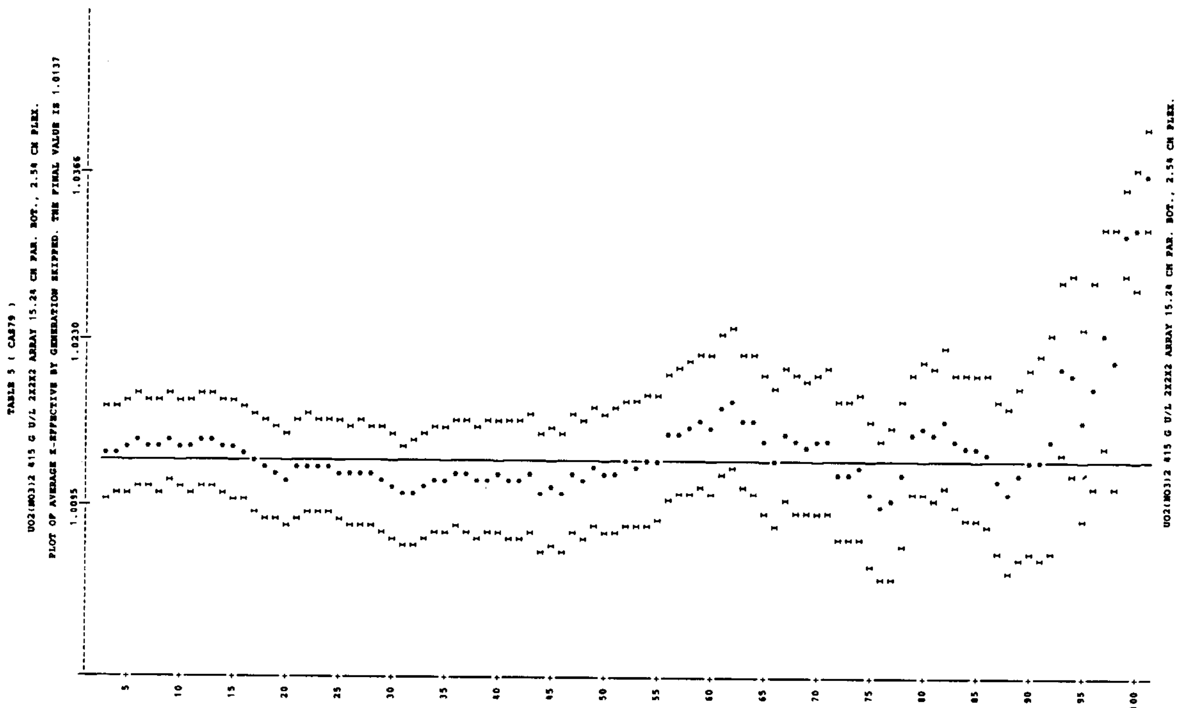
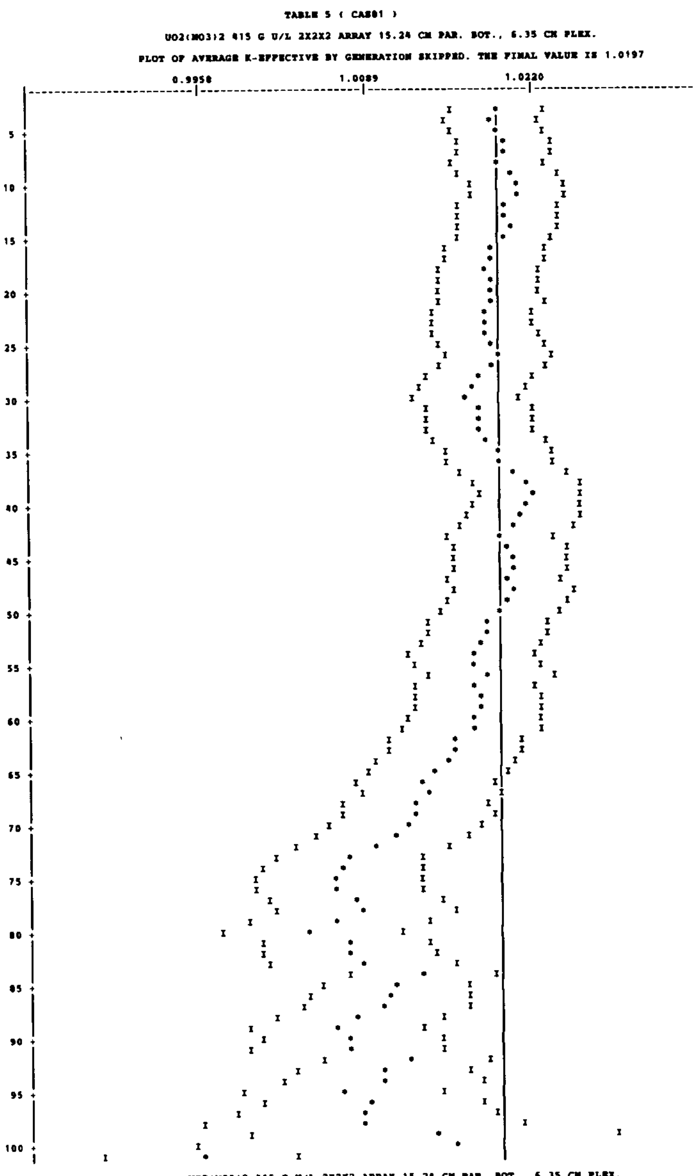


Fig. B.5 (continued)



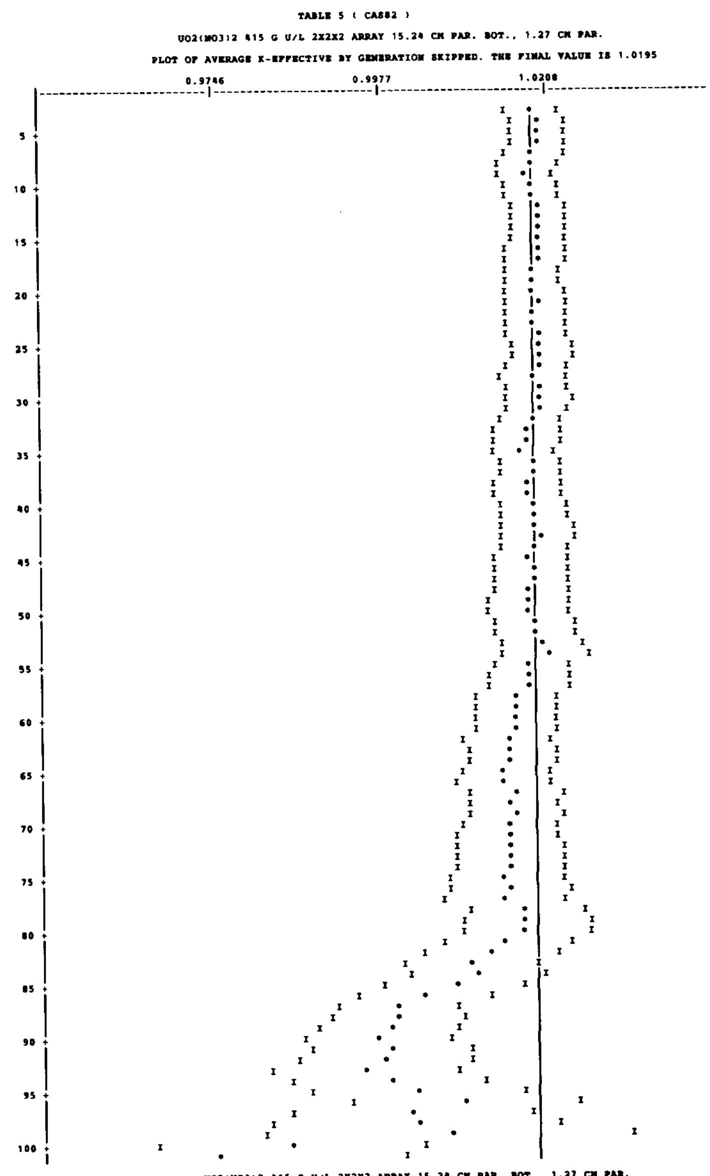
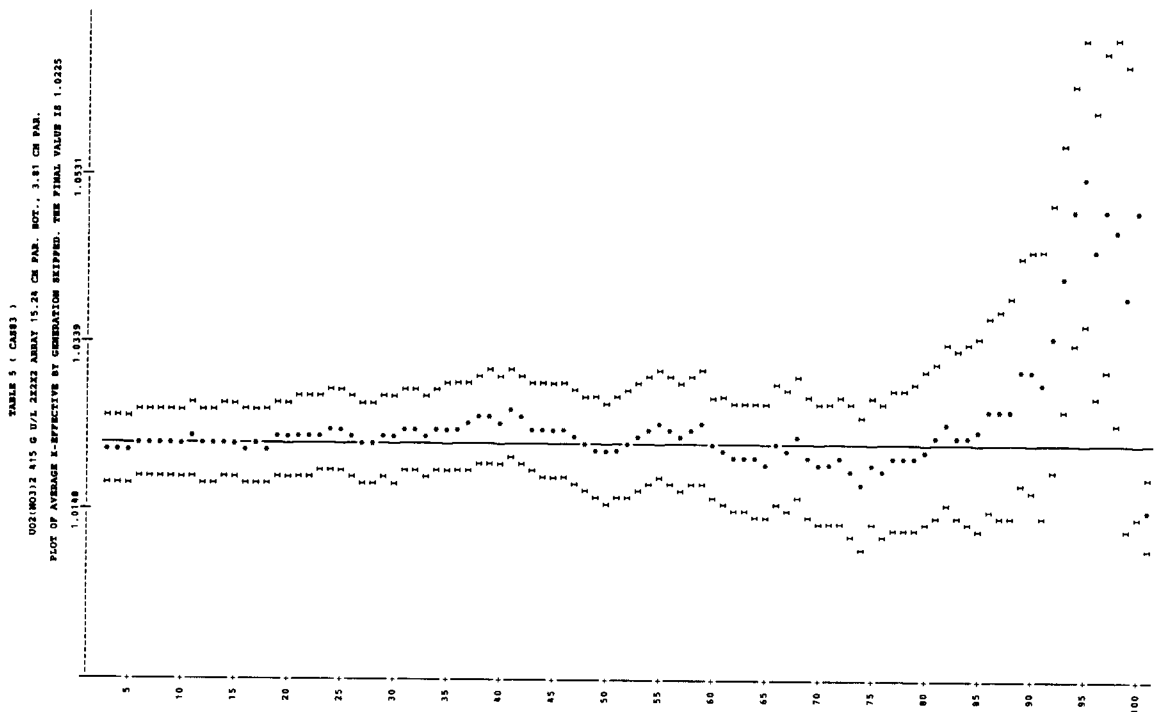


Fig. B.5 (continued)



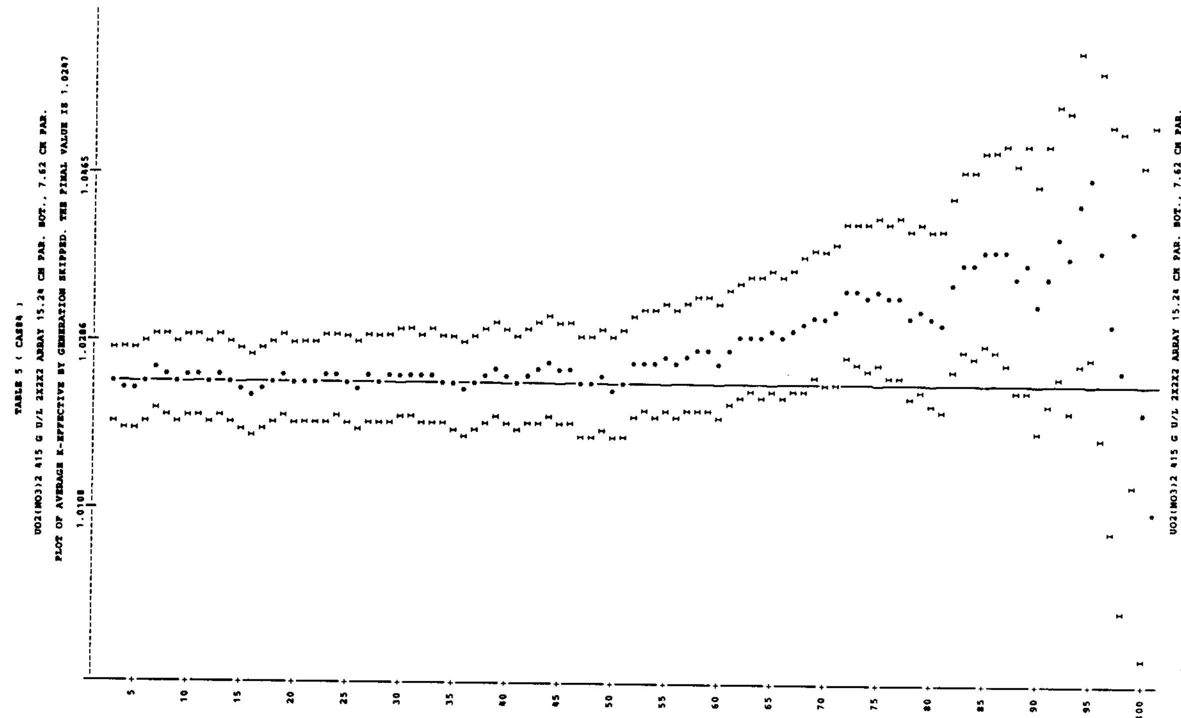
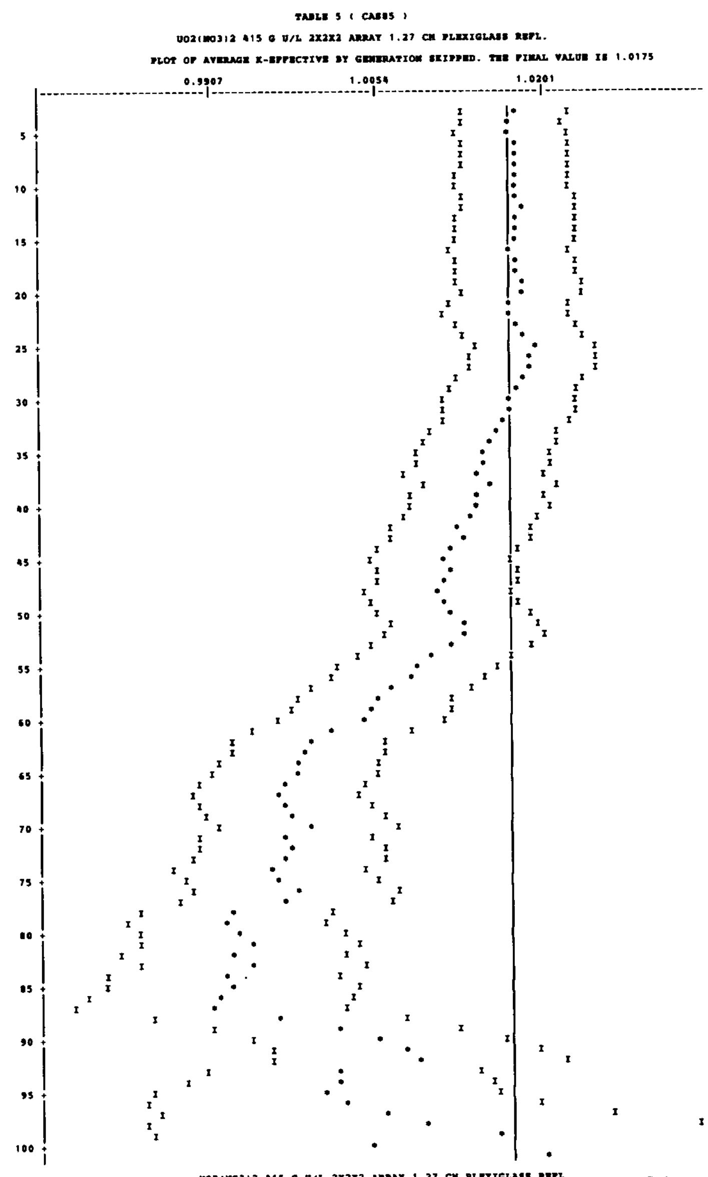


