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SOFTWARE QUALIFICATION REPORT
for
MCNP Version 4B2
A General Monte Carlo N-Particle Transport Code

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Civilian Radioactive Waste Management System
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CHANGE HISTORY

Revision Number	Effective Date	Description of and Reason for Revision
0	1/22/98	Initial Issue
1	4/17/98	Install/qualify MCNP4B2 with fixes and establish new baseline with revision of the SQR. Revise CSCI: MCNP V4B2LV and 30033 V4B2LV. Cancel prior media numbers 30033-M03-001, 30033-M03-002, 30033-M03-004, 30033-M72-003, 30033-M72-005 and reissue new media numbers 30055-M72-001 for PC, 30056-M03-001 for HP, 30057-M03-001 for Sun platforms that includes shielding validation problems and coincident surface fix. Incorporates shielding addendum (DCN 01) and all prior platforms. Incorporates LV.WP.SG.02/98-033, LV.WP.JAM.02/98-035, LV.WP.JAM.02/98-039.

INFORMATION ONLY

Table of Contents

INFORMATION ONLY

INFORMATION ONLY

1.0 INTRODUCTION

1.1 Purpose

This Software Qualification Report (SQR) is an update to the SQR for MCNP4B with the implementation of current QAP-SI-0 procedures and updates to the code package as mentioned in Reference 11. This SQR documents the verification and validation process for the installation of the MCNP4B2 code package. This process includes validation of the criticality and neutron/gamma shielding capabilities of the code. Since no modifications are needed for implementation by the Waste Package Operations (WPO) of the Civilian Radioactive Waste Management System (CRWMS) Management and Operating Contractor (M&O), this code is classified as acquired software. The MCNP4B package was provided on a CD by Los Alamos National Laboratory (LANL) where it is maintained under the LANL MCNP Quality Assurance Plan (Ref. 2). Verification and validation of the MCNP4B code by the developer is documented in Reference 15. The update file (fix file) to correct a code error was obtained electronically from LANL (www-xdiv.lanl.gov/XCI/PROJECTS/MCNP/world/fix4b2) to produce MCNP4B2, after receiving a notice of the error. The software acquisition correspondence is given in Attachment I. This software package is needed to support current analyses for the waste package/engineered barrier system of the Monitored Geological Repository. If additional computer platforms are required in the future, validation will be documented in revisions/addenda to this SQR.

The MCNP4B2 code package was developed by LANL. Generally, MCNP4B2 performs three dimensional neutron or gamma transport calculations for complex systems. For the analysis required for the waste package/engineered barrier system, the primary use will be for criticality analyses for spent nuclear fuel and other fissile material systems. Also, shielding calculations for the neutron and gamma sources contained in the waste package will be performed to determine the internal and external effects of the radiation.

The sample installation test cases accompanying the code package exercise these neutron and gamma transport capabilities to ensure they are all functioning correctly. The sample cases will be used to verify correct installation and operation of the MCNP4B2 code package. Additional criticality benchmark test cases are provided to validate computations performed by the MCNP4B2 code package. This type of validation method using additional benchmark test cases is an established practice in the MCNP Software Quality Assurance Plan at LANL (Ref. 2). MCNP4B2 also provides the capability to transport electrons (beta particles) for shielding problems, but this capability is not required for waste package analyses.

In the current configuration, the MCNP4B2 code package, which is physically residing on the QUICHE HP 9000/C160 series workstation and PC desktop computers, uses nuclear cross sections based on the ENDF/B-V and ENDF/B-VI (Ref. 14) libraries.

INFORMATION ONLY

1.2 Software Description

A full description of the MCNP4B2 code package is provided in the MCNP4B user manual (Ref. 1). The following excerpts will provide a general description.

> "MCNP is a general-purpose Monte Carlo N-Particle code that can be used for neutron, photon, electron, or coupled neutron/photon/electron transport, including the capability to calculate eigenvalues for critical systems. The code treats arbitrary three-dimensional configurations of materials in geometric cells bounded by first-degree and second-degree surfaces and fourth-degree elliptical tori."
>
> "Pointwise cross-section data are used. For neutrons, all reactions given in a particular cross-section evaluation (such as ENDF/B-VI) are accounted for. Thermal neutrons are described by both the free gas and S(α,β) models."
>
> "Important standard features that make MCNP very versatile and easy to use include a powerful general source, criticality source, and surface source; both geometry and output tally plotters; a rich collection of variance reduction techniques; a flexible tally structure; and an extensive collection of cross-section data."

More detailed theoretical and operational information can be obtained in the MCNP4B user manual.

Chapter 1 provides an overview of the complete system, the theoretical basis of the code, and tips for efficient use of the code.

Chapter 2 describes the geometry and cross section features of the code, and also provides details of the implementation of the theoretical basis of the code. The criticality capability of the code (to calculate the effective multiplication factor, k_{eff}) is described as is the capability for shielding calculations.

Chapter 3 provides detailed descriptions of the input required to create a model for MCNP4B2, including the geometric description capabilities and the material properties. Chapter 4 provides example problem input and descriptions, and Chapter 5 provides output for these samples.

1.2.1 MCNP4B2 Computational Methods

The MCNP4B2 code package uses the Monte Carlo methodology to perform transport calculations. The Monte Carlo numerical method simulates and records the behavior of individual particles within a system. This mathematical approach applies random selections of particle transport characteristics and interactions based on probabilities, cross sections, and system geometry. The behavior of the simulated particles is extrapolated to describe the average behavior of all of the particles within the

system. The Monte Carlo method as applied to neutrons in an MCNP criticality calculation is based upon following a number of individual neutrons through their various transport experiences such as scattering, fission, absorption, or leakage. The fission process is regarded as the birth event that separates generations of neutrons. A generation is the lifetime of a neutron from birth by fission to death by either escape, parasitic capture, or absorption leading to fission. The average behavior of the sample set of neutrons is used to describe the average behavior of the system with regard to the number of neutrons in successive generations (i.e. neutron multiplication factor, k_{eff}).

MCNP4B2 calculates three k_{eff} estimates for each cycle in a given problem.

1) the collision estimate,

2) the absorption estimate, and

3) the track length estimate.

A detailed description of the three k_{eff} estimates may be found in Chapter 2 of the MCNP4B user manual. According to statisticians at the Los Alamos National Laboratory,

> "the three-combined k_{eff} estimator is the best final estimate from an MCNP calculation (Ref. 1). The confidence interval based on the three statistically combined k_{eff} estimates is the recommended result to use for all final k_{eff} confidence interval quotations because all of the available information has been used in the final result."

1.2.2 MCNP4B2 Cross Section Libraries

The MCNP4B2 code package is qualified with an associated set of cross section libraries based on ENDF/B-V and ENDF/B-VI nuclear data.

The cross section library installation procedure and validation of correct operation is provided in Sections 2.3 and 3.2, respectively. Validation of ENDF/B-V and ENDF/B-VI library cross sections is achieved by experimental benchmark test cases that exercise the MCNP4B2 cross section library.

1.3 Functional Requirements

The MCNP4B2 code package has the capability to perform criticality and shielding calculations. Shielding calculations include neutron, gamma, electron, and (n,gamma) sources. MCNP4B2 accomplishes these calculations with a well established computer source code and cross section data libraries. The criticality capability and neutron and gamma shielding capabilities are installed and tested using developer supplied test cases and additional benchmark tests. The electron transport capabilities are installed but have not been tested. Upon requirement of additional capabilities, or

version/revision changes, the SQR shall be revised to include the required test cases and the revised SQR will be submitted to the Software Configuration Manager (SCM) per QAP-SI-0.

1.3.1 General Requirements

The MCNP4B2 code package generates data to support waste package performance activities (WBS 1.2.2) related to criticality and shielding. The system can perform the following analyses:

1) three dimensional criticality analyses;

2) three dimensional shielding analyses for neutron sources;

3) three dimensional shielding analyses for gamma sources; and

4) three dimensional shielding analyses for gamma sources produced by neutron interactions (coupled n-gamma problems).

Examples of analyses that can be supported by the MCNP4B2 system are:

1) evaluation of criticality for various waste package designs within the range of acceptable fuel types, including plutonium materials,

2) evaluation of the neutron and gamma-ray fluence and dose rate on the waste container materials and environment, and

MCNP4B2 requires that the user provide data which describe the materials and geometry which define the desired problem. MCNP4B2 also provides a Graphical User Interface (GUI) that provides interactive plotting of geometry models and tallies.

1.3.2 Input/Output Requirements

Input to MCNP4B2 is provided by keyboard text entry via a text input file identified on the command line. The desired outfile is also identified on the command line. Problems may be stopped, and later re-started through the use of a "CONTINUE" run which uses a problem history file named "runtpe" and a source distribution file "srctp". This feature is useful when the calculated results of a run are not statistically adequate, and continuing the problem run can improve the statistics to acceptable values. MCNP4B2 input/output requirements include:

1) MCNP4B2 instructions regarding housekeeping functions such as print options;

2) Cross section library specifications;

INFORMATION ONLY

3) Model geometry in three dimensions; and

4) Material specifications for the regions in the geometrical model.

MCNP4B2 can use a variety of cross section libraries which are provided with the code. The library used for each isotope specified in the material specifications of the geometrical model is defined by an extension of the isotope identifier. Hence, isotope cross sections may be retrieved by MCNP4B2 from a single or several libraries at the user's discretion. A user may employ either ENDF/B-V or ENDF/B-VI cross section libraries available in the MCNP4B2 code package as required. Additional cross section libraries for the Unix based workstations are maintained in the subdirectory attached to the main MCNP directory on the QUICHE HP 9000/C160 workstation. The ENDF/B-V and ENDF/B-VI cross section library for the desktop PC version is maintained in a sub-directory of the main MCNP directory on each PC.

MCNP4B2 provides a hard copy listing in ASCII format of the output that contains a listing of the input file, the interpretation of the problem model, and the calculational results. In addition, ASCII tally files and binary data files containing the problem history and source distribution information are produced.

1.3.3 Hardware/Software Platform Requirements

The current package, MCNP4B2, is distributed for implementation on a variety of computer platforms including the HP 9000/735, HP 9000/C160, and HP 9000/C180, and SUN Ultra-2 computers. The HP version is a Unix based system that is optimized for the 9000 series computers without software modifications. The SUN version is also a Unix based system that is optimized for the SUN Ultra-2 workstations without software modifications. Additionally, the current MCNP4B2 package is implemented on a desktop computer platform with an MS-DOS operating system, version 5.10 or higher. Software updates required for installation of the MCNP4B2 code package were source corrections contained in the file "install.fix", dated 09/22/97, obtained from LANL. Installation options appropriate to the HP 9000/C180, HP 9000/C160, HP 9000/735, SUN Ultra-2 and the desktop computer were used. Two versions of the code package were installed on the WPO desktop PCs having differing memory sizes. The version with smaller memory size (standard) requires 32 Meg of memory; the larger version requires 64 Meg of memory.

The MCNP4B2 software, as acquired, is configured for installation on a HP 9000 series Unix workstation, SUN Ultra-2 Unix workstation, and PC desktop computer. There are no limitations on the number of users or CPUs on which the software can be installed for the WPO in Las Vegas, Nevada.

In the WPO, the MCNP4B2 code package is installed on a hard disk drive located on the QUICHE HP 9000/C160 workstation. This disk drive is also mounted as part of a Network File Server (NFS)

INFORMATION ONLY

which allows any CPU connected to the NFS to access the hard disk. The network is composed of HP 9000/735 class machines using the HP-UX V9.07 Unix based operating system and HP 9000/C160 and HP 9000/C180 class machines using the V10.20 Unix based operating system. In the verification and validation process, installation test cases and benchmark test cases are run using the NFS mount on the workstation QUICHE. However, both types of test problems are run on the HP 9000/735, HP 9000/C160 and HP 9000/C180 CPUs to test the operating systems and workstation environments for satisfactory operation. Future additions of HP 9000/735, HP 9000/C160 or HP 9000/C180 class machines shall not require a re-qualification effort if they use one of the above listed operating systems. If a computer is added to the network that does not conform to the specified requirements the following shall be completed: (1) the test cases shall be performed on the new machine, (2) this SQR shall be revised to include the additional computer specifications and test case results, and (3) the new SQR shall be provided to the SCM to be included in the software baseline package as specified in the M&O procedure QAP-SI-0.

The code package is also installed on a hard disk drive (/usr2/mcnp4b) located on the SUN Ultra-2 Unix workstation using Solaris 2.6 operating system. In the verification and validation process, installation test cases and benchmark test cases are run using the executable and cross section libraries located in /usr2/mcnp4b and /usr2/mcnp4b/xslib directories, respectively.

The MCNP4B2 code package is installed on a hard drive in a GATEWAY2000 P5-166 PC desktop computer running under the Windows 95 operating system. In the verification and validation process, installation test cases and benchmark test cases are run on one of the WPO PC desktop computers. A subset of the verification and validation test cases are run on all other WPO PC desktop computers accessing the code to verify the correct operation of the code on these computers. Future additions of PC desktop computers shall not require a full re-qualification effort if they use the above listed operating system. If a computer is added to the network that does not conform to the specified requirements the following shall be completed: (1) the test cases shall be performed on the new machine, (2) this SQR shall be revised to include the additional computer specifications and test case results, and (3) the new SQR shall be provided to the SCM to be included in the software baseline package as specified in the M&O procedure QAP-SI-0.

1.3.4 Computational Methods/Algorithm Requirements

The software will at a minimum be required to perform the following tasks, as necessary, and have the appropriate computational algorithms included in the source code:

1) Determine the system k_{eff} for complex geometries using Monte Carlo methods;

2) Provide appropriate cross section libraries; and

3) Perform three dimensional neutron and gamma-ray shielding calculations.

INFORMATION ONLY

The MCNP4B2 package meets these requirements and is commonly used for problems similar to Waste Package problems.

1.3.5 Other Requirements

There are no additional user requirements or code requirements (internal, external, or user) because the inputs are all provided by an analyst and the MCNP4B2 system does not interface with other codes. The user is responsible for independently collecting any materials or geometry information the MCNP4B2 code package may require. For configuration control, the users shall have only a read/execute privilege to the code. There are no hardware requirements beyond those stated in Section 1.3.3 above.

1.4 Description Of Validation

Correct installation of the MCNP4B2 code package is first verified by running the installation test cases which are based on specific criticality and shielding problems for neutron and gamma radiation provided with the software by the developer. The acceptance criteria for qualification of the MCNP4B2 code package requires agreement of numerical results within the statistical accuracy of the calculations. Test case results should not deviate significantly from the vender supplied results for the same test case. Deviate significantly for this situation means that numerical results do not agree to within the fifth significant figure for deterministic calculations. For statistical calculations, results should agree within the statistical uncertainty of the cases. Differences larger than this specified criteria must be documented. After verification of correct installation, validation testing is implemented by running benchmark test cases from published sources to insure that the MCNP4B2 code provides correct answers for problems of the type required for the WPO program.

The input and significant results of the MCNP4B2 verification test cases and validation benchmark cases are provided in this SQR. Complete results of the computer calculations are not presented here due to the large volume of data printed in the computer outputs and because the full output listing is not of primary relevance to the validation effort. The complete results of the computer calculations are available on electronic medias, MOY-980421-19 (MI: 30056-M03-001) for HPs, MOY-980421-18 (MI: 30057-M03-001) for the SUN and MOY-980421-20 (MI: 30055-M72-001) for PCs.

Validation of the ENDF/B-V and ENDF/B-VI based cross section libraries are performed by benchmark test case comparisons. The results based on the ENDF/B-VI library were compared with the results of a number of other data libraries for infinite medium simulations of all nuclides (Ref. 8). Additional testing by LANL included a number of experimental benchmarks consisting of pulsed sphere experiments (Ref. 9) and iron benchmark analyses (Ref. 10). Thus, benchmark test cases of this type are suitable for confirming correct installation of the cross section libraries for use with the MCNP4B2 code package.

INFORMATION ONLY

1.5 Additional Documentation And References

Additional software documents and references for installation and qualification activities of the MCNP4B2 software package are listed below:

1. "MCNP4B, A General Monte Carlo N-Particle Transport Code", LA-12625-M Version 4B, Prepared by the Radiation Transport Group, X-6, Los Alamos National Laboratory, March, 1997.

2. "MCNP Software Quality Assurance Plan", LA-13138, Los Alamos National Laboratory, April, 1996.

3. "MCNPDAT6, MCNP4A Standard Neutron Cross Sections (Based on ENDF/B-VI), Photon Interaction, and Electron Data Libraries", DLC-181, Radiation Safety Information Computational Center Data Library Collection, Oak Ridge National Laboratory, December, 1994.

4. "Critical Separation Between Subcritical Clusters of 2.35 Wt% and 4.31 Wt% ^{235}U Enriched UO_2 Rods In Water With Fixed Neutron Poisons", PNL-2438, Battelle Pacific Northwest Laboratories, October, 1977.

5. "Reference Problem Set to Benchmark Analysis Methods for Burnup Credit Applications (Draft)", ORNL/TM-12295, Computing Applications Division ORNL, November, 1993.

6. Whalen, Daniel J., David A. Cardon, Jennifer L. Uhle, and John S. Hendricks, "MCNP: Neutron Benchmark Problems", LA-12212, LANL, November, 1991.

7. Wagner, John C., James E. Sisolak, and Gregg W. McKinney, "MCNP: Criticality Safety Benchmark Problems", LA-12415, LANL, October, 1992.

8. Court, John D., John S. Hendricks, and Stephanie C. Frankle, "MCNP ENDF/B-VI Validation: Infinite Media Comparisons of ENDF/B-VI and ENDF/B-V", LA-12887, LANL, December, 1994.

9. Court, John D., Ronald C. Brockhoff, and John S. Hendricks, "Lawrence Livermore Pulsed Sphere Benchmark Analysis of MCNP ENDF/B-VI", LA-12885, LANL, December, 1994.

10. Court, John D., and John S. Hendricks, "Benchmark Analysis of MCNP ENDF/B-VI Iron", LA-12884, LANL, December, 1994.

INFORMATION ONLY

11. J.S. Hendricks, "MCNP4B", LANL memorandum XTM:JSH-97-13 (U), January 29, 1997.

12. Ueki, K. and Ohashi, A., "Neutron Shielding Ability of KRAFTON N2 - Mannan - KRAFTON N2 Sandwich-Type Material and Others", Proceedings of New Horizons in Radiation Protection and Shielding Topical Meeting, Pasco, WA, 1992.

13. Broadhead, B. L.; Tang, J. S.; Childs, R. L.; Parks, C. V.; Taniuchi, H., "Evaluation of Shielding Analysis Methods in Spent Fuel Cask Environments", EPRI TR-104329. Palo Alto, California: Electric Power Research Institute, 1995.

14. Hendricks, John S., Stephanie C. Frankle, and John D. Court, "ENDF/B-VI Data for MCNP", LA-12891, LANL, December, 1994.

15. Hendricks, John S., and John D. Court, "MCNP4B Verification and Validation", LA-13181, LANL, August, 1996.

No additional documentation other than listed above is required to qualify the MCNP4B2 code package for use on the HP 9000 series workstations, SUN Ultra-2 workstations, or the PC desktop computers. The above listing of documentation is also sufficient for the installation of the ENDF/B-VI cross section library in the MCNP4B2 baseline.

2.0 INSTALLATION

The MCNP4B2 code package, as received, was compiled on a HP 9000 series Unix based workstation and a PC desktop personal computer. The installation procedures provide guidelines for installation on the HP 9000 series workstations and on the PC desktop systems in the WPO. Installation procedures are described in Attachment II.

2.1 MCNP4B2 Installation Procedure

The MCNP4B electronic software package was transmitted to the WPO on a CD. The CD contains a file named 'READMAAG' that provides instructions for installation of the package on the HP machine.

2.1.1 HP Unix Based Workstation

The MCNP4B2 code package is installed by S. Goluoglu of the WPO following the instructions for removal from the media and installation. The code is installed on the WPO HP Unix workstation (CRWMS M&O #102878), identified as OPUS. The files were transferred from the CD to the local

INFORMATION ONLY

directory '/users/goluoglu/mcnp4b'. The information in the 'READMAAG' file in the 'INSTALL' directory was then followed to install the code. Attachment II contains a copy of the READMAAG file used for the installation. The code package was then moved to '/opt/neut/MCNP4B' to allow general access by all local WPO Unix machines.

The MCNP4B2 installation process is controlled by a script (install) which makes the necessary platform-dependent adjustments. The script also executes other scripts (makemcnp) to incorporate latest fixes to the code. Since acquisition of the code package, the developers have released a fix file to fix the bugs they found after the release of the code package. This fix file is downloaded from the developers' web site (http://www-xdiv.lanl.gov/XCI/PROJECTS/MCNP/world/fix4b2) and copied onto a file called "install.fix". The version that incorporates these latest fixes is called MCNP4B2 as opposed to the original release which is called MCNP4B. The installation process can be duplicated by executing this script (install) with the file named 'answer' (which was created during the installation) as an input file, and the new 'install.fix' file as a fix file. The files 'answer' and 'install.fix' are listed in Attachment II. A listing of all the MCNP4B2 executable and library files currently contained in the mcnp directory and its subdirectories is provided in Attachment III. These files have been placed under the control of the appropriate systems administrator to provide write protection on these files.

Based upon the review of the installation procedure provided with the code, a comparison with the files loaded onto the HP 9000/735 workstation and the installation procedure, and the results of the verification cases described in the following section, the following conclusions are made:

1) the complete MCNP4B2 code system has been installed on HP9000 work stations as directed by the supplier and is accessible to all CPUs via a NFS;

2) the program has been tested on the HP 9000/735 workstations with V9.07 Unix operating system, HP 9000/C160 and the HP 9000/C180 workstations using the V10.2 Unix operating systems; and

3) that the MCNP4B2 code package is functioning correctly on these workstations.

2.1.2 PC DESKTOP COMPUTERS

The MCNP4B electronic software package was transmitted to the WPO on a CD. The CD contains a file named 'READMAAG', dated 02/10/97, that provides instructions for installation of the package on DOS systems. This version contains the ENDF/B-IV cross section data as the file "testlib1" used for the transmittal test cases. The ENDF/B-V and ENDF/B-VI cross section data are provided in separate files included with the transmittal package. The code installation procedure includes the installation of the cross section libraries.

INFORMATION ONLY

The PC version of the code was installed by J. A. McClure of the WPO using the instructions provided in the code package. The code was installed on the WPO GATEWAY2000 P5-166 PC desktop computer (CRWMS M&O #110837) using the WINDOWS 95/MS-DOS 6.22 operating system. Two versions of the MCNP4B2 code were compiled on the desktop PC differing only in the size of the memory block specified for the code as part of the installation process. The standard version labeled "mcnp4b2.exe", uses 4,000,000 bytes of memory and the large version, labeled "mcnp4b2x.exe", uses 9,600,000 bytes of memory.

Attachment II provides the complete installation procedure of the MCNP4B2 code package and cross section data files on the PC desktop computer. The installation consists of three parts executed in sequence: system setup, compilation of the source code, and validation with test problems. All the files created in the installation and validation process reside in the d:\mcnp4b directory and c:\tmpspace directory. Cross sections reside in the d:\mcnp4b.xc directory. A listing of all the executable and library files in the d:\mcnp4b and d:\mcnp4b.xc directories required for running actual criticality and shielding problems is provided in Attachment III. These files and directory contents are controlled per QAP-SI-3. All the MCNP4B2 source code shall be removed from the qualified PC platform.

The MCNP4B2 installation process is controlled by a script (install.bat) which makes the necessary platform-dependent adjustments. The script also executes other scripts (makemcnp.bat) to incorporate the latest fixes into the code. Since acquisition of the code package, the developers have released a fix file to incorporate corrections made after the release of the code package. This fix file is downloaded from the developers' web site and copied onto a file called "install.fix". No changes were made to the developers' "install.fix" file except to change the version name and compilation date. The installation process can be duplicated by executing this script (install.bat) with the file named 'answer' (which was created during the installation) as an input file, and the new 'install.fix' file as a fix file. The files 'answer' and 'install.fix' are listed in Attachment II.

Based upon the review of the installation procedure provided with the code, a comparison with the files loaded onto the PC and the installation procedure, and the results of the validation cases described in the following section, it is judged that MCNP4B2 has been installed on the GATEWAY2000 P5-166 PC as directed by the developer, and that the criticality and shielding capabilities are functioning correctly.

2.1.3 SUN Ultra-2 Unix Based Workstation

The procedure for installation of MCNP Version 4B2 on SUN Unix workstations running under Solaris 2.6 is the same as the procedure for Unix based workstations described in detail in Section 2.1.1 and Attachment II. MCNP4B2 executable and cross section libraries are placed in the directories /usr2/mcnp4b and /usr2/mcnp4b/xslib, respectively, on OTIS (CRWMS M&O #115491).

INFORMATION ONLY

A listing of all the MCNP4B2 executable and library files currently contained in the mcnp directory and its subdirectories is provided in Attachment III. These files have been placed under the control of the appropriate systems administrator to provide write protection on these files.

2.2 MCNP4B2 Installation Verification

As described in installation instructions provided with the MCNP4B code package, the developer supplied test cases for the criticality and neutron/gamma shielding will be used for the code verification. Since this sequence provides statistical results, the acceptance criteria stated in the Section 1.4 requires agreement of numerical results within the statistical accuracy of the calculations. Differences larger than this criteria must be documented. The verification and validation test cases were run on the installation systems except for the desktop PC. The executable program files from the installation computer (GATEWAY2000 P6-166, CRWMS M&O #110837) were transferred to desktop Dell PowerEdge 2000 PCs with larger memory for verification and validation testing.

2.2.1 Installation Test Case Description

Twenty-nine developer supplied test cases are included with the MCNP4B package. They are briefly described in Table 2.2.1-1 and electronic copies of both the input and output files are included in the code package. Since an electronic copy of the output is provided with the code package, verification of results is simplified by use of the 'diff' command on the Unix operating system, and by the 'fc' (file comparison) command on the PC MS-DOS system in the Windows 95 operating system. This is a sophisticated system command that compares two files and lists those lines that must be changed in the files to bring them into agreement. A review of the list produced by this command will provide an accurate and complete validation of the MCNP4B2 code package based on the comparison of sample case results.

For the HP 9000 workstations, SUN Ultra-2 workstation, and PC's, the sample problems exercise the capabilities of the MCNP4B2 code. The sample problems provide a considerable amount of output, even with conservative printout requests. Thus, the output listings for these cases will be archived on electronic medias MOY-980421-19 (MI: 30056-M03-001) for HPs, MOY-980421-18 (MI: 30057-M03-001) for the SUN and MOY-980421-20 (MI: 30055-M72-001) for PCs. All significant differences noted in the 'diff' file will be included and discussed.

INFORMATION ONLY

TABLE 2.2.1-1
Description of the 29 MCNP4B2 Installation Test Cases

Problem	Particle	Description
1	Neutron	Simple neutron problem to test some basic operations of mcnp
2	Neutron	Three different tallies of the same physical quantity
3	Neutron	Many features of the general source
4	Photon	Photons
5	Neutron	Toroidal tokamak
6	Neutron	Cutoffs, flagging, and variance reduction features
7	Neutron	Generate surface source for problem 8
8	Neutron, Photon, Electron	Use surface source from problem 7
9	Neutron	kcode in complicated cells and sdef
10	Neutron, Photon	General test problem /x6code/gtprob
11	Neutron, Photon	Intertwined super pretzels with S(α, β), mode n p
12	Neutron	Porosity tool model
13	Neutron	Check of the volume calculator, rotational symmetry cases
14	Neutron	Test general source in repeated structures
15	Neutron	Test filled lattice and skewed lattice
16	Photon	Test general source in a lattice
17	Neutron, Photon	kcode in a rectangular finite lattice
18	Neutron	kcode in a hexagonal prism lattice
19	*	Multigroup Boltzmann-Fokker-Planck ver. of problem 20
20	Electron, Photon	Continuous-energy electron version of problem 19
21	Photon	Electron-photon problem - generates surface source for problem 22

INFORMATION ONLY

Problem	Particle	Description
22	Photon	Electron-photon ssr from problem 21
23	Photon, Electron	Forward 80 group electron-photon detector chip problem
24	Neutron	Reflecting lattice. 15x15 at 3.75 w/o ^{235}U enrichment
25	Neutron	Continuation with kcode 250 .7 1 4
26	Neutron	Continuation with kcode 200 1 10 55
27	Neutron	Fission surface source from problem 9
28	Neutron	Coupled Neutron-Photon Adjoint Problem
29	Neutron	ssr from problem 7; copy of inp08 to test auger production

2.2.2 Results of Installation Test Cases

Satisfactory agreement between the results of the sample problems executed on the OPUS HP9000/735 workstation, OTIS SUN Ultra-2 workstation, the PC desktop computers (Dell PowerEdge 2000: 112110 and Dell PowerEdge 2000: 112113), and those included with the installation package sent by the developer verify the correct installation of the MCNP4B2 code package and confirm that the criticality and shielding capabilities are functioning correctly. Any differences in output files that were noted consisted of a unit change in the 5th or 6th significant digit of particular values which is considered insignificant. In all cases, these minor differences occurred in intermediate calculational steps and were determined to be the result of differences in numerical processing (round-off) inherent in the CPU architecture of the HP 9000/735, SUN Ultra-2 workstation and/or PC systems. These differences were determined to be insignificant.

Installation test cases 1-29 were also run on the SPUDS HP 9000/C180 workstation. This approach assured correct performance of the code for both operating systems and both types of CPUs.

The results of the installation test cases for the SPUDS HP 9000/C180 workstation, the OPUS HP 9000/735 workstation, the OTIS SUN Ultra-2 workstation, and the desktop Dell PowerEdge 2000 PCs indicate that MCNP4B2 code package is operating correctly on all four systems. No significant differences were determined in output comparisons on all four systems.

INFORMATION ONLY

2.3 Cross Section Library Installation

The cross section libraries for use in MCNP4B2 are readily available in the data package DLC-189 supplied by RSICC. However, these ASCII cross section files increase the execution times considerably. Therefore, a conversion utility program, named "makxsf", is used to convert these ASCII cross section files into BINARY. A "makxsf" file is created along with MCNP4B2 executable during a successful installation of MCNP4B2. The "makxsf" program reads and processes the cross section files according to the input parameters given in a "specs" file which is also included in the cross section package. Input to the "makxsf" program also includes a cross section directory file, "xsdir1", specifying which cross sections to process. Output includes binary cross section files and a new directory "xsdir2". The final BINARY cross section files and the "xsdir" file (renamed or copied from the "xsdir2" file) are then used in all future calculations. The description of the cross section files are given in the "README" file supplied by the MCNP4B2 developers. Instructions for accessing these cross sections and the results of test cases utilizing these cross sections are included.

INFORMATION ONLY

3.0 VALIDATION

A series of benchmark experiments are analyzed to insure that the MCNP4B2 code package provides correct answers for problems of the type required for the waste package design program. These benchmark test cases are selected from published experiments and do not include the verification test cases supplied by the developer. Supplementary test cases for validation provided by the software developer are not required. Regression testing of previously baselined software is not required. The agreement noted by this comparison provides the validation for the MCNP4B2 code package for design applications consistent with the type of problems analyzed by the WPO.

Descriptions of the benchmark test cases used in the validation of the MCNP4B2 code package installed on the HP 9000 workstations, SUN Ultra-2 workstation and the PC desktop computers are described in detail in the following sections. The results of the execution of the software validation, including the extent to which the results agree with the acceptance criteria are given in Sections 3.1, 3.2 and 3.3.

3.1 MCNP4B2 Criticality Validation Tests

3.1.1 Rodded Lattices

Critical Configurations of Subcritical Clusters of 2.35 Wt% Enriched UO_2 Rods in Water with Fixed Neutron Absorber Plates

This section includes four unique critical configurations (Ref. 4) each consisting of three fuel assemblies of various size arranged in a row with various absorber plates positioned between them. The fuel assemblies in each critical experiment contained 2.35 Wt% U-235 enriched UO_2 fuel rods with a square pitch of 2.032 cm. The absorber plates placed between the fuel assemblies were either BORAL, aluminum, or stainless steel. One experiment did not use absorber plates. These critical experiments demonstrate MCNP4B2's ability to accurately predict the critical multiplication factor (k_{eff}) for configurations containing light-water reactor fuel separated by absorber plates as is often found in waste package designs. The general configuration for the four experiments is shown is Figure 3.1.1-1.

The fuel rod description is shown in Figure 3.1.1-2. The UO_2 composition used in the MCNP4B2 models is shown in Table 3.1.1-1. The 1100, 5052-H32, and 6061 aluminum compositions used in the MCNP4B2 models are shown in Table 3.1.1-2. The acrylic spacer grids and base plate shown in Figure 3.1.1-1 were modeled as plexiglass. Substituting plexiglass for acrylic in the models will have an insignificant effect on the critical multiplication factor of the configurations due the limited reactivity worth of the spacer grids and base plate. The plexiglass composition used in the models is shown in Table 3.1.1-3.

INFORMATION ONLY

Table 3.1.1-1
2.35 Wt% U-235 Enriched UO_2 Composition (9.20 g/cc)

Element/Isotope	Weight Percent
U-234	0.0049
U-235	2.0715
U-238	86.0741
Oxygen	11.8495

Table 3.1.1-2
Aluminum Compositions

Element/Isotope	Weight Percent	
	Type 6061 Aluminum (2.6989 g/cc)	Type 5052-H32 Aluminum (2.70 g/cc)
Aluminum	96.93	96.4
Carbon	1.0	2.5
Silicon	0.6	0.25
Titanium	0.15	—
Chromium	0.195	0.25
Manganese	0.15	0.1
Iron	0.7	0.4
Copper	0.275	0.1

INFORMATION ONLY

Table 3.1.1-3
Plexiglass Composition (1.18 g/cc)

Element/Isotope	Atom Density (atoms/b-cm)
Hydrogen	0.05678
Carbon	0.03549
Oxygen	0.01420

The first experiment, designated EXP1, consisted of three 20 x 16 fuel rod lattices separated by water only. The rod-to-rod spacing between the fuel lattices was 8.39 cm. The configuration was uniformly surrounded by a 30 cm water reflector. This configuration's x-y plane, x-z plane, and y-z plane cross-sectional views obtained from the MCNP4B2 plotting sequence are presented in Figures 3.1.1-3, -4, -5, respectively.

The second experiment, designated EXP2, consisted of a 20 x 16 fuel rod lattice positioned between two 22 x 16 fuel rod lattices. The rod-to-rod spacing between the fuel lattices was 5.05 cm. BORAL absorber plates were positioned between the center and outer fuel lattices. The absorber plates were positioned 0.645 cm from the cell boundaries of the center assembly. The BORAL absorber plates were 36.5 cm wide, 91.5 cm long, and 0.713 cm thick. The 0.713 cm thickness includes a 0.102 cm thick aluminum cladding on both sides of the B_4C-Al absorber material. The BORAL composition used in the MCNP4B2 model is shown in Table 3.1.1-4. The configuration was uniformly surrounded by a 30 cm water reflector. This configuration's x-y plane, x-z plane, and y-z plane cross-sectional views obtained from the MCNP plotting sequence are presented in Figures 3.1.1-6, -7, -8, respectively.

Table 3.1.1-4
BORAL Absorber Plate Composition (2.49 g/cc)

Element/Isotope	Weight Percent
Carbon	7.97
Aluminum	63.0
Iron	0.33
Boron-10	5.28
Boron-11	23.42

INFORMATION ONLY

The third experiment, designated EXP3, consisted of three 20 x 16 fuel rod lattices. The rod-to-rod spacing between the fuel lattices was 8.67 cm. Type 6061 aluminum absorber plates were positioned between the center and outer fuel lattices. Table 3.1.1-2 shows the type 6061 aluminum composition used in the MCNP4B2 model. The absorber plates were positioned 0.645 cm from the cell boundaries of the center assembly. The aluminum absorber plates were 35.6 cm wide, 91.5 cm long, and 0.625 cm thick. The configuration was uniformly surrounded by a 30 cm water reflector. This configuration's x-y plane, x-z plane, and y-z plane cross-sectional views obtained from the MCNP plotting sequence are presented in Figures 3.1.1-9, -10, -11, respectively.

The fourth experiment, designated EXP4, consisted of three 20 x 16 fuel rod lattices. The rod-to-rod spacing between the fuel lattices was 6.88 cm. Type 304 stainless steel absorber plates were positioned between the center and outer fuel lattices. Table 3.1.1-5 shows the type 304 stainless steel composition used in the MCNP4B2 model. The absorber plates were positioned 0.645 cm from the cell boundaries of the center assembly. The aluminum absorber plates were 35.6 cm wide, 91.5 cm long, and 0.485 cm thick. The configuration was uniformly surrounded by a 30 cm water reflector. This configuration's x-y plane, x-z plane, and y-z plane cross-sectional views obtained from the MCNP plotting sequence are presented in Figures 3.1.1-12 and -13, respectively.

Table 3.1.1-5
Type 304 Stainless Steel Composition (7.9 g/cc)

Element/Isotope	Weight Percent
Carbon	0.08
Nitrogen	0.40
Silicon	1.0
Phosphorous	0.045
Sulfur	0.03
Chromium	19.0
Manganese	2.0
Iron	67.245
Cobalt	0.20
Nickel	10.0

INFORMATION ONLY

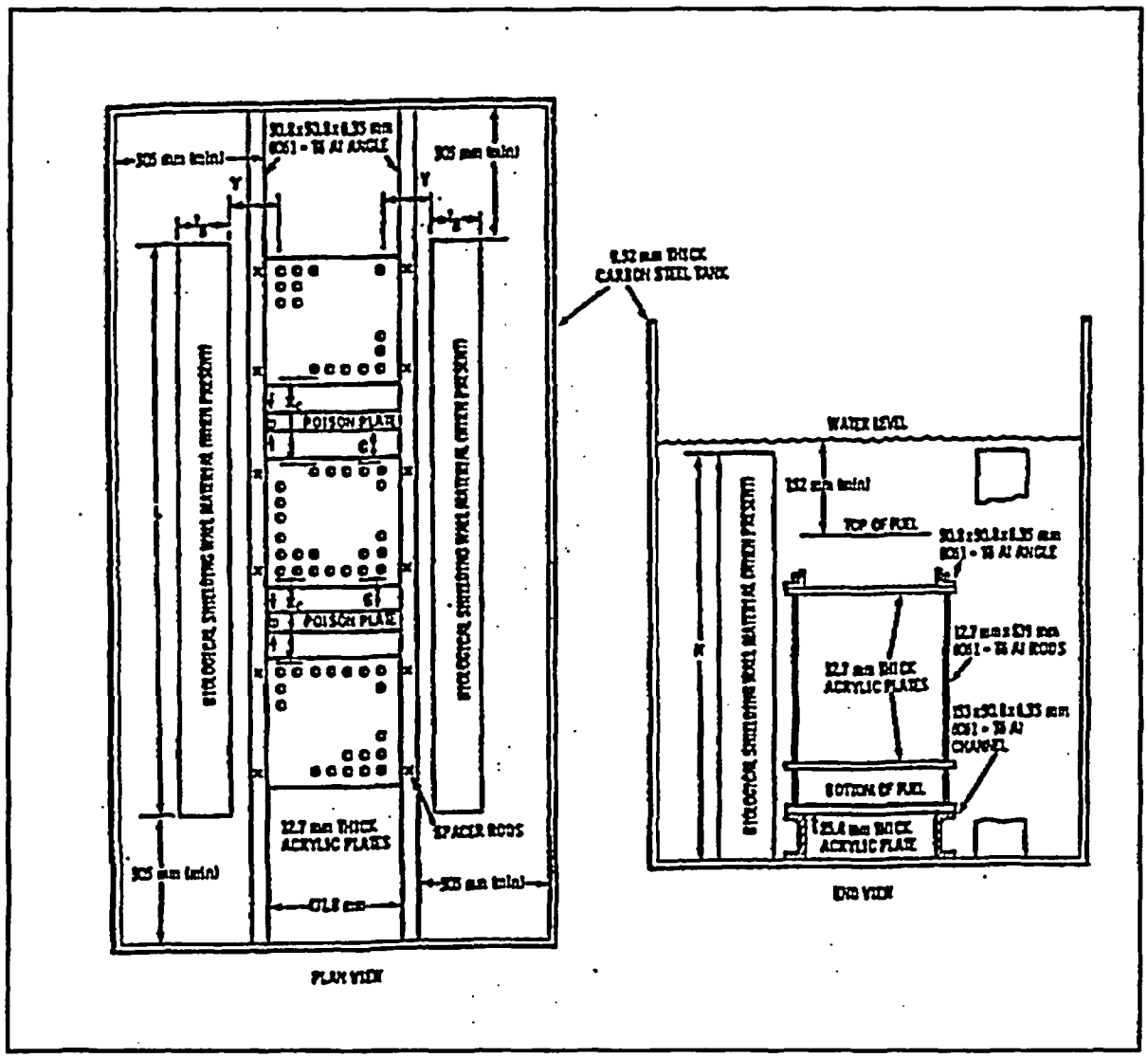

Figure 3.1.1-1 Absorber Plate Experimental Setup

INFORMATION ONLY

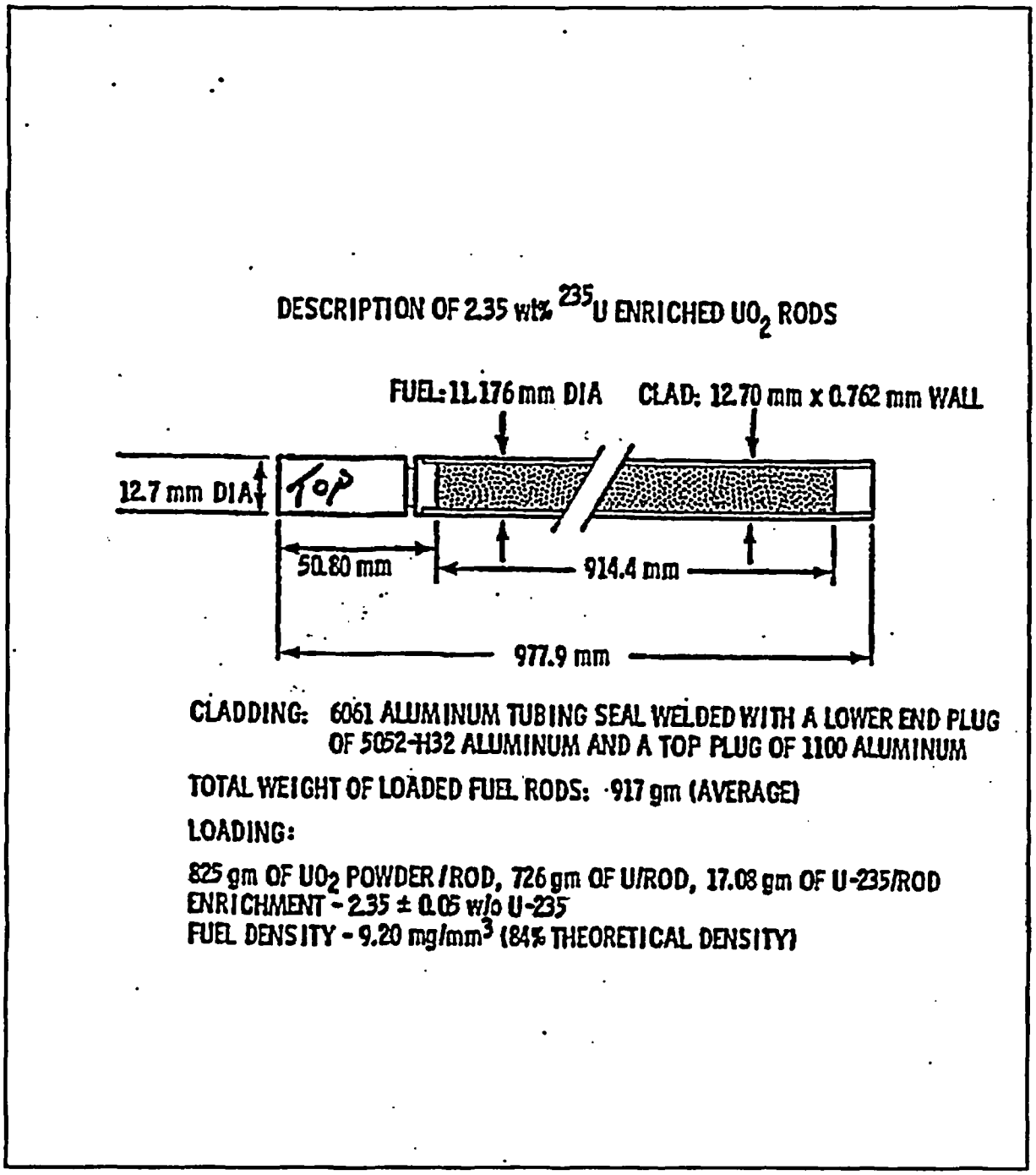

Figure 3.1.1-2 Absorber Plate Experiments' Fuel Rod Description

INFORMATION ONLY

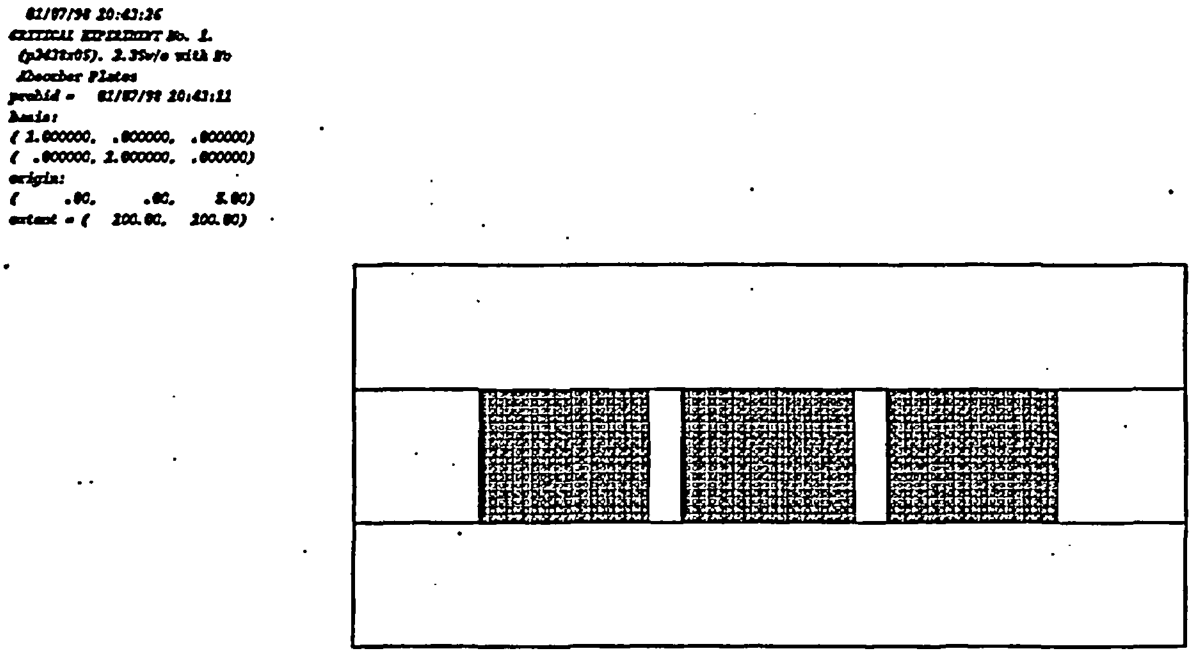

Figure 3.1.1-3 MCNP Plot: EXP1 x-y plane cross-section

INFORMATION ONLY

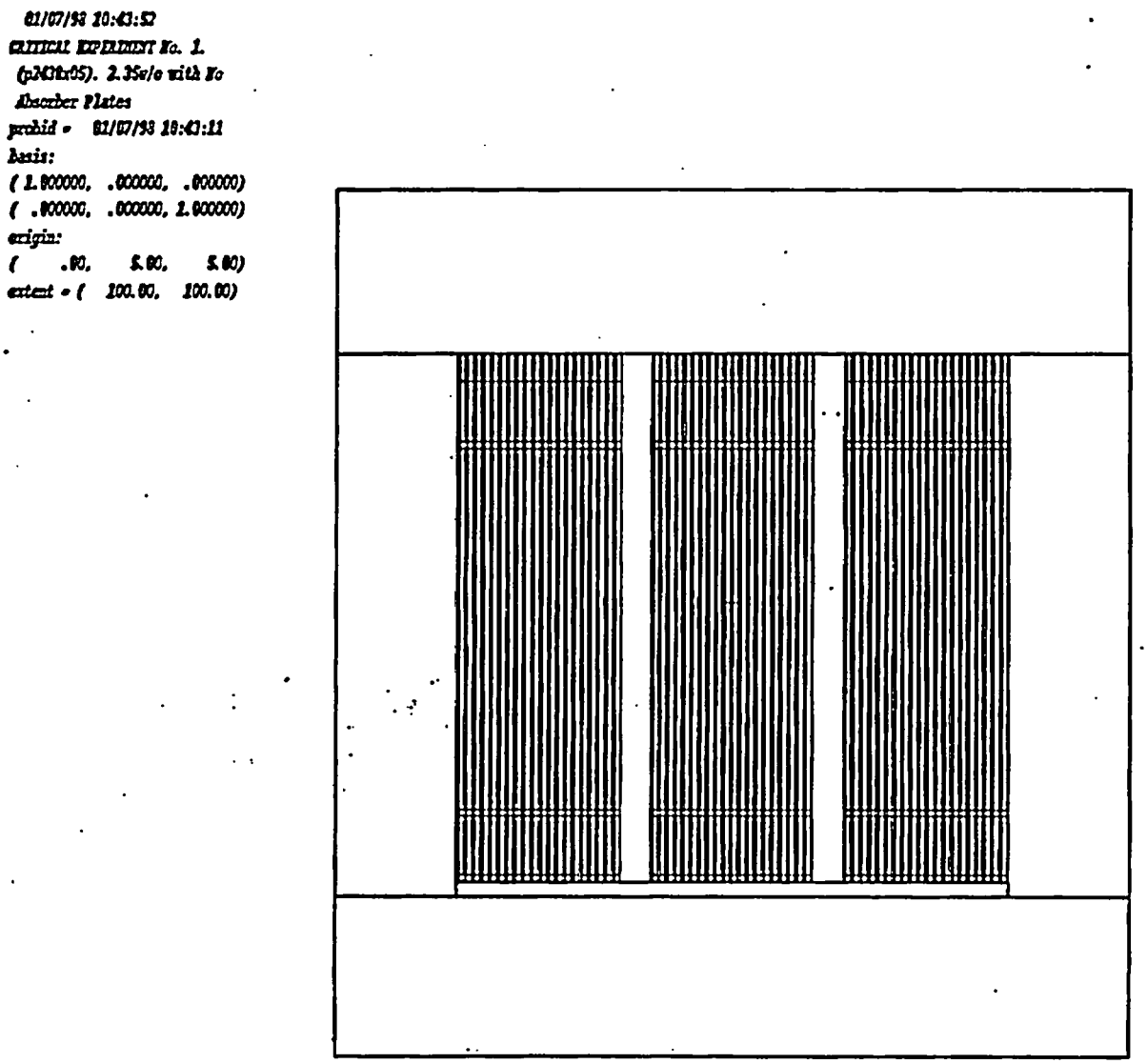

Figure 3.1.1-4 MCNP Plot: EXP1 x-z plane cross-section

INFORMATION ONLY

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Absorber Plates
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(.000000, .000000, 2.000000)
origin:
(5.00, 5.00, 5.00)
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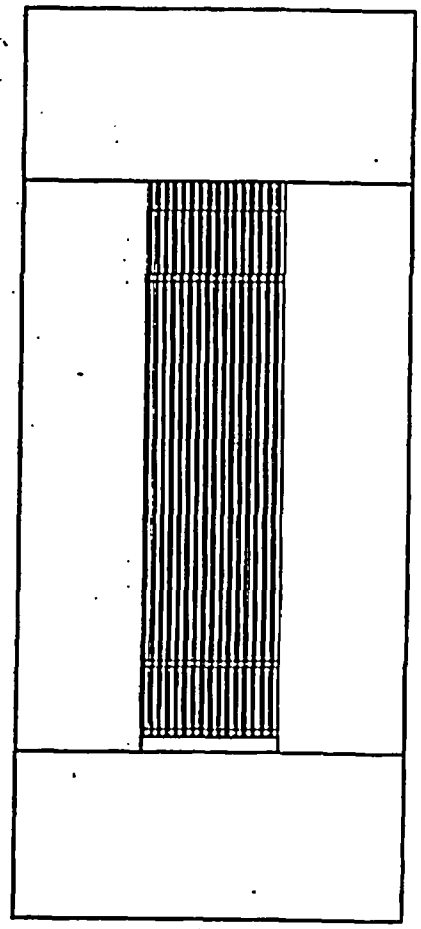

Figure 3.1.1-5 MCNP Plot EXP1 y-z plane cross-section

INFORMATION ONLY

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Absorber Plates
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(.000000, 1.000000, .000000)
origin:
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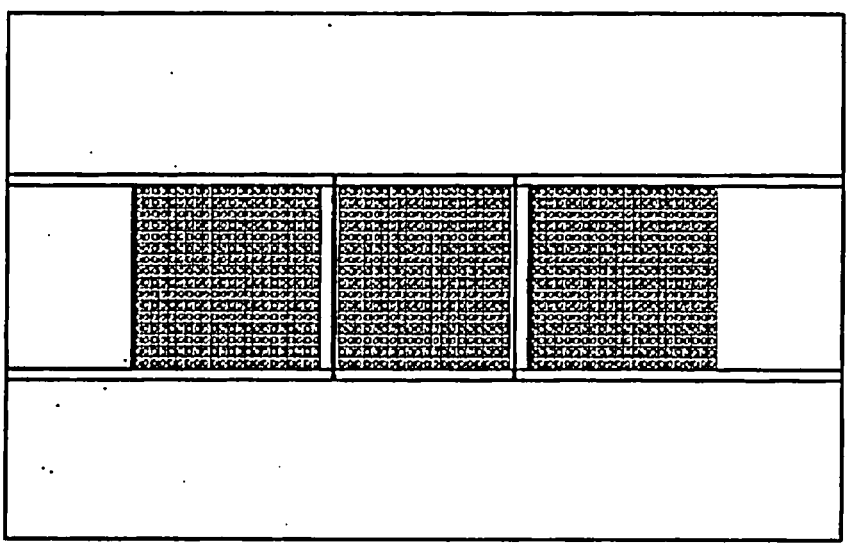

Figure 3.1.1-6 MCNP Plot: EXP2 x-y plane cross-section

INFORMATION ONLY

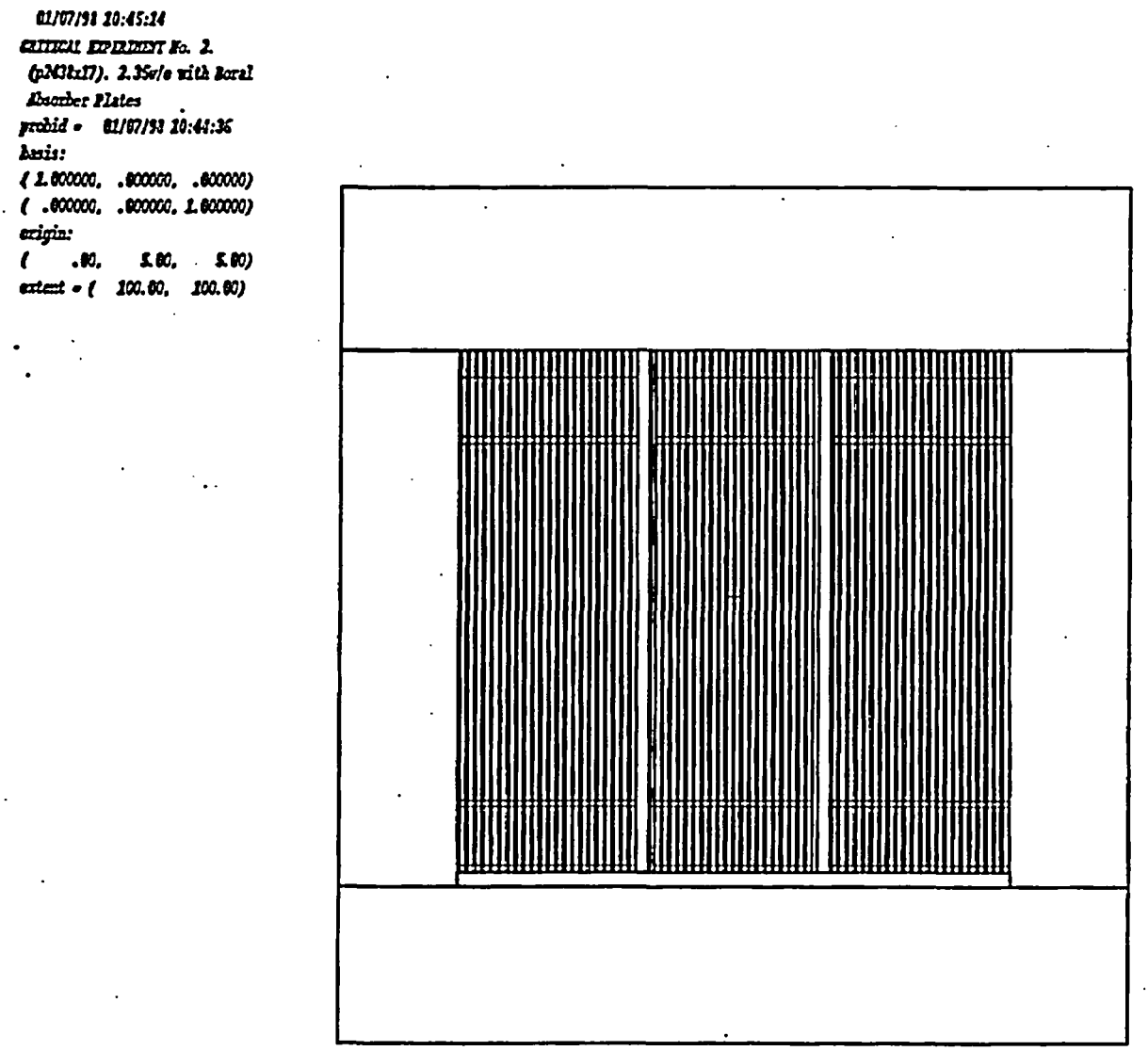

Figure 3.1.1-7 MCNP Plot: EXP2 x-z plane cross-section

INFORMATION ONLY

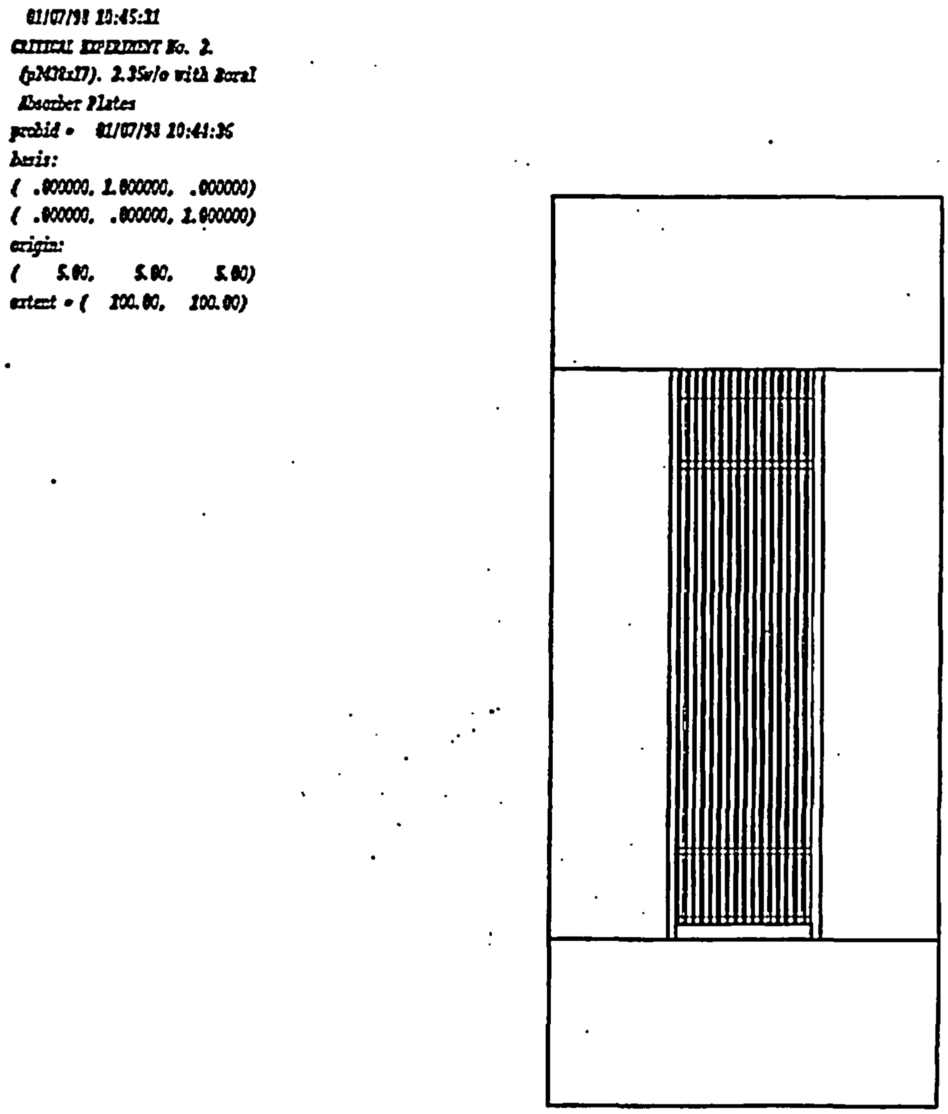

Figure 3.1.1-8 MCNP Plot: EXP2 y-z plane cross-section

INFORMATION ONLY

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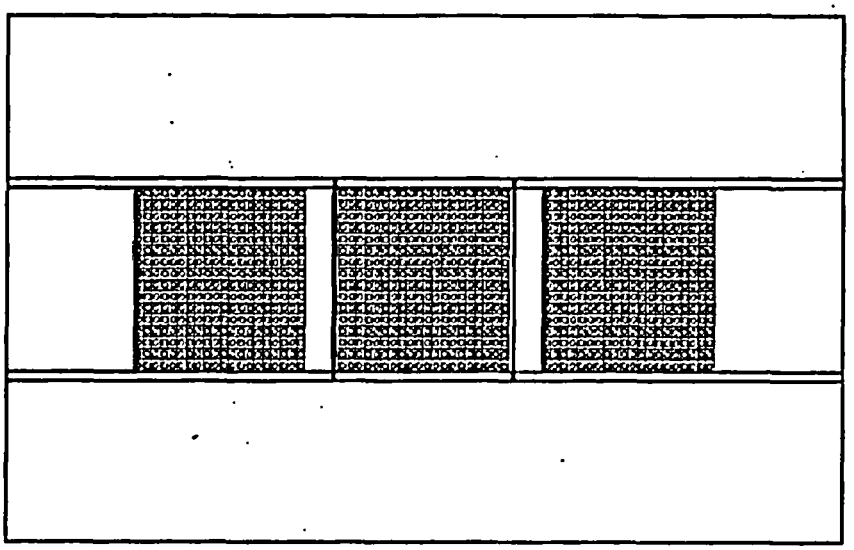

Figure 3.1.1-9 MCNP Plot: EXP3 x-y plane cross-section

INFORMATION ONLY

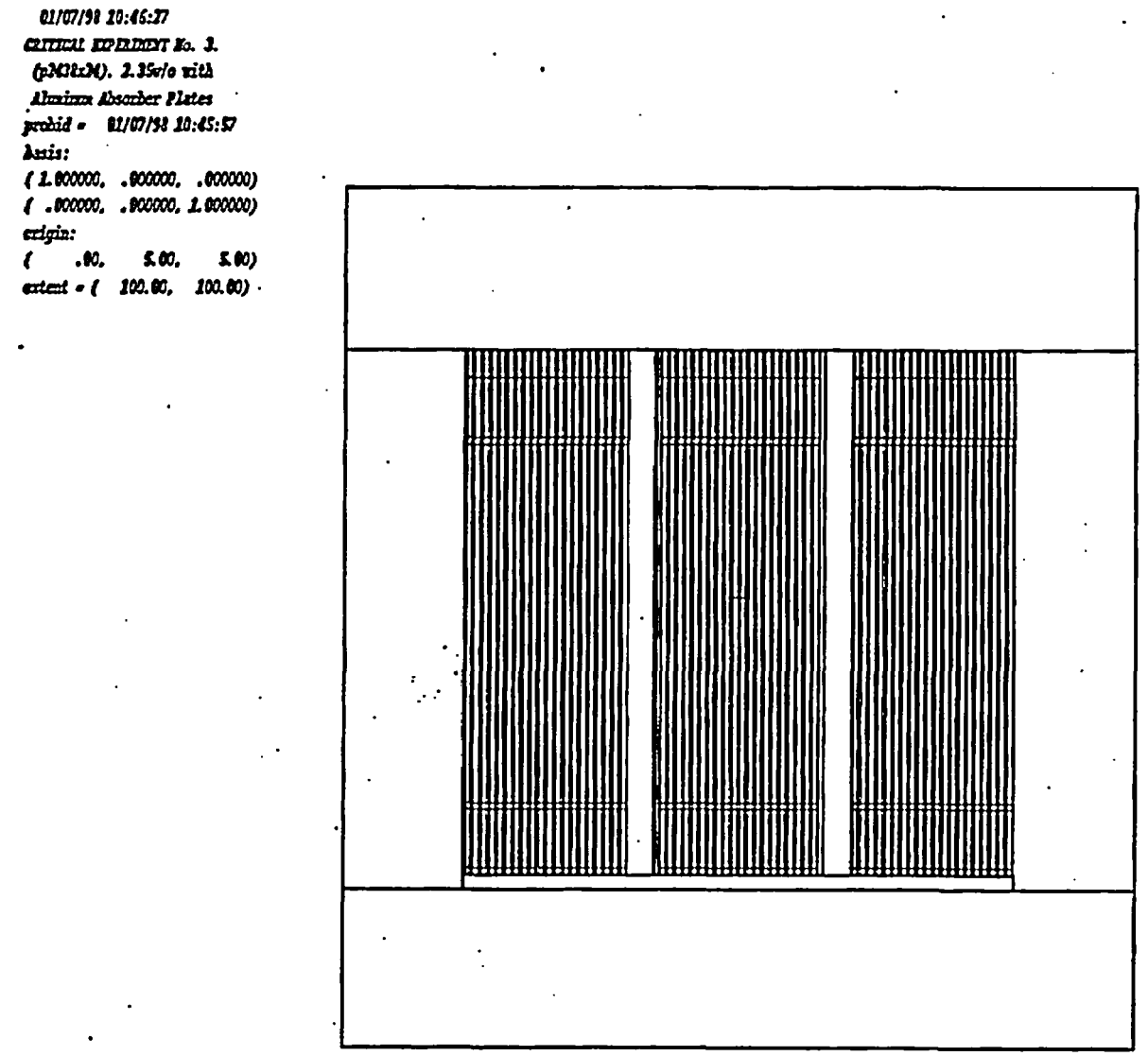

Figure 3.1.1-10 MCNP Plot: EXP3 x-z plane cross-section

INFORMATION ONLY

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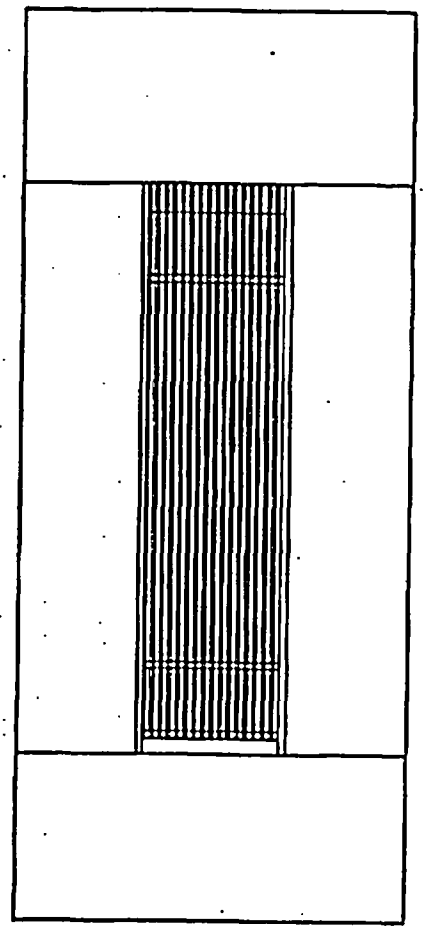