Fig. B.5 (continued)



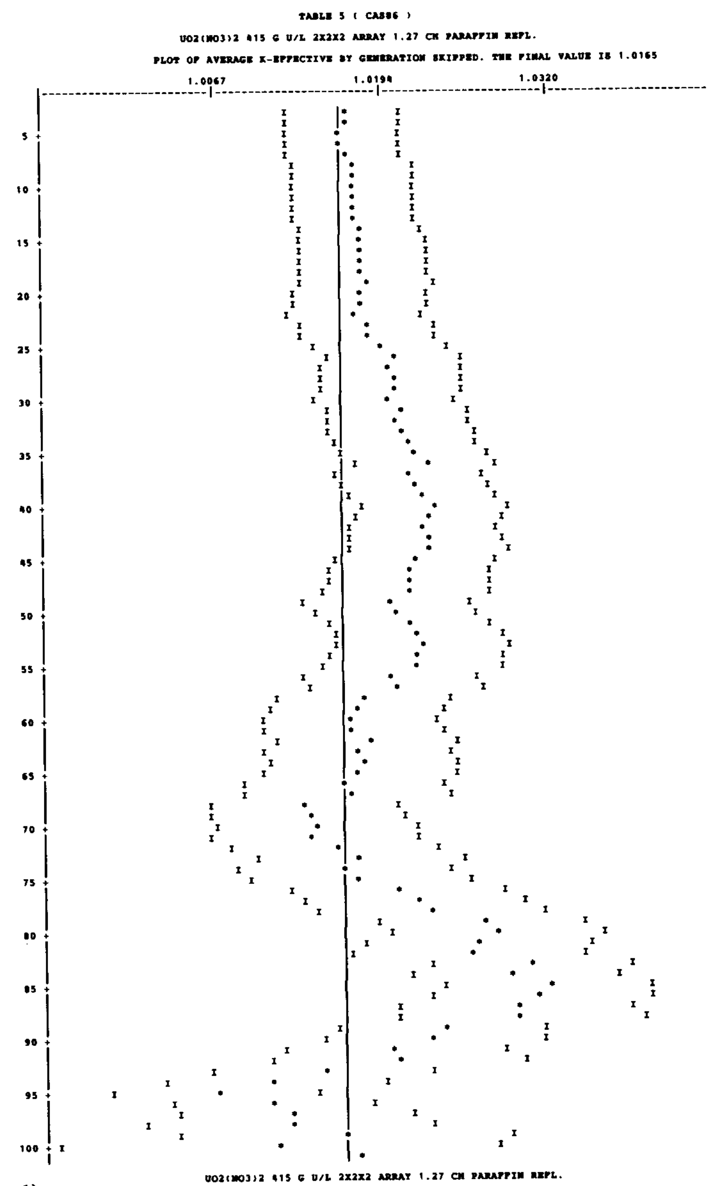
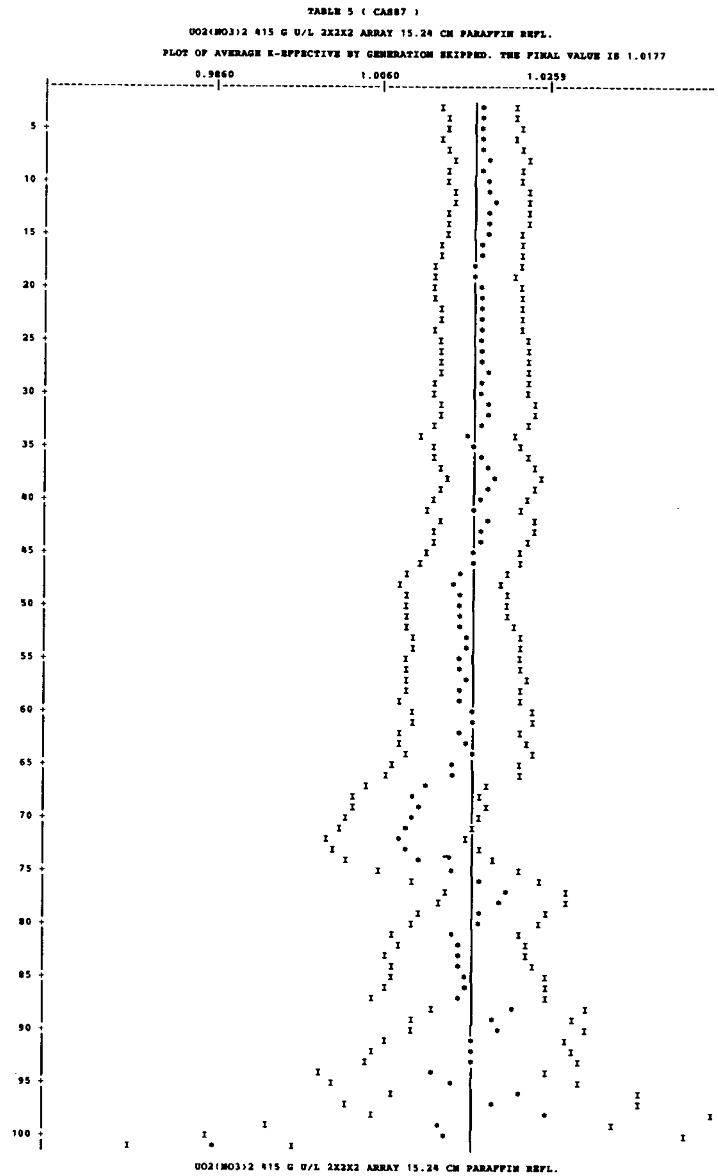


Fig. B.5 (continued)



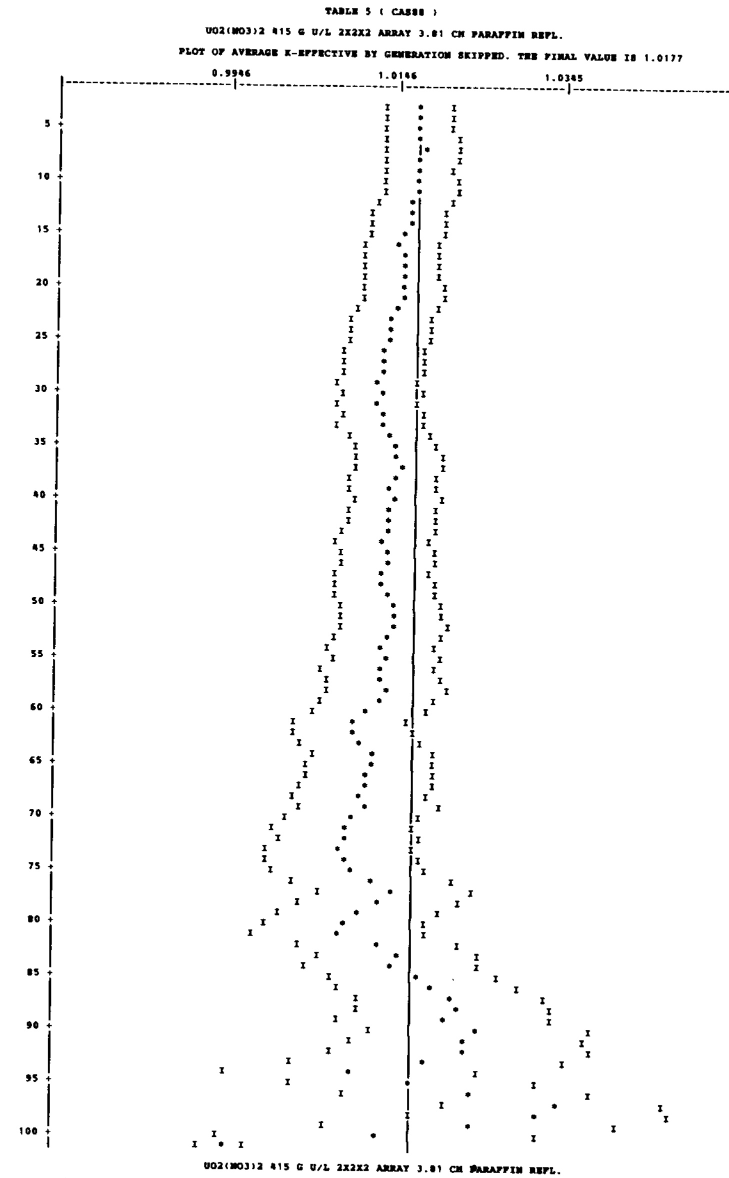
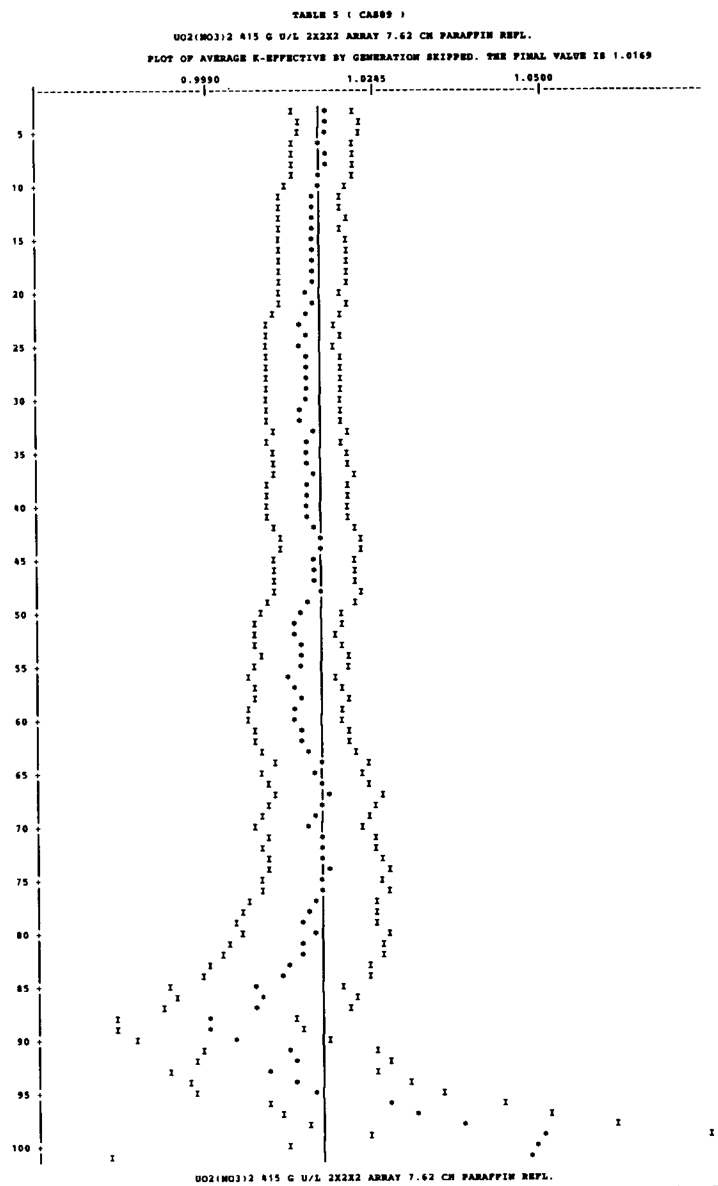


Fig. B.5 (continued)

Table 5 plots (cont.)



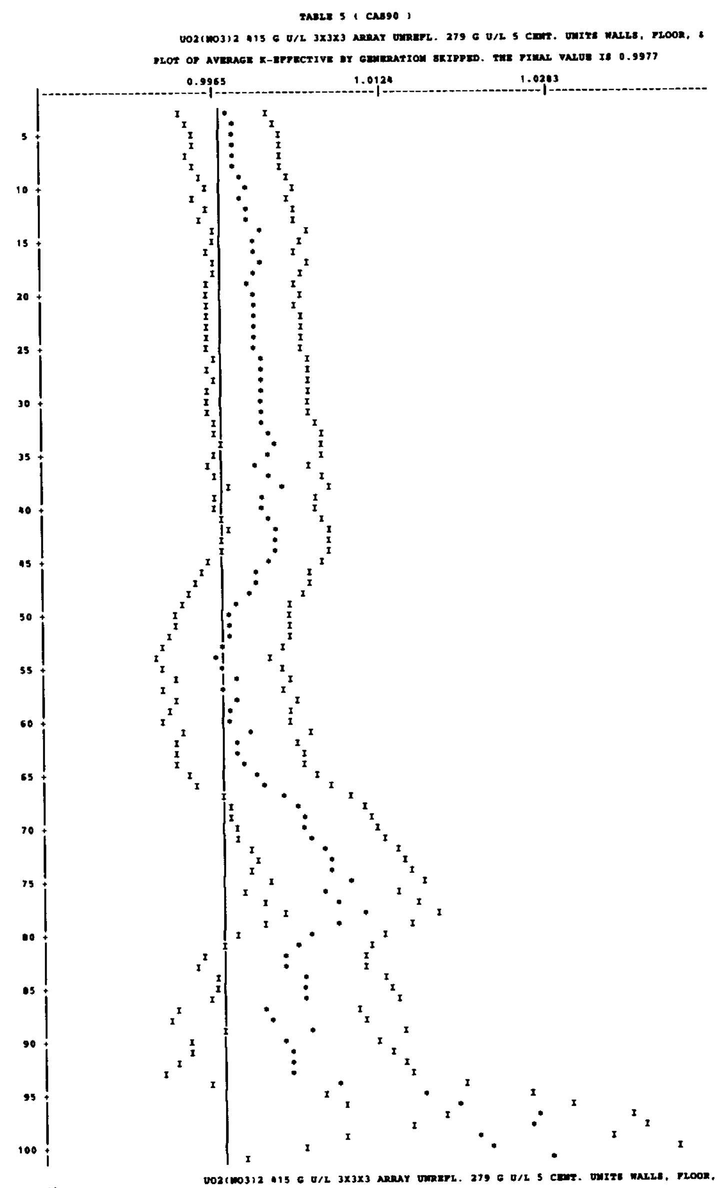
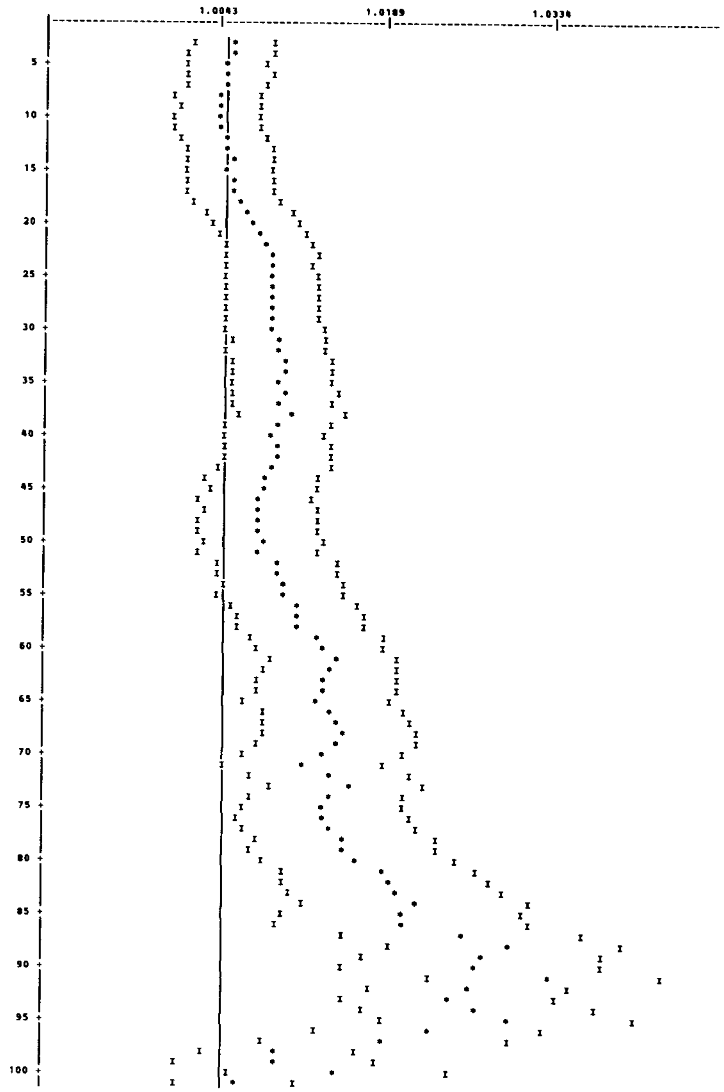