Figure 3.1.1-11 MCNP Plot: EXP3 y-z plane cross-section

INFORMATION ONLY

01/07/98 10:43:02
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Absorber Plates
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extent = (100.00, 100.00)

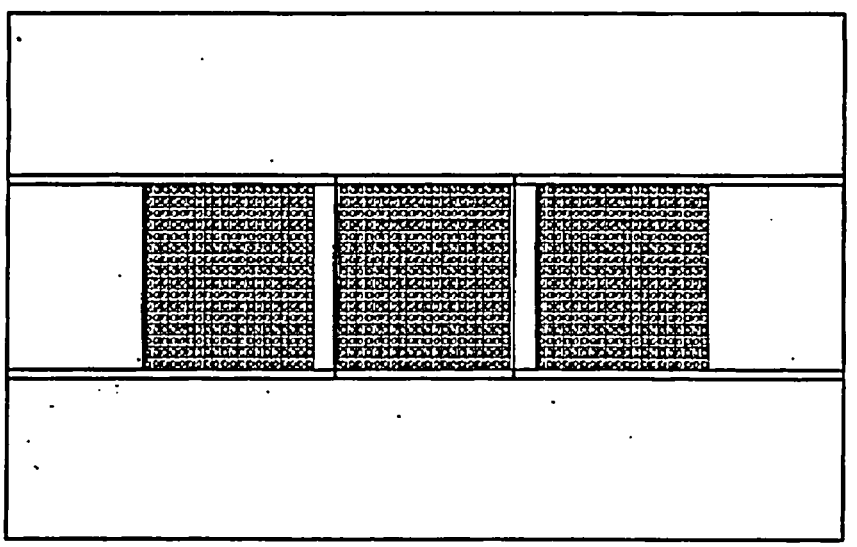


Figure 3.1.1-12 MCNP Plot: EXP4 x-y plane cross-section

INFORMATION ONLY

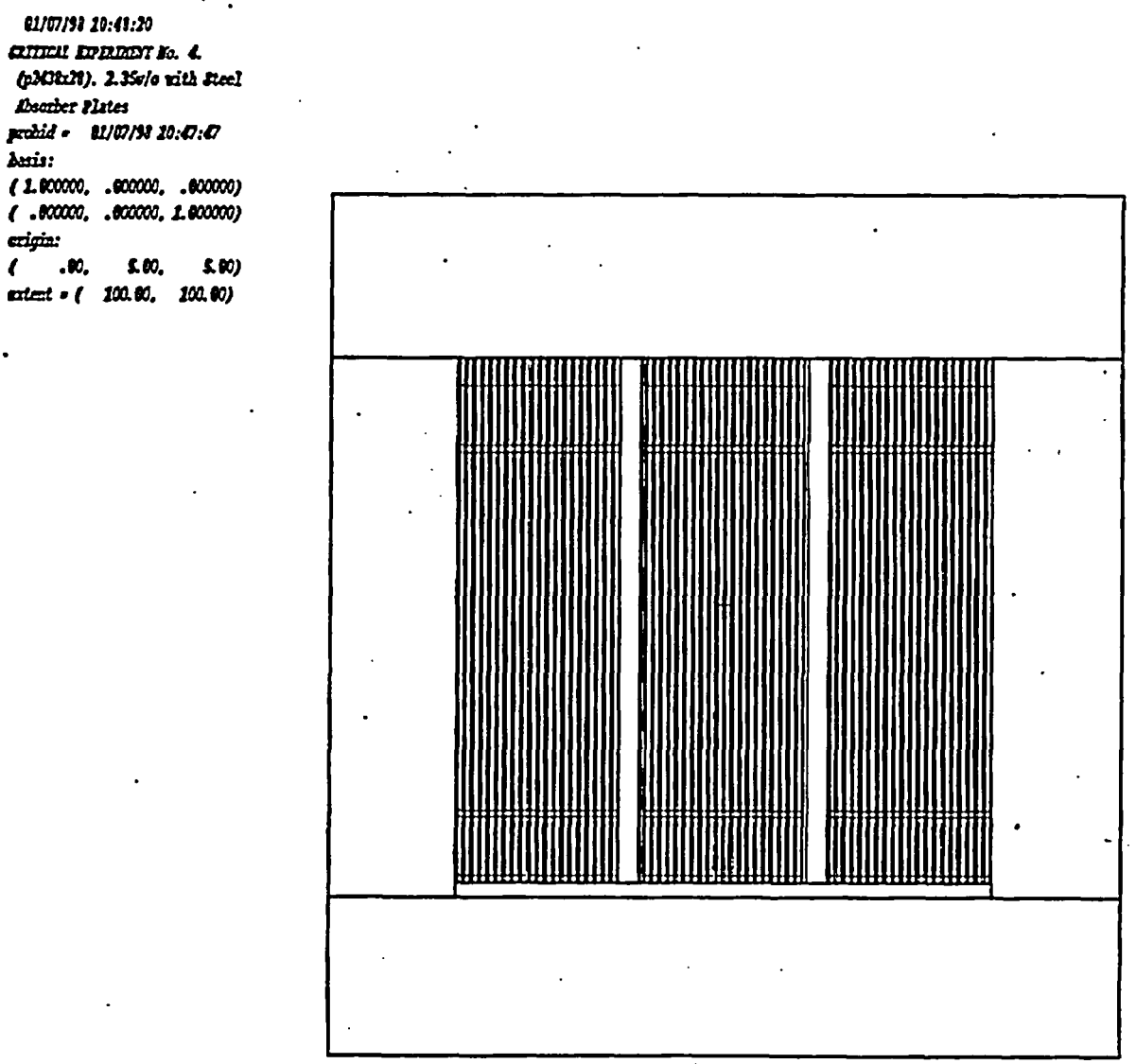


Figure 3.1.1-13 MCNP Plot: EXP4 x-z plane cross-section

INFORMATION ONLY

3.1.2 Mixed Oxide Fuel

Electric Power Research Institute Mixed Oxide Critical Configurations

This section contains six critical experiment configurations (Ref. 5) composed of unborated and borated water moderated lattices of 2 wt% PuO_2 (8 wt% Pu-240)/98 wt% UO_2 (natural) fuel rods. The PuO_2/UO_2 fuel rod description is shown in Figure 3.1.2-1. The PuO_2/UO_2 composition used in the MCNP models in shown in Table 3.1.2-1. The fuel rods were supported in a core structure composed of "eggcrate" type lattice plates with an upper lead shield. The axial view of the general core configuration is shown in Figure 3.1.2-2. The eggcrate lattice description is shown in Figure 3.1.2-3. The aluminum compositions used in the MCNP models are shown in Table 3.1.2-2. A water reflector of at least 30 cm thickness was located below the aluminum base plate and around the fuel rod configuration in each experiment.

Table 3.1.2-1
2 Wt% PuO_2 (8 Wt% Pu-240)/98 Wt% UO_2 (natural) Fuel Composition (9.54 g/cc)

Element/Isotope	Atom Density (atoms/b-cm)
U-234	1.2462E-6
U-235	1.4891E-4
U-236	2.0943E-9
U-238	2.0619E-2
Pu-238	3.8850E-8
Pu-239	3.9477E-4
Pu-240	3.3218E-5
Pu-241	1.6023E-6
Pu-242	1.1887E-7
Am-241	1.5024E-6
Oxygen	4.3763E-2

INFORMATION ONLY

Table 3.1.2-2
Type 6061 Aluminum Composition (2.6989 g/cc)

Element/Isotope	Weight Percent
Aluminum	96.93
Carbon	1.0
Silicon	0.6
Titanium	0.15
Chromium	0.195
Manganese	0.15
Iron	0.7
Copper	0.275

The first experiment, designated EXP22, is a 1.778 cm square pitch lattice composed of 469 fuel rods. The core loading diagram is shown in Figure 3.1.2-4. The water-to-fuel volume ratio is 1.195, and the water moderator is unborated. This critical experiment was analyzed with the WPO MCNP4B2 code system. This configuration's x-y plane, x-z plane, and y-z plane cross-sectional views obtained from the MCNP plotting sequence are presented in Figures 3.1.2-5, -6, -7, respectively.

The second experiment, designated EXP23, is a 1.778 cm square pitch lattice composed of 761 fuel rods. The core loading diagram is shown in Figure 3.1.2-8. The water-to-fuel volume ratio is 1.195, and the water moderator contains 680.9 ppm of boron. This configuration's x-y plane cross-sectional view obtained from the MCNP plotting sequence is presented in Figure 3.1.2-9.

The third experiment, designated EXP24A, is a 2.210 cm square pitch lattice composed of 197 fuel rods. The core loading diagram is shown in Figure 3.1.2-10. The 1.562 cm pitch eggcrate lattice plate is used in this experiment. The fuel rods are loaded into every other lattice location to obtain the 2.210 cm pitch. The water-to-fuel volume ratio is 2.527, and the water moderator is unborated. This configuration's x-y plane cross-sectional view obtained from the MCNP plotting sequence is presented in Figure 3.1.2-11.

The fourth experiment, designated EXP25, is a 2.210 cm square pitch lattice composed of 761 fuel rods. The core loading diagram is shown in Figure 3.1.2-12. The 1.562 cm pitch eggcrate lattice plate is used in this experiment. The fuel rods are loaded into every other lattice location to obtain

INFORMATION ONLY

the 2.210 cm pitch. The water-to-fuel volume ratio is 2.527, and the water moderator contains 1090.4 ppm of boron. This configuration's x-y plane cross-sectional view obtained from the MCNP plotting sequence is presented in Figure 3.1.2-13.

The fifth experiment, designated EXP26, is a 2.515 cm square pitch lattice composed of 160 fuel rods. The core loading diagram is shown in Figure 3.1.2-14. The 1.778 cm pitch eggcrate lattice plate is used in this experiment. The fuel rods are loaded into every other lattice location to obtain the 2.515 cm pitch. The water-to-fuel volume ratio is 3.641, and the water moderator is unborated. This configuration's x-y plane cross-sectional view obtained from the MCNP plotting sequence is presented in Figure 3.1.2-15.

The sixth experiment, designated EXP27, is a 2.515 cm square pitch lattice composed of 689 fuel rods. The core loading diagram is shown in Figure 3.1.2-16. The 1.778 cm pitch eggcrate lattice plate is used in this experiment. The fuel rods are loaded into every other lattice location to obtain the 2.515 cm pitch. The water-to-fuel volume ratio is 3.641, and the water moderator contains 767.2 ppm of boron. This configuration's x-y plane cross-sectional view obtained from the MCNP plotting sequence is presented in Figure 3.1.2-17.

INFORMATION ONLY

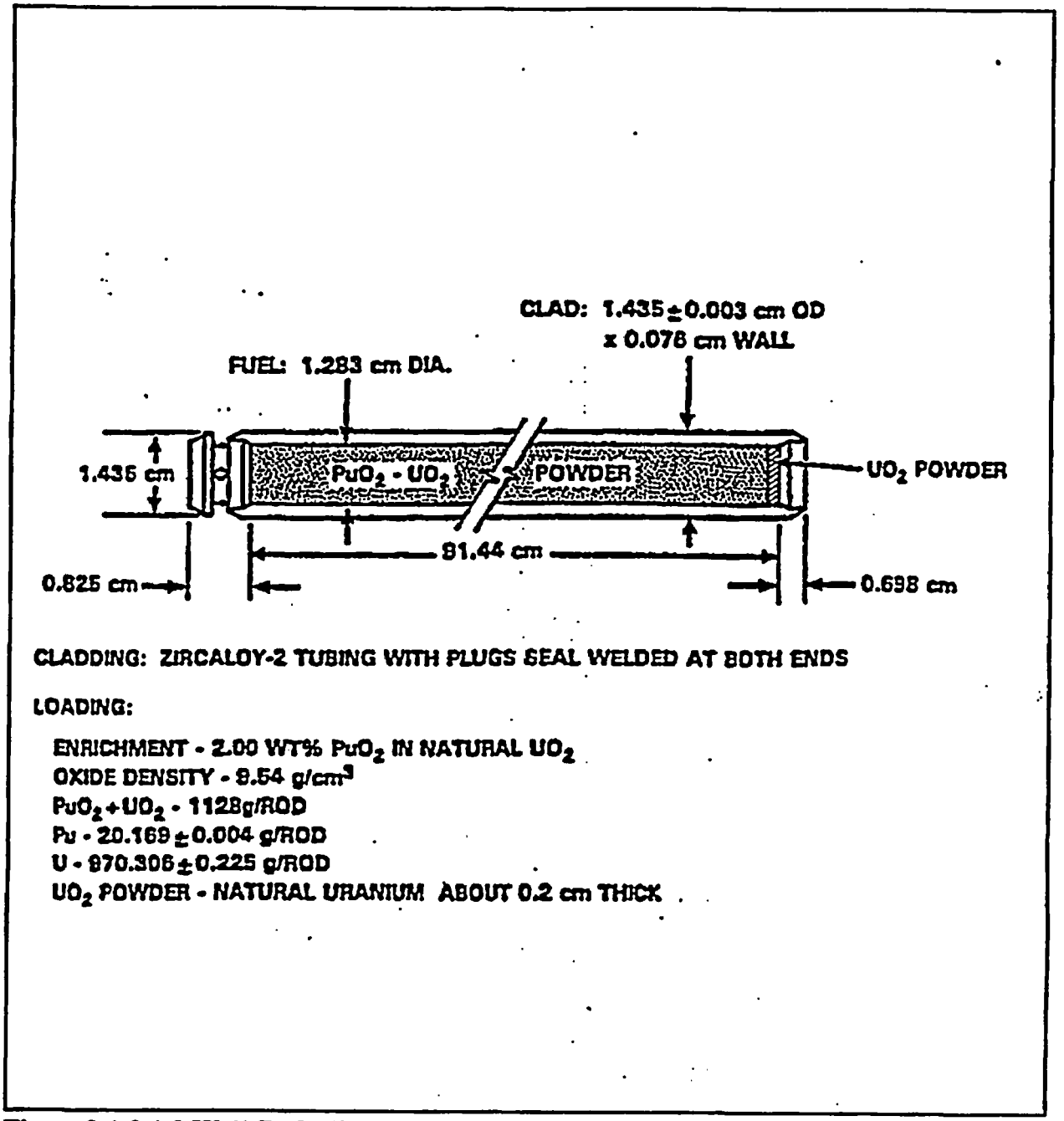


Figure 3.1.2-1 2 Wt% PuO_2 (8 Wt% Pu-240)/98 Wt% UO2 (natural) Fuel Rod

INFORMATION ONLY

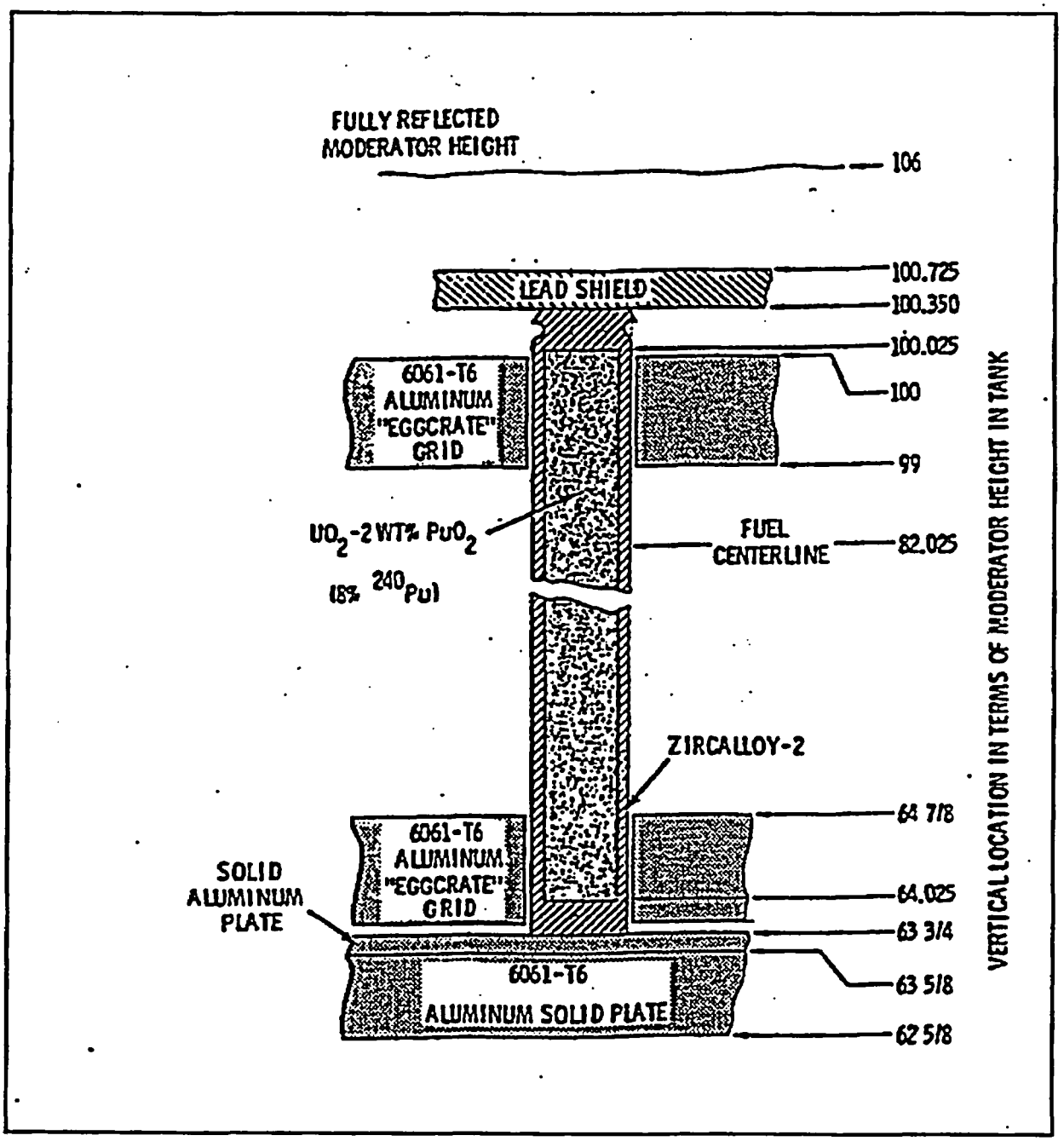
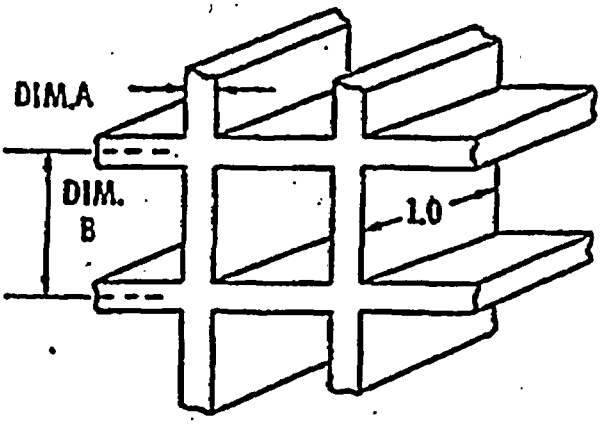


Figure 3.1.2-2 Axial View of the EPRI Mixed Oxide General Core Configuration

INFORMATION ONLY



FUEL TYPE	PITCH	GRID	DIM.A	DIM B
UO_2-2.35% ^{235}U	0.615 0.87	UPPER LOWER	0.032 0.090	0.615
UO_2-2 WT% PuO_2 (8% ^{240}Pu)	0.87	UPPER LOWER	0.032 0.032	0.615
UO_2-2 WT% PuO_2 (8% ^{240}Pu)	0.70 0.99	UPPER LOWER	0.125 0.125	0.70

Figure 3.1.2-3 Mixed Oxide Experiment Eggcrate Lattice Plate Description

INFORMATION ONLY

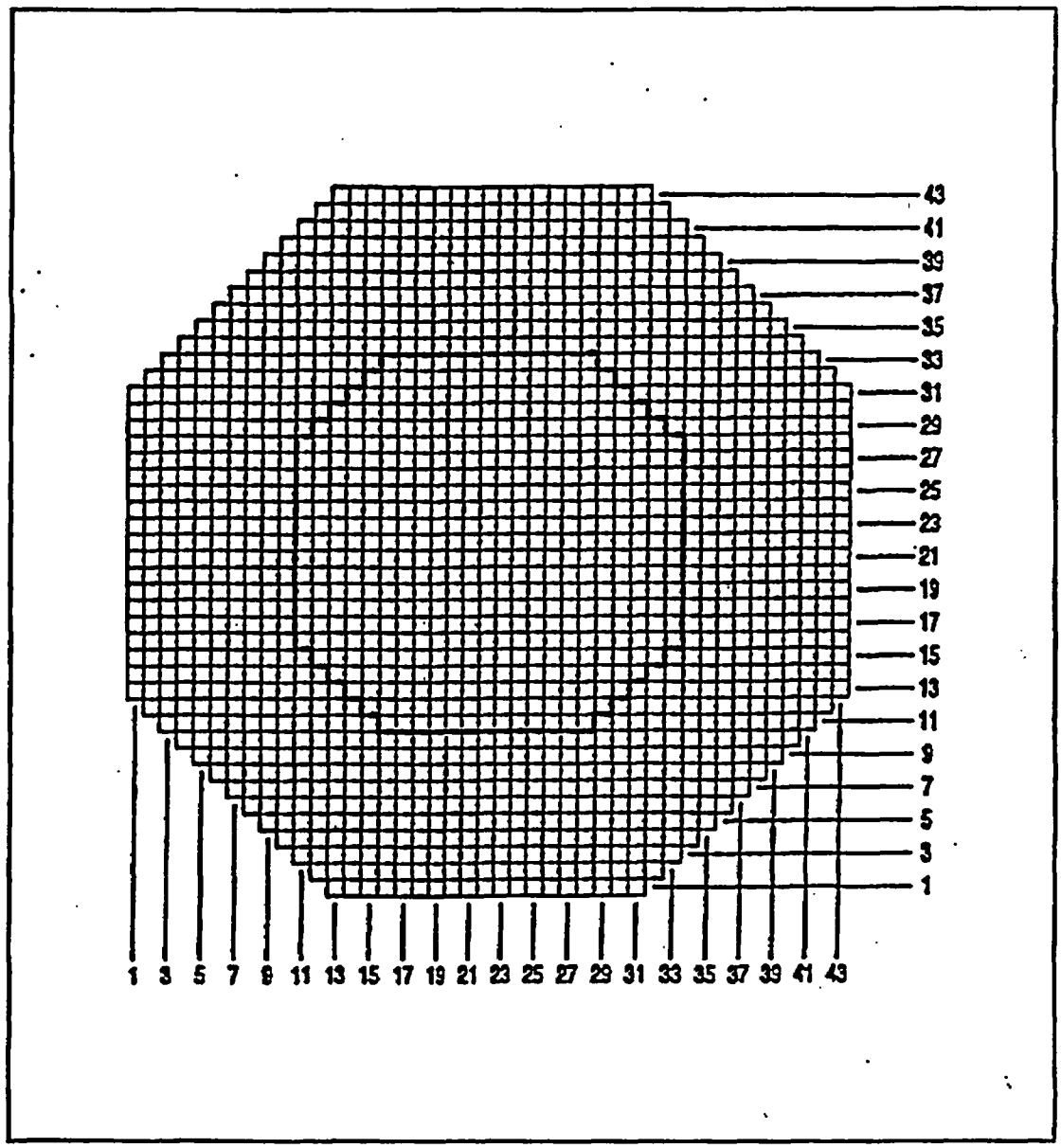


Figure 3.1.2-4 EXP22 Core Loading Description

INFORMATION ONLY

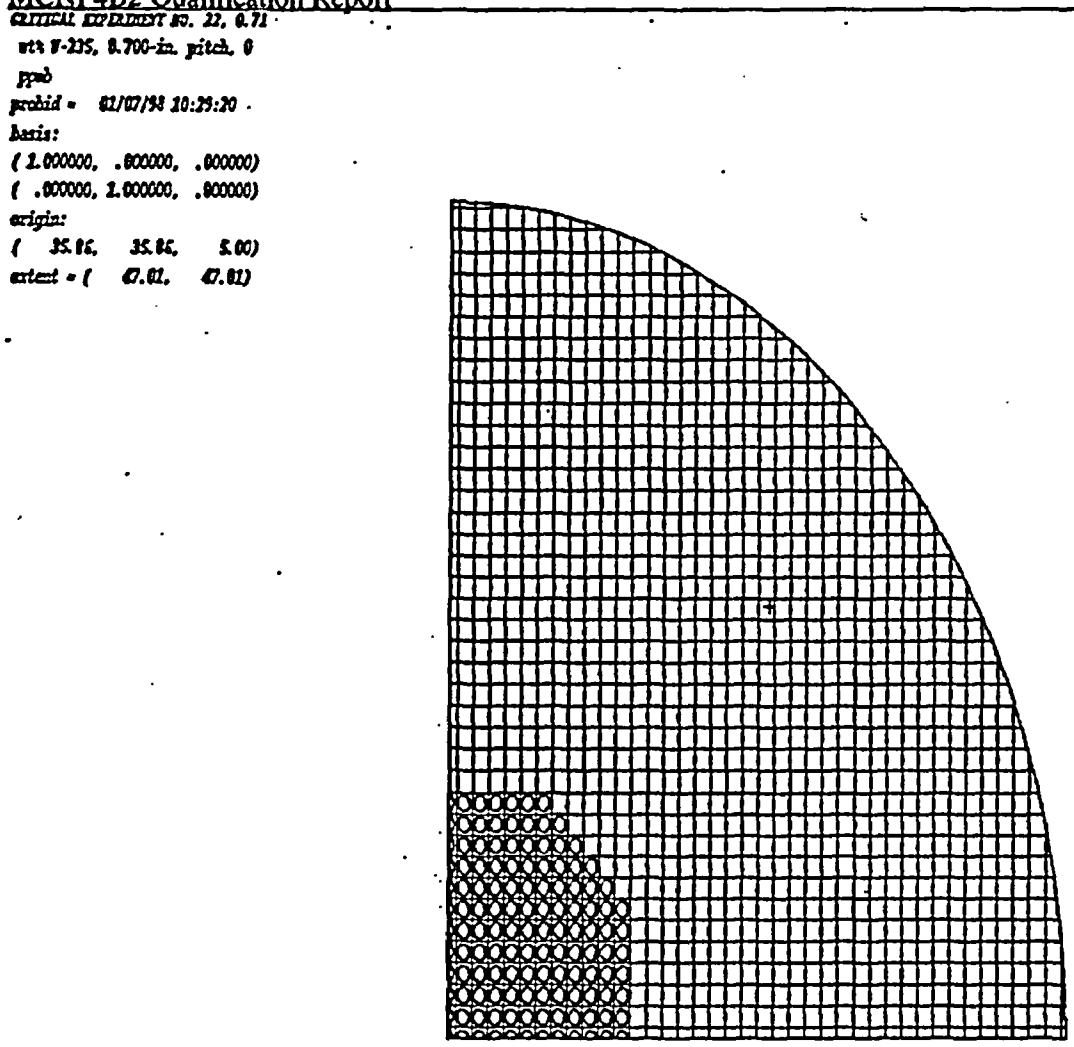


Figure 3.1.2-5 MCNP Plot: EXP22 x-y plane cross-section

INFORMATION ONLY

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ppmB
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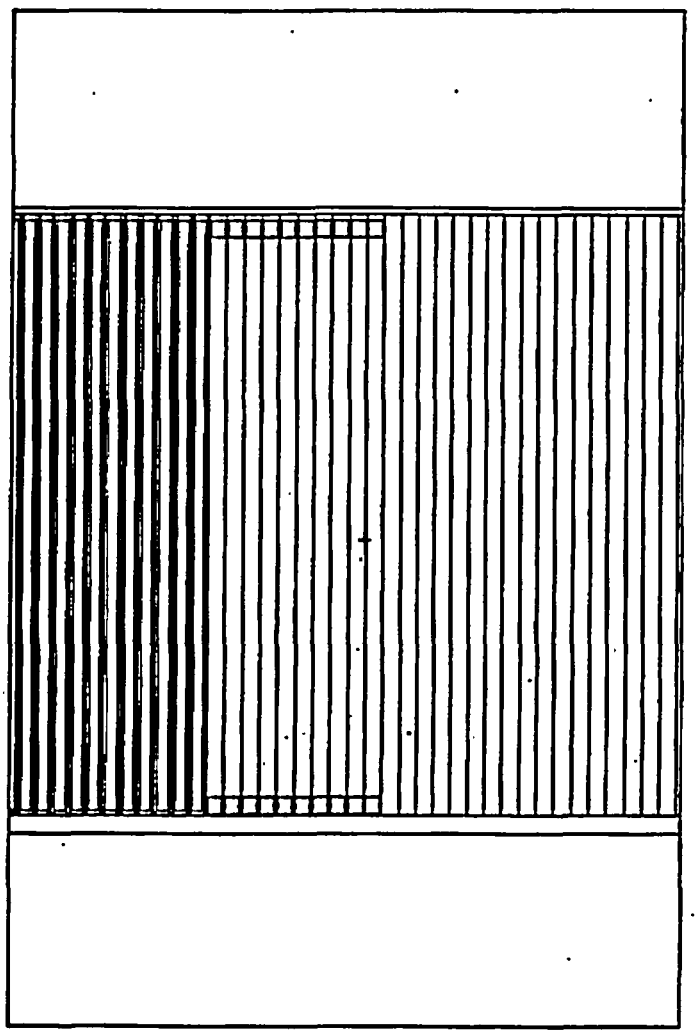

Figure 3.1.2-6 MCNP Plot: EXP22 x-z plane cross-section

INFORMATION ONLY

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ppmb
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origin:
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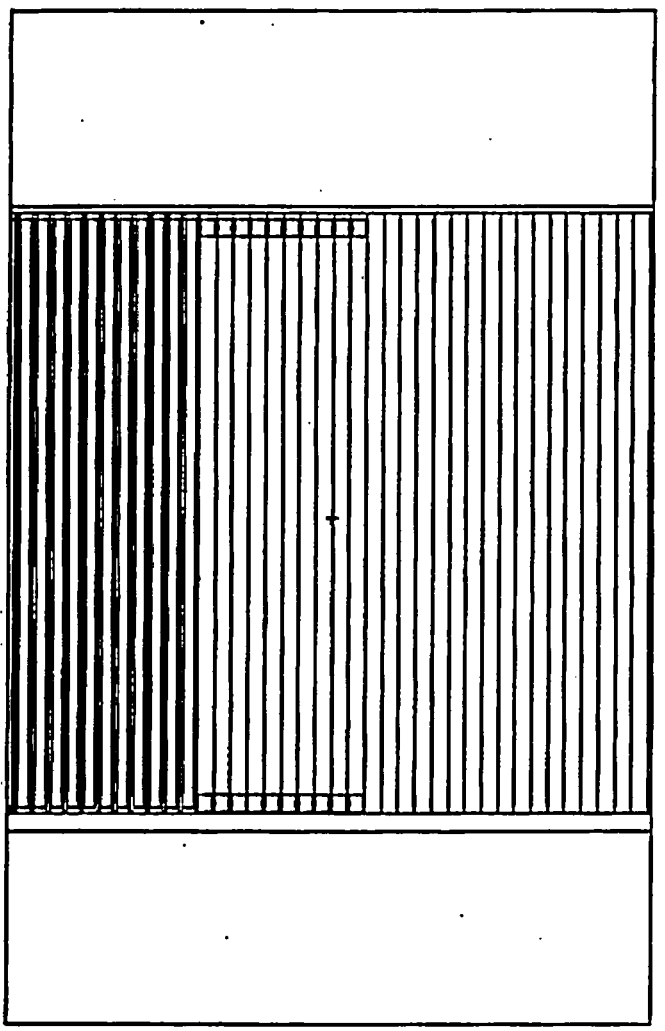

Figure 3.1.2-7 MCNP Plot: EXP22 y-z plane cross-section

INFORMATION ONLY

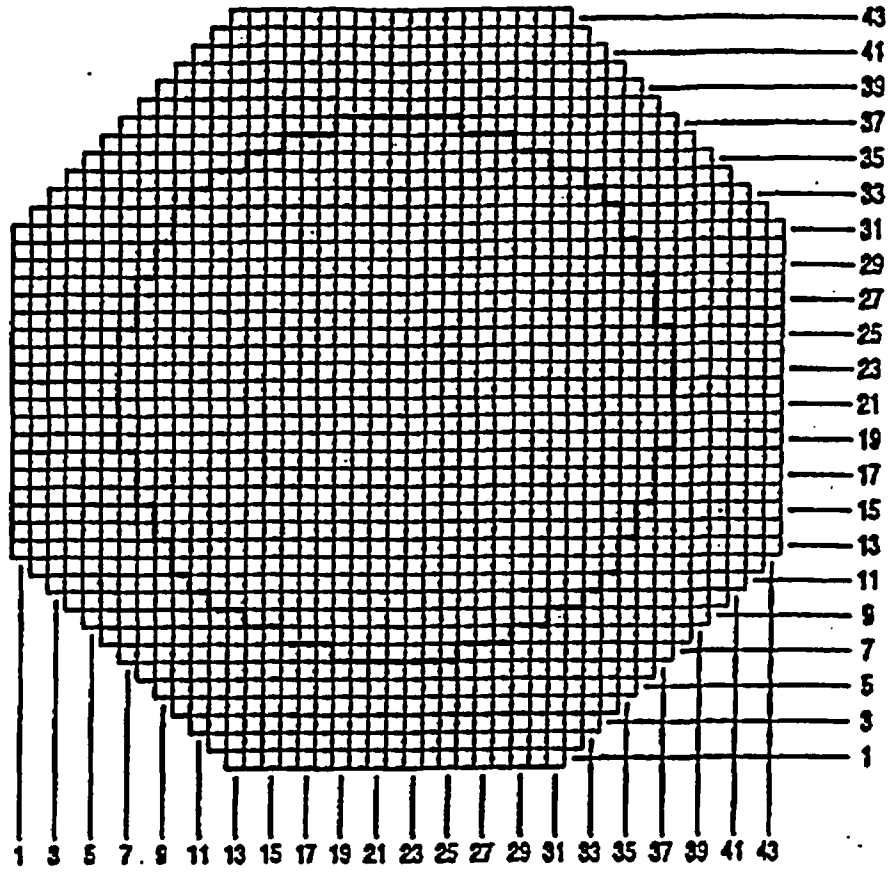

Fig. 31. EPRI 0.70-in. UO_2-2 wt % PuO_2 core, borated (from ref. 30).

Figure 3.1.2-8 EXP23 Core Loading Description

INFORMATION ONLY

01/07/98 10:39:29
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620.9 ppmb
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(.000000, 1.000000, .000000)
origin:
(35.29, 33.53, 5.00)
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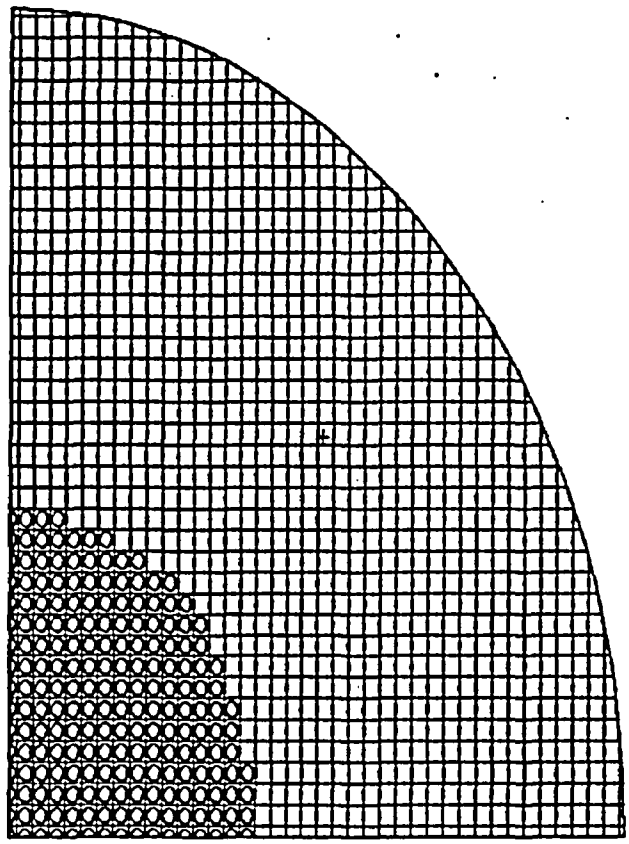

Figure 3.1.2-9 MCNP Plot: EXP23 x-y plane cross-section

INFORMATION ONLY

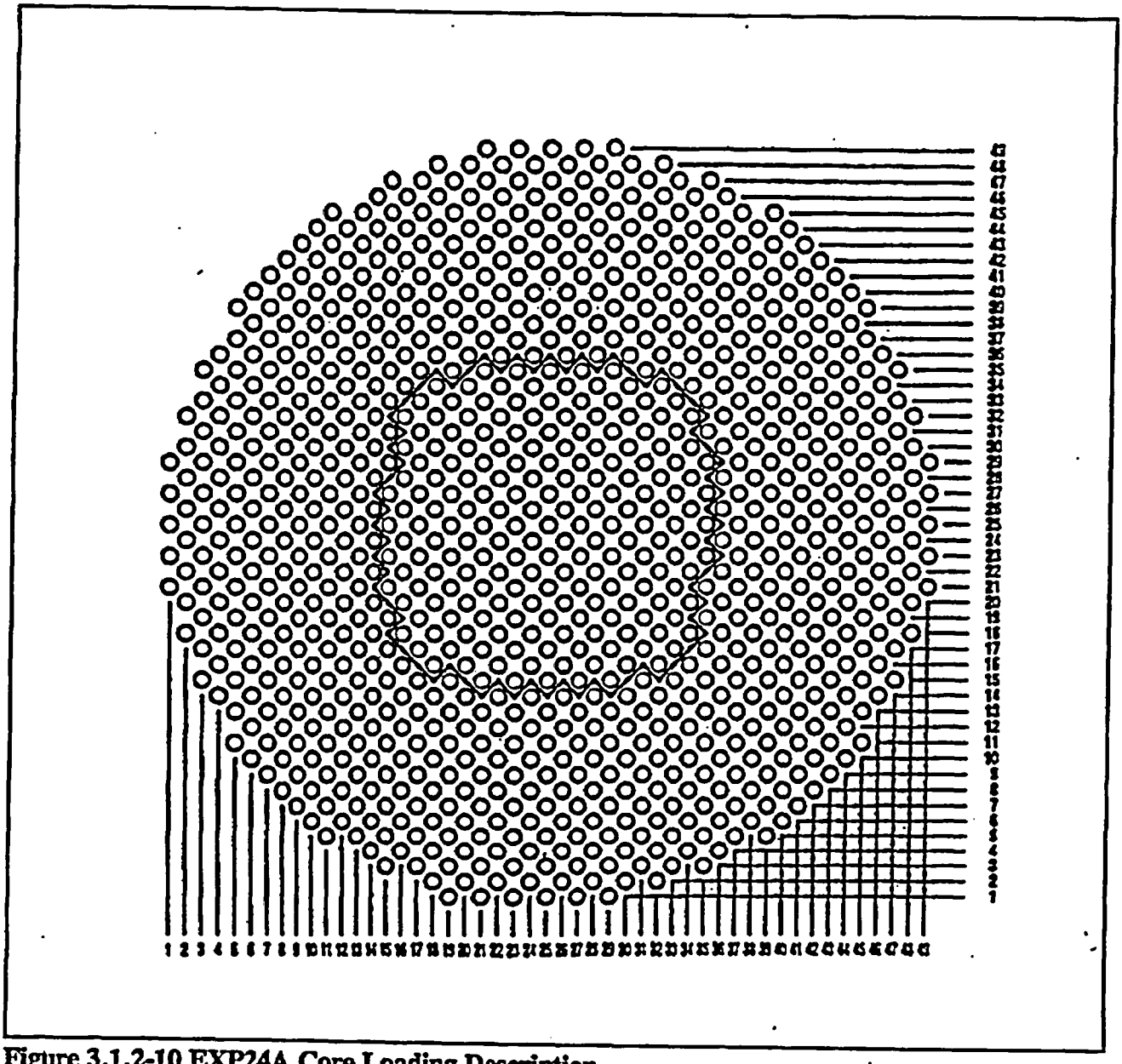

Figure 3.1.2-10 EXP24A Core Loading Description

INFORMATION ONLY

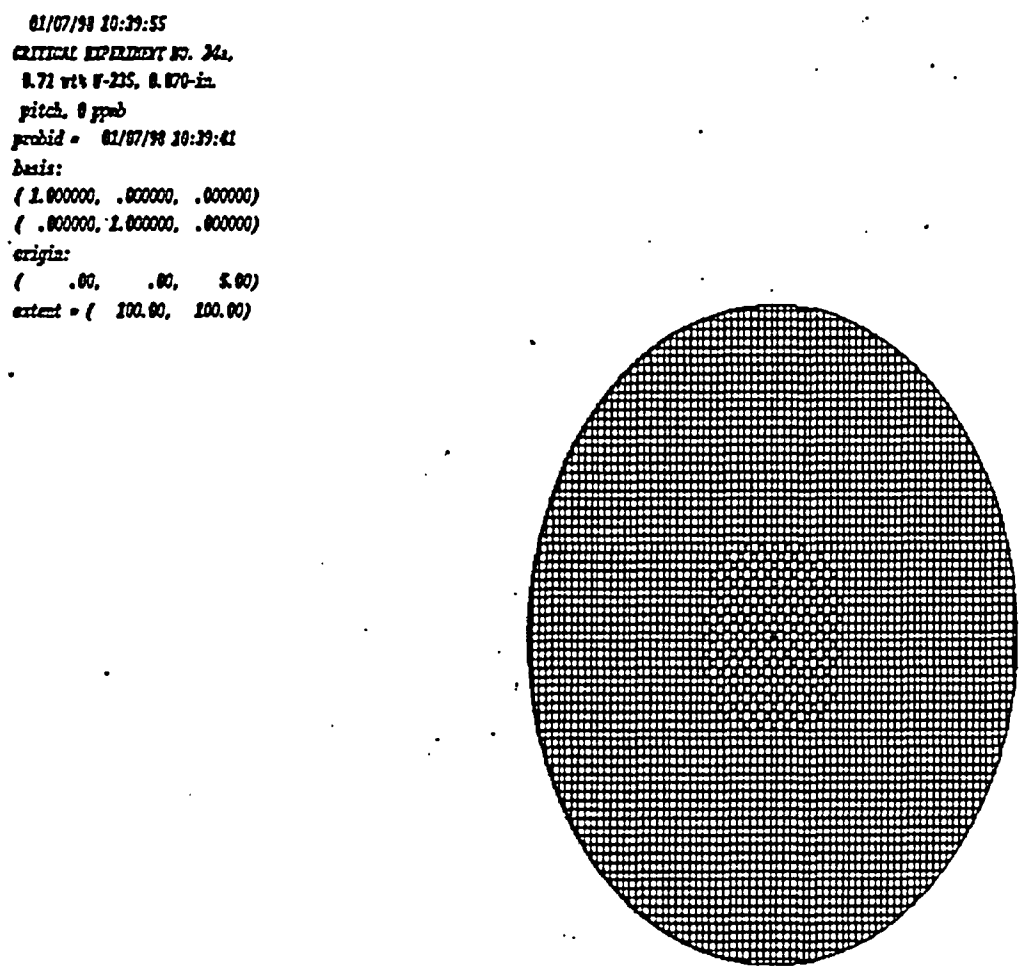

Figure 3.1.2-11 MCNP Plot: EXP24A x-y plane cross-section

INFORMATION ONLY

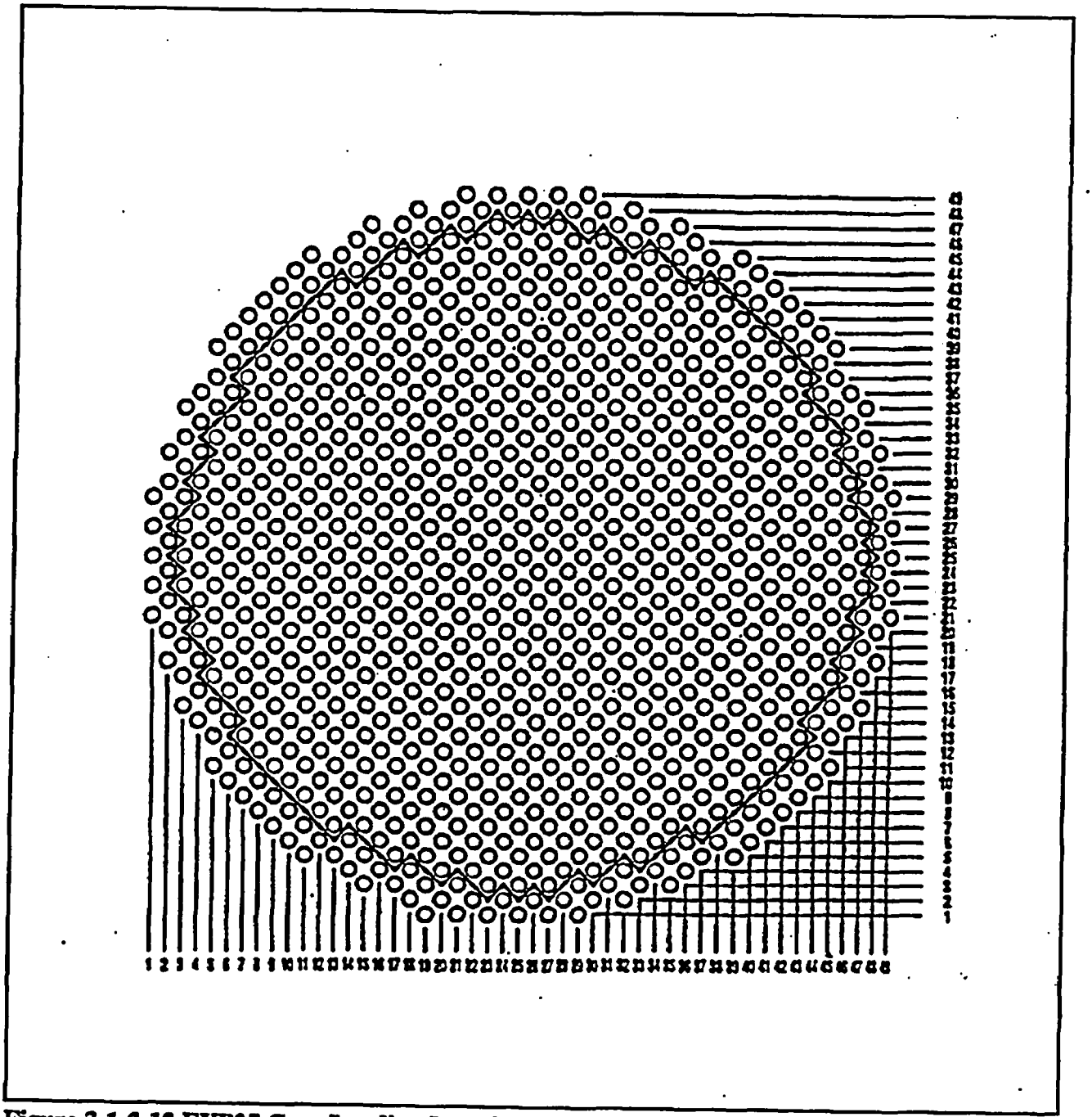

Figure 3.1.2-12 EXP25 Core Loading Description

INFORMATION ONLY

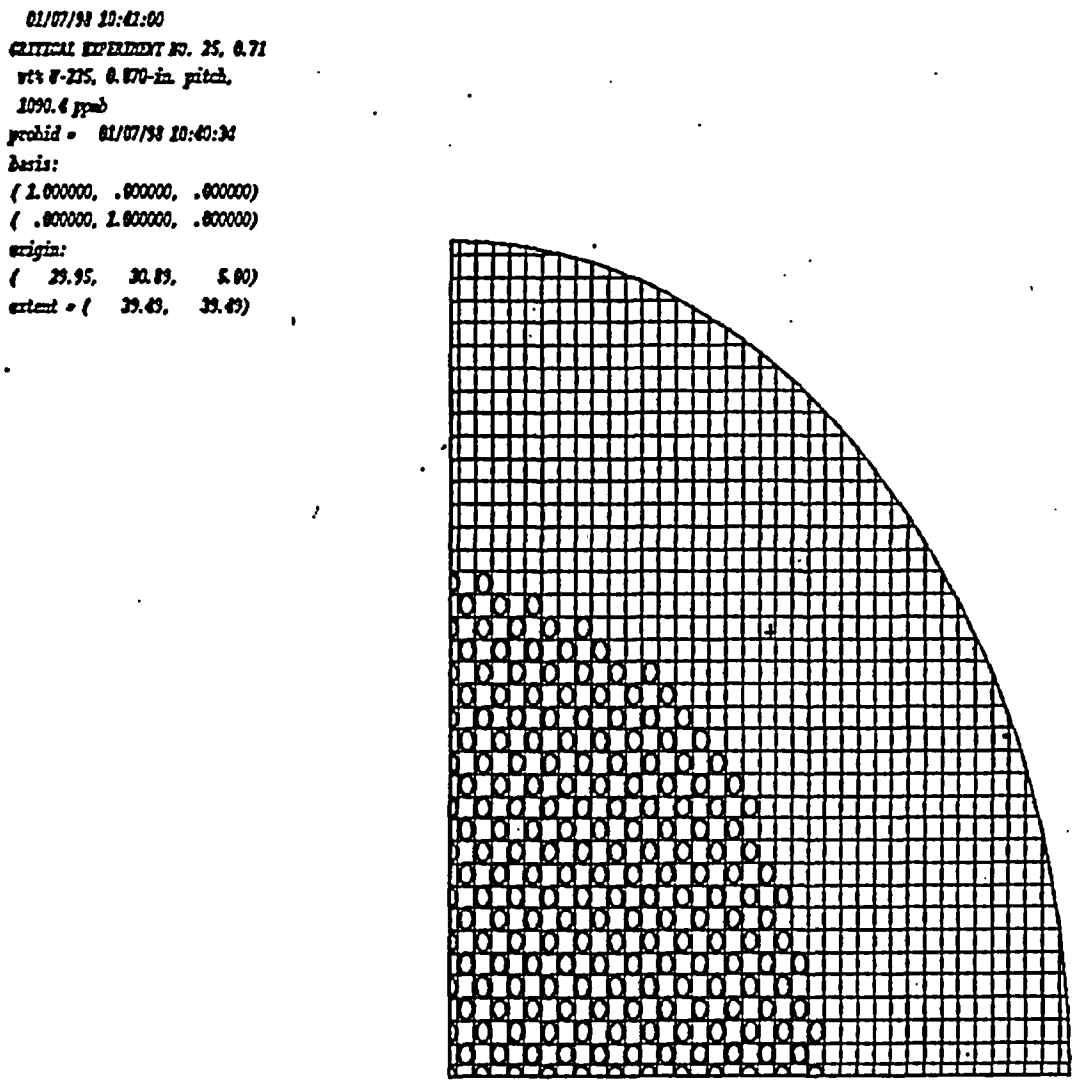

Figure 3.1.2-13 MCNP Plot: EXP25 x-y plane cross-section

INFORMATION ONLY

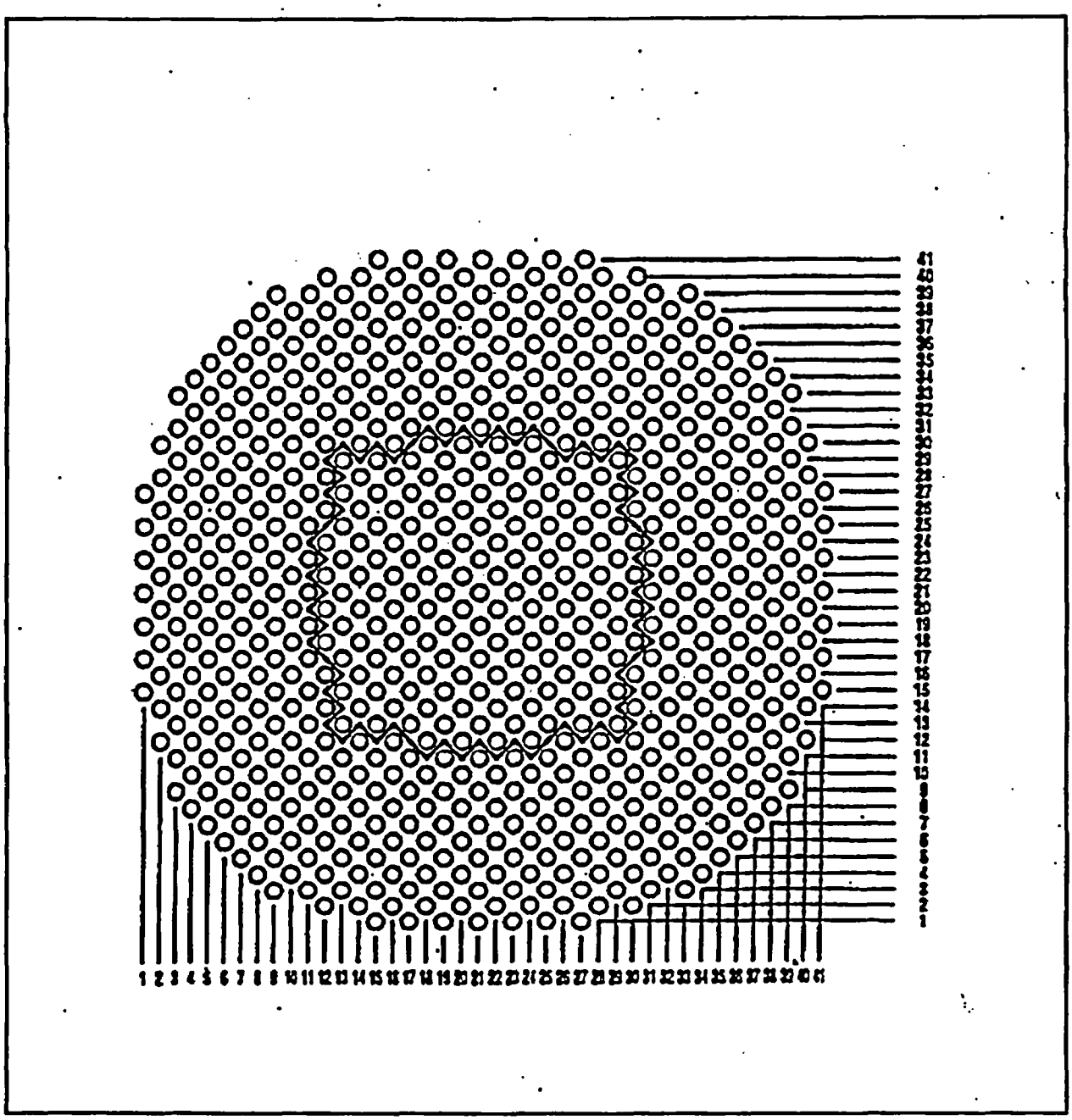

Figure 3.1.2-14 EXP26 Core Loading Description

INFORMATION ONLY

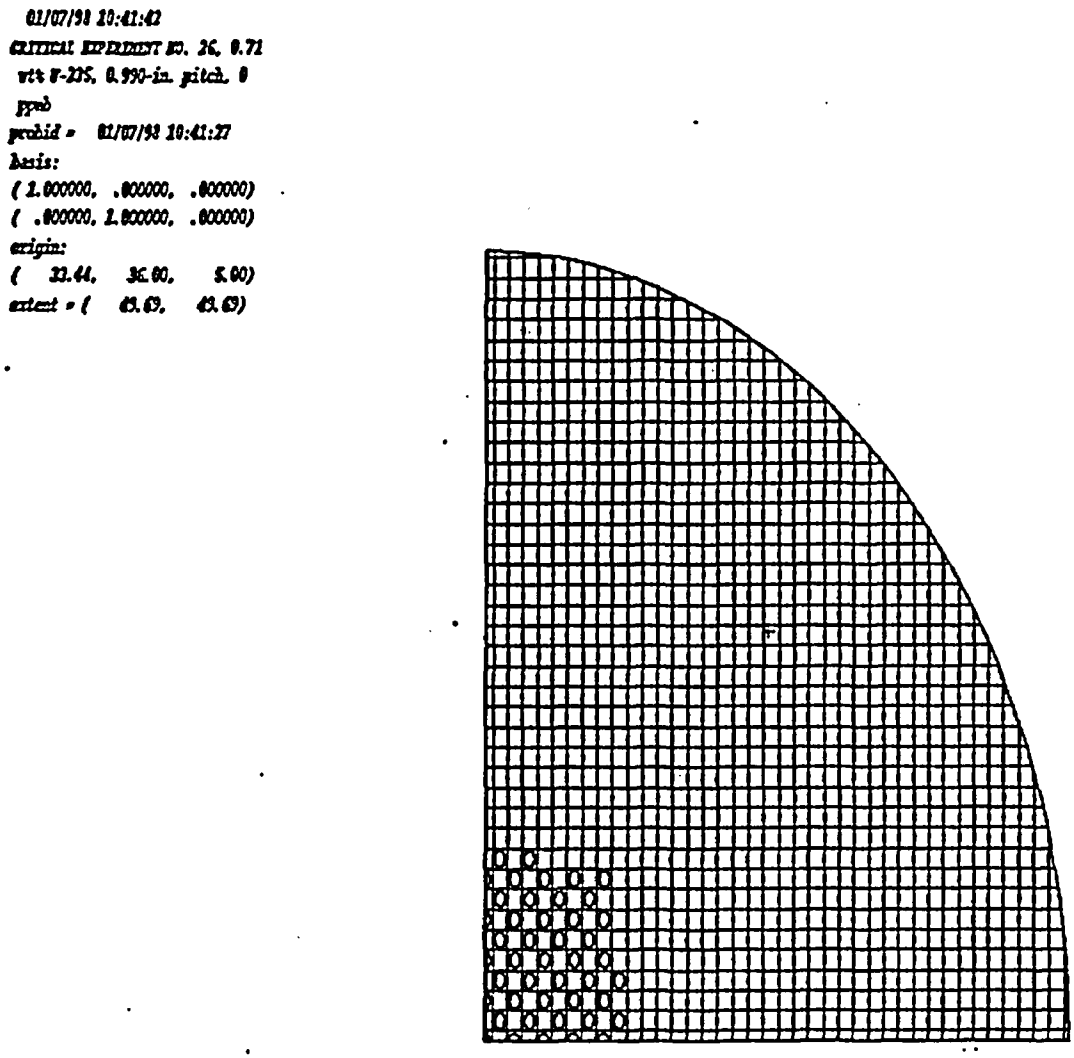

Figure 3.1.2-15 MCNP Plot: EXP26 x-y plane cross-section

INFORMATION ONLY

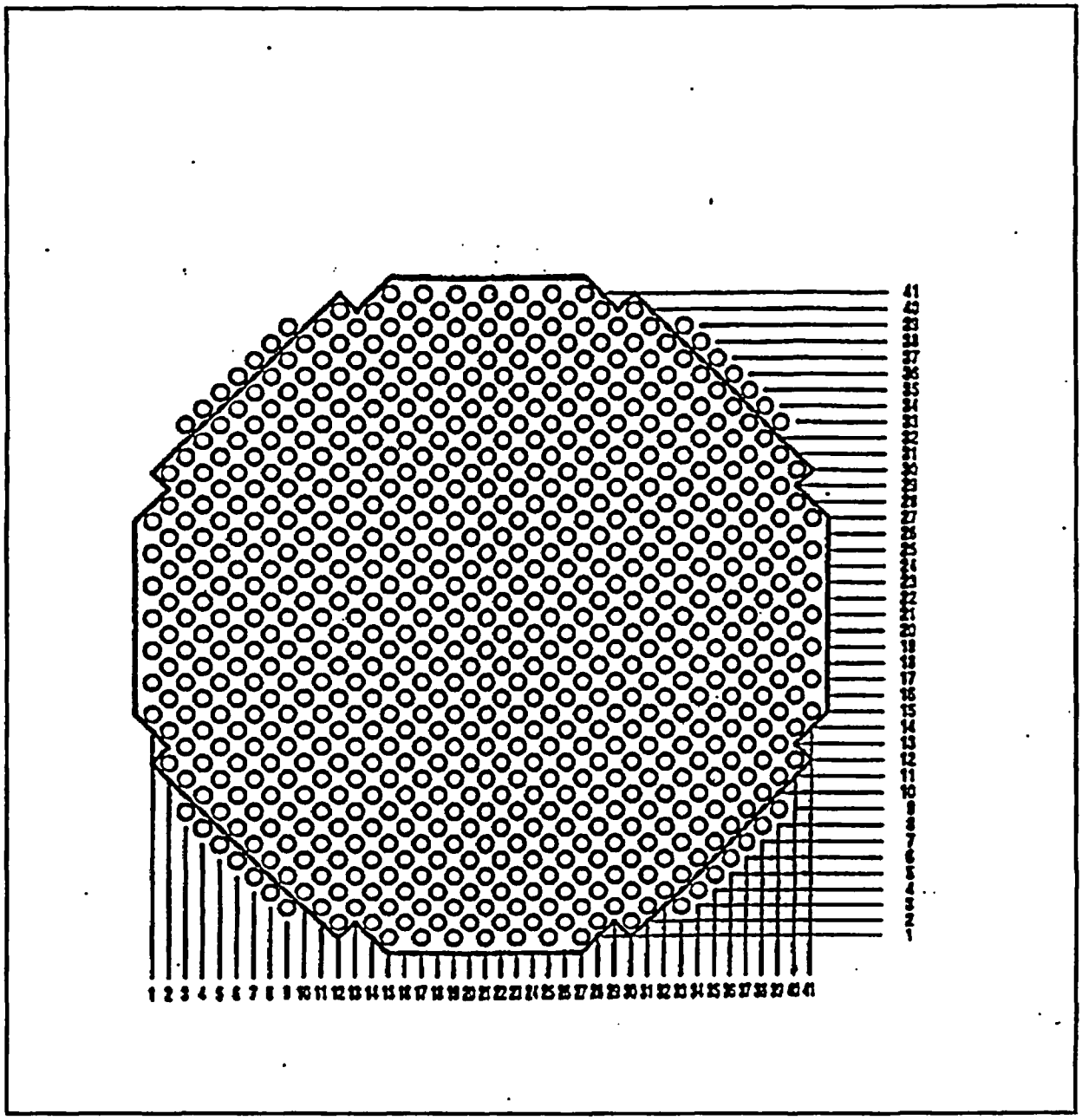

Figure 3.1.2-16 EXP27 Core Loading Description

INFORMATION ONLY

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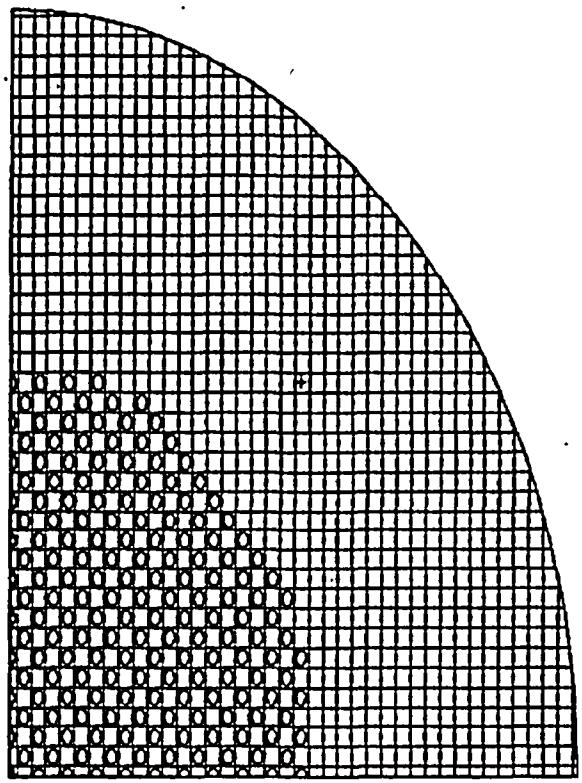

Figure 3.1.2-17 MCNP Plot: EXP27 x-y plane cross-section

INFORMATION ONLY

3.1.3 Criticality Benchmarks

Seventeen additional criticality benchmark cases briefly described in Tables 12, 13, and 14 of Reference 14 were selected for the MCNP4B2 validation.. These test cases are a subset of those listed in References 6 and 7 with input decks and provide additional validation tests to demonstrate that the code package is performing correctly on the Unix workstations and PC desktop systems over the parameter range covered by these cases. The relevant output for the 17 test cases requires numerous printed pages and is too large to include in this SQR. This output is archived in corresponding electronic medias.