Fig. B.5 (continued)

TABLE 5 (CAS91)

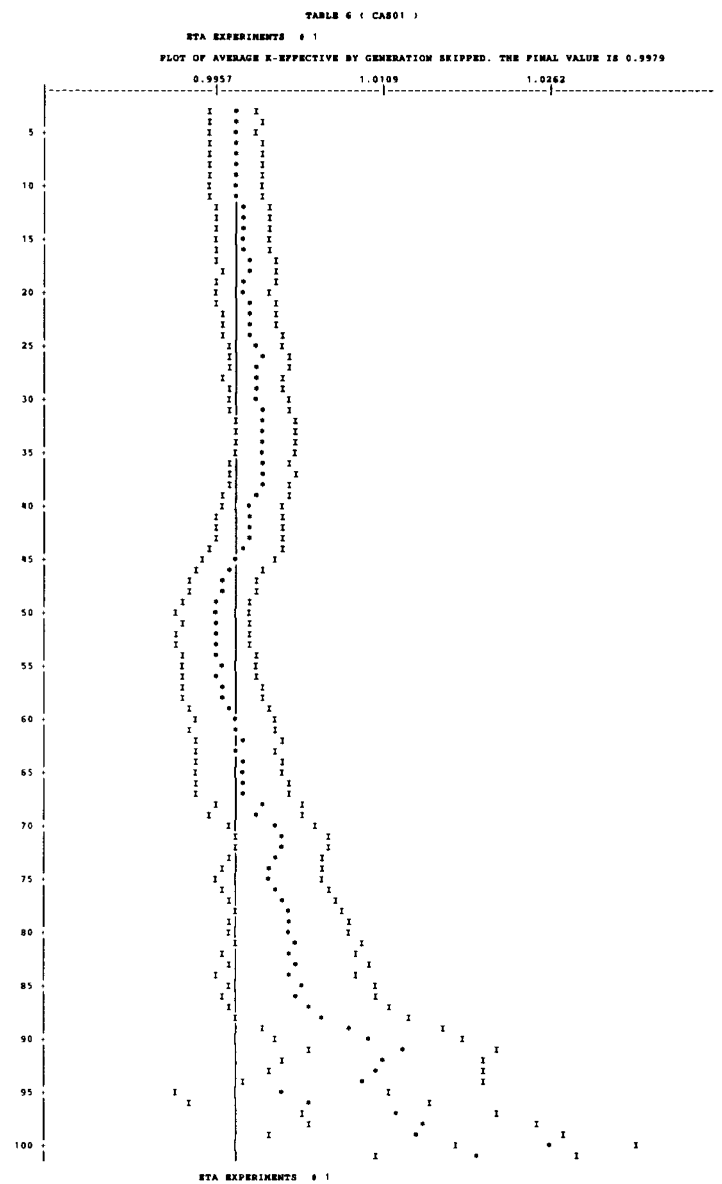
UO2(NO3)2 63.3 G U/L 3X3X3 ARRAY UNREFL. WALLS, FLOOR, & TANK

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0052



UO2(NO3)2 63.3 G U/L 3X3X3 ARRAY UNREFL. WALLS, FLOOR, & TANK

Fig. B.5 (continued)



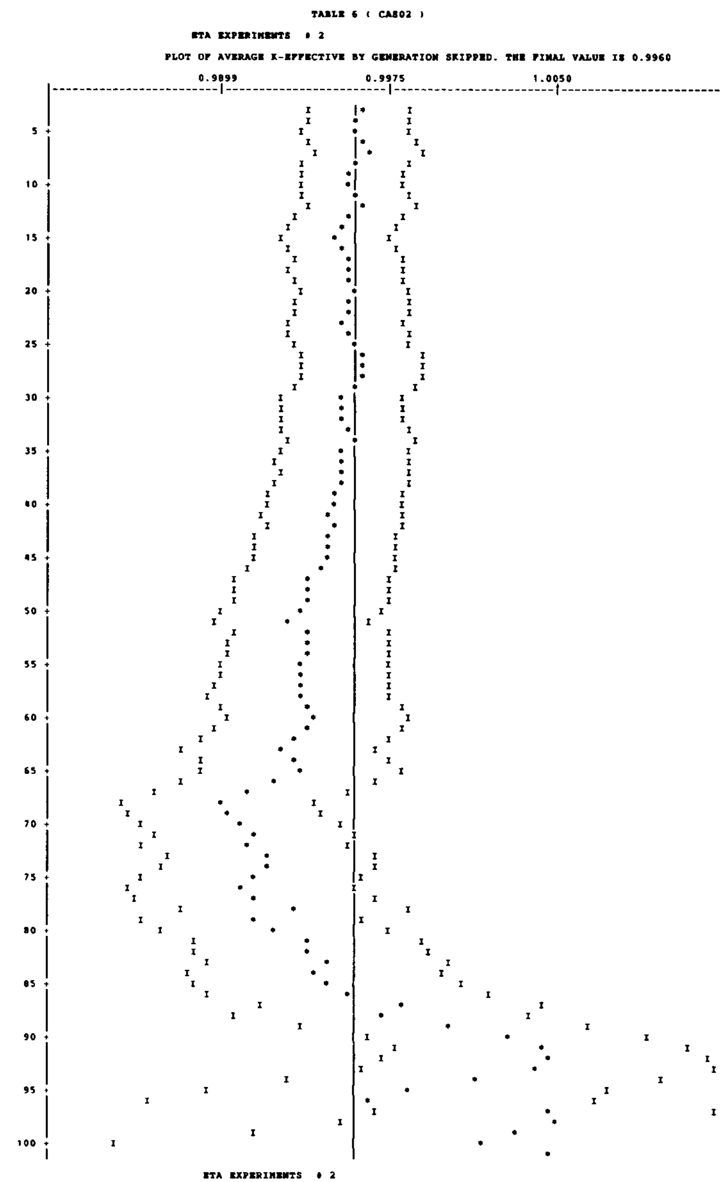
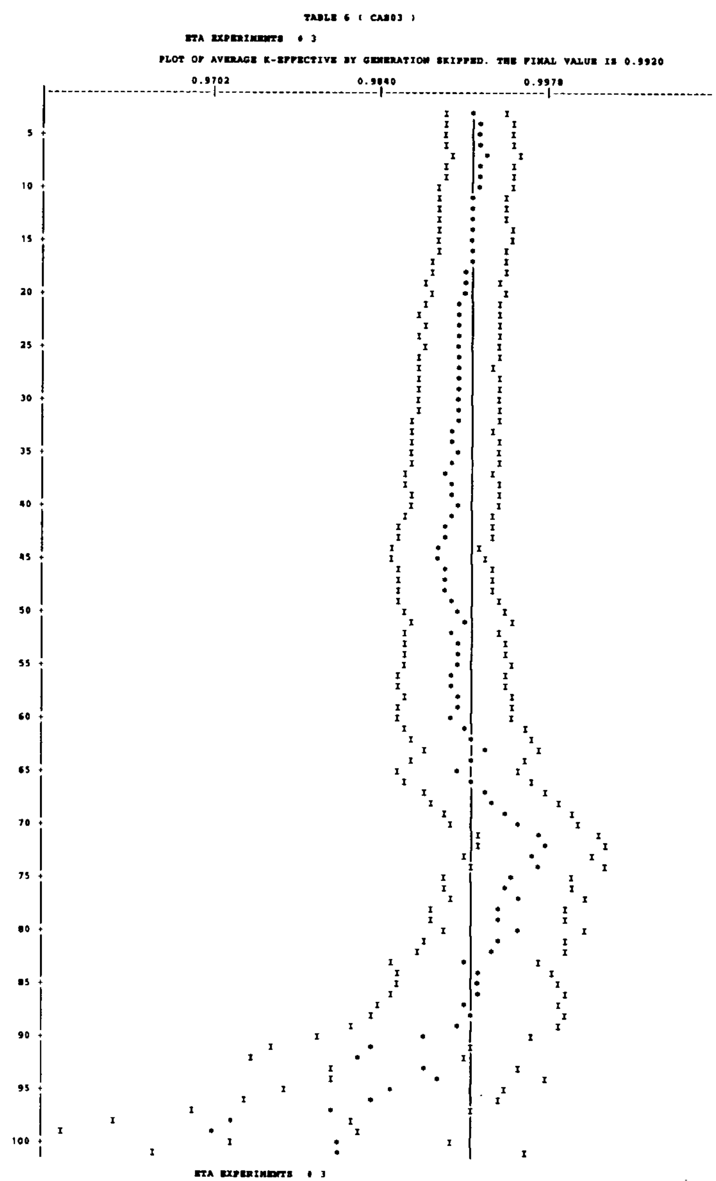


Fig. B.6. Plots for Table 6.



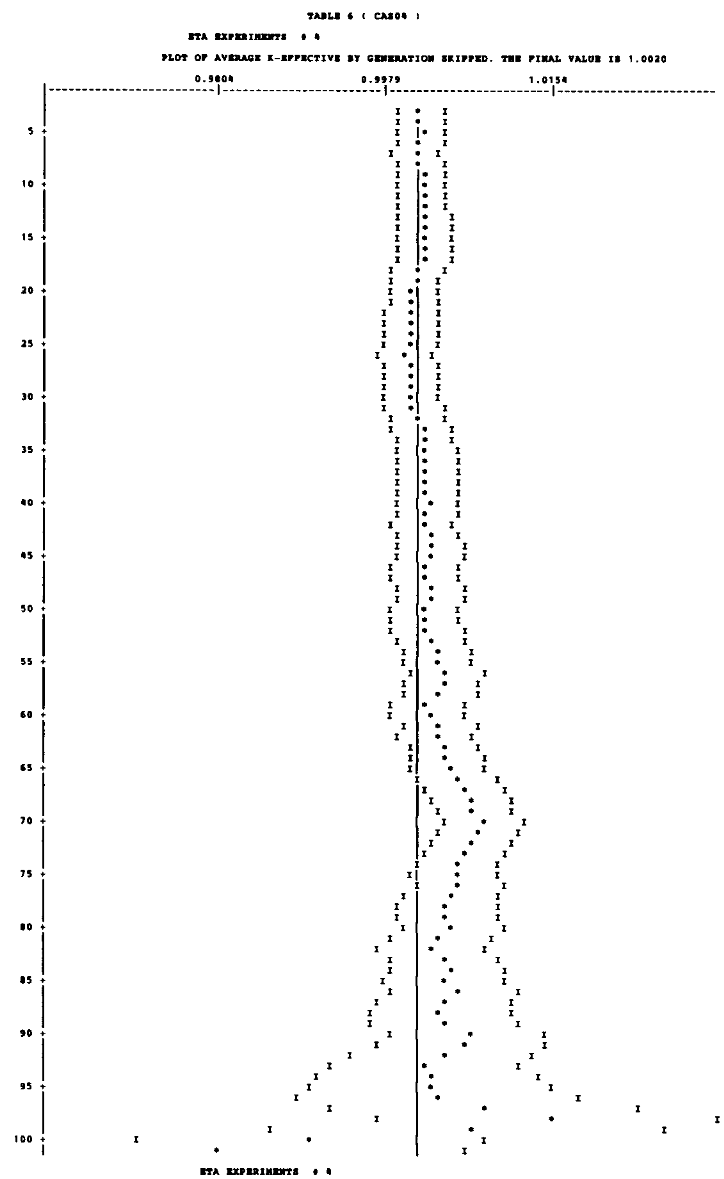
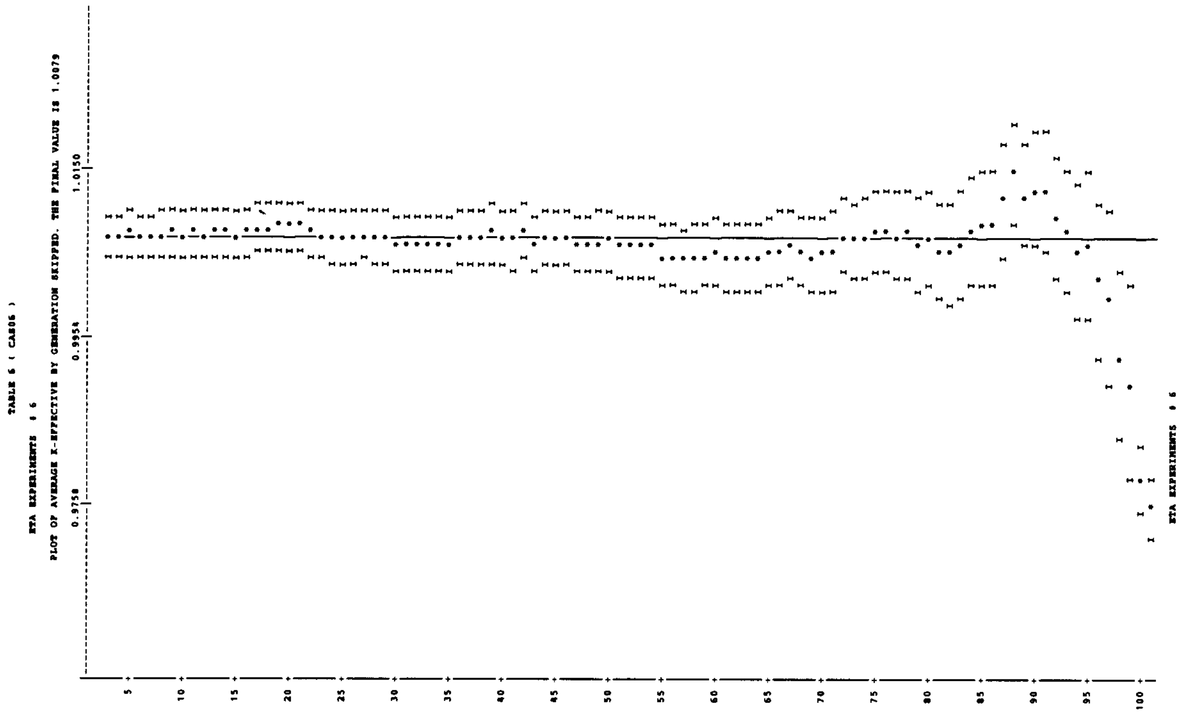


Fig. B.6 (continued)