3.1.4 Results of Validation for the HP 9000 and SUN Ultra-2 Workstations

The results of the validation benchmark test cases on the OPUS HP 9000/735 workstation running HP-UX 9.07 are tabulated in Table 3.1.4-1 along with the results from HP 9000/C180 series workstation running HP-UX 10.20 designated "SPUDS". Results are also provided for the same benchmark test cases run on the SUN Ultra-2 workstation to confirm correct operation. The multiplication factor results from MCNP4B2 represent the combined average of three MCNP4B2 estimated multiplication factors: collision, absorption, and track length. Differences in multiplication factors between operating systems and CPUs (HP 9000/C180 vs. HP 9000/735) for the same experiments are within 3σ statistical uncertainty. Also, the differences in multiplication factors between different brand workstations (HP vs. SUN) for the same experiments are within 3σ statistical uncertainty. The ten benchmark test cases are well established critical experiments which all have a multiplication factor of 1.000. It must be noted that input files for the problems exp22, exp23, exp24a, exp25, exp26 and exp27 had to be modified to use corrected Zr cross sections as mentioned in the 'README' file (Attachment II).

The seventeen additional criticality benchmark test cases were run on the WPO workstations as part of the validation process.. The original results obtained by LANL and the results from the rerun of these cases on the OPUS HP 9000/735 workstation, the SPUDS HP 9000/C180 workstation, and OTIS SUN Ultra-2 workstation are listed in Table 3.1.4-2. In the latest release of MCNP (version 4B2), the repeated structure source description has been changed and is not compatible with version 4A. Therefore, the benchmark problem 3 input file had to be modified. The filename for the modified case is 'prob3n'.

In addition, a subset of the benchmark cases (exp1, exp27, prob1, prob20, LA1X, LA3, godiva, and jez4.5) were run on each HP 9000 workstation (HODGE: 700667, PORTNOY: 700669, MILO: 105062, OLIVER: 700314, DALLAS: 110689, QUICHE: 110431, BOBBI: 111503, MAJOR: 115288, ZORK: 115289 and ROSEBUD: 700315) in the WPO to verify correct network installation. The results of these cases show that all similar machines give identical results.

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While most of the results fall within 2σ of the experiments, the maximum percent deviation from the experiment is observed to be approximately 3% which satisfies the acceptance criteria previously established. Based on the MCNP4B2 multiplication factor results for the benchmark test cases, the MCNP4B2 code package installed at the NFS mount point located on the QUICHE HP 9000/C160 workstation and run on any HP 9000 workstation in the WPO and the code package installed on SUN Ultra-2 workstation are determined to be operating correctly for applications involving criticality and shielding analyses supporting WPO activities.

TABLE 3.1.4-1
MCNP4B2 RESULTS (k_{eff}) FOR BENCHMARK CASES ON UNIX WORKSTATIONS

	HP9000/C180 (SPUDS)	HP9000/735 (OPUS)	SUN Ultra-2 (OTIS)
Case ID	k_{eff} (σ)	k_{eff} (σ)	k_{eff} (σ)
Exp1	1.0001 (0.0013)	0.9990 (0.0013)	1.0000 (0.0013)
Exp2	0.9993 (0.0014)	0.9995 (0.0014)	1.0017 (0.0013)
Exp3	0.9984 (0.0013)	1.0028 (0.0013)	0.9927 (0.0013)
Exp4	1.0018 (0.0013)	1.0035 (0.0013)	1.0021 (0.0013)
Exp22	0.9946 (0.0015)	0.9946 (0.0015)	0.9946 (0.0015)
Exp23	0.9973 (0.0016)	0.9987 (0.0016)	0.9987 (0.0016)
Exp24a	1.0032 (0.0015)	1.0032 (0.0015)	1.0032 (0.0015)
Exp25	1.0053 (0.0014)	1.0053 (0.0014)	1.0053 (0.0014)
Exp26	1.0091 (0.0015)	1.0091 (0.0015)	1.0091 (0.0015)
Exp27	1.0069 (0.0014)	1.0069 (0.0014)	1.0069 (0.0014)

Table 3.1.4-2 MCNP4B2 RESULTS (k_{eff}) FOR ADDITIONAL BENCHMARK CASES

	LANL Results	HP9000/C180 (SPUDS)	HP9000/735 (OPUS)	SUN Ultra-2 (OTIS)
Case ID	k_{eff} (σ)	k_{eff} (σ)	k_{eff} (σ)	k_{eff} (σ)
LA1X	0.9998 (0.0005)	0.9997 (0.0005)	0.9997 (0.0005)	0.9997 (0.0005)
LA2X	0.9900 (0.0010)	0.9908 (0.0009)	0.9908 (0.0009)	0.9908 (0.0009)
LA3	0.9992 (0.0015)	0.9992 (0.0013)	0.9992 (0.0013)	0.9992 (0.0013)
LA1X5	0.9998 (0.0005)	1.0008 (0.0004)	1.0008 (0.0004)	1.0008 (0.0004)

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	LANL Results	HP9000/C180 (SPUDS)	HP9000/735 (OPUS)	SUN Ultra-2 (OTIS)
Case ID	k_{eff} (σ)	k_{eff} (σ)	k_{eff} (σ)	k_{eff} (σ)
LA2X5	0.9900 (0.0010)	0.9885 (0.0011)	0.9885 (0.0011)	0.9885 (0.0011)
LA3X5	0.9992 (0.0015)	1.0060 (0.0014)	1.0060 (0.0014)	1.0060 (0.0014)
Godiva	0.9953 (0.0011)	0.9940 (0.0010)	0.9940 (0.0010)	0.9940 (0.0010)
Jez20	1.0097 (0.0012)	1.0073 (0.0012)	1.0073 (0.0012)	1.0073 (0.0012)
Jez4.5	1.0023 (0.0022)	1.0057 (0.0017)	1.0057 (0.0017)	1.0057 (0.0017)
Prob1	0.9936 (0.0009)	0.9951 (0.0008)	0.9951 (0.0008)	0.9951 (0.0008)
Prob3n	1.0002 (0.0011)	0.9988 (0.0011)	0.9997 (0.0010)	0.9988 (0.0011)
Prob6	0.7426 (0.0007)	0.7426 (0.0007)	0.7426 (0.0007)	0.7426 (0.0007)
Prob7	0.9954 (0.0008)	0.9951 (0.0008)	0.9951 (0.0008)	0.9951 (0.0008)
Prob12	0.9994 (0.0013)	0.9987 (0.0012)	0.9987 (0.0012)	0.9987 (0.0012)
Prob13	0.9914 (0.0008)	0.9924 (0.0008)	0.9924 (0.0008)	0.9924 (0.0008)
Prob14	0.9969 (0.0008)	0.9972 (0.0009)	0.9972 (0.0009)	0.9972 (0.0009)
Prob15	1.0003 (0.0011)	1.0005 (0.0011)	1.0005 (0.0011)	1.0005 (0.0011)
Prob16	0.9924 (0.0009)	0.9904 (0.0010)	0.9904 (0.0010)	0.9904 (0.0010)
Prob18	1.0308 (0.0013)	1.0274 (0.0013)	1.0306 (0.0013)	1.0285 (0.0013)
Prob20	0.9981 (0.0015)	0.9996 (0.0015)	0.9996 (0.0015)	0.9996 (0.0015)

3.1.5 Results of MCNP4B2 Criticality Validation Cases For PC

The validation cases for the standard sized desktop PC version of MCNP4B2 were run on the Dell PowerEdge 2000: 112110 and the validation cases for the large sized PC version on the Dell PowerEdge 2000: 112105. The results of the validation benchmark test cases on these WPO computers are tabulated in Table 3.1.5-1 together with HP 9000 workstation results for to confirm correct operation. The multiplication factor results from MCNP4B2 represent the combined average of three MCNP4B2 estimated multiplication factors: collision, absorption, and track length. Differences in multiplication factors between operating systems for the same experiments are within 3σ statistical uncertainty. The ten benchmark test cases are well established critical experiments which all have a multiplication factor of 1.000. In addition, a subset of the benchmark cases were run using the standard sized MCNP4B2 module on a set of additional PC desktop computers (Dell PowerEdge 2000: 112105, Dell Optiplx Gxi: 113132, GATEWAY2000 P5-166: 110942, GATEWAY2000 P5-166: 110831, Dell PowerEdge 2000: 112113, and GATEWAY2000 P5-166: 110837) in the WPO to verify correct installation. A subset of the benchmark cases using the large sized MCNP4B2 module were also run on the additional PC desktop computers with 64 Meg of RAM (Dell PowerEdge 2000: 112110, and Dell PowerEdge 2000: 112113) in the WPO to verify correct installation. The results of these cases show that all PC desktop machines give identical results.

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The seventeen additional criticality benchmark test cases were run on the WPO workstations as part of the validation process.. The original results obtained by LANL and the results from the rerun of these cases on the PC desktop computers Dell PowerEdge 2000: 112105 (large version) and Dell PowerEdge 2000: 112110 (standard version) are listed in Table 3.1.5-2. In addition, a subset of the benchmark cases were run using the standard sized MCNP4B2 module on a set of additional PC desktop computers (Dell PowerEdge 2000: 112105, Dell Optiplx Gxi: 113132, GATEWAY2000 P5-166: 110942, GATEWAY2000 P5-166: 110831, Dell PowerEdge 2000: 112113, and GATEWAY2000 P5-166: 110837) in the WPO to verify correct installation. A subset of the benchmark cases using the large sized MCNP4B2 module were also run on the additional PC desktop computers with 64 Meg of RAM (Dell PowerEdge 2000: 112110, and Dell PowerEdge 2000: 112113) in the WPO to verify correct installation. The results of these cases show that all PC desktop machines give identical results.

In the latest release of MCNP (version 4B2), the repeated structure source description has been changed and is not compatible with version 4A. Therefore, the benchmark problem 3 input file from the additional criticality benchmark cases had to be modified. The filename for the modified case is 'prob3n'.

Based on the MCNP4B2 multiplication factor results for the ten benchmark test cases, the MCNP4B2 code package installed on the PC desktop computers located in the WPO is determined to be operating correctly for applications involving criticality and shielding analyses supporting WPO activities.

INFORMATION ONLY

TABLE 3.1.5-1
MCNP4B2 RESULTS (k_{eff}) FOR CRITICALITY BENCHMARK CASES ON HP AND PC PLATFORMS

	HP9000/C180 (SPUDS)	HP9000/735 (OPUS)	PC desktop (Dell PowerEdge 2000: 112105)	PC desktop (Dell PowerEdge 2000: 112110)
Case ID	k_{eff} (σ)	k_{eff} (σ)	k_{eff} (σ)	k_{eff} (σ)
Exp1	1.0001 (0.0013)	0.9990 (0.0013)	0.99944 (0.00128)	0.99944 (0.00128)
Exp2	0.9993 (0.0014)	0.9995 (0.0014)	0.99982 (0.00135)	0.99982 (0.00135)
Exp3	0.9984 (0.0013)	1.0028 (0.0013)	1.00137 (0.00124)	1.00137 (0.00124)
Exp4	1.0018 (0.0013)	1.0035 (0.0013)	0.99988 (0.00129)	0.99988 (0.00129)
Exp22	0.9946 (0.0015)	0.9946 (0.0015)	0.99726 (0.00147)	0.99726 (0.00147)
Exp23	0.9973 (0.0016)	0.9987 (0.0016)	1.00062 (0.00152)	1.00062 (0.00152)
Exp24a	1.0032 (0.0015)	1.0032 (0.0015)	1.00554 (0.00150)	1.00554 (0.00150)
Exp25	1.0053 (0.0014)	1.0053 (0.0014)	1.00715 (0.00158)	1.00715 (0.00158)
Exp26	1.0091 (0.0015)	1.0091 (0.0015)	1.00821 (0.00139)	1.00821 (0.00139)
Exp27	1.0069 (0.0014)	1.0069 (0.0014)	1.01018 (0.00142)	1.01018 (0.00142)

Table 3.1.5-2 MCNP4B2 RESULTS (k_{eff}) FOR ADDITIONAL BENCHMARK CASES

	LANL Results	PC desktop (Dell PowerEdge 2000: 112105)	PC desktop (Dell PowerEdge 2000: 112110)
Case ID	k_{eff} (σ)	k_{eff} (σ)	k_{eff} (σ)
LA1X	0.9998 (0.0005)	1.0000 (0.0004)	1.0000 (0.0004)
LA2X	0.9900 (0.0010)	0.9896 (0.0011)	0.9896 (0.0011)
LA3	0.9992 (0.0015)	0.9992 (0.0013)	0.9992 (0.0013)
LA1X5	0.9998 (0.0005)	1.0008 (0.0004)	1.0008 (0.0004)
LA2X5	0.9900 (0.0010)	0.9885 (0.0011)	0.9885 (0.0011)
LA3X5	0.9992 (0.0015)	1.0060 (0.0014)	1.0060 (0.0014)
Godiva	0.9953 (0.0011)	0.9953 (0.0011)	0.9953 (0.0011)

INFORMATION ONLY

	LANL Results	PC desktop (Dell PowerEdge 2000: 112105)	PC desktop (Dell PowerEdge 2000: 112110)
Case ID	k_{eff} (σ)	k_{eff} (σ)	k_{eff} (σ)
Jez20	1.0097 (0.0012)	1.0073 (0.0012)	1.0073 (0.0012)
Jez4.5	1.0023 (0.0022)	1.0057 (0.0017)	1.0057 (0.0017)
Prob1	0.9936 (0.0009)	0.9937 (0.0009)	0.9937 (0.0009)
Prob3n	1.0002 (0.0011)	1.0004 (0.0010)	1.0004 (0.0010)
Prob6	0.7426 (0.0007)	0.7426 (0.0007)	0.7426 (0.0007)
Prob7	0.9954 (0.0008)	0.9954 (0.0008)	0.9954 (0.0008)
Prob12	0.9994 (0.0013)	0.9993 (0.0013)	0.9993 (0.0013)
Prob13	0.9914 (0.0008)	0.9914 (0.0008)	0.9914 (0.0008)
Prob14	0.9969 (0.0008)	0.9969 (0.0008)	0.9969 (0.0008)
Prob15	1.0003 (0.0011)	1.0007 (0.0011)	1.0007 (0.0011)
Prob16	0.9924 (0.0009)	0.9920 (0.0011)	0.9920 (0.0011)
Prob18	1.0308 (0.0013)	1.0300 (0.0013)	1.0300 (0.0013)
Prob20	0.9981 (0.0015)	0.9996 (0.0014)	0.9996 (0.0014)

3.2 Results Of Cross Section Installation Tests

During the original generation and testing of cross section library, results calculated using this library were compared with the results for a number of other data libraries for infinite medium simulations of all nuclides. In addition, a number of experimental benchmarks consisting of pulsed sphere experiments, iron benchmark experiments, and criticality experiments were run. The cases listed in References 6 and 7 are adequate for validating the cross section library for use with MCNP4B2. The benchmark test cases listed in Table 3.1.5-2 are a subset of those listed in References 6 and 7 and demonstrate that the validation can be extended to the HP 9000 series workstations, SUN Ultra-2 workstations and PC desktop computers. The output from these benchmark test cases (including mirrored input) is archived on electronic medias, MOY-980421-19 (MI: 30056-M03-001), MOY-980421-18 (MI: 30057-M03-001), and MOY-980421-20 (MI: 30055-M72-001).

Based on the result comparisons of these specific test cases, the operation of the MCNP4B2 code package on the SPUDS HP 9000/C180 workstation, the GATEWAY2000 P5-166 PC desktop computer, OTIS SUN Ultra-2 workstation and any other HP 9000 series workstation or DOS based PC desktop computer located at the WPO where MCNP4B2 is installed was determined to be satisfactory for criticality analysis. No limitations on the use of the cross section library with MCNP4B are noted.

INFORMATION ONLY

3.3 MCNP4B2 Shielding Validation Tests

In order to investigate the applicability of MCNP Monte Carlo code to address waste package shielding concerns several experimental simple benchmark problems and an experimental benchmark cask problem are modeled by using the MCNP version 4B2 code installed on Waste Package Operations workstations and desktop PCs. Since it was already shown that HP workstations with same operating system version give identical results, the problems are run on machines that are representative of their class; namely, SPUDS, an HP Unix workstation running HP-UX V10.20 (CRWMS M&O #111504), opus, an HP Unix workstation running HP-UX V9.07 (CRWMS M&O #102878), otis, a SUN ULTRA-2 Unix workstation running SOLARIS 2.6 (CRWMS M&O #115491), and a PC desktop computer with Pentium processor (Dell OptiPlex Gxi, CRWMS M&O #113132). The acceptance criteria for shielding validation problems requires the ratio of calculated dose to measured dose to be greater than or equal to 0.95.

3.3.1 Simple Benchmark Problems

Several experimental benchmarks were performed by Ueki and Ohashi (Ref. 12) to help validate shielding computational tools. These experiments were used to validate several computer codes by Broadhead, et al. (Ref. 13). The experiments involved many different shield materials such as iron, graphite and polyethylene which are commonly used in the industry. The experimental set-up is shown in Figure 3.3.1-1. The neutron benchmarks used a Cf-252 neutron source whereas the photon benchmarks used a Co-60 gamma-ray source. Both types of measurements were performed with the same experimental configuration. The distance between the source and the back of the shield was 90 cm for neutron benchmark problems and 70 cm for photon benchmark problems. For photon benchmarks the detector was enclosed in a 5 cm lead sleeve. Also, the effect of shield thickness is examined by varying the thickness of the shield material.

The MCNP neutron calculations were performed with the cross sections in the RMCCS2 library and Cf-252 neutron spectrum as the source spectrum. The MCNP photon calculations were performed with MCPLIB2 cross sections and Co-60 source with gamma energies of 1.17 and 1.33 MeV. The results were renormalized to the total source strength to obtain the final dose rate. Note that percent standard deviation is defined as $(\sigma/R)*100$ where R is the dose rate per source particle per second. This can be interpreted as percent relative error.

3.3.2 Results of Simple Benchmark Problems

The source strengths of the neutron sources (Cf-252) used in the experiments were 1.62E+07, 1.50E+07, and 6.28E+07 neutrons per second for graphite, iron, and polyethylene, respectively. The

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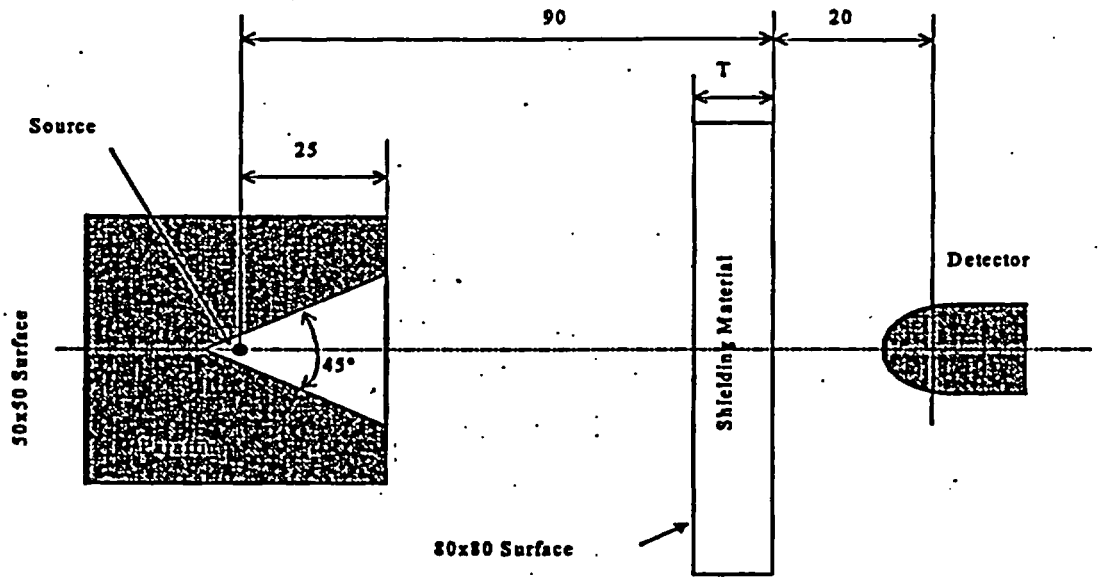

Figure 3.3.1-1 Schematic of Source, Shield and Detector ("T" is the thickness of the shield).

source strength for the gamma source was 40 mCi (Co-60). Since the results reported in the mcnp output are per source particle, the final result is obtained by multiplying the dose rate by the corresponding source strength.

The neutron results from the workstations spuds, opus and otis are all identical and given in Tables 3.3.1-1 through 3.3.1-3. The results from the PC are given in Tables 3.3.1-4 through 3.3.1-6. The results show good agreement between the experiments and mcnp calculations. For graphite and iron slabs, mcnp results are within 15%. For polyethylene, the differences between the experiments and calculations are as high as 50%.

Table 3.3.1-1. Comparison of Neutron Dose Rates from Workstations for Graphite Slabs

Case Name	Shield Thickness (cm)	Experiment*	Calculated*	% Standard Deviation	Calculated/ Experiment
ueki.1	0	176.2	202.6	1	1.15
ueki.2	5	131.3	143.81	3	1.10
ueki.3	15	66.4	69.70	5	1.05
ueki.4	25	30.8	31.90	4	1.04
ueki.5	35	13.5	15.46	3	1.14

INFORMATION ONLY

*Dose equivalent rate (μSv/h)

Table 3.3.1-2. Comparison of Neutron Dose Rates from Workstations for Iron Slabs

Case Name	Shield Thickness (cm)	Experiment*	Calculated*	% Standard Deviation	Calculated/ Experiment
ueki.11	0	165.3	185.96	1	1.12
ueki.12	5	118.2	129.59	5	1.10
ueki.13	15	62.5	65.29	6	1.04
ueki.14	25	34.6	35.60	4	1.03
ueki.15	35	19.0	18.16	3	0.96

*Dose equivalent rate (μSv/h)

Table 3.3.1-3. Comparison of Neutron Dose Rates from Workstations for Polyethylene Slabs

Case Name	Shield Thickness (cm)	Experiment*	Calculated*	% Standard Deviation	Calculated/ Experiment
ueki.31	0	683.0	774.50	1	1.13
ueki.32	5	288.0	370.18	7	1.29
ueki.33	15	42.6	57.77	9	1.36
ueki.34	25	8.3	12.25	11	1.48
ueki.35	35	2.25	3.28	10	1.46

*Dose equivalent rate (μSv/h)

Table 3.3.1-4. Comparison of Neutron Dose Rates from PC for Graphite Slabs

Case Name	Shield Thickness (cm)	Experiment*	Calculated*	% Standard Deviation	Calculated/ Experiment
ueki.1	0	176.2	202.6	1	1.15
ueki.2	5	131.3	143.81	3	1.10
ueki.3	15	66.4	69.70	5	1.05
ueki.4	25	30.8	31.90	4	1.04
ueki.5	35	13.5	15.51	3	1.15

*Dose equivalent rate (μSv/h)

INFORMATION ONLY

Table 3.3.1-5. Comparison of Neutron Dose Rates from PC for Iron Slabs

Case Name	Shield Thickness (cm)	Experiment*	Calculated*	% Standard Deviation	Calculated/ Experiment
ueki.11	0	165.3	185.96	1	1.12
ueki.12	5	118.2	129.59	5	1.10
ueki.13	15	62.5	65.26	6	1.04
ueki.14	25	34.6	35.60	4	1.03
ueki.15	35	19.0	18.31	3	0.96

*Dose equivalent rate (μSv/h)

Table 3.3.1-6. Comparison of Neutron Dose Rates from PC for Polyethylene Slabs

Case Name	Shield Thickness (cm)	Experiment*	Calculated*	% Standard Deviation	Calculated/ Experiment
ueki.31	0	683.0	774.50	1	1.13
ueki.32	5	288.0	370.18	7	1.29
ueki.33	15	42.6	57.77	9	1.36
ueki.34	25	8.3	12.25	11	1.48
ueki.35	35	2.25	3.25	10	1.44

*Dose equivalent rate (μSv/h)

The gamma dose rate results from the workstations spuds, opus and otis are all also identical and given in Table 3.3.1-7. The results from PC are given in Table 3.3.1-8. The results show very good agreement between the experiments and mcnp calculations for iron shield thicknesses up to 20 cm. For 25 and 30 cm thick iron shields, the attenuation of photons is approximately four orders of magnitude. It appears that the photon intensity is low enough for the floor and room scatter effects to be important. Therefore, in order to better assess the room scatter effects for thick iron shields, the 25 and 30 cm cases need to be reevaluated. However, due to insufficient information about the physical dimensions and properties of the detector and surrounding Pb sheath, the assessment of the roomscatter effects will not be performed.

Table 3.3.1-7. Comparison of Gamma Dose Rates for Iron Slabs from Workstations

Case Name	Shield Thickness (cm)	Experiment*	Calculated*	% Standard Deviation	Calculated/ Experiment
ueki.21	0	1022.0	1022.85	1	1.00
ueki.22	5	255.0	275.36	2	1.08
ueki.24	15	9.62	10.33	3	1.07

INFORMATION ONLY

Case Name	Shield Thickness (cm)	Experiment*	Calculated*	% Standard Deviation	Calculated/ Experiment
ueki.25	20	1.67	1.71	3	1.02
ueki.26	25	0.34	0.28	3	0.83
ueki.27	30	0.12	0.05	4	0.42

*Dose equivalent rate (μSv/h)

Table 3.3.1-8. Comparison of Gamma Dose Rates for Iron Slabs from PC

Case Name	Shield Thickness (cm)	Experiment*	Calculated*	% Standard Deviation	Calculated/ Experiment
ueki.21	0	1022.0	1022.85	1	1.00
ueki.22	5	255.0	275.36	2	1.08
ueki.24	15	9.62	10.33	3	1.07
ueki.25	20	1.67	1.71	3	1.02
ueki.26	25	0.34	0.28	3	0.83
ueki.27	30	0.12	0.05	4	0.42

*Dose equivalent rate (μSv/h)

3.3.3 Multidimensional Cask Benchmark

The cask analyzed in this report is the Westinghouse MC-10 low-alloy, forged-steel storage cask with 24 PWR 15x15 spent fuel assemblies. The cask is 2.7 m in diameter and 4.8 m in height. It weighs approximately 110 tons after being loaded with PWR spent fuel assemblies. A layer of BISCO NS-3TM around the cask is used as the neutron shield. Vertical carbon steel fins pass through the neutron shield to increase cooling of the cask. The fuel basket inside the cask is made of aluminum, and each basket location contains a stainless steel enclosure and neutron poison for criticality control. The cask is closed with two lids and a seal cover which has elastomer and metallic O-rings. The horizontal and vertical cross sections of the cask are shown in Figures 3.3.3-1 and 3.3.3-2, respectively.

INFORMATION ONLY

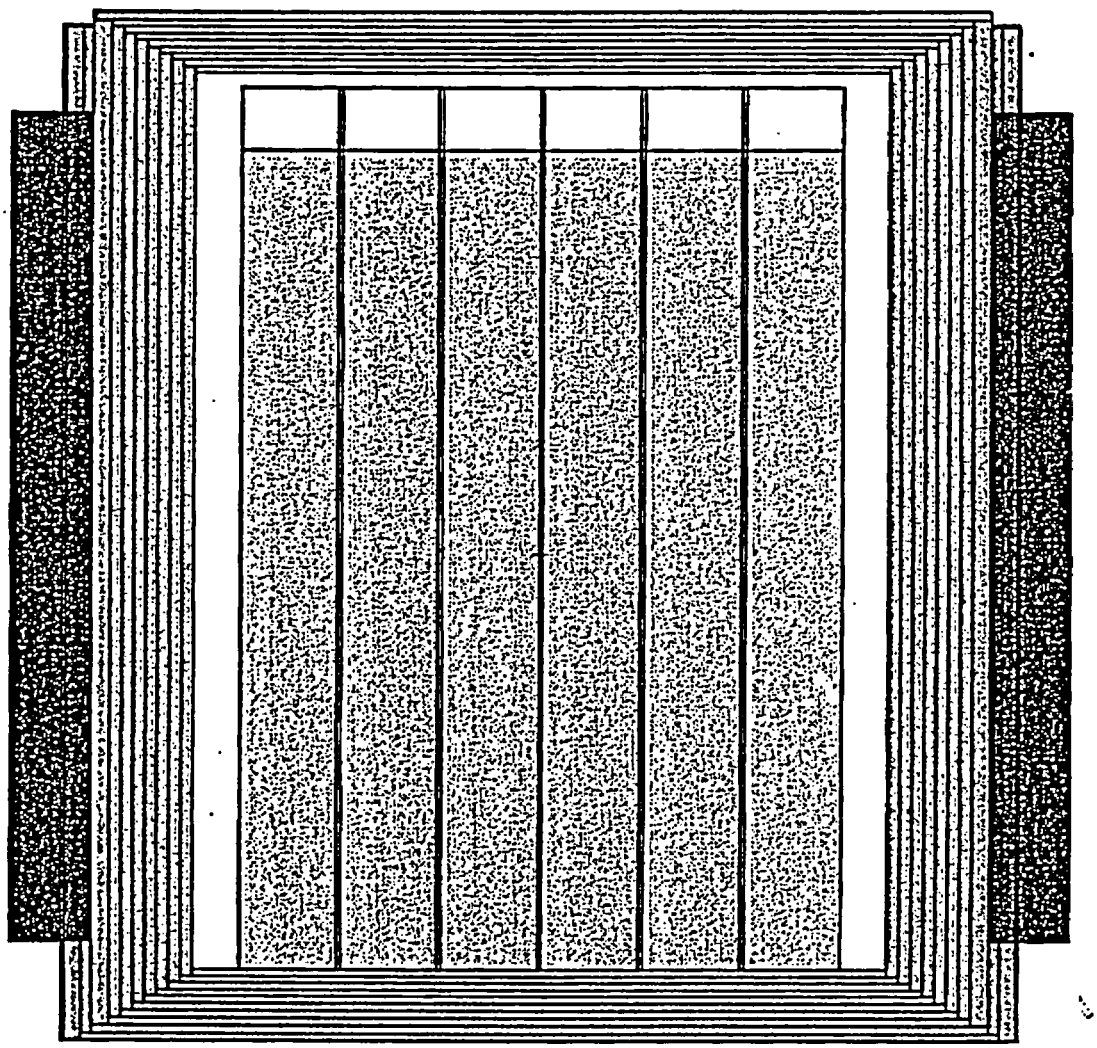

Figure 3.3.3-1 MC-10 Storage Cask Vertical Cross Section

INFORMATION ONLY

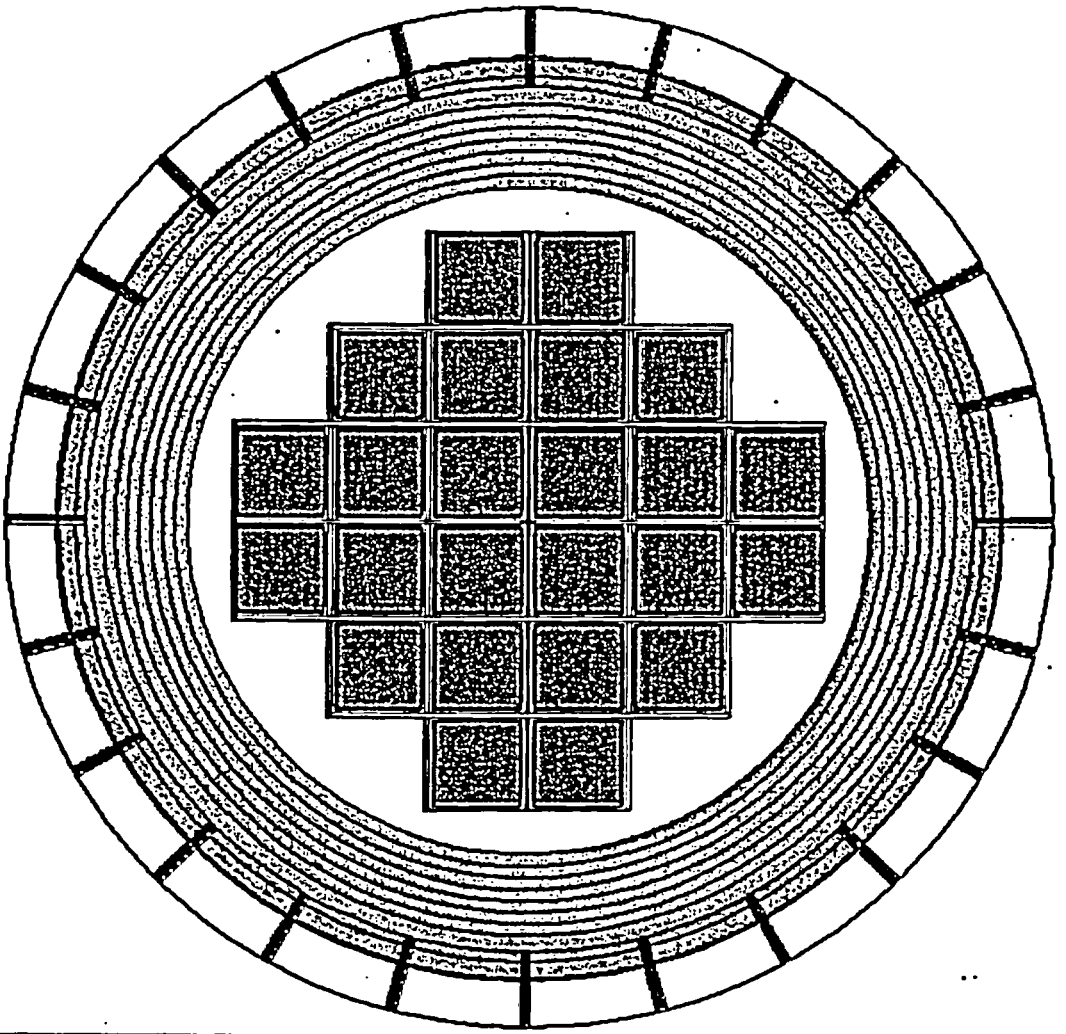

Figure 3.3.3-2 MC-10 Storage Cask Horizontal Cross Section

INFORMATION ONLY

3.3.4 Multidimensional Cask Benchmark Results

The comparison of surface averaged dose rates for the MC-10 cask are given in Table 3.3.4-1. Note that all workstations calculated identical results. The results show that mcnp conservatively overestimates the average surface dose rate by 65%. The over prediction is mostly due to an overestimate of initial Co-59 impurity level. Therefore, with the limitation that initial impurity levels are known, these results substantiate confidence in the code.

Table 3.3.4-1. Comparison of Gamma Dose Rates for MC-10 Cask

Case Name	Machine	Experiment (mrem/h)	Calculated (mrem/h)	% Standard Deviation	Calculated/ Experiment
mc10new	workstations	21.4	35.40	3	1.65
mc10new	PC	21.4	35.32	3	1.65

3.4 Conclusions of MCNP4B2 Shielding Validation Tests

Since the simple benchmark experiments are very simple in nature they can be modeled with virtually all two or three dimensional shielding codes that are being used today. The simplicity also makes it possible to model the actual physical setting without any approximations for the geometry. These benchmarks serve as a valuable source for determination of attenuation effects of iron, graphite and polyethylene for neutral particle transport. Although the MC-10 storage cask is not simple in geometry, it can be modeled with mcnp. Since the storage cask is similar to the waste packages that are being designed by WPO, the benchmark proves to be a good source for validation efforts.

As a result of calculations performed with MCNP Version 4B2 which was installed on WPO workstations and PC's, it is concluded that the code can be used for shielding analyses of the waste packages and/or other configurations of radioactive materials that can be encountered during nuclear waste disposal. The results show that MCNP usually over predicts the dose rates by as much as 65%. All ratios of calculated dose to measured dose are greater than or equal to 0.95 which satisfies the acceptance criteria established in Section 3.3.

It is also concluded that the code should not be used for thick iron shields (25 cm or greater) with comparable source strength (40 mCi) for which roomscatter effects can be significant. Note that for higher source strengths (e.g., greater than 4 Ci) the roomscatter effects would be negligible even for 30 cm thick iron shield. Therefore, the code can still be used for thick iron shields (25 cm or greater) if the source strength is shown to be high enough for the roomscatter effects to be negligible.

INFORMATION ONLY

4.0 RECOMMENDATIONS

The installation of the MCNP4B2 code package with associated cross section libraries was reviewed and found to have been accomplished according to the instructions provided by the developer. The test cases required for installation verification and code validation have been executed and found to satisfy the acceptance criterion for numerical results. Additional benchmark test cases have been successfully run to validate the proper operation of MCNP4B2. Thus, the MCNP4B2 code package installation was shown to be satisfactory and complete in all aspects. All elements of the software pertaining to the criticality due to neutrons and to the shielding due to neutrons and photons are included in the validation. Sections not included in the validation are the sections that involve charged particle transport.

Based upon the sufficient fulfillment of installation requirements as set forth by the developer, and the acceptance of the MCNP4B2 code by the NRC, it is recommended that the MCNP4B2 code be approved for use in criticality and shielding analyses of nuclear systems, including but not limited to spent nuclear fuel and other fissile material systems.

As noted above in Sections 3.1.3 and 3.4 for the Unix workstations, this validation document pertains to the HP 9000/735, HP 9000/C160, HP 9000/C180 workstations using the Unix operating systems V9.07 and V10.20, and SUN Ultra-2 workstation using the Unix operating system Solaris 2.6. The HP 9000 workstations (C180's, C160s and 735s) are connected to the QUICHE MCNP4B2 code package installation via a NFS mount. Numerous benchmark test cases have been run on all Unix workstations in this configuration at the WPO and results have been sufficiently similar for this validation document. For the PC version, this validation document pertains to the PC platforms using the MS-DOS running under WINDOWS 95 operating system. This validation document is valid for other PCs if they meet the platform requirements as listed in Section 1.3.3.

Also, the installation process can be repeated by following the instructions mentioned earlier in Chapter 2. However, if the user has a platform similar to one of the platforms used in this SQR, then the user may copy the executable and binary cross section libraries to a controlled location on the hard drive and run the full verification and validation test problems set. Upon calculating the same results reported in this SQR, the user may run the small set of problems to further install the software to all other identical machines. List of the files used in verification and validation are given in Attachment IV and archived on relevant electronic media based on platform type. Original Unix files are in the directory mcnp/exec. The files used during installation and verification and validation on WPO Unix machines are in the mcnp4b/exec and mcnp4b/ver-val directories. After restoring the files, the user will have the mcnp executable under mcnp4b/exec, cross section files under mcnp4b/xslib, verification files under mcnp4b/exec (mcnp4b/test for SUN), criticality validation problems under mcnp4b/ver-val/endf5 and

INFORMATION ONLY

mcnp4b/ver-val/endf6, and shielding validation problems under mcnp4b/ver-val/shield. The coincident plane test problem is located under mcnp4b/ver-val/4b2fix. The small set that is used for regression testing is included in the directory mcnp4b/ver-val/smlset. Due to very large volume, all input and output files generated during verification, validation and regression testing of the MCNP Version 4B2 are archived in the electronic media MOY-980414-11 and listed in Attachment V.

A non-qualified PC executable version of the MCNP Version 4B2 is included with the installation which may be used only for graphical representation of models and not for analysis.

Finally, the instructions on how to use MCNP4B2 on WPO computers are given in Attachment VI. These instructions were originally distributed via interoffice correspondences LV.WP.SG.02/98-033, LV.WP.JAM.02/98-035 and LV.WP.JAM.02/98-039.

INFORMATION ONLY

5.0 ATTACHMENTS

Attachment I: Software Acquisition Correspondence (I-1 thru I-2)

Attachment II: Installation Information/Notes (II-1 thru II-66)

Attachment III: MCNP4B2 Directory And File Listing (III-1 thru III-8)

Attachment IV: List of Verification and Validation Test Problems (IV-1 thru IV-34)

Attachment V: List of Output Files Archived on Electronic Media MOY-980414-11 (verification, validation, and regression testing files) (V-1 thru V-20)

Attachment VI: Execution Instructions (VI-1 thru VI-5)

Attachment VII: Regression Testing Correspondence (VII-1 thru VII-8)

INFORMATION ONLY

Attachment I: Software Acquisition Correspondence

This attachment contains a copy of the correspondence showing means of acquisition of the MCNP4B2 package and associated libraries from LANL.

INFORMATION ONLY

To: Kenneth Wright
cc:
Subject: Request for verification of MCNP4B software distribution

Kenneth D. Wright and others,

Kenneth Wright attended an MCNP class at Los Alamos National Laboratory in 1997 and as part of his registration fee received 3 CD's provided by us, one with the MCNP source package, and two data library versions, one for a PC and one for a Unix based platform. I personally attest to these facts.

Judi Briesmeister
Group XCI, LANL

INFORMATION ONLY

Attachment II: Installation Information/Notes

This attachment contains a copy of the installation instructions contained in the "READMAAG." and "README" files of the code package followed by a brief description of the cross section files. No difficulties were encountered with the installation by the installer. The "answer" file created during installation and the "install.fix" file used during installation are also included. A separate section is included in this Attachment on installation of the MCNP4B2 code with the ENDF/B-V and ENDF/B-VI cross section data files on the PC platform. This section follows the READMAAG and README sections for the Unix version.

INFORMATION ONLY

INSTALLATION OF MCNP4B2 ON Unix WORKSTATIONS

File 'READMAAG'

MCNP4B Notes 2/10/97

Copyright

MCNP was prepared by the Regents of the University of California at Los Alamos National Laboratory (the University) under contract number W-7405-ENG-36 with the U. S. Department of Energy (DOE). The University has certain rights in the program pursuant to the contract and the program should not be copied or distributed outside your organization. All rights in the program are reserved by the DOE and the University. Neither the U. S. government nor the University makes any warranty, express or implied, or assumes any liability or responsibility for the use of this software.

User Support

A LIMITED amount of free user support is available from John Hendricks, mcnp@lanl.gov, and Judi Briesmeister, 505-667-7277. Users are encouraged to communicate with other users via the two list servers, mcnp-l@psi.ch and mcnp-forum@lanl.gov. Our WWW Web site is:

http://www-xdiv.lanl.gov/XTM/mcnp

Contact mcnp@lanl.gov to be added to the MCNP e-mail list or to arrange additional support on a fee basis.

DISTRIBUTION FILES

INFORMATION ONL

The following files should be present with the MCNP 4B distribution:

FILE	DESCRIPTION
Readme	This file.
INSTALL	Installation controller. Named INSTALL.SYS for non-Unix systems (e.g., VMS and DOS).
INSTALL.FIX	Installation fix file.
MCSETUP.FOR	Setup FORTRAN code.
PRPR.ID	FORTRAN preprocessor code.
MAKXS.ID	Cross-section processor source code.
MCNPC.ID	MCNP C source code (used on Unix systems only).
MCNPF.ID	MCNP FORTRAN source code (named MCNP4B.ID).
RUNPROB	Script file for MCNP verification. Named RUNPROB.SYS for non-Unix systems.
TESTINP.TAR	Compressed input files for MCNP verification. Named TESTINP.SYS for non-Unix systems.
TESTMCTL.SYS	Compressed tally output files for MCNP verification.
TESTOUTP.SYS	Compressed MCNP output files for MCNP verification.
TESTDIR	Cross-section directory for MCNP verification.
TESTLIB1	Cross-section data for MCNP verification..

Substitute the appropriate system identifier from the following table for the "SYS" suffix.

SYSTEM	IDENTIFIER	SYSTEM	IDENTIFIER
Cray UNICOS	ucos	DEC ULTIRX	dec
Sun SunOS	sun	PC DOS	dos
IBM RS/6000 AIX	aix	Sun Solaris	sun
HP-9000 HPUX	hp	SGI IRIX	sgi
VAX VMS	vms		

The INSTALL.FIX file is used to implement corrections to either the MCNP source or the MAKEMCNP script. The latter is important for future changes/bugs in compilers and/or operating systems. The format of this file is provided within INSTALL.FIX, and more details can be found in Appendix C of the MCNP manual. The MCSETUP utility is a user friendly interface for creating system dependent files. The remaining files in the first group are MCNP related source code, and the second group of

INFORMATION ONLY

files are used for MCNP verification (i.e. running the 29 MCNP test problems).

For DOS systems, two additional utilities have been included: the file compare utility FC.EXE and the archive utility PKXARC.COM.

SYSTEM REQUIREMENTS

Software Requirements:

(1) A FORTRAN 77 compiler. The supported compiler for each system is listed in the 1.1 MCSETUP menu (see below).

(2) On Unix systems, a C compiler is recommended and a Bourne-shell command interpreter is required to execute the installation scripts. If the X-Window graphics are to be used, an ANSI C library must be available.

Hardware Requirements:

	Minimum	Recommended
RAM	2 Mbytes	16 Mbytes
Disk Space	50 Mbytes	100 Mbytes

GETTING STARTED

Before proceeding, read the "KNOWN PROBLEMS AND AVAILABLE UPGRADES" section below. Your computer system may require modifications to the INSTALL.FIX file.

On VMS systems:

1. add the following line in your LOGIN.COM file to enable argument passing on the MCNP execution line:

   MCNP :== $MCNP_DISK:[MCNP_PATH]MCNP.EXE

   where MCNP_DISK and MCNP_PATH are the disk and directory path

INFORMATION ONLY

to be used for the MCNP installation. To update this change, log back in or type @LOGIN.

2. The compilation process may be speedup up on VMS by increasing the system's paging file size. Otherwise, it may take an hour to compile.

3. VMS is not fully supported and will be dropped unless a funding source is found.

On all systems, initiate the installation controller with the following commands:

COMMANDS	COMMENT
chmod a+x install ./install SYS	Unix systems - SYS keyword given in the table above.
COPY INSTALL.VMS INSTALL.COM @INSTALL	VMS systems
COPY INSTALL.DOS INSTALL.BAT INSTALL	DOS systems

The MCSETUP utility is initiated first. Simply alter the main menu according to the MCNP options you desire. Note the following:

(1) Section 1.1 of the main menu SHOULD BE ALTERED FIRST. This sets the appropriate computer system which in turn selects suitable defaults for the remaining options.

(2) Default responses are included within barckets, [], (i.e., a <CR> will produce the default response) and additional options are included within parentheses.

(3) If the dynamic memory option is turned "off", an appropriate value for the MDAS parameter should be set (default is mdas=4000000). In general MDAS should be greater than 100000 and less than

INFORMATION ONLY

(R-2)/4 * 1000000, where R is your available RAM in Mbytes.

(4) More information on the setup options is available in the MCNP manual. If you are unsure as to graphics libraries available on your system or their location, contact your system administrator. Default library names and directory paths are supplied by the MCSETUP utility; however these may not be applicable to your system. A FATAL error message is displayed if needed libraries could not be located. Included in this message is the expected library name and path.

When done altering the main menu, use the PROCESS command to continue the installation. The MCSETUP utility creates three system dependent files: the PRPR C patch file (PATCHC, for Unix systems only), the PRPR FORTRAN patch file (PATCHF), and the MAKEMCNP script. MCSETUP also creates an ANSWER file which contains the MCSETUP input for future installations. This file reflects all options chosen during the initial installation and can be used in future installations by

COMMAND(S)	COMMENT
./install SYS < answer	Unix systems
ASSIGN ANSWER.DAT SYS$COMMAND @INSTALL	VMS systems
INSTALL ANSWER	DOS systems

Next, the installation controller initiates the MAKEMCNP script which creates the MCNP executable. System differences can result in compilation errors (e.g., unsatisfied externals). If this occurs, contact MCNP@LANL.GOV regarding a fix. In most cases a two line fix can be added to your INSTALL.FIX file to rectify the situation (the INSTALL.FIX file included with the distribution contains examples of such fixes).

The last section of the installation controller performs MCNP verification by running the 29 MCNP test problems. If this step is to be omitted, rename the RUNPROB file with some other name (e.g.,

INFORMATION ONLY

RUNPROB.ORG).

On most dedicated systems, compilation time is roughly 15-30 minutes and verification an additional 20-40 minutes.

UPON COMPLETION

A successful compilation generates an MCNP executable, called mcnp on Unix systems and MCNP.EXE on VMS and DOS sytems. The MCNP FORTRAN source will be placed in the flib directory on Unix systems or called MCNP.FOR on VMS and DOS systems. Likewise for the object code. A normal completion results in the following message:

Installation complete - see Readme.file.

A log of the installation process is written to the INSTALL.LOG file. An abnormal completion results in one of the following messages:

SETUP ERROR OR USER ABORT.
COMPILATION ERROR - see INSTALL.LOG file.
VERIFICATION ERROR - see INSTALL.LOG file.

The cause of the error can be found in the INSTALL.LOG file.

Upon completion of MCNP verification, 29 difm?? files will exist containing the MCNP tally differences between your runs and the standard. Similarly, the 29 difo?? files will contain the MCNP output file differences between your runs and the standard. Exact tracking is required for MCNP verification, thus significant differences (i.e. other than round-off in the last digit) may prove to be serious (e.g. compiler bugs, etc.). In such cases the INSTALL.LOG file should be reviewed to ensure that the 29 test problems ran successfully.

KNOWN PROBLEMS AND AVAILABLE UPGRADES

(1) The following comments relate to PCs:
(a) Windows NT 4.0 is supported with Lahey graphics. Older versions

INFORMATION ONLY

of NT result in fatal runtime erros related to opening files - the fix is to modify the FORTRAN and open all scratch files with file names.

(b) Windows 95 and DOS are also supported with Lahey graphics. On some DOS systems the INSTALL.BAT file echos all commands from the MAKEMCNP and RUNPROB batch files to the screen rather than to the INSTALL.LOG file, so error messages may appear only on the screen.

(c) On all PCs the CTRL-C interrupts are problematic. Usually executing the Lahey FORTRAN compiler will "magically" enable interrupts for subsequent MCNP runs. To test this, simply copy PRPR.ID to PRPR.FOR and execute "F77L3 PRPR.FOR", and run MCNP.

(d) Also on all PCs, the graphics plots can be saved to a postscript file using the FILE command at the PLOT or MCPLOT prompt. These postscript files can be sent to any postscript-ready printer for printing in color or black and white.

(e) The graphics for DOS systems has been upgraded to include support for X-windows. The INSTALL.FIX file has been modified to enable this. The following combination of software packages have proven to provide this capability:

Package	Version	Cost
F77L/EM-32 Lahey FORTRAN (702)831-2500	5.20	$795
MetaWare High C (408)429-6382	3.20 or 3.30	$795
DESQview/X by Quarterdeck (800)354-3222	2.00	$180
with the X11 OSF/Motif Toolkit for MetaWare		$250

Other combinations most likely also work (e.g., F77L/EM-32 5.01 with MetaWare C 3.02, etc.). DESQview/X is an X library based window manager. Theoretically any X based window manager can be used in this combination. MCNP executables created with this combination can be used on other DOS systems that only have DESQview/X (which reduces the cost to only $180, omitting the toolkit). RSICC will likely provide such executables in future releases. Contact GWM@LANL.GOV for further information.

(f) On both Pentium and Pentium Pro, using Lahey LF90 compiler, change
option break(lockl)
to

INFORMATION ONLY

call break(lockl)
If when lf90 compiles the code, you get "out of memory errors", split the source into two files and compiled each one separately.

(2) A bug has been found with IBM RS/6000 AIX XLF 3.01 linker. When X-windows is used with PVM multiprocessing the linker gives unsatisfied externals. Simply enter the link line manually and switch the order of the libraries (X11 last, PVM first):

```
xlf -o mcnp *.o -L/pvm_path -lfpvm3 -lpvm3 -L/usr/lib -lX11
mv *.o olib
```

We do not have the same problem on the XLF 3.0.2 linker.

(3) On all systems, EXACT tracking of ALL the test problems is required to verify proper code installation. If you do not track exactly or the code crashes running the test problems, recompile using a lower optimization and try again. If errors persist with even with NO optimization, try compiling without graphics. 99% of installation problems are due to compiler optimization bugs, compiler bugs, bad graphics libraries, or bad operating system environments.

INFORMATION ONLY

File 'README'

README file for RSICC package DLC-189 1/97

This new package of data libraries contains all publically available data libraries supported by XTM for use with MCNP. The package contains the following neutron data libraries:

Continuous-energy
ENDF60 RMCCS RMCCSA ENDF5U ENDF5P
NEWXS ENDF5MT* MISC5XS** ENDL85 KIDMAN
100XS
Discrete
NEWXSD DRMCCS DRE5
Multigroup
MGXSNP
S(alpha,beta)
TMCCS THERXS
Dosimetry
531DOS 532DOS LLLDOS

the photon libraries: MCPLIB1 MCPLIB02

and the electron library: EL1

* The data library ENDF5MT contains data previously available in the library EPRIXS, along with the U600K data library.

** The data library MISC5XS contains corrected data for ENDF/B-V based Zr as described below, and the libraries IRNAT, MISCXS, ARKRC, TM169, GDT2GP, and T2DDC. None of these data libraries have been previously distributed through RSICC. The ENDF/B-V Zr data has been corrected for five ZAIDs from the libraries RMCCS, DRMCCS, ENDF5P, DRE5, and EPRIXS. [Ref. 1-2] Below is a summary of the changes that have been made:

INFORMATION ONLY

(Previous)	(Corrected)
RMCCS	40000.51c --> 40000.57c MISC5XS 300K
DRMCCS	40000.51d --> 40000.57d MISC5XS 300K
ENDF5P	40000.50c --> 40000.56c MISC5XS 300K
DRE5	40000.50d --> 40000.56d MISC5XS 300K
EPRIXS	40000.53c --> 40000.58c MISC5XS 600K

Additionally, the corresponding XSDIR file for all of these libraries is also distributed with this package. The file XSDIR1 will need to be renamed as XSDIR prior to running MCNP.

A SPECS file which preserves the default libraries is also provided for the MCNP user for producing Type 2 (Binary) versions of the data libraries to conserve disk space and speed up calculations.

The user must be aware of the limitations for some of these continuous-energy neutron data libraries.

ENDF60: This library is described in the accompanying file README_ENDF60, and other documentation in pdf format.

100XS: The 100XS library contains 9 data files nuclides each having an evaluation extending to 100 MeV. The 9 materials are Be-9, C-12, O-16, Al-27, Si, Ca- 40, Fe, W, and U-238. Modifications were made to the original evaluations and resulting data files to make them more compatable with MCNP, and version 4B of MCNP is needed to use these libraries. These files have been given the ZAID ending of ".21c". Heating numbers on this library are known to overestimate the energy deposition. The report "Summary Documentation for the 100XS Neutron Cross Section Library (Release 1)" LA-UR-96-24 [Ref. 3] describes the general characteristics of the library.

KIDMAN: This library contains data for a number of fission-product nuclides at 300K. There are no photon

INFORMATION ONLY

production available for nuclides on this library, and therefore the neutron heating numbers correspond to total heating (neutron + photon). Total charged particle production MTs (MT=203-207) are available where appropriate. [Ref. 4]

MISC5XS: The data previously released as GDT2GP provide ENDF/B-V based Gd cross-section with photon production data from T-2 (LANL). The photon-production data are only valid up to 1 MeV. Since the photon production data were added to an existing set (ENDF5U), the neutron heating information is incorrect for this library and should not be used. [Ref. 5]

The data previously released as ARKRC are from both ENDF and ENDL sources. The neutron cross-section information for the Kr isotopes are from ENDF, while the cross-sections are from ENDL for Ar. Photon production data were added by T-2 (LANL). Photon production data were included to provide the user with rough estimates for quantities such as photon heating, not for detailed calculations. [Ref. 6]

The data previously released as T2DDC were provided by T-2 (LANL) for Br-79, Br-81, Rb-85, Rb-87, I-127 and Cs-133. All evaluations, with the exception of Cs-133, are incomplete having no photon production, heating numbers, or angular distribution information. [Ref. 7]

The thermal neutron libraries, TMCCS and THERXS, contain S(alpha,beta) data tables for MCNP. TMCCS is a library based on ENDF/B-V (which was unchanged from ENDF/B-III) and provides data for several materials at a number of temperatures. [Ref. 8] THERXS provides data for a few additional moderators based on later T-2 (LANL) evaluations.

The three dosimetry libraries, 531DOS, 532DOS, and LLLDOS, provide (energy, cross-section) pairs for a large number of reactions that are used in various

INFORMATION ONLY

dosimetry or activation applications. The ZAIDs on these libraries can only be used with the FM card option in MCNP, not for actual transport. [Ref. 9]

The latest tables for Appendix G may be downloaded from our WWW site at http://www-xdiv.lanl.gov/XTM/data/dataweb.html .

The photon data library MCPLIB02 is described in the pdf formatted document mcplib02.pdf.

REFERENCES

1. "Repairing ENDF/B-V Zirconium Cross Sections," R.E. Seamon, Los Alamos National Laboratory internal memorandum, X-6:RES-91-358 (1991).

2. "Revised ENDF/B-V Zirconium Cross Sections," R.E. Seamon, Los Alamos National Laboratory internal memorandum, X-6:RES-92-324 (1992).

3. "Summary Documentation for the 100XS Neutron Cross Section Library (Release 1)," Los Alamos National Laboratory internal memorandum, XTM:RCL-95-259 and LA-UR-96-24 (1995).

5. "ENDF/B-V Gd Cross Sections with Photon Production," R. C. Little and R. E. Seamon, Los Alamos National Laboratory internal memorandum, X-6:RCL:RES-86-30 (1986).

6. "Argon and Kyrpton Cross-section Files," R. C. Little, Los Alamos National Laboratory internal memorandum, June 30, 1982.

7. "Cross Sections in ACE Format for Various IP Target Materials," R. C. Little, Los Alamos National Laboratory internal memorandum, August 19, 1982.

INFORMATION ONLY

8. "New Thermal Library for MCNP (Update)," R. C. Little, Los Alamos National Laboratory internal memorandum, X-6:RCL-86-400 (1986).

9. "Dosimetry/Activation Cross Sections for MCNP," R. C. Little, Los Alamos National Laboratory internal memorandum, March 13, 1984.

Brief Description of Some Cross Section Files

dre52	: 54 tables from ENDF/B-V (discrete data corresponding to ENDF5P2 plus ENDF5U2)
drmccs2	: 91 tables from ENDF/B-V, LANL and ENDL85 (discrete data corresponding to RMCCS2 plus RMCCSA2)
endf5p2	: 23 tables from ENDF/B-V continuous energy
endf5u2	: 31 tables from ENDF/B-V continuous energy neutron
mgxsnp2	: multigroup cross sections for neutrons and photons 4/19/91
newxs2	: newly processed evaluations 4/19/91
newxsd2	: discrete version of newxs2 4/19/91
rmccs2	: 64 tables from ENDF/B-V, LANL and ENDL85 (continuous energy neutron)
rmccsa2	: 27 tables from ENDF/B-V, LANL and ENDL85 (continuous energy neutron)
531dos2	: 18 tables from ENDF/B-V neutron dosimetry tape 531
531dos2	: 43 tables from ENDF/B-V neutron dosimetry activation tape 532
lldos2	: 374 tables from Livermore ACTL neutron dosimetry
tmccs2	: 42 tables from ENDF/B-V thermal neutrons (S(α,β) thermal cross sections)
therxs2	: thermal data for SMETH, LMETH, HORTHO, DPARA and DORTHO
100xs2	: 9 data files nuclides each having an evaluation extending to 100 MeV
kidman2	: data for a number of fission product nuclides at 300K
misc5xs2	: corrected data for ENDF/B-V based Zr, and data libraries IRNAT, MISCXS, ARKRC, TM169, GDT2GP, and T2DDC
endf5mt2	: data previously available in the library EPRIXS (evaluations at various temperatures including 300, 600 and 900 degrees for 7 isotopes), along with the U600K data library
endl852	: ENDL85 based continuous energy neutron cross sections
mcplib12	: 94 tables based on DLC-7E and Storm/Israel photons
mcplib022	: photon interaction library covering the energy range 1 keV - 100 GeV for elements Z = 1 to 94
el12	: electron library cross sections
endf602	:124 nuclides with an individual data file for each (processed with NJOY91 at room temperature (300K), using flat weighting, and thinned such that most nuclides had no more than 400,000 words)

INFORMATION ONLY

File 'ANSWER'

```
1.1
4
2.1
1
2.2
1
2.3
1
3.1
1
3.2
1
3.3
1
/usr/lib/X11R5
libX11.a
/usr/include/X11R5
4.1
1
/opt/neut/MCNP4B/xslib
4.2
2
5.1
1
p
```


INFORMATION ONLY

File 'INSTALL.FIX'

```
c      <<<<< makemcnp changes for MCNP4B2 >>>>>      loddat 09/22/97
c
c  For each fix, enter five integer parameters on one line in free
c  format, ip(1)-ip(5) described below, followed by the appropriate
c  number of new lines.
c
c  ip(1) = The applicable computer system number or 0 for all systems.
c  ip(2) = The file number:
c     1 = patchf
c     2 = makemcnp
c     3 = patchc
c  ip(3) = The applicable line number to edit-see the MCSETUP source.
c  ip(4) = The alter code:
c     1 = insert the following ip(5) line(s) before line ip(3)
c     2 = replace line ip(3) with the following ip(5) line(s)
c     3 = insert the following line after entry ip(5) of line ip(3)
c     4 = delete lines ip(3) through ip(5)
c  ip(5) = The number of new line(s) if ip(4)=1,2
c          The entry number if ip(4)=3
c          The last line number to delete if ip(4)=4
c
c  The number of new lines that follow ip(1)-ip(5) is given by:
c       = ip(5) if ip(4)=1,2
c       = 1 if ip(4)=3
c       = 0 if ip(4)=4

c********************* FIXES FOR SYSTEM 1 (Cray UNICOS) *****************
c
c  Add the *define t3d for the Cray T3D.
c   1 1 2 1 1
c  *define t3d
c
c  Provide links to the T3D compilers and linker. XTM:GWM-95-128
c  Change the CFT77 compile line.
c  1 2 18 1 4
c  export TARGET; TARGET=CRAY-T3D
c  ln -s /mpp/bin/cc cc
```


INFORMATION ONLY

```
c    ln -s /mpp/bin/cft77 cft77
c    ln -s /mpp/bin/mppldr segldr
c    Provide links to the T3D compilers and linker. XTM:GWM-95-128
c    1 2 26 2 1
c    cft77 compile
c
c    Add CFTLIB library on UNICOS for profile timing.   06/30/95 (GWM)
c    1 2 28 3 10
c     -L/usr/local/lib -lprof

c********************** FIXES FOR SYSTEM 2 (Sun  SunOS ) ******************

c    Add a second X-window include path for some SunOS systems.
c    2 2 18 3 4
c     -I/usr/openwin/include/X11

c    Add a link to the ANSI C library (libansi.a) on some SunOS systems.
c    2 2 29 3 10
c     -L/home -lansi

c********************** FIXES FOR SYSTEM 3 (IBM  AIX  ) ******************
c
c    PVM libraries must go first for pvm version at some installations.
c    3 2 30 2 1
c xlf -o mcnp *.o -L/usr/lanl/pvm3.3/lib -lfpvm3 -lpvm3 -L/usr/lib -lX11

c********************** FIXES FOR SYSTEM 4 (HP   HPUX ) ******************
c
c    Add a link to the C math library (libM.a) on some HP systems.
c    4 2 29 3  6
c     -lM

c********************** FIXES FOR SYSTEM 5 (VAX  VMS  ) ******************
c
c    Add an additional *define keyword for PRPR on a VAX VMS system.
c     5 1 2 1  1
c    *define dissegs

c****************** FIXES FOR SYSTEM 6 (DEC Unix and PC LINUX) ************
c
c    The following 7 lines enable GNU F77 compilation on LINUX.
```


INFORMATION ONLY

```
c   Tim Goorley, jgoorley@mit.edu XTM-RN(U97-028) 7/21/97
c   6 1 2 1 1
c   *define linux
c   6 2 27 3 1
c    -O0
c   6 2 28 4 28
c   6 3 2 1 1
c   *define linux

c********************** FIXES FOR SYSTEM 7 (PC  DOS  ) ******************
c
c   The following 9 lines enable LAHEY F90 compilation on DOS/WINDOWS.
c   Also uncomment the 2 lines in TTYINT below [call break()].
c   7 2 8 2 1
c   lf90 prpr.for
c   7 2 9 4 9
c   7 2 17 2 1
c   lf90 makxsf.for
c   7 2 18 4 18
c   7 2 43 2 1
c   lf90 mcnp.for
c   7 2 50 4 50

c********************** FIXES FOR SYSTEM 8 (Sun  Sol. ) ******************

c********************** FIXES FOR SYSTEM 9 (SGI  IRIX ) ******************


c************ FIXES FOR THE MCNP FORTRAN SOURCE (PATCHF FILE) *************

0 1 11 2
*/ Integrate your patch with the following. If your patch makes changes
*/ to the ZC, VV, CM, GS, MB, or BD decks, contact MCNP@LANL.GOV for
*/ details on including your patch via the INSTALL.FIX file. When
*/ integrating your patch, be sure the order of the changes (increasing
*/ in line number) is preserved to avoid a PRPR error. See Appendix
*/ C, page C-8 in the MCNP manual for more details.
*/
*/ ------------------------------------------------------ ttyint
*ident tt4b2
*/ Uncomment (delete 1st 3 columns) of next 2 lines to enable LAHEY F90
```