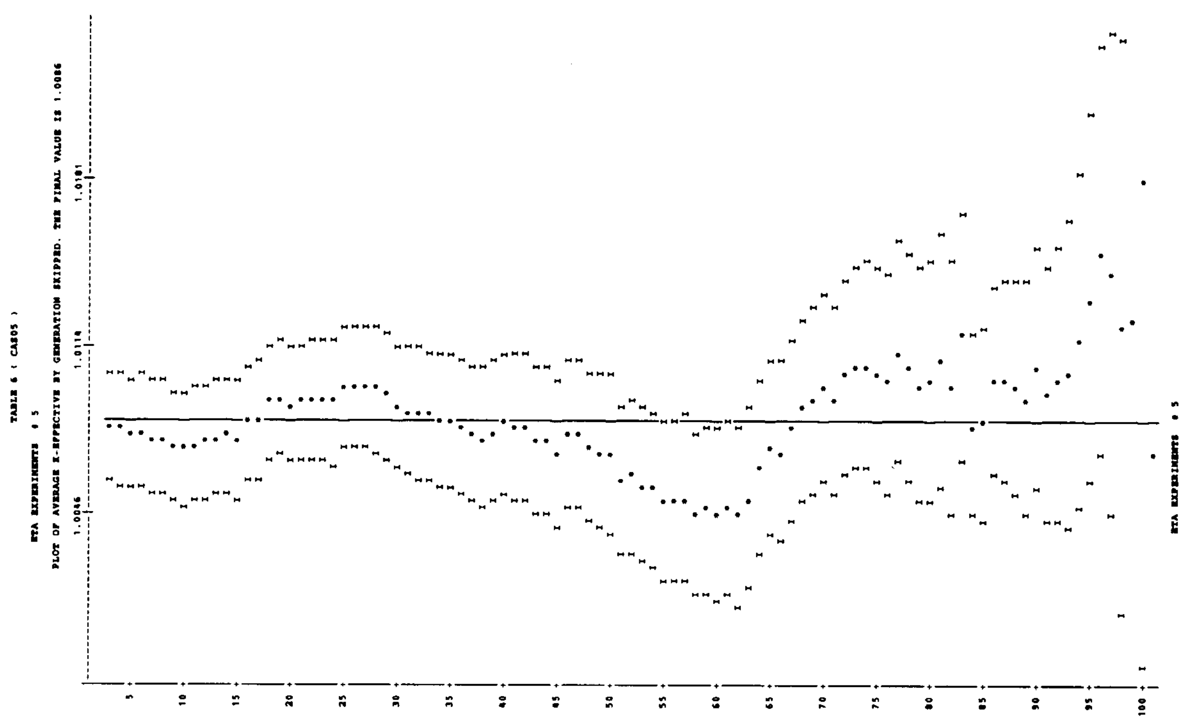
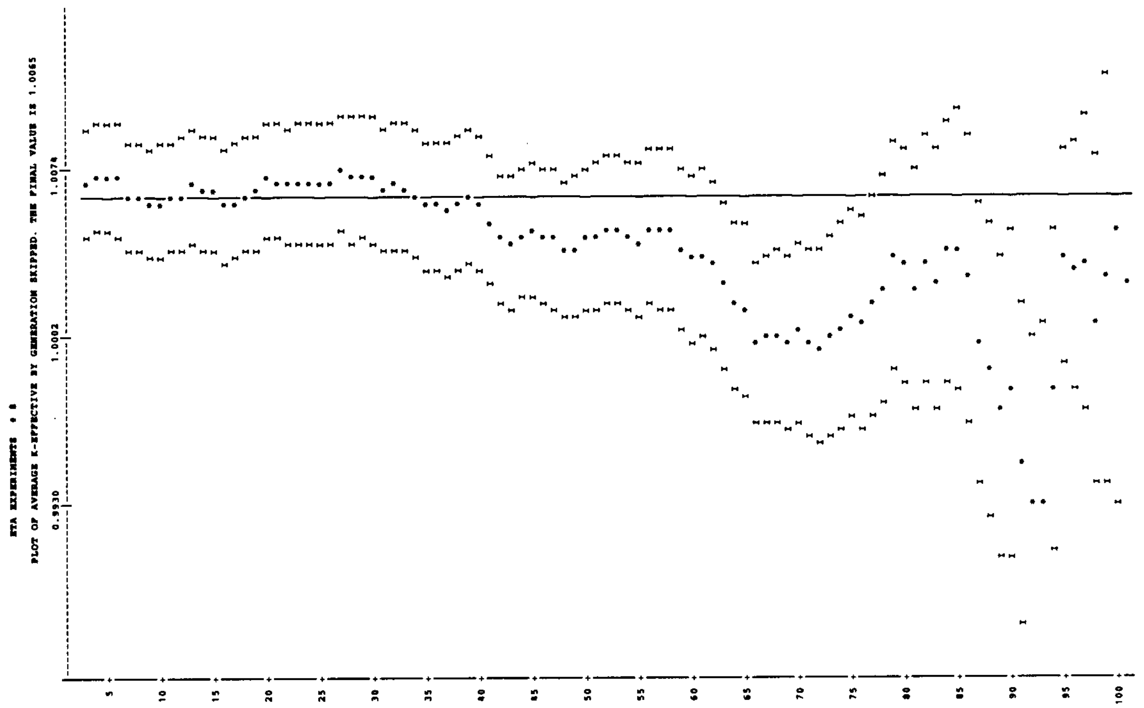


Fig. B.6 (continued)



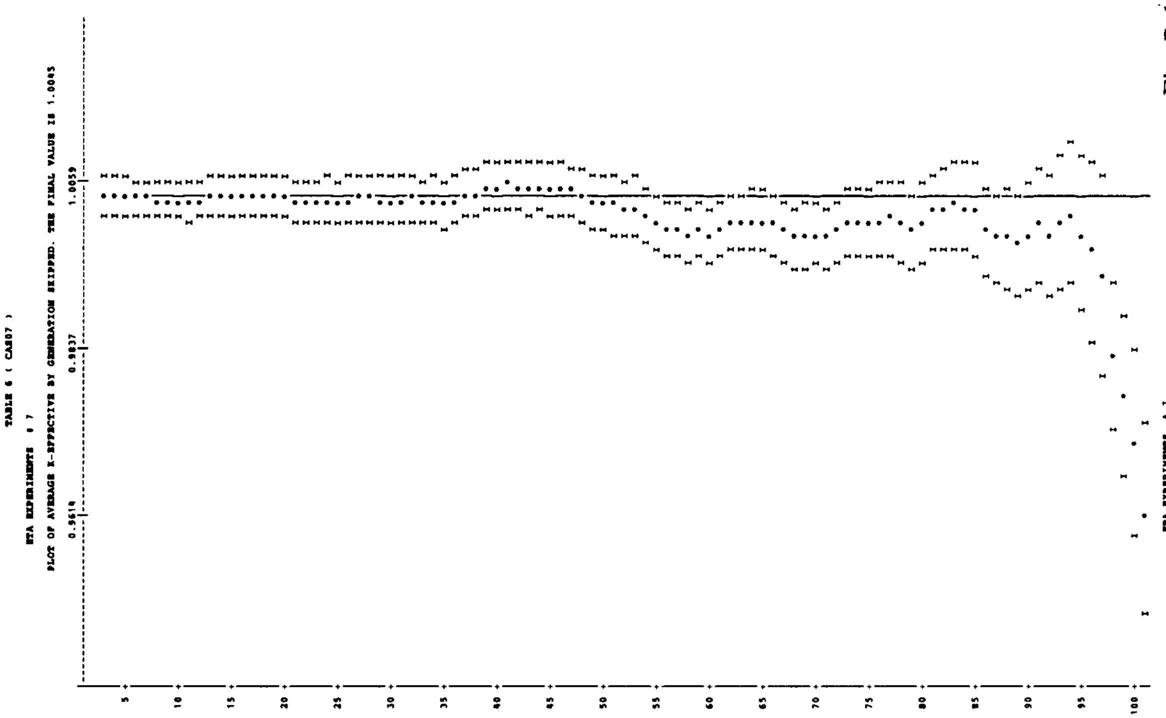


Fig. B.6 (continued)

TABLE 6 (CAS09)

STA EXPERIMENTS # 9

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 1.0084

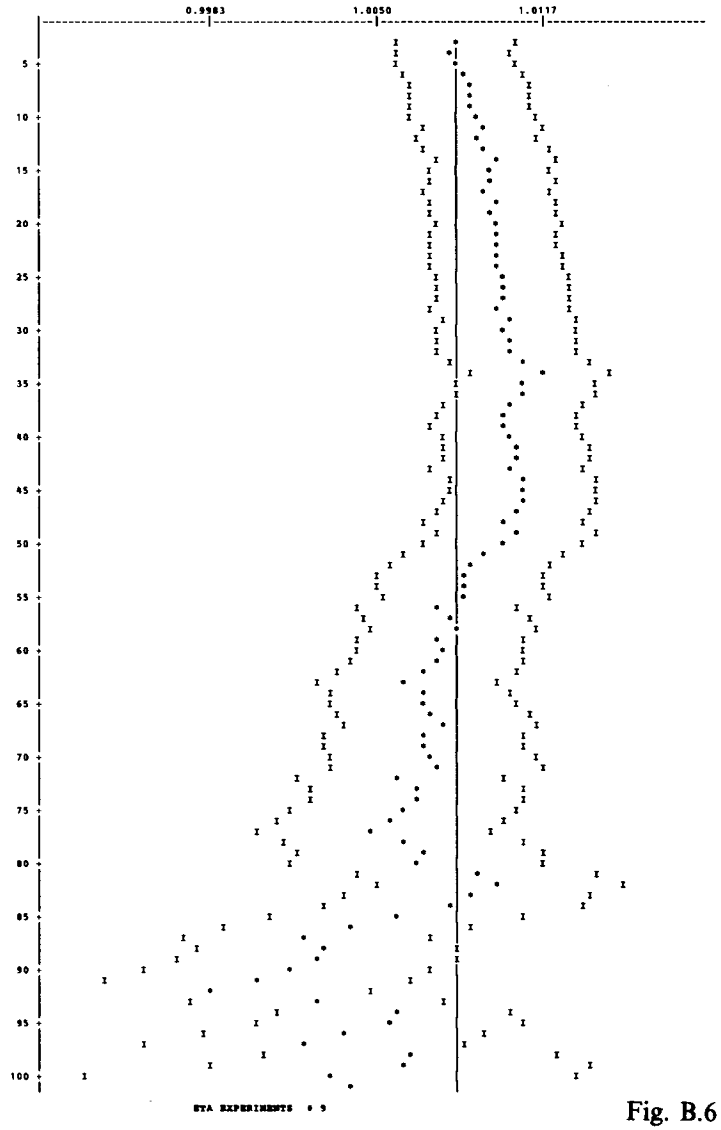


TABLE 6 (CAS10)

STA EXPERIMENTS # 10

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 0.9979

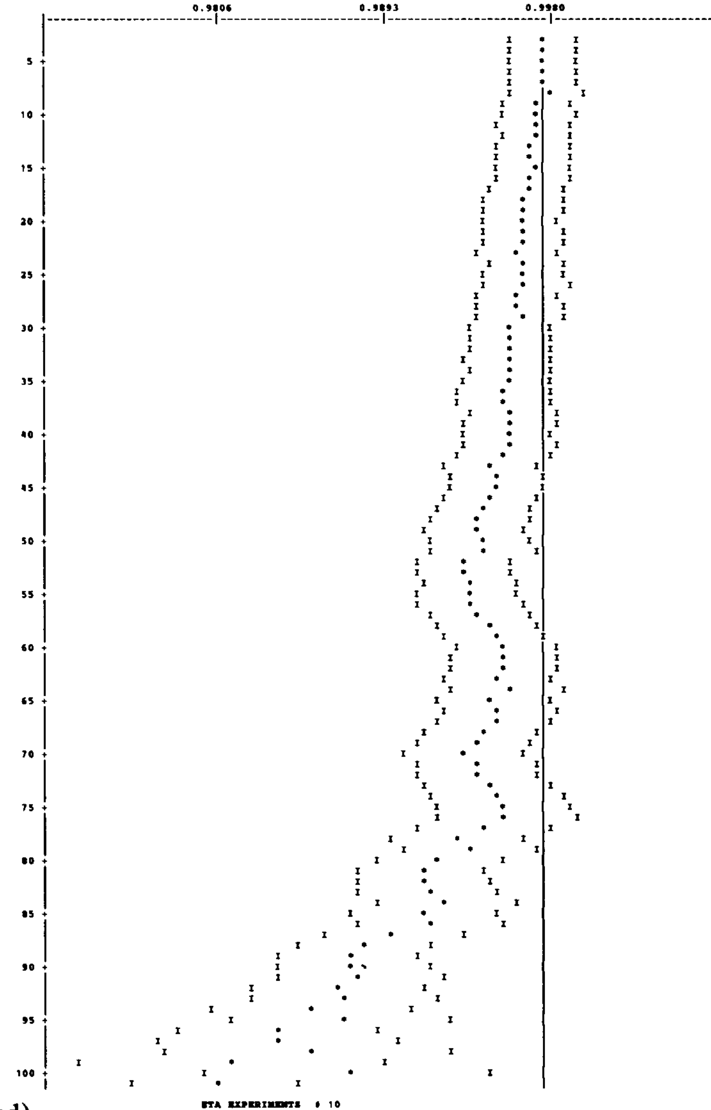
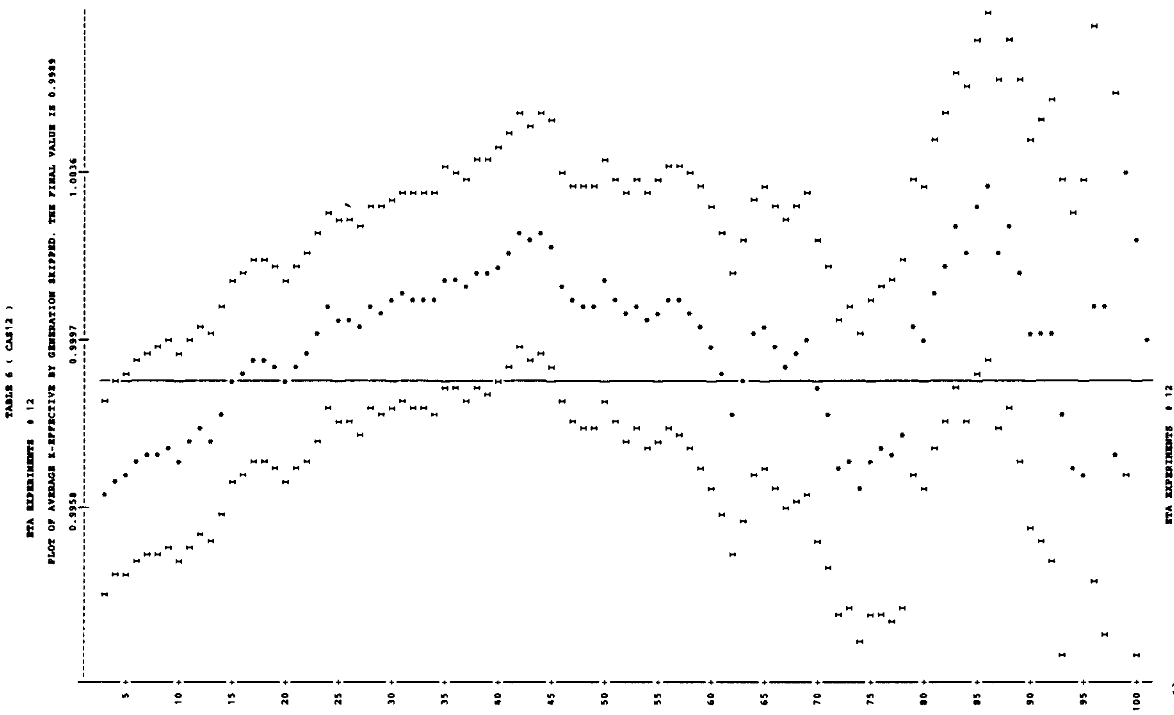


Fig. B.6 (continued)



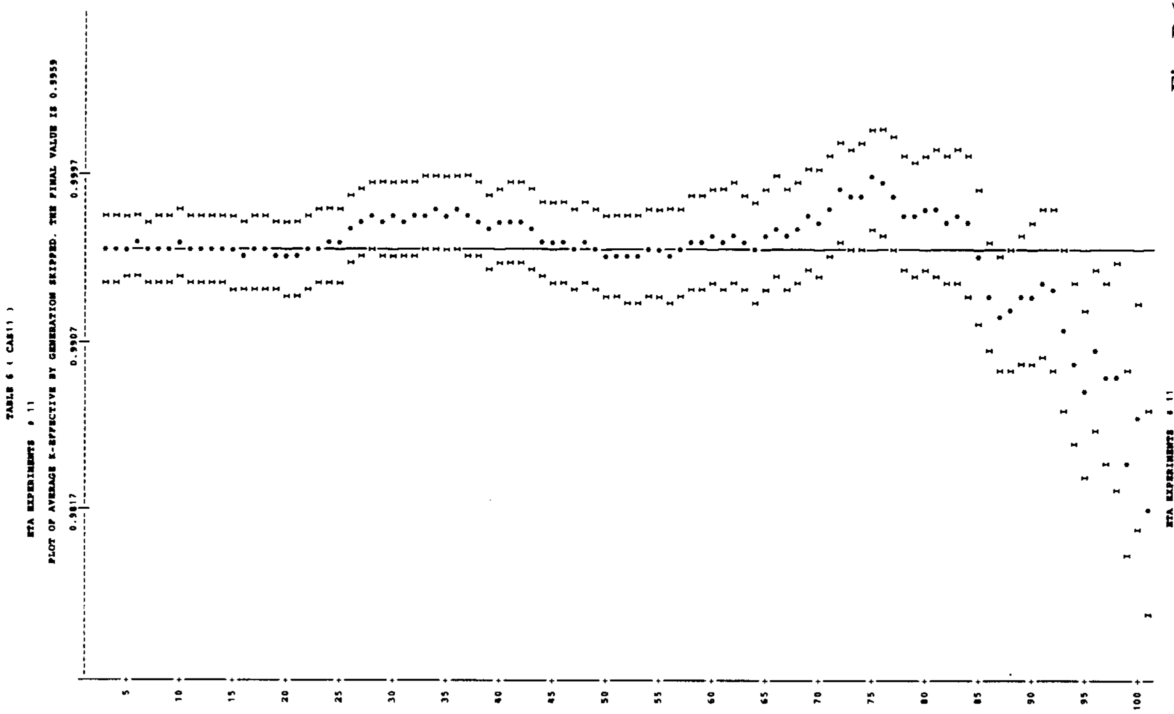


Fig. B.6 (continued)