INFORMATION ONLY

```
*/ compilation on DOS/WINDOWS.                07/07/97  (GWM/GWM)
*/ *d,tt4a.28                                 <1014>
*/     call break(lockl)
*/
*/ ------------------------------------------------ msgcon
*/ Fix a print bug.  Wrong number of arguments.   07/07/97  (GWM/GWM)
*ident me4b2
*d,me4b.195                                   <20311>
     call errprn(0,j,1,one*max(1,ntasks),zero,'ntk',' ',
*/ Force PVM to free some buffers.            07/07/97  (GWM/GWM)
*/ $20 awarded to Dudley A. Raine, III, ORNL (XTM:JSH-97-176)  (GWM/GWM)
*i,me4b.311                                   <20498>
c
c       free the receive buffers.
     do 582 nt=1,ntasks
  582 call mfbuf(ib(nt),i)
*/
*/ ------------------------------------------------ startp
*ident sp4b2
*/ Wrong index. Affects var. reduction and tracking. 07/07/97  (GWM/GWM)
*d,sp4b.8,sp4b.10                             <21159-21161>
     if(wc1(i).ge.0.)go to 85
     wcs1tc(i)=-wc1(i)*wgt
     wcs2tc(i)=-wc2(i)*wgt
*/
*/ ------------------------------------------------ levcel
*ident ll4b2
*/ Silent wrong answers for near-coincident lattices.      08/25/97
*/ $20 to Lee Montierth (INEEL) XTM:JSH-97-208
*d,ll4b.25                                    <22232>
     jsu=-abs(jsu)
     if(l.gt.ll+1.and.lat(llat+1,icl).ne.0)call findel(icl)
     jsu=abs(jsu)
*/
*/ ------------------------------------------------ ypbssp
*ident yp4b2
*/ Wrong index. Affects var. reduction and tracking. 07/07/97  (GWM/GWM)
*d,yp4b.2,yp4b.4                              <22590-22592>
     if(wc1(i).ge.0.)go to 45
     wcs1tc(i)=-wc1(i)*wgt
     wcs2tc(i)=-wc2(i)*wgt
```


INFORMATION ONLY

```
*/
*/ ---------------------------------------------------- wtwndo
*ident we4b2
*/ Fix a print bug.  Wrong number of arguments.     07/23/97  (GWM/GWM)
*d,we4b.145                                        <23152>
 200 call errprn(1,nwsg(3),-1,1,icl,zero,'icl',
*/
*/ ---------------------------------------------------- track
*ident tr4b2
*/ Silent wrong answers for near-coincident lattices.        08/25/97
*/ $20 to Lee Montierth (INEEL) XTM:JSH-97-208
*d,tr4b.18                                         <23651>
    if(dl(i)+coincd.lt.dl(levp))go to 445
*/
*/ ---------------------------------------------------- findel
*ident fn4b2
*/ Silent wrong answers for near-coincident lattices.        08/25/97
*/ $20 to Lee Montierth (INEEL) XTM:JSH-97-208
*d,fn.6                                            <24481>
    dimension ii(3),jx(14,2)
*i,fn.7  after equivalence                             <24482>
    data jx/1,1,2,2,3,3,1,1,2,2,2,2,3,3,
   1  1,-1,1,-1,1,-1,1,-1,1,-1,1,-1,1,-1/
*d,fn.10  n=                                       <24485>
*d,fn4b.5,fn4b.16  ii(i)= thru label 10              <24493-24504>
  10 ii(i)=nint(a)
*d,fn.22,fn.52                                   <24510-24550>
c
c       correct for coincident surfaces and hexagonal prism lattices.
c       check if new location completely inside lattice element.
    jc=0
  30 jc=jc+1
    if(jc.gt.10)go to 70
    do 60 jk=lca(llca+ic),abs(lca(llca+ic+1))-1
    j=abs(lja(llja+jk))
    k=kst(lkst+j)
    l=lsc(llsc+j)
    if(k.eq.1)t4=scf(l+1)*xxx+scf(l+2)*yyy+scf(l+3)*zzz-scf(l+4)
    if(k.ne.1)t4=gpblcm(k-1)-scf(l+1)
    if(jsu.ge.0)go to 40
    if(ksc(lksc-jsu).ne.ksc(lksc+j))go to 40
```


INFORMATION ONLY

```
      if(k.eq.1)t5=scf(l+1)*uuu+scf(l+2)*vvv+scf(l+3)*www
      if(k.ne.1)t5=gpblcm(k+2)
      if(abs(t4).le.coincd*abs(t5))t4=t5
   40 if(lja(llja+jk)*t4.gt.0)go to 60
c
c       location coincident with or beyond surface j, index ix.
      j1=jk-lca(llca+ic)+6*lat(llat+1,ic)-5
      ix=jx(j1,1)
      iy=jx(j1,2)
   50 ii(ix)=ii(ix)+iy
      xxx=xxx-iy*vcl(lvcl+1,ix,m)
      yyy=yyy-iy*vcl(lvcl+2,ix,m)
      zzz=zzz-iy*vcl(lvcl+3,ix,m)
c
c       if on or beyond hex side 3, increment sides 1 and 2.
      if(ix.ne.2.or.j1.lt.11)go to 30
      iii=iii-iy
      xxx=xxx+iy*vcl(lvcl+1,1,m)
      yyy=yyy+iy*vcl(lvcl+2,1,m)
      zzz=zzz+iy*vcl(lvcl+3,1,m)
      go to 30
   60 continue
      return
   70 kdb=1
*/
*/ ---------------------------------------------------- findlv
*ident fv4b2
*/ Silent wrong answers for near-coincident lattices.        08/25/97
*/ $20 to Lee Montierth (INEEL) XTM:JSH-97-208
*d,fv.35                                          <24587>
   60 jsu=-abs(jsu)
      if(lat(llat+1,icl).ne.0)call findel(icl)
      jsu=abs(jsu)
*/
*/ ---------------------------------------------------- chkcel
*ident cc4b2
*/ Silent wrong answers for near-coincident lattices.        08/25/97
*/ $20 to Lee Montierth (INEEL) XTM:JSH-97-208
*d,cc4b.4                                         <24700>
      t5=scf(i)*uuu+scf(i+1)*vvv+scf(i+2)*www
      if(abs(t4).le.coincd*abs(t5))t4=t5
```


INFORMATION ONLY

```
*d,cc4b.9                                    <24705>
    if(abs(t4).le.coincd*abs(gpblcm(k+2)))t4=gpblcm(k+2)
*/
*/ ---------------------------------------------------- mfbuf
*ident mf4b2
*/ Force PVM to free some buffers.          07/07/97  (GWM/GWM)
*/ $20 awarded to Dudley A. Raine, III, ORNL (XTM:JSH-97-176)  (GWM/GWM)
*i,mf4b.83                                   <41720>
    subroutine mfbuf(ib,in)
c       perform function 'free message buffer'.
*call mb
*if def,pvm,1
    call pvmffreebuf(ib,in)
    return
    end
*/
*/ ---------------------------------------------------- getidt
*ident gi4b2
*/ Provide cleaner separation of LINUX and DEC.     06/04/97  (GWM/GWM)
*d,gi4b.1                                    <42208>
*if def,linux,3
*d,gi4b.5                                    <42212>
*i,gi4a.1                                    <42213>
*if -def,linux,3
```


INFORMATION ONLY

INSTALLATION OF MCNP4B2 ON PC

The READMAAG file for the code installation and the README file for cross section installation are the same as for the HP installation. Installation differences are limited to platform dependencies which include directories, scripts, and platform software. Installation documentation peculiar to the PC desktop computers is given in this section. Installation of the MCNP4B2 code is performed through use of an "install.bat" script which sets up the source correction files, updates the MCNP4B2 source, and calls the compiler and linker modules. The installation verification cases were run separately following successful installation of the code. The utility program "mcsetup" which builds the "makemcnp.bat" file is configured for the Lahey f77 compiler as obtained from the transmittal CD. This program was modified to use the Lahey lf90 compiler for the MCNP4B2 installation. This modification was restricted to changing the data block in the "mcsetup" source from f77 commands to lf90 commands. The revised source for the program "mcsetup" is included as part of this documentation. Installation on PC platforms which have RAM of 32 meg or less will require the MCNP4B2 source code to be split into parts for compilation. A fortran routine "fsplit' was written and used in this installation which copied the MCNP4B2 compilation source to three parts. The "install.bat", "install.fix", "makemcnp.bat", "mcsetup.for", "fsplit.for", and "answer" files used for the installation are listed below. The "answer" file may be used with the "install.bat" script to duplicate the installation.

Two versions of the MCNP4B2 program were install on the WPO desktop PCs differing only in the size of the volatile memory controlled by the parameter "MDAS" defined during the installation setup. One version was installed with a standard sized "MDAS" parameter of 4,000,000 bytes which will run on any of the WPO desktop PCs. A second version with a large "MDAS" parameter of 9,600,000 bytes was also installed on WPO desktop PCs with 64 Meg of RAM. The large version will not run on all WPO PCs because of memory requiements.

Install.bat file for PC desktop computer

```
echo off
echo *
echo ************************************************
echo *                          Time     *
echo *  Run the SETUP program ...    (1-2 min.)  *
echo *                                *
echo ************************************************
for %%f in (inp01 inp02 inp03 inp04 inp05) do if exist %%f del %%f
for %%f in (inp06 inp07 inp08 inp09 inp10) do if exist %%f del %%f
for %%f in (inp11 inp12 inp13 inp14 inp15) do if exist %%f del %%f
for %%f in (inp16 inp17 inp18 inp19 inp20) do if exist %%f del %%f
```

INFORMATION ONLY

```
for %%f in (inp21 inp22 inp23 inp24 inp25) do if exist %%f del %%f
for %%f in (inp01o inp02o inp03o inp04o inp05o) do if exist %%f del %%f
for %%f in (inp06o inp07o inp08o inp09o inp10o) do if exist %%f del %%f
for %%f in (inp11o inp12o inp13o inp14o inp15o) do if exist %%f del %%f
for %%f in (inp16o inp17o inp18o inp19o inp20o) do if exist %%f del %%f
for %%f in (inp21o inp22o inp23o inp24o inp25o) do if exist %%f del %%f
for %%f in (mctl01 mctl02 mctl03 mctl04 mctl05) do if exist %%f del %%f
for %%f in (mctl06 mctl07 mctl08 mctl09 mctl10) do if exist %%f del %%f
for %%f in (mctl11 mctl12 mctl13 mctl14 mctl15) do if exist %%f del %%f
for %%f in (mctl16 mctl17 mctl18 mctl19 mctl20) do if exist %%f del %%f
for %%f in (mctl21 mctl22 mctl23 mctl24 mctl25) do if exist %%f del %%f
for %%f in (outp01 outp02 outp03 outp04 outp05) do if exist %%f del %%f
for %%f in (outp06 outp07 outp08 outp09 outp10) do if exist %%f del %%f
for %%f in (outp11 outp12 outp13 outp14 outp15) do if exist %%f del %%f
for %%f in (outp16 outp17 outp18 outp19 outp20) do if exist %%f del %%f
for %%f in (outp21 outp22 outp23 outp24 outp25) do if exist %%f del %%f
if exist patchc del patchc
if exist patchf del patchf
if exist makemcnp.bat del makemcnp.bat
if exist codef del codef
if exist mcnp.for del mcnp.for
if exist mcnp.obj del mcnp.obj
if exist mcnp4b2.exe del mcnp4b2.exe
if exist install.log del install.log
rem  f7713 mcsetup.for >> install.log
rem  386link -nomap mcsetup >> install.log
echo ****************************************
echo *                                      *
echo *  Call LF90 for mcsetup               *
echo *                                      *
echo ****************************************
c:\lf9035\bin\lf90 mcsetup -fix -tp -nwin -bind >> install.log
del mcsetup.obj
rem  del mcsetup.sld
if "%1" == "" mcsetup
if not "%1" == "" mcsetup < %1
if not exist makemcnp.bat goto err1
if exist answer del answer
rename install.ans answer
echo *
echo ************************************************
```

INFORMATION ONLY

```
echo *                              Time      *
echo *  Run the MAKEMCNP script ...  (15-30 min.)  *
echo *                                        *
echo ************************************************
rem  command /c makemcnp > > install.log
call makemcnp > > install.log
if not exist D:\MCNP4B\EXE\mcnp4b2.exe goto err2
rem if not exist runprob.dos goto err3
if not exist runprob.bat goto err3
goto end
echo *
echo ************************************************
echo *                              Time      *
echo *  Run the test problems ...    (20-40 min.)  *
echo *                                        *
echo ************************************************
rem pkxarc -rx testinp.dos > > install.log
rem pkxarc -rx testmctl.dos > > install.log
rem pkxarc -rx testoutp.dos > > install.log
inpdos  > > install.log
mctldos > > install.log
outpdos > > install.log
rem copy runprob.dos runprob.bat > > install.log
rem command /c runprob > > install.log
goto end
call runprob > > install.log
for %%f in (inp01m inp02m inp03m inp04m inp05m) do if not exist %%f goto err4
for %%f in (inp06m inp07m inp08m inp09m inp10m) do if not exist %%f goto err4
for %%f in (inp11m inp12m inp13m inp14m inp15m) do if not exist %%f goto err4
for %%f in (inp16m inp17m inp18m inp19m inp20m) do if not exist %%f goto err4
for %%f in (inp21m inp22m inp23m inp24m inp25m) do if not exist %%f goto err4
echo *
echo ************************************************
echo *                                        *
echo *  Installation complete - see Readme file.   *
echo *                                        *
echo ************************************************
goto end
:err1
echo *
echo ************************************************
```


INFORMATION ONLY

```
echo *                                          *
echo *  SETUP ERROR OR USER ABORT.              *
echo *                                          *
echo ************************************************
goto end
:err2
echo *
echo ************************************************
echo *                                          *
echo *  COMPILATION ERROR - see INSTALL.LOG file.  *
echo *                                          *
echo ************************************************
goto end
:err3
echo *
echo ************************************************
echo *                                          *
echo *  VERIFICATION ERROR - missing RUNPROB file. *
echo *                                          *
echo ************************************************
goto end
:err4
echo *
echo ************************************************
echo *                                          *
echo *  VERIFICATION ERROR - see INSTALL.LOG file. *
echo *                                          *
echo ************************************************
:end
```

Install.fix file for PC desktop computer

```
c       <<<<< makemcnp changes for MCNP4B2 >>>>>       loddat 09/22/97
c                        M&O WPO new loddat = 03/31/98
c       File install.fix.std
c       File install.fix.x for the large memory version differs only in the value
c            assigned to MDAS
c
c  For each fix, enter five integer parameters on one line in free
c  format, ip(1)-ip(5) described below, followed by the appropriate
c  number of new lines.
```


INFORMATION ONLY

```
c
c   ip(1) = The applicable computer system number or 0 for all systems.
c   ip(2) = The file number:
c      1 = patchf
c      2 = makemcnp
c      3 = patchc
c   ip(3) = The applicable line number to edit-see the MCSETUP source.
c   ip(4) = The alter code:
c      1 = insert the following ip(5) line(s) before line ip(3)
c      2 = replace line ip(3) with the following ip(5) line(s)
c      3 = insert the following line after entry ip(5) of line ip(3)
c      4 = delete lines ip(3) through ip(5)
c   ip(5) = The number of new line(s) if ip(4)=1,2
c           The entry number if ip(4)=3
c           The last line number to delete if ip(4)=4
c
c   The number of new lines that follow ip(1)-ip(5) is given by:
c        = ip(5) if ip(4)=1,2
c        = 1 if ip(4)=3
c        = 0 if ip(4)=4

c********************* FIXES FOR SYSTEM 1 (Cray UNICOS) ******************
c
c    Add the *define t3d for the Cray T3D.
c     1 1 2 1 1
c    *define t3d
c
c    Provide links to the T3D compilers and linker. XTM:GWM-95-128
c    Change the CFT77 compile line.
c    1 2 18 1 4
c    export TARGET; TARGET=CRAY-T3D
c    ln -s /mpp/bin/cc cc
c    ln -s /mpp/bin/cft77 cft77
c    ln -s /mpp/bin/mppldr segldr
c    Provide links to the T3D compilers and linker. XTM:GWM-95-128
c    1 2 26 2 1
c    cft77 compile
c
c    Add CFTLIB library on UNICOS for profile timing.    06/30/95 (GWM)
c    1 2 28 3 10
c     -L/usr/local/lib -lprof
```


INFORMATION ONLY

```
c********************* FIXES FOR SYSTEM 2 (Sun  SunOS ) *****************

c    Add a second X-window include path for some SunOS systems.
c    2 2 18 3 4
c     -I/usr/openwin/include/X11

c    Add a link to the ANSI C library (libansi.a) on some SunOS systems.
c    2 2 29 3 10
c     -L/home -lansi

c********************* FIXES FOR SYSTEM 3 (IBM  AIX   ) *****************
c
c    PVM libraries must go first for pvm version at some installations.
c    3 2 30 2 1
c  xlf -o mcnp *.o -L/usr/lanl/pvm3.3/lib -lfpvm3 -lpvm3 -L/usr/lib -lX11

c********************* FIXES FOR SYSTEM 4 (HP  HPUX  ) *****************
c
c    Add a link to the C math library (libM.a) on some HP systems.
c    4 2 29 3  6
c     -lM

c********************* FIXES FOR SYSTEM 5 (VAX  VMS   ) *****************
c
c    Add an additional *define keyword for PRPR on a VAX VMS system.
c     5 1 2 1  1
c    *define disscgs

c***************** FIXES FOR SYSTEM 6 (DEC UNIX and PC LINUX) ************
c
c    The following 7 lines enable GNU F77 compilation on LINUX.
c    Tim Goorley, jgoorley@mit.edu XTM-RN(U97-028) 7/21/97
c    6 1 2 1 1
c    *define linux
c    6 2 27 3 1
c     -O0
c    6 2 28 4 28
c    6 3 2 1 1
c    *define linux
```


INFORMATION ONLY

```
c********************* FIXES FOR SYSTEM 7 (PC   DOS   ) *****************
c
c    The following 9 lines enable LAHEY F90 compilation on DOS/WINDOWS.
c    Also uncomment the 2 lines in TTYINT below [call break()].
c    7 2 8 2 1
c    lf90 prpr.for
c    7 2 9 4 9
c    7 2 17 2 1
c    lf90 makxsf.for
c    7 2 18 4 18
c    7 2 43 2 1
c    lf90 mcnp.for
c    7 2 50 4 50

c********************* FIXES FOR SYSTEM 8 (Sun  Sol.  ) *****************

c********************* FIXES FOR SYSTEM 9 (SGI  IRIX  ) *****************


c*********** FIXES FOR THE MCNP FORTRAN SOURCE (PATCHF FILE) ************

0 1 2 2 0
*/ Integrate your patch with the following. If your patch makes changes
*/ to the ZC, VV, CM, GS, MB, or BD decks, contact MCNP@LANL.GOV for
*/ details on including your patch via the INSTALL.FIX file. When
*/ integrating your patch, be sure the order of the changes (increasing
*/ in line number) is preserved to avoid a PRPR error.  See Appendix
*/ C, page C-8 in the MCNP manual for more details.
*/
*/ ------------------------------------------------ ttyint
*ident tt4b2v
*/
*/   comdeck zc
*/  change version and date
*/
*d,zc4b.1
      parameter (kod='mcnp',ver='4b2')
*d,zc4b.4
      parameter (mdas=4000000)
*d,bd4b.3
    3 hsd/'sequential','direct'/,ibin/'fdusmcet'/,loddat/'03/31/98'/,
```


INFORMATION ONLY

```
*d,bd4b.4
    a hdpath/'d:\mcnp4b'/,
*ident tt4b2
*/
*/ Uncomment (delete 1st 3 columns) of next 2 lines to enable LAHEY F90
*/ compilation on DOS/WINDOWS.                    07/07/97  (GWM/GWM)
*/   undelete next two lines                  03/31/98  (WPO/JAM)
*d,tt4a.28                                          <1014>
    call break(lockl)
*/
*/ ------------------------------------------------ msgcon
*/ Fix a print bug.  Wrong number of arguments.    07/07/97  (GWM/GWM)
*ident me4b2
*d,me4b.195                                         <20311>
    call errprn(0,j,1,one*max(1,ntasks),zero,'ntk',' ',
*/ Force PVM to free some buffers.                 07/07/97  (GWM/GWM)
*/ $20 awarded to Dudley A. Raine, III, ORNL (XTM:JSH-97-176)  (GWM/GWM)
*i,me4b.311                                         <20498>
c
c       free the receive buffers.
    do 582 nt=1,ntasks
 582 call mfbuf(ib(nt),i)
*/
*/ ------------------------------------------------ startp
*ident sp4b2
*/ Wrong index. Affects var. reduction and tracking. 07/07/97  (GWM/GWM)
*d,sp4b.8,sp4b.10                                   <21159-21161>
    if(wc1(i).ge.0.)go to 85
    wcs1tc(i)=-wc1(i)*wgt
    wcs2tc(i)=-wc2(i)*wgt
*/
*/ ------------------------------------------------ levcel
*ident ll4b2
*/ Silent wrong answers for near-coincident lattices.          08/25/97
*/ $20 to Lee Montierth (INEEL) XTM:JSH-97-208
*d,ll4b.25                                          <22232>
    jsu=-abs(jsu)
    if(l.gt.ll+1.and.lat(llat+1,icl).ne.0)call findel(icl)
    jsu=abs(jsu)
*/
*/ ------------------------------------------------ ypbssp
```


INFORMATION ONLY

```
*ident yp4b2
*/ Wrong index. Affects var. reduction and tracking. 07/07/97  (GWM/GWM)
*d,yp4b.2,yp4b.4                                    <22590-22592>
     if(wc1(i).ge.0.)go to 45
     wcs1tc(i)=-wc1(i)*wgt
     wcs2tc(i)=-wc2(i)*wgt
*/
*/ ---------------------------------------------- wtwndo
*ident we4b2
*/ Fix a print bug.  Wrong number of arguments.     07/23/97  (GWM/GWM)
*d,we4b.145                                         <23152>
  200 call errprn(1,nwsg(3),-1,1,icl,zero,'icl',
*/
*/ ---------------------------------------------- track
*ident tr4b2
*/ Silent wrong answers for near-coincident lattices.          08/25/97
*/ $20 to Lee Montierth (INEEL) XTM:JSH-97-208
*d,tr4b.18                                          <23651>
     if(dl(i)+coincd.lt.dl(levp))go to 445
*/
*/ ---------------------------------------------- findel
*ident fn4b2
*/ Silent wrong answers for near-coincident lattices.          08/25/97
*/ $20 to Lee Montierth (INEEL) XTM:JSH-97-208
*d,fn.6                                             <24481>
     dimension ii(3),jx(14,2)
*i,fn.7  after equivalence                           <24482>
     data jx/1,1,2,2,3,3,1,1,2,2,2,2,3,3,
    1  1,-1,1,-1,1,-1,1,-1,1,-1,1,-1,1,-1/
*d,fn.10  n=                                        <24485>
*d,fn4b.5,fn4b.16  ii(i)= thru label 10              <24493-24504>
   10 ii(i)=nint(a)
*d,fn.22,fn.52                                     <24510-24550>
c
c       correct for coincident surfaces and hexagonal prism lattices.
c       check if new location completely inside lattice element.
     jc=0
   30 jc=jc+1
     if(jc.gt.10)go to 70
     do 60 jk=lca(llca+ic),abs(lca(llca+ic+1))-1
     j=abs(lja(llja+jk))
```


INFORMATION ONLY

```
      k=kst(lkst+j)
      l=lsc(llsc+j)
      if(k.eq.1)t4=scf(l+1)*xxx+scf(l+2)*yyy+scf(l+3)*zzz-scf(l+4)
      if(k.ne.1)t4=gpblcm(k-1)-scf(l+1)
      if(jsu.ge.0)go to 40
      if(ksc(lksc-jsu).ne.ksc(lksc+j))go to 40
      if(k.eq.1)t5=scf(l+1)*uuu+scf(l+2)*vvv+scf(l+3)*www
      if(k.ne.1)t5=gpblcm(k+2)
      if(abs(t4).le.coincd*abs(t5))t4=t5
   40 if(lja(llja+jk)*t4.gt.0)go to 60
c
c       location coincident with or beyond surface j, index ix.
      j1=jk-lca(llca+ic)+6*lat(llat+1,ic)-5
      ix=jx(j1,1)
      iy=jx(j1,2)
   50 ii(ix)=ii(ix)+iy
      xxx=xxx-iy*vcl(lvcl+1,ix,m)
      yyy=yyy-iy*vcl(lvcl+2,ix,m)
      zzz=zzz-iy*vcl(lvcl+3,ix,m)
c
c       if on or beyond hex side 3, increment sides 1 and 2.
      if(ix.ne.2.or.j1.lt.11)go to 30
      iii=iii-iy
      xxx=xxx+iy*vcl(lvcl+1,1,m)
      yyy=yyy+iy*vcl(lvcl+2,1,m)
      zzz=zzz+iy*vcl(lvcl+3,1,m)
      go to 30
   60 continue
      return
   70 kdb=1
*/
*/ ---------- findlv
*ident fv4b2
*/ Silent wrong answers for near-coincident lattices.        08/25/97
*/ $20 to Lee Montierth (INEEL) XTM:JSH-97-208
*d,fv.35                                          <24587>
   60 jsu=-abs(jsu)
      if(lat(llat+1,icl).ne.0)call findel(icl)
      jsu=abs(jsu)
*/
*/ ---------- chkcel
```


INFORMATION ONLY

```
*ident cc4b2
*/ Silent wrong answers for near-coincident lattices.          08/25/97
*/ $20 to Lee Montierth (INEEL) XTM:JSH-97-208
*d,cc4b.4                                                    <24700>
      t5=scf(i)*uuu+scf(i+1)*vvv+scf(i+2)*www
      if(abs(t4).le.coincd*abs(t5))t4=t5
*d,cc4b.9                                                    <24705>
      if(abs(t4).le.coincd*abs(gpblcm(k+2)))t4=gpblcm(k+2)
*/
*/ ------------------------------------------------------ mfbuf
*ident mf4b2
*/ Force PVM to free some buffers.                 07/07/97  (GWM/GWM)
*/ $20 awarded to Dudley A. Raine, III, ORNL (XTM:JSH-97-176)  (GWM/GWM)
*i,mf4b.83                                                   <41720>
      subroutine mfbuf(ib,in)
c       perform function 'free message buffer'.
*call mb
*if def,pvm,1
      call pvmffreebuf(ib,in)
      return
      end
*/
*/ ------------------------------------------------------ getidt
*ident gi4b2
*/ Provide cleaner separation of LINUX and DEC.      06/04/97  (GWM/GWM)
*d,gi4b.1                                                    <42208>
*if def,linux,3
*d,gi4b.5                                                    <42212>
*i,gi4a.1                                                    <42213>
*if -def,linux,3
```

Makemcnp.bat file for PC desktop computer

```
rem Batch file to make MCNP 4A on the PC DOS.
rem Files needed: prpr.id,makxs.id,patchf,mcnpf.id.
rem change executable name to 'mcnp4b2x' for large version
echo on
rem
del compile
del newid
del patch
```


INFORMATION ONLY

```
copy prpr.id prpr.for
rem f77l3 prpr.for
rem 386link -nomap prpr
c:\lf9035\bin\lf90 prpr -fix -tp -nwin -bind > > install.log
del prpr.for
del prpr.obj
rem del prpr.sld
copy makxs.id codef
type patchf | find "*define" > patch
prpr
rename compile makxsf.for
rem f77l3 makxsf.for
rem 386link -nomap makxsf
c:\lf9035\bin\lf90 makxsf -fix -tp -nwin -bind > > install.log
del makxsf.for
del makxsf.obj
rem del makxsf.sld
del codef
del patch
del newid
copy mcnp4b.id codef
copy patchf patch
prpr
del mcnp1.for
del mcnp2.for
del mcnp3.for
del codef
del patch
call fsplit
del newid
del compile
rem 386link -nomap -pack mcnp
move mcnp1.for c:\tmpspace
move mcnp2.for c:\tmpspace
move mcnp3.for c:\tmpspace
c:
cd ..
cd tmpspace
c:\lf9035\bin\lf90 mcnp1 -c -fix -tp -nwin -o0 > >d:\mcnp4b\install\install.log
c:\lf9035\bin\lf90 mcnp2 -c -fix -tp -nwin -o0 > >d:\mcnp4b\install\install.log
c:\lf9035\bin\lf90 mcnp3 -c -fix -tp -nwin -o0 > >d:\mcnp4b\install\install.log
```


INFORMATION ONLY

```
c:\lf9035\bin\lf90 *.obj -bind -nomap -exe d:\mcnp4b\exe\mcnp4b2 > >d:\mcnp4b\install\install.log
rem -libp c:\lf9035\lib -l lf90
del mcnp1.for
del mcnp2.for
del mcnp3.for
del mcnp1.obj
del mcnp2.obj
del mcnp3.obj
d:
rem del mcnp.sld
```

Mcsetup source file for Lahey lf90 compiler

```
C    Last change:  JAM   1 Apr 98    2:07 pm
     program mcsetup
c
c    program updates to compilr with Lahey lf90 compiler, version 3.5
c    december 18, 1997
c
c    hsymb(4,i) = Linker library symbol(s). (comment)
c
c     data statements for lf90
c     data (hmake(j,7),j=1,mxnl)/
c    1 'rem Batch file to make MCNP 4A on the PC DOS.',
c    2 'rem Files needed: prpr.id,makxs.id,patchf,mcnpf.id.',
c    3 'echo on','del compile','del newid','del patch',
c    7 'copy prpr.id prpr.for',
c    8 'rem f77l3 prpr.for','rem 386link -nomap prpr',
c    9 'lf90 prpr -fix -tp -nwin > > install.log',
c    1 'del prpr.for','del prpr.obj','rem del prpr.sld',
c    3 'copy makxs.id codef','type patchf | find "*define" > patch',
c    5 'prpr','rename compile makxsf.for','rem f77l3 makxsf.for',
c    8 'rem 386link -nomap makxsf',
c    6 'lf90 makxsf -fix -tp -nwin > > install.log',
c    7 'del makxsf.for','del makxsf.obj',
c    1 'rem del makxsf.sld','del codef','del patch','del newid',
c    5 'copy mcnpf.id codef','copy patchf patch',
c    7 'prpr','rename compile mcnp.for','del codef','del patch',
c    1 'del newid','rem f77l3 mcnp.for','rem 386link -nomap -pack mcnp',
c    2'lf90 mcnp -fix -tp -nwin -nomap -g -lib plot.lib > > install.log',
```


INFORMATION ONLY

```
c    4 'rem del mcnp.sld',13*' '/
c
c       Setup the proper files on each computer system.
c
c       IUO  = PATCHC, PATCHF, and MAKEMCNP output files.
c       IUF  = INSTALL.FIX input file.
c       IUS  = Internal scratch fix file.
c       IUW  = INSTALL.ANS answer file.
c       MXND = Maximum number of parameter distributions.
c       MXNE = Maximum number of entries per main menu section.
c       MXNF = Maximum number of internal fixes per system.
c       MXNI = Maximum number of instruction messages.
c       MXNL = Maximum number of lines per patch or make file.
c       MXNO = Maximum number of options per main menu entry - note
c              this is also the maximum number of supported systems.
c       MXNU = Maximum number of unavailable options per system.
c       NCOL = Number of main menu columns.
c       NSEC = Number of main menu sections.
c
      parameter (iuo=31,iuf=32,ius=33,iuw=34,mxnd=20,mxne=3,mxnf=7,
     1 mxni=3,mxnl=70,mxno=10,mxnu=10,ncol=4,nsec=5)
c
      dimension ib(5),ichk(mxne,nsec),idef(mxne,nsec,mxno),
     1 ifix(4,mxnf,mxno),ifxl(2,5),iopt(4,mxnu,mxno),
     2 ipar(3,mxno,mxne,nsec),ipms(mxnd),neps(nsec)
c
      character h*3,hfmt*10,hname(mxno,3)*12,hsymb(4,mxno)*7
      character*20 hmenu(ncol,mxne,nsec),hoptn(mxno,ncol-1,mxne,nsec),hp
      character*41 ha,hb,hparm(mxno,mxnd)
      character*80 hc,hmesg(20),htitl(nsec)
      character*120 hd,hf,hfixs(mxnf),hmake(mxnl,mxno),hpatc(mxnl),
     1 hpatf(mxnl)
c
      logical lv
c
c       Main menu titles.
      data htitl/'COMPUTER SYSTEM DESCRIPTION','GENERAL OPTIONS',
     1 'GRAPHICS OPTIONS','CROSS-SECTION OPTIONS',
     2 'MULTIPROCESSING OPTIONS'/
c
c       Option data - Section 1 (Computer System Description).
```