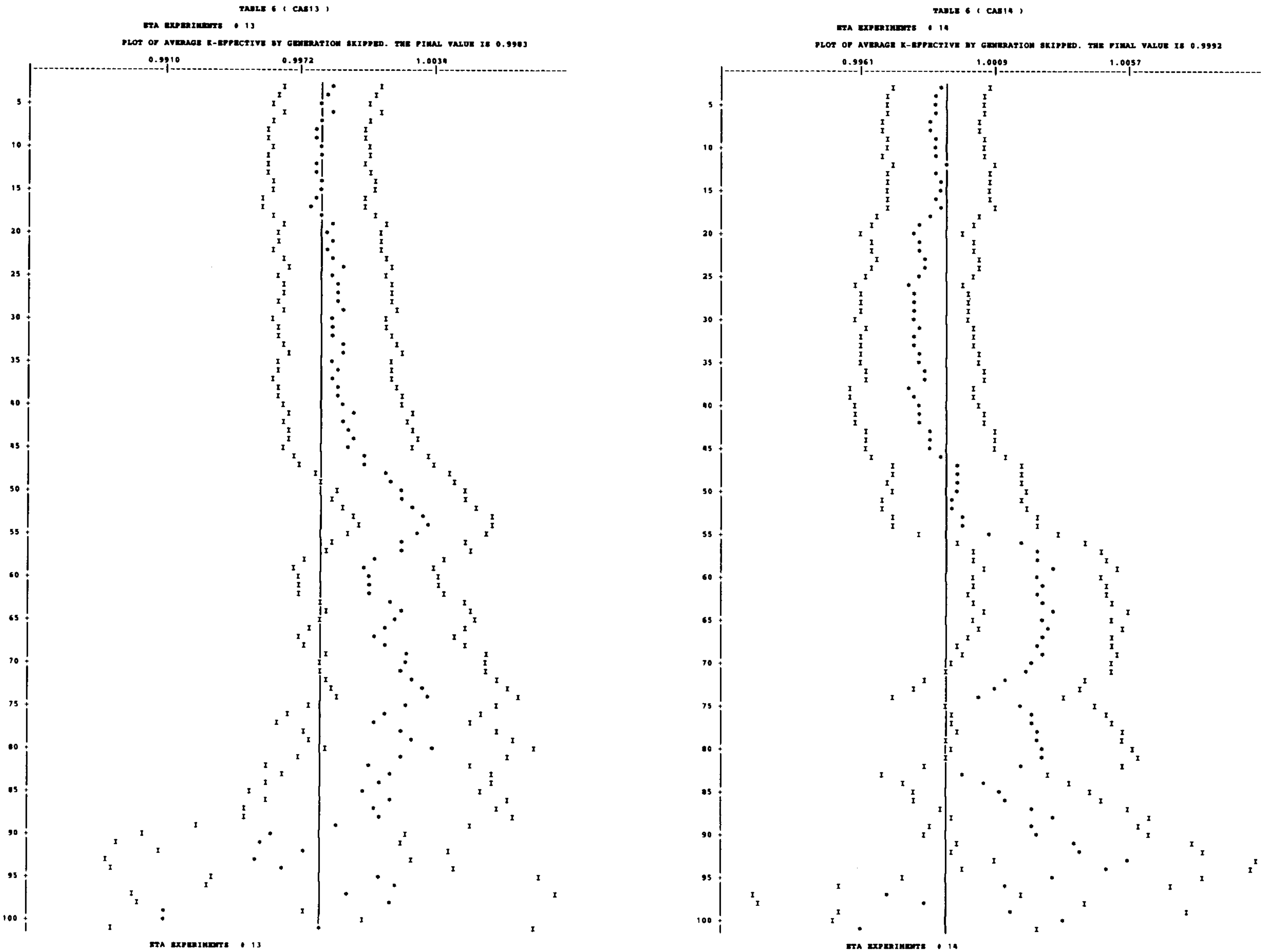


Fig. B.6 (continued)

TABLE 6 (CAS15)

ETA EXPERIMENTS # 15

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 0.9925

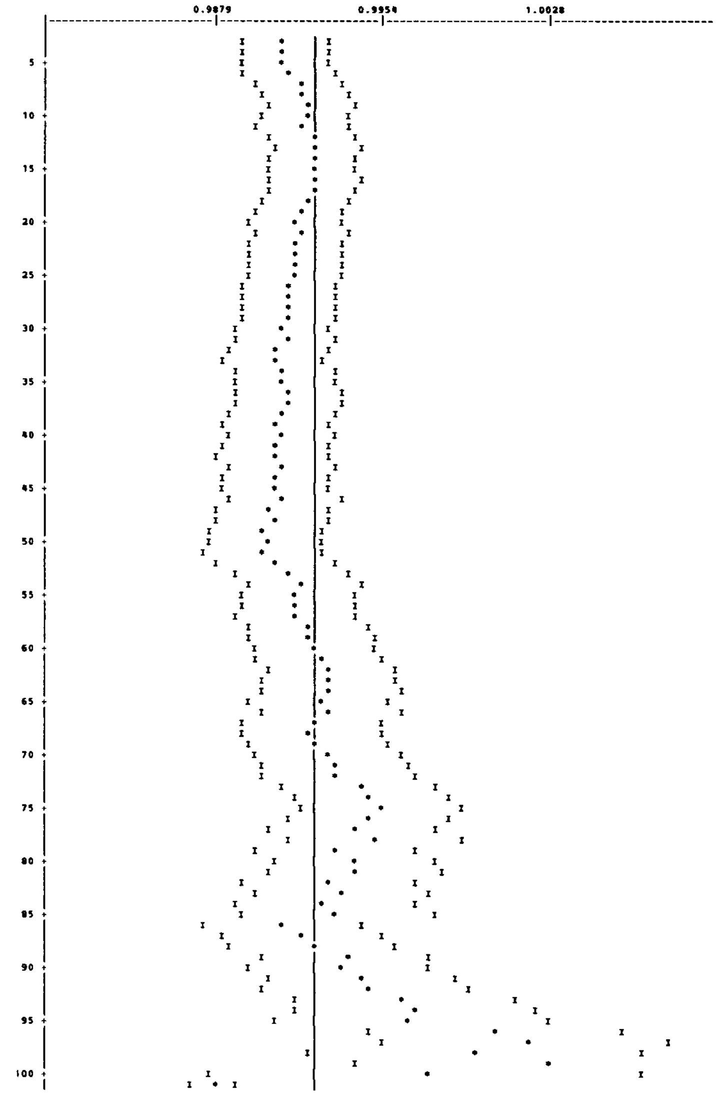


TABLE 6 (CAS16)

ETA EXPERIMENTS # 16

PLOT OF AVERAGE K-EFFECTIVE BY GENERATION SKIPPED. THE FINAL VALUE IS 0.9976

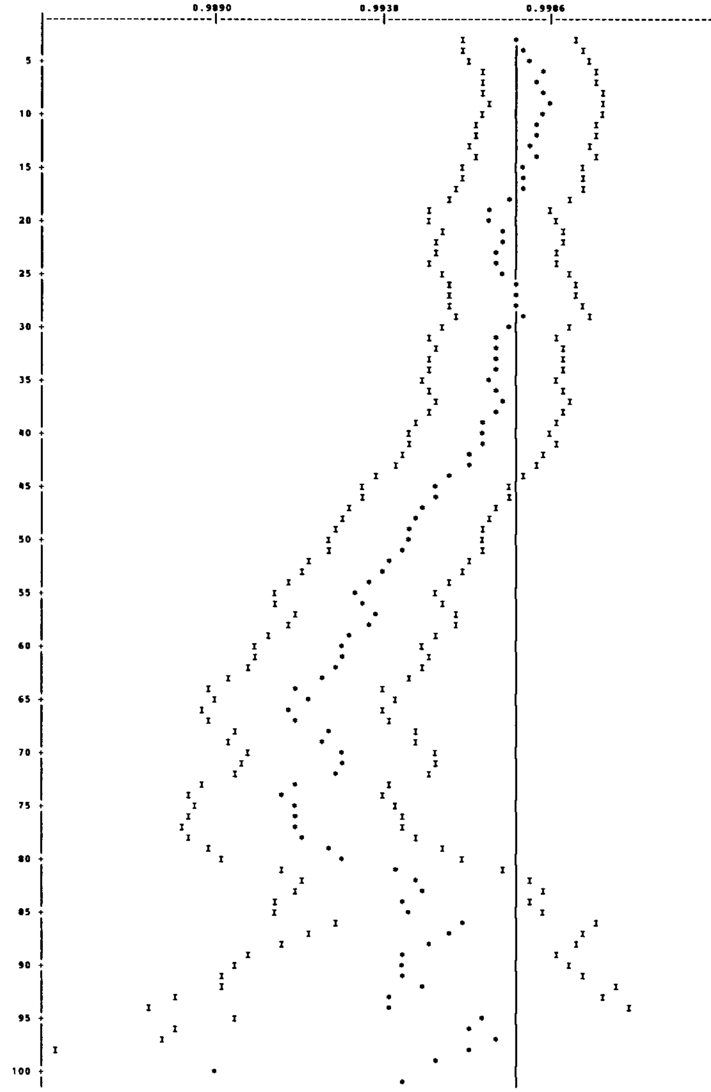
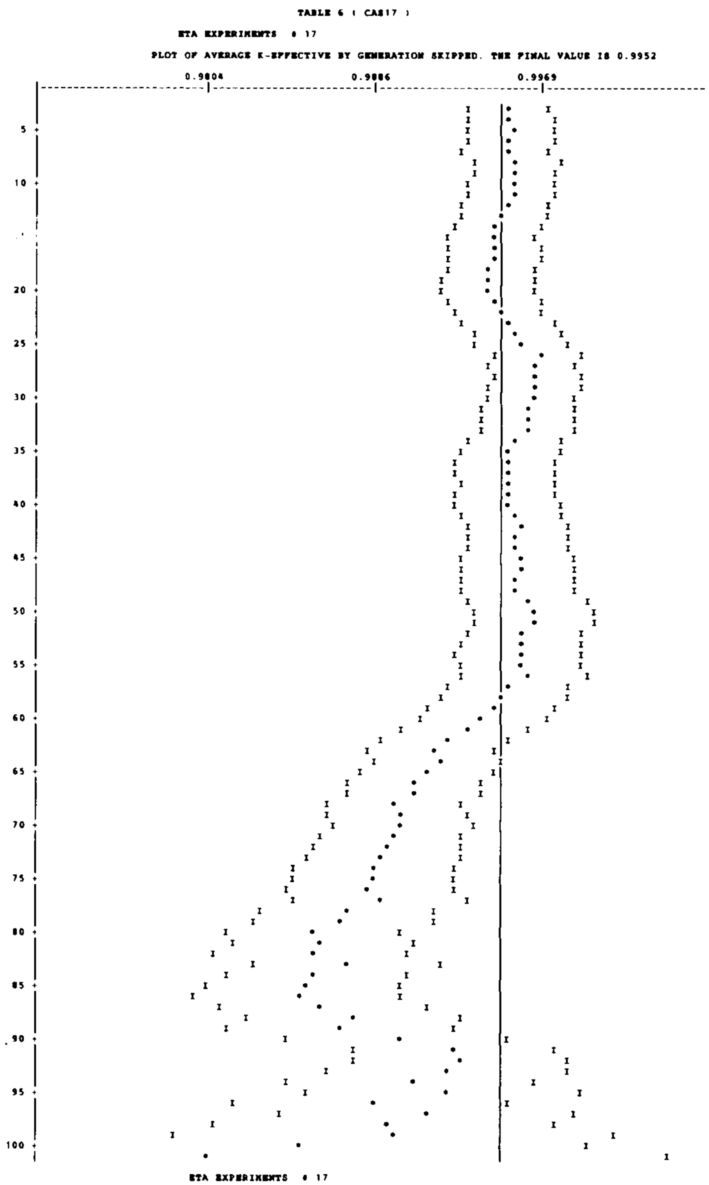


Fig. B.6 (continued)



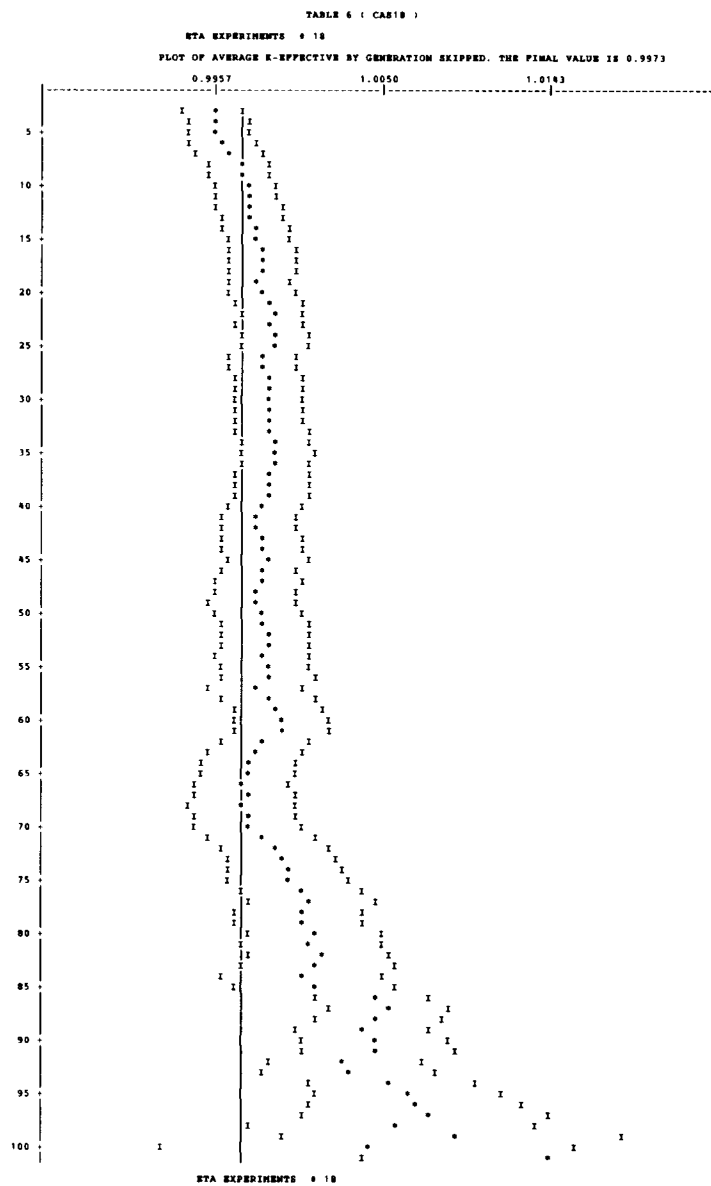
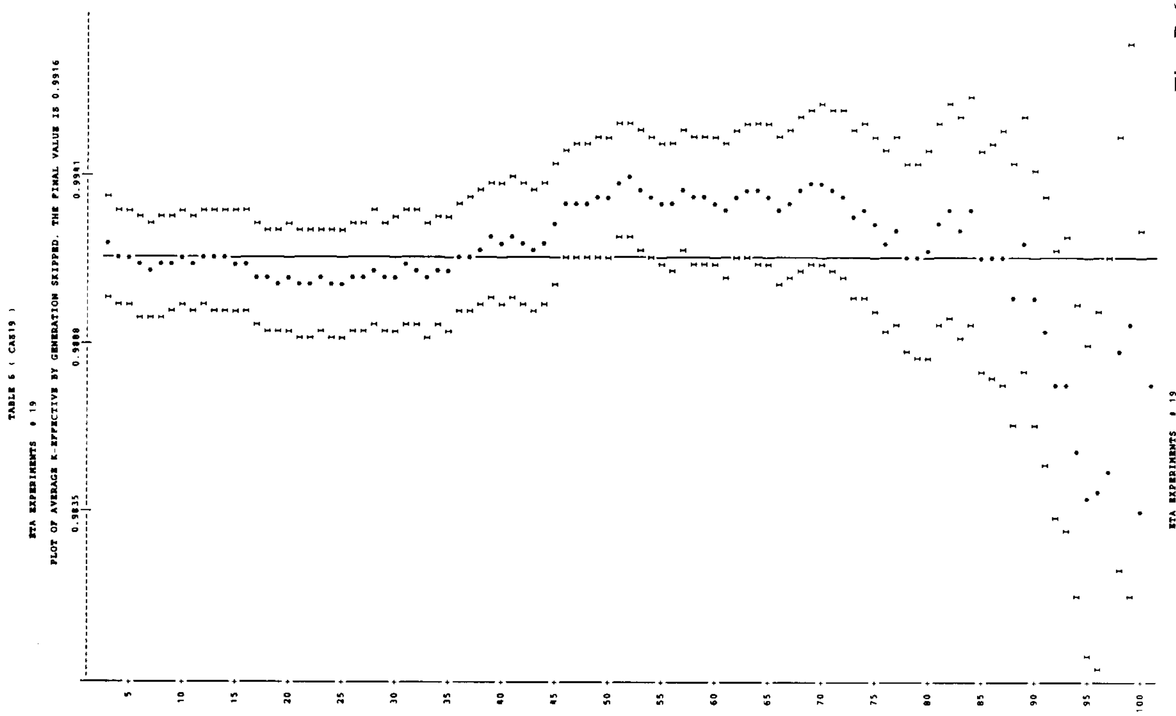


Fig. B.6 (continued)



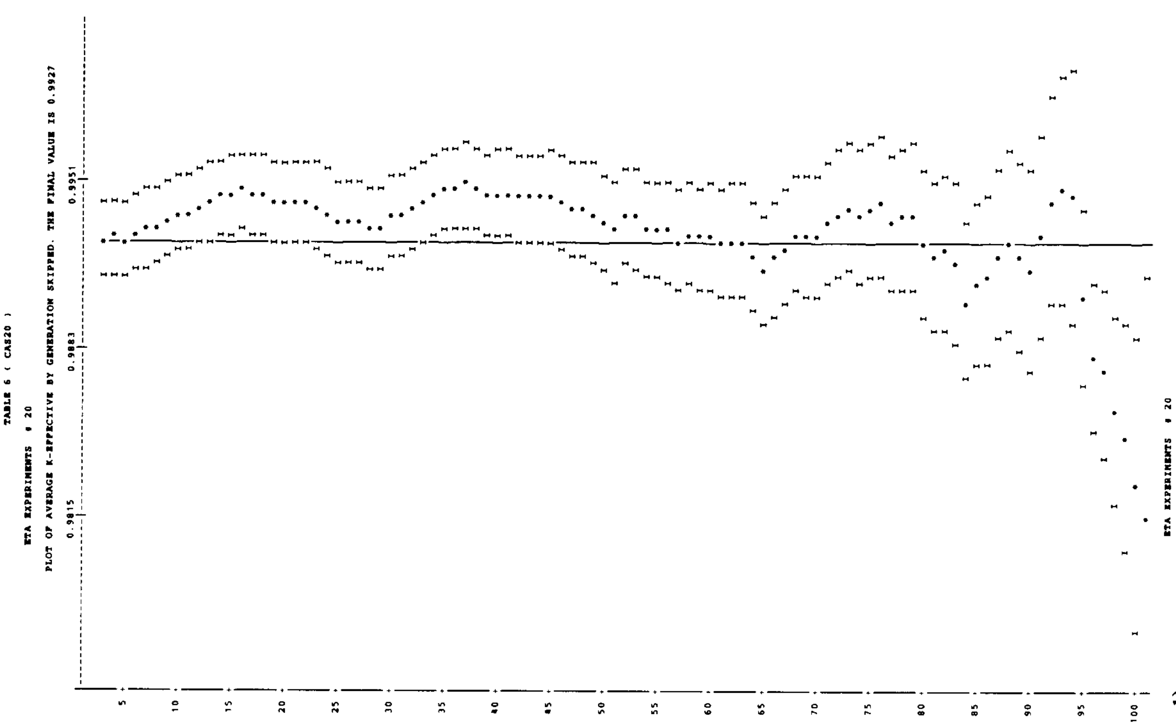
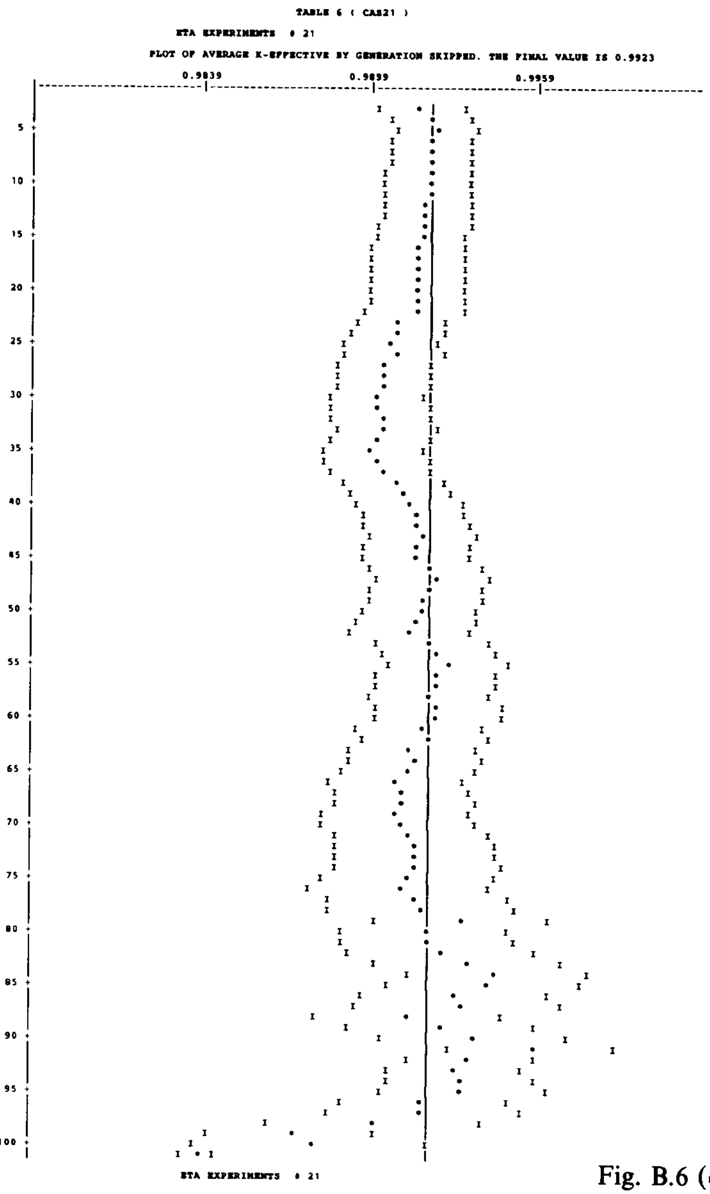


Fig. B.6 (continued)



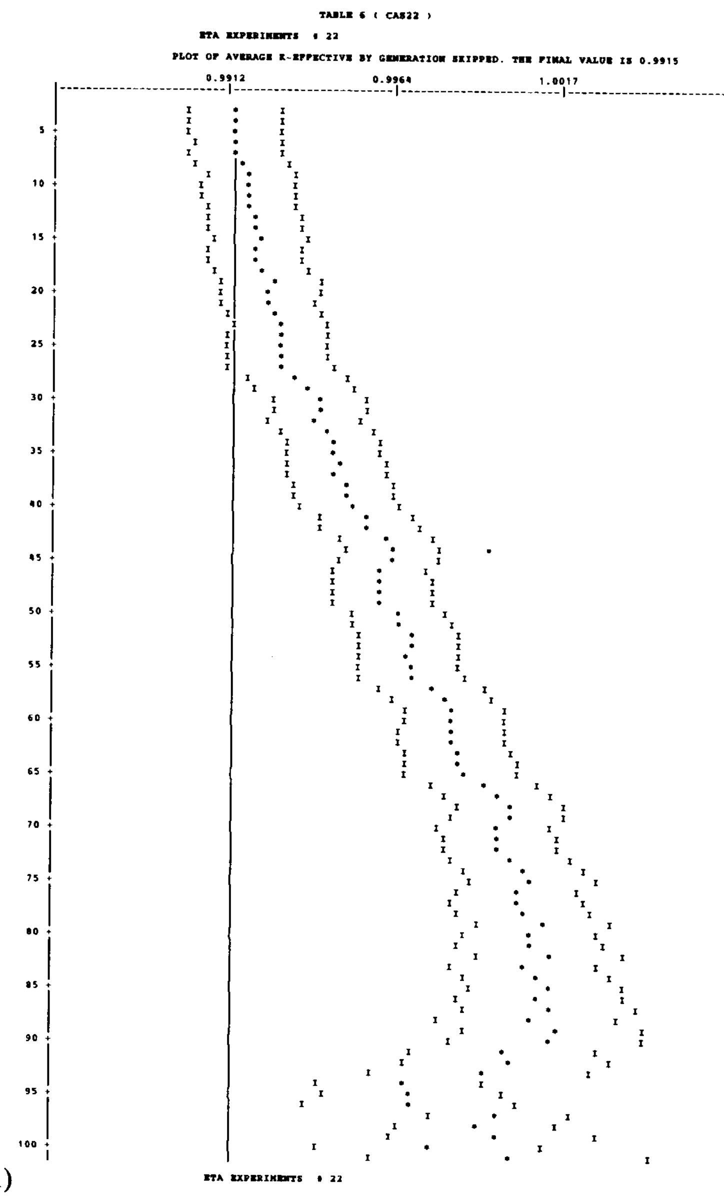


Fig. B.6 (continued)

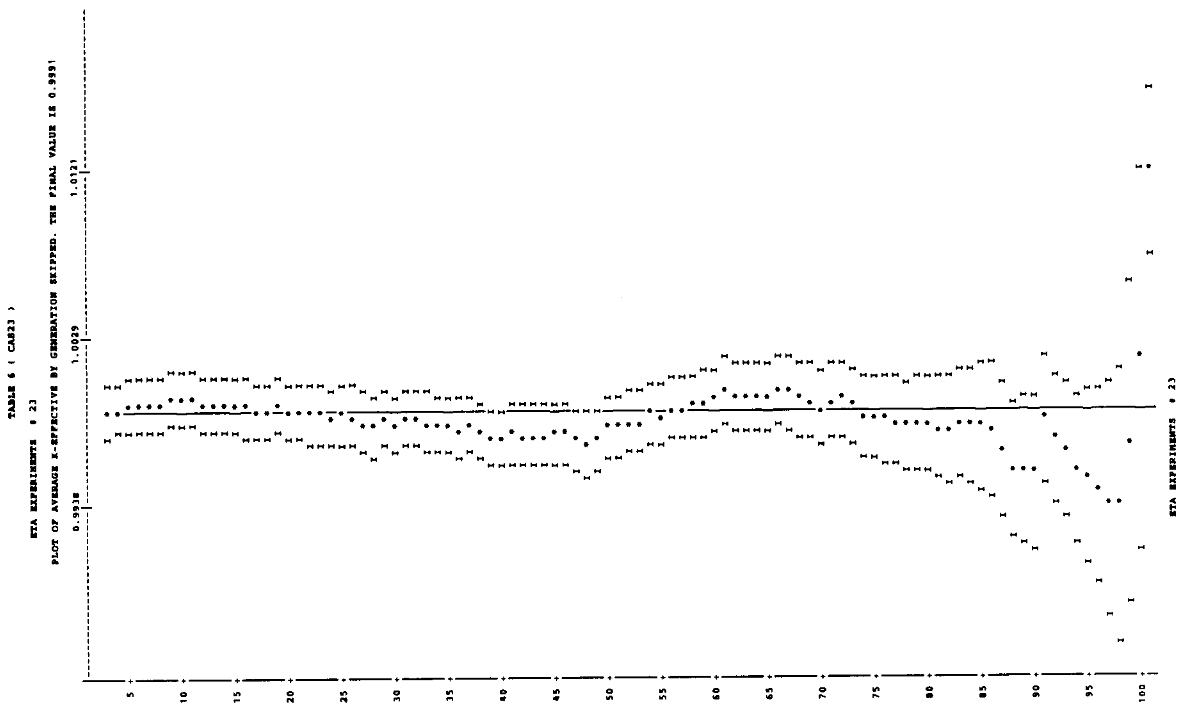


Fig. B.6 (continued)

Appendix C

CALCULATED RESULTS AND EXPERIMENTAL PARAMETERS

In order to analyze the data from the validation calculations, the experiments were parameterized. The results could then be categorized in a number of ways to test for trends and bias. Table C.1 contains the parameters which were used for data analysis for each experiment.

Key terms are as follows:

RUN	-	Sequential number assigned to experiments.
MEMB	-	Case number which corresponds to Tables 1-6.
KEFF	-	KENO calculated k.
SDM	-	KENO calculated standard deviation.
GBAR	-	Average energy group of neutron causing fission.
ENRLEV	-	Enrichment level (high, intermediate, low).
ASSAY	-	Fuel enrichment.
REFLCOND	-	Reflection condition (reflected, partially reflected, unreflected).
REFL	-	Reflector material.
SYSGEOM	-	Overall system geometry (array, single unit).
UNITGEOM	-	Principal geometry of unit (cylinder, slab, sphere).
FUELMIX	-	Indicator as to whether the system was considered primarily heterogeneous or homogeneous.
FUEL	-	Primary form of fissile material.
FMATL	-	Principal fissile nuclide in fuel.
REF	-	Reference number for reference which describes the critical experiment.

Table C.1. Calculational results and experimental parameters

TABLE=1

RUN	MEMB	KEFF	SDM	GBAR	ENRLEV	ASSAY	REFLCOND	REFL	SYSGEOM	UNITGEOM	FUELMIX	FUEL	FMATL	REF
1	CAA01	0.9945	0.0036	21.2098	L	4.89	R	H2O	A	CY	HET	METAL	U235	14
2	CAA02	0.9912	0.0030	21.7488	L	4.89	R	H2O	A	CY	HET	METAL	U235	14
3	CAA03	0.9924	0.0031	22.8842	L	4.89	R	H2O	A	CY	HET	METAL	U235	14
4	CAA04	0.9942	0.0032	23.1207	L	4.89	R	H2O	A	CY	HET	METAL	U235	14
5	CAA05	0.9839	0.0034	23.2252	L	4.89	R	H2O	A	CY	HET	METAL	U235	14
6	CAA06	0.9957	0.0036	21.1295	L	4.89	R	COMP	A	CY	HET	METAL	U235	14
7	CAA07	0.9778	0.0036	21.4048	L	4.89	R	PB	A	CY	HET	METAL	U235	14
8	CAA08	0.9966	0.0030	22.8577	L	4.89	R	PB	A	CY	HET	METAL	U235	14
9	CAA09	0.9950	0.0029	22.7496	L	4.89	R	PB	A	CY	HET	METAL	U235	14
10	CAA10	1.0010	0.0032	20.9158	L	4.89	R	PB	A	CY	HET	METAL	U235	14
11	CAA11	0.9921	0.0033	20.8889	L	4.89	R	PB	A	CY	HET	METAL	U235	14
12	CAA12	0.9885	0.0026	24.0050	L	4.89	R	UO2F2	A	CY	HET	METAL	U235	14
13	CAA13	1.0035	0.0022	24.3601	L	4.89	R	UO2F2	A	CY	HET	METAL	U235	14
14	CAA14	0.9921	0.0025	24.4837	L	4.89	R	UO2F2	A	CY	HET	METAL	U235	14
15	CAA15	0.9908	0.0020	24.1875	L	4.89	R	UO2F2	A	CY	HET	METAL	U235	14
16	CAA16	0.9940	0.0025	24.1867	L	4.89	R	UO2F2	A	CY	HET	METAL	U235	14
17	CAA17	0.9884	0.0029	24.2535	L	4.89	R	UO2F2	A	CY	HET	METAL	U235	14
18	CAA18	0.9885	0.0025	24.3097	L	4.89	R	UO2F2	A	CY	HET	METAL	U235	14
19	CAA19	0.9875	0.0035	23.3587	L	4.89	U		S	SL	HOM	U308	U235	15
20	CAA20	1.0030	0.0031	24.0125	L	4.89	U		S	SL	HOM	U308	U235	15
21	CAA21	1.0055	0.0029	24.5659	L	4.89	U		S	SL	HOM	U308	U235	15
22	CAA22	1.0042	0.0034	24.2557	L	4.89	U		S	SL	HOM	U308	U235	15
23	CAA23	0.9791	0.0036	23.3846	L	4.89	R	H2O	S	SL	HOM	U308	U235	15
24	CAA24	0.9918	0.0033	23.6607	L	4.89	R	H2O	S	SL	HOM	U308	U235	15
25	CAA25	1.0015	0.0035	24.1830	L	4.89	R	H2O	S	SL	HOM	U308	U235	15
26	CAA26	0.9991	0.0025	24.6252	L	4.89	R	H2O	S	SL	HOM	U308	U235	15
27	CAA27	0.9991	0.0040	22.8645	L	4.89	R	H2O	S	SL	HOM	U308	U235	15
28	CAA28	0.9739	0.0035	21.6194	L	4.89	R	H2O	S	SL	HOM	U308	U235	15
29	CAA29	0.9938	0.0031	24.3746	L	4.89	R	H2O	S	SL	HOM	U308	U235	15
30	CAA30	0.9861	0.0032	24.2794	L	4.89	U		S	CY	HOM	UO2F2	U235	15
31	CAA31	0.9936	0.0032	24.2837	L	4.89	U		S	SL	HOM	UO2F2	U235	15
32	CAA32	0.9856	0.0028	24.5312	L	4.89	U		S	CY	HOM	UO2F2	U235	15
33	CAA33	0.9949	0.0027	24.7174	L	4.89	U		S	SP	HOM	UO2F2	U235	15
34	CAA34	0.9959	0.0022	24.7148	L	4.89	U		S	CY	HOM	UO2F2	U235	15
35	CAA35	1.0029	0.0030	24.3638	L	4.89	R	H2O	S	CY	HOM	UO2F2	U235	15
36	CAA36	1.0106	0.0026	24.3983	L	4.89	R	H2O	S	SL	HOM	UO2F2	U235	15
37	CAA37	0.9931	0.0027	24.5838	L	4.89	R	H2O	S	CY	HOM	UO2F2	U235	15
38	CAA38	0.9927	0.0022	24.7829	L	4.89	R	H2O	S	SP	HOM	UO2F2	U235	15
39	CAA39	1.0001	0.0025	24.7326	L	4.89	R	H2O	S	CY	HOM	UO2F2	U235	15

Table C.1 (continued)

TABLE=2

RUN	MEMB	KEFF	SDM	GBAR	ENRLEV	ASSAY	REFLCOND	REFL	SYSGEOM	UNITGEOM	FUELMIX	FUEL	FMATL	REF
40	CAB01	0.9893	0.0026	14.4590	L	3.85	R	H2O	A	CY	HET	METAL	U235	16
41	CAB02	1.0025	0.0029	15.9174	L	3.85	R	H2O	A	CY	HET	METAL	U235	16
42	CAB03	0.9927	0.0025	16.7417	L	3.85	R	H2O	A	CY	HET	METAL	U235	16
43	CAB07	0.9897	0.0025	13.4583	L	3.85	R	H2O	A	CY	HET	METAL	U235	16
44	CAB08	0.9924	0.0032	15.6574	L	3.85	R	H2O	A	CY	HET	METAL	U235	16
45	CAB09	.	.	.	L	3.85	R	H2O	A	CY	HET	METAL	U235	16
46	CAB10	0.9998	0.0024	16.8740	L	3.85	R	H2O	A	CY	HET	METAL	U235	16
47	CAB11	0.9953	0.0025	17.1558	L	3.85	R	H2O	A	CY	HET	METAL	U235	16
48	CAB12	0.9943	0.0028	17.5492	L	3.85	R	H2O	A	CY	HET	METAL	U235	16
49	CAB13	0.9960	0.0028	15.8499	L	3.85	R	H2O	A	CY	HET	METAL	U235	16
50	CAB14	1.0093	0.0026	17.1937	L	3.85	R	H2O	A	CY	HET	METAL	U235	16
51	CAB15	0.9992	0.0030	18.5920	L	3.85	R	H2O	A	CY	HET	METAL	U235	16
52	CAB16	0.9877	0.0029	19.6705	L	3.85	R	H2O	A	CY	HET	METAL	U235	16

Table C.1 (continued)

TABLE=3

RUN	MEMB	KEFF	SDM	GBAR	ENRLEV	ASSAY	REFLCOND	REFL	SYSGEOM	UNITGEOM	FUELMIX	FUEL	FMATL	REF
53	CAS04	0.9998	0.0022	23.2902	L	1.40	U		S	SL	HOM	UF4	U235	17
54	CAS05	0.9989	0.0026	23.2900	L	1.40	U		S	SL	HOM	UF4	U235	17
55	CAS06	0.9967	0.0022	23.2874	L	1.40	U		S	SL	HOM	UF4	U235	17
56	CAS11	1.0023	0.0030	22.5151	L	2.00	R	PARA	S	SL	HOM	UF4	U235	18
57	CAS12	1.0096	0.0026	22.2578	L	2.00	U		S	SL	HOM	UF4	U235	18
58	CAS13	1.0054	0.0029	23.2545	L	2.00	R	PARA	S	SL	HOM	UF4	U235	18
59	CAS14	1.0028	0.0027	23.0477	L	2.00	U		S	SL	HOM	UF4	U235	18
60	CAS15	0.9967	0.0024	23.6820	L	2.00	R	PARA	S	SL	HOM	UF4	U235	18
61	CAS16	1.0000	0.0026	23.9033	L	2.00	R	PARA	S	SL	HOM	UF4	U235	18
62	CAS17	0.9982	0.0027	24.1189	L	2.00	R	PARA	S	SL	HOM	UF4	U235	18
63	CAS18	0.9975	0.0024	24.0427	L	2.00	U		S	SL	HOM	UF4	U235	18
64	CAS19	0.9885	0.0020	24.4577	L	2.00	R	PARA	S	SL	HOM	UF4	U235	18
65	CAS20	0.9846	0.0018	24.4312	L	2.00	U		S	SL	HOM	UF4	U235	18
66	CAS21	1.0145	0.0030	22.2473	L	3.00	R	PARA	S	SL	HOM	UF4	U235	18
67	CAS22	1.0228	0.0030	22.2309	L	3.00	R	PARA	S	SL	HOM	UF4	U235	18
68	CAS23	1.0169	0.0032	22.2164	L	3.00	R	PARA	S	SL	HOM	UF4	U235	18
69	CAS24	1.0129	0.0026	22.2283	L	3.00	R	PARA	S	SL	HOM	UF4	U235	18
70	CAS25	1.0201	0.0032	22.2284	L	3.00	R	PARA	S	SL	HOM	UF4	U235	18
71	CAS26	1.0152	0.0025	21.7760	L	3.00	U		S	SL	HOM	UF4	U235	18
72	CAS27	1.0187	0.0030	21.7904	L	3.00	U		S	SL	HOM	UF4	U235	18
73	CAS28	1.0180	0.0028	21.7835	L	3.00	U		S	SL	HOM	UF4	U235	18
74	CAS29	1.0131	0.0030	23.5158	L	3.00	R	POLY	S	SL	HOM	UF4	U235	18
75	CAS30	1.0173	0.0030	23.2846	L	3.00	U		S	SL	HOM	UF4	U235	18
76	CAS31	1.0131	0.0030	23.2908	L	3.00	U		S	SL	HOM	UF4	U235	18
77	CAS32	1.0124	0.0030	23.2869	L	3.00	U		S	SL	HOM	UF4	U235	18
78	CAS33	0.9989	0.0030	24.2166	L	4.98	R	COMP	S	CY	HOM	UO2F2	U235	19
79	CAS34	1.0006	0.0028	24.2332	L	4.98	R	COMP	S	CY	HOM	UO2F2	U235	19
80	CAS35	0.9970	0.0034	24.2310	L	4.98	U		S	SP	HOM	UO2F2	U235	20
81	CAS36	1.0023	0.0032	24.2333	L	4.98	U		S	CY	HOM	UO2F2	U235	21
82	CAR01	1.0081	0.0034	21.4024	L	4.46	R	PLEX	S	SL	HET	U3O8	U235	22
83	CAR02	1.0052	0.0031	21.3916	L	4.46	R	PLEX	S	SL	HET	U3O8	U235	22
84	CAR03	0.9876	0.0030	19.6444	L	4.46	R	PLEX	S	SL	HET	U3O8	U235	22
85	CAR04	1.0089	0.0029	21.2115	L	4.46	R	CONC	S	SL	HET	U3O8	U235	22
86	CAR05	0.9998	0.0027	19.1840	L	4.46	R	CONC	S	SL	HET	U3O8	U235	22
87	CAR06	0.9951	0.0031	12.8911	L	4.46	R	PLEX	S	SL	HOM	U3O8	U235	23
88	CAR07	0.9998	0.0032	18.3330	L	4.46	R	PLEX	S	SL	HOM	U3O8	U235	23
89	CAR08	0.9980	0.0036	19.2715	L	4.46	R	PLEX	S	SL	HOM	U3O8	U235	23
90	CAR09	0.9983	0.0030	19.3540	L	4.46	R	PLEX	S	SL	HOM	U3O8	U235	23
91	CAR10	1.0008	0.0034	17.7171	L	4.46	R	CONC	S	SL	HOM	U3O8	U235	23
92	CAR11	1.0073	0.0032	21.5573	L	4.46	R	PLEX	S	SL	HET	U3O8	U235	24
93	CAR12	1.0109	0.0031	20.2060	L	4.46	R	PLEX	S	SL	HET	U3O8	U235	24
94	CAR13	1.0108	0.0032	20.1720	L	4.46	R	PLEX	S	SL	HET	U3O8	U235	24
95	CAR14	0.9907	0.0034	18.5482	L	4.46	R	PLEX	S	SL	HOM	U3O8	U235	24
96	CAR15	1.0106	0.0033	18.5995	L	4.46	R	PLEX	S	SL	HOM	U3O8	U235	24
97	CAR16	0.9978	0.0036	19.2434	L	4.46	R	PLEX	S	SL	HOM	U3O8	U235	24
98	CAR17	1.0069	0.0033	20.7665	L	4.46	R	PLEX	S	SL	HET	U3O8	U235	25
99	CAR18	1.0005	0.0030	21.8233	L	4.46	R	PLEX	S	SL	HET	U3O8	U235	25
100	CAR19	1.0097	0.0032	18.2384	L	4.46	R	PLEX	S	SL	HOM	U3O8	U235	25
101	CAR20	0.9911	0.0031	18.4058	L	4.46	R	PLEX	S	SL	HOM	U3O8	U235	25

Table C.1 (continued)

--TABLE=4--

RUN	MEMB	KEFF	SDM	GBAR	ENRLEV	ASSAY	REFLCOND	REFL	SYSGEOM	UNITGEOM	FUELMIX	FUEL	FMATL	REF
102	CAA01	1.0096	0.0026	24.9405	H	93.20	U		S	SP	HOM	UO2F2	U235	26
103	CAA02	1.0036	0.0023	25.0019	H	93.20	U		S	SP	HOM	UO2F2	U235	26
104	CAA03	0.9998	0.0023	24.9968	H	93.20	U		S	SP	HOM	NITRATE	U235	26
105	CAA04	1.0071	0.0039	22.5453	H	93.20	R	H2O	S	SP	HOM	UO2F2	U235	26
106	CAA05	0.9971	0.0046	23.4178	H	93.20	R	H2O	S	SP	HOM	UO2F2	U235	26
107	CAA06	0.9964	0.0023	24.9948	H	93.20	R	H2O	S	SP	HOM	UO2F2	U235	26
108	CAA07	1.0097	0.0043	24.2629	H	93.20	R	H2O	S	SP	HOM	UO2F2	U235	27
109	CAA08	1.0212	0.0033	24.6833	H	93.20	R	H2O	S	SP	HOM	UO2F2	U235	27
110	CAA09	0.9991	0.0039	23.7419	H	93.20	U		S	SP	HOM	UO2F2	U235	27
111	CAA10	1.0164	0.0042	24.1535	H	93.20	R	H2O	S	SP	HOM	UO2F2	U235	27
112	CAA11	1.0351	0.0039	24.6366	H	93.20	R	H2O	S	SP	HOM	UO2F2	U235	27
113	CAA12	1.0090	0.0039	23.6132	H	93.20	U		S	CY	HOM	NITRATE	U235	28
114	CAA13	1.0060	0.0035	21.6046	H	93.20	U		S	CY	HOM	NITRATE	U235	28
115	CAA14	1.0119	0.0042	24.5733	H	93.20	U		S	CY	HOM	NITRATE	U235	28
116	CAA15	1.0027	0.0046	23.6688	H	93.20	U		S	CY	HOM	NITRATE	U235	28
117	CAA16	1.0024	0.0045	21.5956	H	93.20	U		S	CY	HOM	NITRATE	U235	28
118	CAA17	1.0106	0.0041	23.6234	H	93.20	R	CONC	S	CY	HOM	NITRATE	U235	28
119	CAA18	1.0145	0.0044	21.8900	H	93.20	R	CONC	S	CY	HOM	NITRATE	U235	28
120	CAA19	1.0056	0.0043	23.6210	H	93.20	R	CONC	S	CY	HOM	NITRATE	U235	28
121	CAA20	1.0037	0.0044	21.8675	H	93.20	R	CONC	S	CY	HOM	NITRATE	U235	28
122	CAA21	1.0094	0.0040	23.6508	H	93.20	R	CONC	S	CY	HOM	NITRATE	U235	28
123	CAA22	1.0092	0.0037	21.9725	H	93.20	R	CONC	S	CY	HOM	NITRATE	U235	28
124	CAA23	1.0085	0.0040	23.6011	H	93.20	R	PLEX	S	CY	HOM	NITRATE	U235	28
125	CAA24	1.0113	0.0047	21.8062	H	93.20	R	PLEX	S	CY	HOM	NITRATE	U235	28
126	CAA25	0.9947	0.0041	23.5969	H	93.20	R	PLEX	S	CY	HOM	NITRATE	U235	28
127	CAA26	1.0033	0.0040	21.8159	H	93.20	R	PLEX	S	CY	HOM	NITRATE	U235	28
128	CAA27	1.0157	0.0034	23.6729	H	93.20	R	PLEX	S	CY	HOM	NITRATE	U235	28
129	CAA28	1.0141	0.0043	22.0524	H	93.20	R	PLEX	S	CY	HOM	NITRATE	U235	28
130	CAA29	1.0046	0.0033	24.4591	H	93.20	R	CONC	A	CY	HOM	NITRATE	U235	28
131	CAA30	1.0061	0.0041	21.9559	H	93.20	R	CONC	A	CY	HOM	NITRATE	U235	28
132	CAA31	1.0119	0.0035	24.3045	H	93.20	R	CONC	A	CY	HOM	NITRATE	U235	28
133	CAA32	1.0056	0.0041	21.9640	H	93.20	R	CONC	A	CY	HOM	NITRATE	U235	28
134	CAA33	1.0098	0.0033	24.3539	H	93.20	R	CONC	A	CY	HOM	NITRATE	U235	28
135	CAA34	1.0014	0.0038	21.7453	H	93.20	R	CONC	A	CY	HOM	NITRATE	U235	28
136	CAA35	1.0129	0.0045	21.9253	H	93.20	R	CONC	A	CY	HOM	NITRATE	U235	28
137	CAA36	1.0099	0.0039	21.9359	H	93.20	R	CONC	A	CY	HOM	NITRATE	U235	28
138	CAA37	1.0000	0.0034	24.5738	H	93.20	R	PLEX	A	CY	HOM	NITRATE	U235	28
139	CAA38	0.9961	0.0038	22.1639	H	93.20	R	PLEX	A	CY	HOM	NITRATE	U235	28
140	CAA39	1.0045	0.0034	24.5916	H	93.20	R	PLEX	A	CY	HOM	NITRATE	U235	28
141	CAA40	0.9985	0.0039	22.2004	H	93.20	R	PLEX	A	CY	HOM	NITRATE	U235	28
142	CAA41	0.9984	0.0040	24.5568	H	93.20	R	PLEX	A	CY	HOM	NITRATE	U235	28
143	CAA42	1.0041	0.0036	21.9131	H	93.20	R	PLEX	A	CY	HOM	NITRATE	U235	28
144	CAA43	0.9982	0.0038	22.1281	H	93.20	R	PLEX	A	CY	HOM	NITRATE	U235	28

Table C.1 (continued)

TABLE=5

RUN	MEMB	KEFF	SDM	GBAR	ENRLEV	ASSAY	REFLCOND	REFL	SYSGEOM	UNITGEOM	FUELMIX	FUEL	FMATL	REF
145	CAS01	1.0004	0.0027	4.8613	H	93.80	U		S	SP	HOM	METAL	U235	29
146	CAS02	0.9995	0.0031	8.5157	H	97.67	R	H2O	S	SP	HOM	METAL	U235	35
147	CAS03	1.0029	0.0044	21.7017	H	93.20	U		S	CY	HOM	NITRATE	U235	28
148	CAS04	1.0067	0.0028	4.9879	H	93.20	U		S	CY	HOM	ALLOY	U235	30
149	CAS05	1.0023	0.0027	25.0041	H	93.20	U		S	SP	HOM	UO2F2	U235	26
150	CAS06	1.0012	0.0022	24.9987	H	93.20	U		S	SP	HOM	NITRATE	U235	31
151	CAS07	1.0042	0.0030	11.7017	H	93.50	R	H2O	S	SP	HET	METAL	U235	32
152	CAS08	1.0124	0.0031	6.4136	H	93.20	R	C	S	CY	HET	METAL	U235	33
153	CAS09	1.0027	0.0025	4.9072	H	94.00	R	U238	S	SL	HOM	METAL	U235	32
154	CAS10	1.0114	0.0034	10.4697	H	93.10	R	OIL	S	SP	HET	METAL	U235	33
155	CAS11	0.9977	0.0035	9.4346	H	93.10	R	OIL	S	SP	HET	METAL	U235	34
156	CAS12	1.0004	0.0031	4.8365	H	93.20	U		M	CY	HOM	METAL	U235	36
157	CAS13	0.9854	0.0035	24.5321	H	92.60	U		A	CY	HOM	NITRATE	U235	38
158	CAS14	1.0585	0.0038	21.1722	H	93.20	R	PLEX	A	MIX	HOM	NITRATE	U235	39
159	CAS15	1.0126	0.0030	8.2822	H	93.20	R	POLY	A	CY	HET	METAL	U235	40
160	CAS16	0.9879	0.0037	21.4089	H	92.60	U		A	CY	HOM	NITRATE	U235	38
161	CAS17	1.0250	0.0037	22.1149	H	92.60	R	PARA	A	CY	HOM	NITRATE	U235	38
162	CAS18	1.0010	0.0045	21.5958	H	92.60	R	PLEX	A	CY	HOM	NITRATE	U235	38
163	CAS19	1.0329	0.0046	20.7978	H	93.10	U		A	CY	HOM	NITRATE	U235	41
164	CAS20	1.0369	0.0037	22.2455	[illegible]	93.20	R	PLEX	A	CY	HOM	NITRATE	U235	28
165	CAS21	1.0239	0.0043	21.9649	H	93.20	R	CONC	A	CY	HOM	NITRATE	U235	28
166	CAS22	1.0082	0.0034	4.8329	H	93.20	U		M	CY	HOM	METAL	U235	36
167	CAS23	0.9959	0.0030	4.8188	H	93.20	U		M	MIX	HOM	METAL	U235	36
168	CAS24	0.9928	0.0033	4.8267	H	93.20	U		A	CY	HOM	METAL	U235	37
169	CAS25	1.0079	0.0030	4.8332	H	93.20	U		A	CY	HOM	METAL	U235	37
170	CAS26	1.0011	0.0033	10.0912	H	93.20	R	PARA	A	CY	HOM	METAL	U235	37
171	CAS27	1.0083	0.0031	10.3812	H	93.20	R	PARA	A	CY	HOM	METAL	U235	37
172	CAS28	1.0102	0.0037	7.6142	H	93.20	U		A	CY	HET	METAL	U235	37
173	CAS29	0.9872	0.0041	21.4050	H	92.60	U		A	CY	HOM	NITRATE	U235	38
174	CAS30	0.9978	0.0038	24.2763	H	93.20	U		S	SL	HOM	UO2F2	U235	43
175	CAS31	0.9949	0.0035	24.3936	H	93.20	R	H2O	S	SL	HOM	UO2F2	U235	43
176	CAS32	0.9805	0.0039	24.2603	H	93.20	U		A	SL	HOM	UO2F2	U235	43
177	CAS33	0.9995	0.0039	24.5095	H	93.20	R	H2O	A	SL	HOM	UO2F2	U235	43
178	CAS34	0.9803	0.0039	24.2515	H	93.20	U		A	SL	HOM	UO2F2	U235	43
179	CAS35	0.9906	0.0036	24.5440	H	93.20	R	H2O	A	SL	HOM	UO2F2	U235	43
180	CAS36	0.9933	0.0035	24.2518	H	93.20	U		A	SL	HOM	UO2F2	U235	43
181	CAS37	1.0030	0.0031	24.5294	H	93.20	R	H2O	A	SL	HOM	UO2F2	U235	43
182	CAS38	0.9881	0.0035	24.2464	H	93.20	U		A	SL	HOM	UO2F2	U235	43
183	CAS39	0.9952	0.0035	24.5228	H	93.20	R	H2O	A	SL	HOM	UO2F2	U235	43
184	CAS40	0.9824	0.0041	24.2482	H	93.20	U		A	SL	HOM	UO2F2	U235	43
185	CAS41	0.9767	0.0038	24.2608	H	93.20	U		A	SL	HOM	UO2F2	U235	43
186	CAS42	0.9916	0.0037	24.2631	H	93.20	U		A	SL	HOM	UO2F2	U235	43
187	CAS43	0.9835	0.0037	24.2624	H	93.20	U		A	SL	HOM	UO2F2	U235	43
188	CAS44	0.9757	0.0035	24.2571	H	93.20	U		A	SL	HOM	UO2F2	U235	43
189	CAS45	0.9871	0.0040	24.2721	H	93.20	U		S	SL	HOM	UO2F2	U235	43
190	CAS46	0.9832	0.0040	24.2529	H	93.20	U		A	SL	HOM	UO2F2	U235	43
191	CAS47	0.9819	0.0037	24.2521	H	93.20	U		A	SL	HOM	UO2F2	U235	43
192	CAS48	0.9813	0.0039	24.2524	H	93.20	U		A	SL	HOM	UO2F2	U235	43
193	CAS49	0.9831	0.0045	24.2540	H	93.20	U		A	SL	HOM	UO2F2	U235	43
194	CAS50	0.9814	0.0038	24.2552	H	93.20	U		A	SL	HOM	UO2F2	U235	43
195	CAS51	0.9791	0.0036	24.2558	H	93.20	U		A	SL	HOM	UO2F2	U235	43
196	CAS52	0.9852	0.0038	24.2583	H	93.20	U		A	SL	HOM	UO2F2	U235	43
197	CAS53	0.9884	0.0039	24.2670	H	93.20	U		A	SL	HOM	UO2F2	U235	43

Table C.1 (continued)

---TABLE=5 (CONTINUED)---

RUN	MEMB	KEFF	SDM	GBAR	ENRLEV	ASSAY	REFLCOND	REFL	SYSGEOM	UNITGEOM	FUELMIX	FUEL	FMATL	REF
198	CAS54	0.9831	0.0034	24.2588	H	93.20	U		A	SL	HOM	UO2F2	U235	43
199	CAS55	0.9876	0.0038	24.2616	H	93.20	U		A	SL	HOM	UO2F2	U235	43
200	CAS56	0.9869	0.0042	24.2615	H	93.20	U		A	SL	HOM	UO2F2	U235	43
201	CAS57	0.9864	0.0041	24.2662	H	93.20	U		A	SL	HOM	UO2F2	U235	43
202	CAS58	0.9824	0.0037	24.2548	H	93.20	U		A	SL	HOM	UO2F2	U235	43
203	CAS59	0.9836	0.0036	24.2658	H	93.20	U		A	SL	HOM	UO2F2	U235	43
204	CAS60	0.9998	0.0036	22.5166	H	92.60	U		A	CY	HOM	NITRATE	U235	38
205	CAS61	1.0005	0.0038	22.5263	H	92.60	U		A	CY	HOM	NITRATE	U235	38
206	CAS62	0.9934	0.0039	21.4562	H	92.60	U		A	CY	HOM	NITRATE	U235	38
207	CAS63	1.0050	0.0044	21.4410	H	92.60	U		A	CY	HOM	NITRATE	U235	38
208	CAS64	0.9963	0.0038	21.4417	H	92.60	U		A	CY	HOM	NITRATE	U235	38
209	CAS65	1.0081	0.0039	21.4918	H	92.60	U		A	CY	HOM	NITRATE	U235	38
210	CAS66	1.0020	0.0037	21.6613	H	92.60	P	PLEX	A	CY	HOM	NITRATE	U235	38
211	CAS67	1.0217	0.0038	21.8258	H	92.60	P	PLEX	A	CY	HOM	NITRATE	U235	38
212	CAS68	1.0170	0.0042	21.7269	H	92.60	P	PLEX	A	CY	HOM	NITRATE	U235	38
213	CAS69	1.0227	0.0040	22.1217	H	92.60	R	PARA	A	CY	HOM	NITRATE	U235	38
214	CAS70	1.0205	0.0039	22.0406	H	92.60	P	PARA	A	CY	HOM	NITRATE	U235	38
215	CAS71	1.0302	0.0040	22.1075	H	92.60	P	PARA	A	CY	HOM	NITRATE	U235	38
216	CAS72	1.0016	0.0038	21.5822	H	92.60	P	PLEX	A	CY	HOM	NITRATE	U235	38
217	CAS73	1.0134	0.0041	21.6538	H	92.60	P	PARA	A	CY	HOM	NITRATE	U235	38
218	CAS74	1.0172	0.0035	22.1229	H	92.60	R	PARA	A	CY	HOM	NITRATE	U235	38
219	CAS75	1.0300	0.0037	22.0009	H	92.60	P	PARA	A	CY	HOM	NITRATE	U235	38
220	CAS76	1.0046	0.0044	21.6952	H	92.60	P	PLEX	A	CY	HOM	NITRATE	U235	38
221	CAS77	1.0225	0.0040	22.1244	H	92.60	P	PLEX	A	CY	HOM	NITRATE	U235	38
222	CAS78	1.0237	0.0045	22.1373	H	92.60	R	PLEX	A	CY	HOM	NITRATE	U235	38
223	CAS79	1.0137	0.0036	21.8230	H	92.60	P	PLEX	A	CY	HOM	NITRATE	U235	38
224	CAS80	1.0223	0.0045	21.9906	H	92.60	P	PLEX	A	CY	HOM	NITRATE	U235	38
225	CAS81	1.0197	0.0037	22.0513	H	92.60	P	PLEX	A	CY	HOM	NITRATE	U235	38
226	CAS82	1.0195	0.0038	21.7696	H	92.60	P	PLEX	A	CY	HOM	NITRATE	U235	38
227	CAS83	1.0225	0.0039	22.0273	H	92.60	P	PLEX	A	CY	HOM	NITRATE	U235	38
228	CAS84	1.0247	0.0041	22.1092	H	92.60	P	PLEX	A	CY	HOM	NITRATE	U235	38
229	CAS85	1.0175	0.0046	21.6264	H	92.60	P	PLEX	A	CY	HOM	NITRATE	U235	38
230	CAS86	1.0165	0.0042	21.6814	H	92.60	P	PARA	A	CY	HOM	NITRATE	U235	38
231	CAS87	1.0177	0.0042	22.1061	H	92.60	R	PARA	A	CY	HOM	NITRATE	U235	38
232	CAS88	1.0177	0.0041	22.0003	H	92.60	P	PARA	A	CY	HOM	NITRATE	U235	38
233	CAS89	1.0169	0.0046	22.1067	H	92.60	P	PARA	A	CY	HOM	NITRATE	U235	38
234	CAS90	0.9977	0.0042	21.7689	H	92.60	U		A	CY	HOM	NITRATE	U235	38
235	CAS91	1.0052	0.0036	24.5355	H	92.60	U		A	CY	HOM	NITRATE	U235	38

Table C.1 (continued)

TABLE=6

RUN	MEMB	KEFF	SDM	GBAR	ENRLEV	ASSAY	REFLCOND	REFL	SYSGEOM	UNITGEOM	FUELMIX	FUEL	FMATL	REF
236	CAS01	0.9979	0.0022	24.9978	H	93.20	U		S	SP	HOM	NITRATE	U235	12
237	CAS02	0.9960	0.0023	24.9338	H	93.20	U		S	SP	HOM	NITRATE	U235	12
238	CAS03	0.9920	0.0027	24.8696	H	93.20	U		S	SP	HOM	NITRATE	U235	12
239	CAS04	1.0020	0.0024	24.8423	H	93.20	U		S	SP	HOM	NITRATE	U235	12
240	CAS05	1.0086	0.0022	24.6298	H	97.70	U		S	SP	HOM	NITRATE	U233	12
241	CAS06	1.0079	0.0025	24.6005	H	97.70	U		S	SP	HOM	NITRATE	U233	12
242	CAS07	1.0045	0.0023	24.5747	H	97.70	U		S	SP	HOM	NITRATE	U233	12
243	CAS08	1.0065	0.0023	24.5493	H	97.70	U		S	SP	HOM	NITRATE	U233	12
244	CAS09	1.0084	0.0023	24.5177	H	97.70	U		S	SP	HOM	NITRATE	U233	12
245	CAS10	0.9979	0.0017	25.0633	H	93.20	U		S	SP	HOM	NITRATE	U235	12
246	CAS11	0.9959	0.0017	24.7279	H	97.70	U		S	SP	HOM	NITRATE	U233	12
247	CAS12	0.9989	0.0023	25.0338	H	93.20	U		S	CY	HOM	NITRATE	U235	12
248	CAS13	0.9983	0.0022	25.0378	H	93.20	U		S	CY	HOM	NITRATE	U235	12
249	CAS14	0.9992	0.0017	25.0618	H	93.20	U		S	CY	HOM	NITRATE	U235	12
250	CAS15	0.9925	0.0019	25.0692	H	93.20	U		S	CY	HOM	NITRATE	U235	12
251	CAS16	0.9976	0.0016	25.0784	H	93.20	U		S	CY	HOM	NITRATE	U235	12
252	CAS17	0.9952	0.0020	24.6961	H	97.70	U		S	CY	HOM	NITRATE	U233	12
253	CAS18	0.9973	0.0018	24.7122	H	97.70	U		S	CY	HOM	NITRATE	U233	12
254	CAS19	0.9916	0.0015	24.7286	H	97.70	U		S	CY	HOM	NITRATE	U233	12
255	CAS20	0.9927	0.0015	24.7480	H	97.70	U		S	CY	HOM	NITRATE	U233	12
256	CAS21	0.9923	0.0015	25.0740	H	93.20	U		S	CY	HOM	NITRATE	U235	12
257	CAS22	0.9915	0.0014	25.0786	H	93.20	U		S	CY	HOM	NITRATE	U235	12
258	CAS23	0.9991	0.0014	25.0846	H	93.20	U		S	CY	HOM	NITRATE	U235	12

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