INFORMATION ONLY

```
      data (((hoptn(i,j,k,1),i=1,mxno),j=1,ncol-1),k=1,mxne)/
     1 'Cray Unicos','Sun SunOS','IBM RS/6000 AIX','HP-9000 HPUX',
     1 'VAX VMS','DEC UNIX','PC DOS','Sun Solaris','SGI IRIX',' ',
     2 'cray,unicos','sun','aix','hpux','vms','dec,lp64','pcdos',
     2 'sun','dec,lp64',' ',
     3 10*'off',
     1 30*' ',
     1 30*' '/
c
c       Option data - Section 2 (General Options).
      data (((hoptn(i,j,k,2),i=1,mxno),j=1,ncol-1),k=1,mxne)/
     1 'Unix System','Unix System',8*' ',
     2 'unix','*****',8*' ',
     3 'on','off',8*' ',
     1 '32-Bit System','32-Bit System',8*' ',
     2 'cheap','*****',8*' ',
     3 'on','off',8*' ',
     1 'Dynamic Memory','Dynamic Memory',8*' ',
     2 'pointer','*****',8*' ',
     3 'on','off',8*' '/
c
c       Option data - Section 3 (Graphics Options).
      data (((hoptn(i,j,k,3),i=1,mxno),j=1,ncol-1),k=1,mxne)/
     1 'Geometry Plotter','Geometry Plotter',8*' ',
     2 'plot','*****',8*' ',
     3 'on','off',8*' ',
     1 'Tally Plotter','Tally Plotter',8*' ',
     2 'mcplot','*****',8*' ',
     3 'on','off',8*' ',
     1 'X-Window Library','CGS Library','GKS Library','DISSPLA Library',
     1 'LAHEY Library',5*' ',
     2 'gkssim,xlib','gkssim,cgs','*****','gkssim,dissp1a',
     2 'gkssim,lahey',5*' ',
     3 10*'on'/
c
c       Option data - Section 4 (Cross-Section Options).
      data (((hoptn(i,j,k,4),i=1,mxno),j=1,ncol-1),k=1,mxne)/
     1 'Data Path',9*' ',
     2 '*****',9*' ',
     3 'on',9*' ',
     1 '64-Bit Data','64-Bit Data',8*' ',
```

INFORMATION ONLY

```
     2 'xs-64','*****',8*' ',
     3 'on','off',8*' ',
     1 30*' '/
c
c       Option data - Section 5 (Multiprocessing Options).
      data (((hoptn(i,j,k,5),i=1,mxno),j=1,ncol-1),k=1,mxne)/
     1 'Multiprocessing','Distributed Memory','Common Memory',7*' ',
     2 '*****','multp,pvm','multt',7*' ',
     3 'off','on','on',7*' ',
     1 30*' ',
     1 30*' '/
c
c       For each distribution, provide system dependent parameters.
      data ((hparm(i,j),i=1,mxno),j=1,10)/
c
c       Distribution 1 - compiler versions.
     1 'CFT77 6.0.4.1','F77 4.0','XLF 3.02.5.3','F77 9.16',
     2 'FORTRAN 5.9','F77 3.2','F77L-EM/32 5.2','F77 4.0',
     3 'F77 4.0.2',' ',
c
c       Distribution 2 - fixed memory allocation.
     1 10*'mdas=4000000',
c
c       Distribution 3 - graphics library paths.
     1 '/usr/lib','/usr/openwin/lib',2*'/usr/lib',
     2 'gsys:[graphics.lib]','/usr/lib','c: f77l3 lib',3*'/usr/lib',
c
c       Distribution 4 - X-Window graphics library.
     1 10*'libX11.a',
c
c       Distribution 5 - X-Window include path.
     1 '/usr/include','/usr/openwin/include',2*'/usr/include',
     2 'gsys:[graphics.include]','/usr/include','c:xwin',
     3 3*'/usr/include',
c
c       Distribution 6 - CGS graphics library.
     1 10*'libcgs.a',
c
c       Distribution 7 - GKS graphics library.
     1 10*'libgks.a',
c
```

INFORMATION ONLY

```
c       Distribution 8 - DISSPLA graphics library.
     1 4*'libdis66.a','dislib66.olb,cgsfor.olb',5*'libdis66.a',
c
c       Distribution 9 - LAHEY graphics library.
     1 6*' ','graph3.lib',3*' ',
c
c       Distribution 10 - DATAPATH path.
     1 4*'/usr/local/udata/mcnp','gsys:[user.local.udata.mcnp]',
     2 '/usr/local/udata/mcnp','c: mcnp xs',
     3 3*'/usr/local/udata/mcnp'/
      data ((hparm(i,j),i=1,mxno),j=11,mxnd)/
c
c       Distribution 11 - PVM library path.
     1 4*'/usr/lib',' ','/usr/lib',' ',3*'/usr/lib',
c
c       Distribution 12 - PVM library.
     1 4*'libfpvm3.a,libpvm3.a',' ','libfpvm3.a,libpvm3.a',' ',
     2 3*'libfpvm3.a,libpvm3.a',

c
c       Distributions 13-20 - unused.
     1 80*' '/
c
c       Common messages.
      data hmesg/
     1 'FATAL.  This option is not available with the ',
     2 'WARNING.  This option degrades performance with the ',
     3 'WARNING.  This option has not been tested with the ',
     4 'Enter length of MCNP DAS array (typically 1-4 Mwords), <CR> for
     4default:',
     5 'Enter graphics library path (max. 40 characters), <CR> for defau
     5lt:',
     6 'Enter graphics library name, <CR> for default:',
     7 'Enter X-Window include path (max. 40 characters), <CR> for defau
     7lt:',
     8 'Enter cross-section data path (max. 40 characters), <CR> for def
     8ault:',
     9 'Enter PVM library path (max. 40 characters), <CR> for default:',
     1 'Enter PVM library name, <CR> for default:',
     2 10*' '/
c
```


INFORMATION ONLY

```
c       Special symbols for the ith computer system:
c       hsymb(1,i) = Directory path symbol.
c       hsymb(2,i) = Compiler include symbol(s).
c       hsymb(3,i) = Linker library path symbol(s).
c       hsymb(4,i) = Linker library symbol(s).
      data hsymb/
     1 '/',' -I',' -L',' -l',
     2 '/',' -I',' -L',' -l',
     3 '/',' -I',' -L',' -l',
     4 '/',' -I',' -L',' -l',
     5 ' ',' ',',',',',/l',
     6 '/',' -I',' -L',' -l',
     7 ' ',' ',' -libp',' -l',
     8 '/',' -I',' -L',' -l',
     9 '/',' -I',' -L',' -l',
     1 '/',' -I',' -L',' -l'/
c
c       Output file names for each computer system.
      data hname/10*'patchf',
     1 4*'makemcnp','makemcnp.com','makemcnp','makemcnp.bat',
     2 3*'makemcnp',
     3 10*'patchc'/
c
c       Template for the PATCHF file (the same for all systems).
c       Note at about label 10 that hpatf(10) has been initialized.
      data hpatf/
     1 '*define',
     2 '*ident fixf',
     3 '*/',
     4 '*/ ---------------------------------- comdeck zc',
     5 '*d,zc4b.4',
     6 '      parameter (mdas=4000000)',
     7 '*/',
     8 '*/ ---------------------------------- block data',
     9 '*d,bd4b.4',
     1 ' ',
     1 '*/',59*' '/
c
c       Template for the MAKEMCNP file for each computer system.
      data (hmake(j,1),j=1,mxnl)/
     1 '#!/bin/sh','# Script file to make MCNP 4B on the Cray UNICOS.',
```


INFORMATION ONLY

```
     3 '# Files needed: prpr.id,makxs.id,patch?,mcnpc.id,mcnpf.id.',
     4 'set -ex','rm -f compile newid patch','cp prpr.id prpr.f',
     7 'cf77 -o prpr prpr.f','cp makxs.id codef',
     9 'grep *define patchc > patch','prpr','mv compile makxsf.f',
     2 'cf77 -o makxsf makxsf.f','rm -f newid *.f *.o',
     4 'cp mcnpc.id codef','cp patchc patch','prpr',
     7 'mv compile mcnpc.c','cc -c -dz mcnpc.c',
     9 'rm -f codef patch newid',
     1 'cp mcnpf.id codef','cp patchf patch','prpr',
     3 'rm -f codef patch',
     4 'mkdir flib','mkdir olib',
     6 'cft77 -ez -a stack compile',
     7 'mv compile *.c flib',
     8 'segldr -o mcnp *.o',
     9 'mv *.o olib',41*' '/
c
      data (hmake(j,2),j=1,mxnl)/
     1 '#!/bin/sh','# Script file to make MCNP 4B on the Sun SunOS.',
     3 '# Files needed: prpr.id,makxs.id,patch?,mcnpc.id,mcnpf.id.',
     4 'set -ex','rm -f compile newid patch','cp prpr.id prpr.f',
     7 'f77 -o prpr prpr.f','cp makxs.id codef',
     9 'grep *define patchc > patch','prpr','mv compile makxsf.f',
     2 'f77 -o makxsf makxsf.f','rm -f newid *.f *.o',
     4 'cp mcnpc.id codef','cp patchc patch','prpr',
     7 'mv compile mcnpc.c','cc -dalign -c mcnpc.c',
     9 'rm -f codef patch newid',
     1 'cp mcnpf.id codef','cp patchf patch','prpr',
     3 'fsplit compile > clog','rm -f compile codef patch newid clog',
     5 'mkdir flib','mkdir olib',
     7 'f77 -O3 -Nn6000 -Nq6000 -Ns6000 -Nx2000 -dalign -c *.f',
     8 'mv *.f *.c flib',
     9 'f77 -o mcnp -Bstatic *.o',
     1 'mv *.o olib',40*' '/
c
      data (hmake(j,3),j=1,mxnl)/
     1 '#!/bin/sh','# Script file to make MCNP 4B on the IBM AIX.',
     3 '# Files needed: prpr.id,makxs.id,patch?,mcnpc.id,mcnpf.id.',
     4 'set -ex','rm -f compile newid patch','cp prpr.id prpr.f',
     7 'xlf -o prpr prpr.f','cp makxs.id codef',
     9 'grep *define patchc > patch','prpr','mv compile makxsf.f',
     2 'xlf -o makxsf makxsf.f','rm -f newid *.f *.o',
```


INFORMATION ONLY

```
     4 'cp mcnpc.id codef','cp patchc patch','prpr',
     7 'mv compile mcnpc.c','cc -c mcnpc.c',
     9 'rm -f codef patch newid',
     1 'cp mcnpf.id codef','cp patchf patch','prpr',
     3 'fsplit compile > clog','rm -f compile codef patch newid clog',
     5 'mkdir flib','mkdir olib',
     7 'xlf -O -NQ20000 -NA16384 -c *.f',
     8 'xlf -NQ20000 -NA16384 -c brang.f tallyp.f nextit.f',
     9 'mv *.f *.c flib',
     1 'xlf -o mcnp *.o',
     1 'mv *.o olib',39*' '/
c
      data (hmake(j,4),j=1,mxnl)/
     1 '#!/bin/sh','# Script file to make MCNP 4B on the HP9000 HPUX.',
     3 '# Files needed: prpr.id,makxs.id,patch?,mcnpc.id,mcnpf.id.',
     4 'set -ex','rm -f compile newid patch','cp prpr.id prpr.f',
     7 'f77 -o prpr prpr.f','cp makxs.id codef',
     9 'grep *define patchc > patch','prpr','mv compile makxsf.f',
     2 'f77 -o makxsf makxsf.f','rm -f newid *.f *.o',
     4 'cp mcnpc.id codef','cp patchc patch','prpr',
     7 'mv compile mcnpc.c','cc -c mcnpc.c',
     9 'rm -f codef patch newid',
     1 'cp mcnpf.id codef','cp patchf patch','prpr',
     3 'fsplit compile > clog','rm -f compile codef patch newid clog',
     5 'mkdir flib','mkdir olib',
     7 'f77 +T +E1 -O -c *.f',
     8 'mv *.f *.c flib',
     9 'fort77 -o mcnp *.o',
     1 'mv *.o olib',40*' '/
c
      data (hmake(j,5),j=1,mxnl)/
     1 '$ ! COM file to make MCNP 4B on the VAX VMS.',
     2 '$ ! Files needed: prpr.id,makxs.id,patchf.dat,mcnpf.id.',
     3 '$ set verify','$ set noon',
     5 '$ del compile.dat;,newid.dat;,patch.dat;',
     6 '$ copy prpr.id prpr.for','$ fortran prpr','$ link prpr',
     9 '$ del prpr.for;,prpr.obj;','$ copy makxs.id codef.dat',
     1 '$ search patchf.dat *define /output=patch.dat','$ run prpr',
     3 '$ rename compile.dat makxsf.for',
     4 '$ fortran /g_floating makxsf','$ link makxsf',
     6 '$ del codef.dat;,patch.dat;,newid.dat;,makxsf.for;,makxsf.obj;',
```


INFORMATION ONLY

```
     7 '$ copy mcnpf.id codef.dat','$ copy patchf.dat patch.dat',
     9 '$ run prpr','$ del codef.dat;,patch.dat;,newid.dat;',
     1 '$ rename compile.dat mcnp.for',
     2 '$ fortran /g_floating mcnp',
     3 '$ link mcnp',47*' '/
c
      data (hmake(j,6),j=1,mxnl)/
     1 '#!/bin/sh','# Script file to make MCNP 4B on the DEC UNIX.',
     3 '# Files needed: prpr.id,makxs.id,patch?,mcnpc.id,mcnpf.id.',
     4 'set -ex','rm -f compile newid patch','cp prpr.id prpr.f',
     7 'f77 -o prpr prpr.f','cp makxs.id codef',
     9 'grep *define patchc > patch','prpr','mv compile makxsf.f',
     2 'f77 -o makxsf makxsf.f','rm -f newid *.f *.o',
     4 'cp mcnpc.id codef','cp patchc patch','prpr',
     7 'mv compile mcnpc.c','cc -c mcnpc.c',
     9 'rm -f codef patch newid',
     1 'cp mcnpf.id codef','cp patchf patch','prpr',
     3 'fsplit compile > clog','rm -f compile codef patch newid clog',
     5 'mkdir flib','mkdir olib',
     7 'f77 -c *.f',
     8 'f77 -O1 -fpe1 -c itally.f getxs.f gmgww.f',
     9 'mv *.f *.c flib',
     1 'f77 -o mcnp *.o',
     1 'mv *.o olib',39*' '/
c
c     data (hmake(j,7),j=1,43)/
c    1 'rem Batch file to make MCNP 4B on the PC DOS.',
c    2 'rem Files needed: prpr.id,makxs.id,patchf,mcnpf.id.',
c    3 'echo on','del compile','del newid','del patch',
c    7 'copy prpr.id prpr.for','f7713 prpr.for','386link prpr -nomap',
c    1 'del prpr.for','del prpr.obj','del prpr.sld',
c    3 'copy makxs.id codef','type patchf | find "*define" > patch',
c    5 'prpr','rename compile makxsf.for','f7713 makxsf.for',
c    8 '386link makxsf -nomap','del makxsf.for','del makxsf.obj',
c    1 'del makxsf.sld','del codef','del patch','del newid',
c    5 'type patchf | find "*define pcdos" | find "xlib"',
c    6 'if errorlevel 1 goto next','if exist mcnpc.c del mcnpc.c',
c    8 'copy mcnpc.id codef','copy patchc patch','prpr',
c    1 'rename compile mcnpc.c','del codef','del patch','del newid',
c    5 'hc386 -f387 -DMSDOS -Hoff=protection -I\dvx\include -c mcnpc.c',
c    6 ':next','copy mcnpf.id codef','copy patchf patch',
```


INFORMATION ONLY

```
c    9 'prpr','rename compile mcnp.for','del codef','del patch',
c    3 'f7713 mcnp.for /Q1'/
c     data (hmake(j,7),j=44,mxnl)/
c    4 'type patchf | find "*define pcdos" | find "xlib"',
c    5 'if errorlevel 1 goto lahey',
c    6 'set lib=\f7713\lib;\hc33\small;\dvx\lib\hc387',
c    7 '386link mcnp \f7713\lib\hc320  mcnpc -l hc386,hc387,hcna,x11,sys
c    7 -nomap -stub runb',
c    8 'goto end',':lahey',
c    1 '386link mcnp -nomap -nopack -stub runb',
c    1 ':end','del mcnp.sld','echo off',17*' '/
c
     data (hmake(j,7),j=1,mxnl)/
    1 'rem Batch file to make MCNP 4A on the PC DOS.',
    2 'rem Files needed: prpr.id,makxs.id,patchf,mcnpf.id.',
    3 'echo on','rem',
    5 'del compile','del newid','del patch',
    8 'copy prpr.id prpr.for',
    9 'rem f7713 prpr.for','rem 386link -nomap prpr',
    1 'c:\lf9035\bin\lf90 prpr -fix -tp -nwin -bind >> install.log',
    2 'del prpr.for','del prpr.obj','rem del prpr.sld',
    5 'copy makxs.id codef','type patchf | find "*define" > patch',
    7 'prpr','rename compile makxsf.for','rem f7713 makxsf.for',
    * 'rem 386link -nomap makxsf',
    1 'c:\lf9035\bin\lf90 makxsf -fix -tp -nwin -bind >> install.log',
    2 'del makxsf.for','del makxsf.obj',
    4 'rem del makxsf.sld','del codef','del patch','del newid',
    8 'copy mcnp4b.id codef','copy patchf patch',
    * 'prpr','del mcnp1.for','del mcnp2.for','del mcnp3.for',
    4 'del codef','del patch','call fsplit','rem del newid',
    8 'del compile','rem 386link -nomap -pack mcnp',
    * 'move mcnp1.for c:\tmpspace','move mcnp2.for c:\tmpspace',
    2 'move mcnp3.for c:\tmpspace','c:','cd ..','cd tmpspace',
    6 'c:\lf9035\bin\lf90 mcnp1 -c -fix -tp -nwin -o0 >>d:\mcnp4b\insta
    All\install.log',
    7 'c:\lf9035\bin\lf90 mcnp2 -c -fix -tp -nwin -o0 >>d:\mcnp4b\insta
    All\install.log',
    8 'c:\lf9035\bin\lf90 mcnp3 -c -fix -tp -nwin -o0 >>d:\mcnp4b\insta
    All\install.log',
    9 'c:\lf9035\bin\lf90 *.obj -bind -nomap -exe d:\mcnp4b\exe\mcnp4b2
    Ax >>d:\mcnp4b\install\install.log','rem',
```


INFORMATION ONLY

```
     1 'del mcnp1.for','del mcnp2.for','del mcnp3.for',
     4 'del mcnp1.obj','del mcnp2.obj','del mcnp3.obj','d:',
     8 'rem del mcnp.sld',12*' '/
c
c
      data (hmake(j,8),j=1,mxnl)/
     1 '#!/bin/sh','# Script file to make MCNP 4B on the Sun Solaris.',
     3 '# Files needed: prpr.id,makxs.id,patch?,mcnpc.id,mcnpf.id.',
     4 'set -ex','rm -f compile newid patch','cp prpr.id prpr.f',
     7 'f77 -o prpr prpr.f','cp makxs.id codef',
     9 'grep *define patchc > patch','prpr','mv compile makxsf.f',
     2 'f77 -o makxsf makxsf.f','rm -f newid *.f *.o',
     4 'cp mcnpc.id codef','cp patchc patch','prpr',
     7 'mv compile mcnpc.c','cc -dalign -c mcnpc.c',
     9 'rm -f codef patch newid',
     * 'cp mcnpf.id codef','cp patchf patch','prpr',
     3 'fsplit compile > clog','rm -f compile codef patch newid clog',
     5 'mkdir flib','mkdir olib',
     7 'f77 -O3 -Nn6000 -Nq6000 -Ns6000 -Nx2000 -dalign -c *.f',
     8 'mv *.f *.c flib',
     9 'f77 -o mcnp *.o',
     * 'mv *.o olib',40*' '/
c
      data (hmake(j,9),j=1,mxnl)/
     1 '#!/bin/sh','# Script file to make MCNP 4B on the SGI ONYX.',
     3 '# Files needed: prpr.id,makxs.id,patch?,mcnpc.id,mcnpf.id.',
     4 'set -ex','rm -f compile newid patch','cp prpr.id prpr.f',
     7 'f77 -o prpr prpr.f','cp makxs.id codef',
     9 'grep *define patchc > patch','prpr','mv compile makxsf.f',
     2 'f77 -o makxsf makxsf.f','rm -f newid *.f *.o',
     4 'cp mcnpc.id codef','cp patchc patch','prpr',
     7 'mv compile mcnpc.c','cc -c mcnpc.c',
     9 'rm -f codef patch newid',
     1 'cp mcnpf.id codef','cp patchf patch','prpr',
     3 'fsplit compile > clog','rm -f compile codef patch newid clog',
     5 'mkdir flib','mkdir olib',
     7 'f77 -O1 -TARG:madd=OFF -c *.f',
     8 'f77 -c sing.f mapmaz.f',
     9 'mv *.f *.c flib',
     1 'f77 -o mcnp *.o',
     1 'mv *.o olib',39*' '/
```


INFORMATION ONLY

```
c
      data (hmake(j,10),j=1,mxnl)/
     1 '#!/bin/sh','# Script file to make MCNP 4B on the Sun SunOS.',
     3 '# Files needed: prpr.id,makxs.id,patch?,mcnpc.id,mcnpf.id.',
     4 'set -ex','rm -f compile newid patch','cp prpr.id prpr.f',
     7 'f77 -o prpr prpr.f','cp makxs.id codef',
     9 'grep *define patchc > patch','prpr','mv compile makxsf.f',
     2 'f77 -o makxsf makxsf.f','rm -f newid *.f *.o',
     4 'cp mcnpc.id codef','cp patchc patch','prpr',
     7 'mv compile mcnpc.c','cc -dalign -c mcnpc.c',
     9 'rm -f codef patch newid',
     1 'cp mcnpf.id codef','cp patchf patch','prpr',
     3 'fsplit compile > clog','rm -f compile codef patch newid clog',
     5 'mkdir flib','mkdir olib',
     7 'f77 -O3 -Nn6000 -Nq6000 -Ns6000 -Nx2000 -dalign -c *.f',
     8 'mv *.f *.c flib',
     9 'f77 -o mcnp -Bstatic *.o',
     1 'mv *.o olib',40*' '/
c
c       Template for the PATCHC file (the same for all systems).
      data hpatc/
     1 '*define',
     2 '*ident fixc',
     3 '*/',
     4 '*/ ---------------------------------- c routines',
     5 '*/',65*' '/
c
c       Default options for the ith computer system:
c       idef(1,n,i) = Default option for entry 1 of section n.
c       idef(2,n,i) = Default option for entry 2 of section n.
c       idef(3,n,i) = Default option for entry 3 of section n.
      data idef/
     1  1,0,0,  2,2,1,  1,1,1,  1,2,0,  1,0,0,
     2  2,0,0,  1,1,2,  1,1,1,  1,2,0,  1,0,0,
     3  3,0,0,  1,1,1,  1,1,1,  1,2,0,  1,0,0,
     4  4,0,0,  1,1,1,  1,1,1,  1,2,0,  1,0,0,
     5  5,0,0,  2,1,2,  1,1,4,  1,2,0,  1,0,0,
     6  6,0,0,  1,1,1,  1,1,1,  1,2,0,  1,0,0,
     7  7,0,0,  2,1,2,  1,1,5,  1,2,0,  1,0,0,
     8  8,0,0,  1,1,2,  1,1,1,  1,2,0,  1,0,0,
     9  9,0,0,  1,1,1,  1,1,1,  1,2,0,  1,0,0,
```


INFORMATION ONLY

```
     1 10,0,0,  1,1,2,  1,1,1,  1,2,0,  1,0,0/
c
c       Fix parameters for the nth fix of the ith computer system:
c       ifix(1,n,i) = File to fix:  1=patchf, 2=make script, 3=patchc.
c       ifix(2,n,i) = Relevant line number of fix file.
c       ifix(3,n,i) = Alter code:
c         1 = Insert new line(s) before line ifix(2,n)
c         2 = Replace line ifix(2,n) with new line(s)
c         3 = Add new text after entry ifix(4,n) of line ifix(2,n)
c       ifix(4,n,i) = Number of new lines, entry number if ifix(3..)=3.
      data ifix/
     1 1,1,2,1, 1,6,2,1,1,10,2,1, 2,18,3,3, 4*0,     2,28,3,4, 3,1,2,1,
     2 1,1,2,1, 1,6,2,1,1,10,2,1, 2,18,3,3, 2,27,3,2, 2,29,3,5, 3,1,2,1,
     3 1,1,2,1, 1,6,2,1,1,10,2,1, 2,18,3,2, 4*0,     2,30,3,4, 3,1,2,1,
     4 1,1,2,1, 1,6,2,1,1,10,2,1, 2,18,3,2, 4*0,     2,29,3,4, 3,1,2,1,
     5 1,1,2,1, 1,6,2,1,1,10,2,1, 8*0,           2,23,3,3, 3,1,2,1,
     6 1,1,2,1, 1,6,2,1,1,10,2,1, 2,18,3,2, 4*0,     2,30,3,5, 3,1,2,1,
     7 1,1,2,1, 1,6,2,1,1,10,2,1, 8*0,           2,50,3,6, 3,1,2,1,
     8 1,1,2,1, 1,6,2,1,1,10,2,1, 2,18,3,3, 2,27,3,2, 2,29,3,4, 3,1,2,1,
     9 1,1,2,1, 1,6,2,1,1,10,2,1, 2,18,3,2, 4*0,     2,30,3,4, 3,1,2,1,
     1 1,1,2,1, 1,6,2,1,1,10,2,1, 2,18,3,3, 2,27,3,2, 2,29,3,5, 3,1,2,1/
c
c       Limits on external fix parameters within INSTALL.FIX:
c       ifxl(1-2,1) = Lower and upper limits of the system number.
c       ifxl(1-2,2) = Lower and upper limits of the file number.
c       ifxl(1-2,3) = Lower and upper limits of the line number.
c       ifxl(1-2,4) = Lower and upper limits of the alter code.
c       ifxl(1-2,5) = Lower and upper limits of the number of lines.
      data ifxl/0,mxno,  1,3,  0,mxnl,  1,4,  0,1000000/
c
c       Unavailable options for the ith computer system (n <= mxnu):
c       iopt(1,n,i) = Section number of unavailable option n.
c       iopt(2,n,i) = Entry number of unavailable option n.
c       iopt(3,n,i) = Option number of unavailable option n.
c       iopt(4,n,i) = Message number of unavailable option n.
      data iopt/
     1  2,1,1,1, 2,2,1,1, 3,3,5,1,  4,2,1,1,  24*0,
     2  2,1,2,1, 2,2,2,-3, 2,3,1,-2, 3,3,4,-3, 3,3,5,1,  5,1,3,1, 16*0,
     3  2,1,2,1, 2,2,2,-3, 3,3,4,-3, 3,3,5,1,  5,1,3,1,  20*0,
     4  2,1,2,1, 2,2,2,-3, 3,3,4,-3, 3,3,5,1,  5,1,3,1,  20*0,
     5  2,1,1,1, 2,2,2,-3, 2,3,1,1,  3,3,1,-3, 3,3,5,1,  5,1,2,1, 16*0,
```


INFORMATION ONLY

```
     6 2,1,2,1, 2,2,2,-3, 3,3,4,-3, 3,3,5,1,  5,1,3,1,  20*0,
     7 2,1,1,1, 2,2,2,-3, 2,3,1,1,  3,3,1,-3, 3,3,2,1,  3,3,4,-3,
     7 5,1,2,1, 5,1,3,1, 8*0,
     8 2,1,2,1, 2,2,2,-3, 2,3,1,-2, 3,3,4,-3, 3,3,5,1,  5,1,3,1, 16*0,
     9 2,1,2,1, 2,2,2,-3, 3,3,4,-3, 3,3,5,1,  5,1,3,1,  20*0,
     1 2,1,2,1, 2,2,2,-3, 3,3,4,-3, 3,3,5,1,  5,1,3,1,  20*0/
c
c       Parameter distributions for option k of entry j of section i:
c       ipar(1,k,j,i) = Distribution number for parameter 1.
c       ipar(2,k,j,i) = Distribution number for parameter 2.
c       ipar(3,k,j,i) = Distribution number for parameter 3.
      data ipar/
c
c       Parameter dist. - Section 1 (Computer System Description).
     1 1,0,0,  1,0,0,  1,0,0,  1,0,0,  1,0,0,  1,0,0,  1,0,0,  1,0,0,
     1 1,0,0,  1,0,0,
     2 30*0,
     3 30*0,
c
c       Parameter dist. - Section 2 (General Options).
     1 30*0,
     2 30*0,
     3 0,0,0,  2,0,0,  24*0,
c
c       Parameter dist. - Section 3 (Graphics Options).
     1 30*0,
     2 30*0,
     3 3,4,5,  3,6,0,  3,7,0,  3,8,0,  3,9,0,  15*0,
c
c       Parameter dist. - Section 4 (Cross-Section Options).
     1 10,0,0,  27*0,
     2 30*0,
     3 30*0,
c
c       Parameter dist. - Section 5 (Multiprocessing Options).
     1 0,0,0, 11,12,0, 24*0,
     2 30*0,
     3 30*0/
c
c       Messages for each parameter distribution.
      data ipms/0,4,5,6,7,6,6,6,6,8,9,10,8*0/
```


INFORMATION ONLY

```
c
c     Number of entries within each section.
      data neps/1,3,3,2,1/
c
c     ***************************** START UP ******************************
c     *                                                                   *
c     Get the backslash the hard way - end of line on some systems.
      hsymb(1,7)=char(92)
      hparm(7,3)(3:3)=char(92)
      hparm(7,3)(9:9)=char(92)
      hparm(7,10)(3:3)=char(92)
      hparm(7,10)(8:8)=char(92)
      write(hpatf(10),10)
   10 format(42h39h     3 hdpath/'/usr/local/udata/mcnp'/,)
c
c     Initialize the default system.
      isys=1
      hoptn(idef(1,1,isys),3,1,1)='on'
      do 20 i=1,nsec
      do 20 j=1,neps(i)
   20 ichk(j,i)=0
c
c     Set up the default main menu.
   30 do 50 i=1,nsec
      do 50 j=1,neps(i)
      n=idef(j,i,isys)
      do 40 k=1,ncol-1
   40 hmenu(k,j,i)=hoptn(n,k,j,i)
      hmenu(ncol,j,i)=' '
      if(ipar(1,n,j,i).ne.0)hmenu(ncol,j,i)=hparm(isys,ipar(1,n,j,i))
      if(hmenu(ncol,j,i)(18:20).ne.' ')hmenu(ncol,j,i)(18:20)='...'
   50 continue
c
c >>>>>  Print the main menu.
   60 write(*,70)
   70 format(/51h ***************************** MCNP SETUP MAIN MENU ,
     1 29h*****************************,///,34x,
     2 38hKEYWORD(S)    STATUS     PARAMETER(S))
      do 110 i=1,nsec
      write(*,80)htitl(i)
   80 format(1x,a79)
```


INFORMATION ONLY

```
      do 100 j=1,neps(i)
      l=leng(hmenu(2,j,i))
      write(hc,90)11-l/2,1,11-l+l/2
   90 format(27h(4h   (,i1,1h.,i1,2h) ,a19,,i2,3hx,a,i2,1h,,i2,
     1 12hx,a5,5x,a20))
  100 write(*,hc)i,j,(hmenu(k,j,i),k=1,ncol)
  110 write(*,'(1h )')
      write(*,120)
  120 format(49h Enter section number to change [1.1], (P)rocess,,
     1 11h or (Q)uit:)
      read(*,'(a)')h
      if(index('Qq',h(1:1)).eq.0)go to 125
      write(*,122)
  122 format(/47h WARNING.  Do you really want to abort the MCNP,
     1 29h installation? [N]o or (Y)es:)
      read(*,'(a)')h
      if(index('Yy',h(1:1)).ne.0)go to 1130
      go to 60
  125 if(index('Pp',h(1:1)).ne.0)go to 480
c
c       Check the selected entry.
      ns=1
      ne=1
      if(h.eq.' ')go to 150
      if(h(2:2).ne.'.')go to 130
      ns=index('123456789',h(1:1))
      ne=index('123456789',h(3:3))
      if(ns.eq.0.or.ns.gt.nsec)go to 130
      if(ne.gt.0.and.ne.le.neps(ns))go to 150
  130 write(*,140)
  140 format(/41h ILLEGAL OPTION.  Press <CR> to continue.)
      read(*,'(a)')h
      go to 60
c
c >>>>>  Modify the selected entry.
c
c       Print the options menu.
  150 write(*,160)
  160 format(53h ********************************* MCNP CHANGE OPTION MENU ,
     1 27h*********************************,///,7h OPTION,27x,
     2 38hKEYWORD(S)    STATUS     PARAMETER(S))
```


INFORMATION ONLY

```
      n=isys
      do 180 i=1,mxno
      if(hoptn(i,1,ne,ns).eq.' ')go to 190
      hp=' '
      if(ns+ne.eq.2)n=i
      if(ipar(1,i,ne,ns).ne.0)hp=hparm(n,ipar(1,i,ne,ns))
      if(hp(18:20).ne.' ')hp(18:20)='...'
      l=leng(hoptn(i,2,ne,ns))
      write(hc,170)11-l/2,l,11-l+1/2
  170 format(21h(/2h (,i2,1h),4x,a19,,i2,3hx,a,i2,1h,,i2,
     1 12hx,a5,5x,a20))
  180 write(*,hc)i,(hoptn(i,k,ne,ns),k=1,ncol-1),hp
      i=mxno+1
  190 write(*,200)idef(ne,ns,isys)
  200 format(/30h Enter desired option number [,i2,14h] or (C)ancel:)
      read(*,'(a)')h
      if(index('Cc',h(1:1)).ne.0)go to 30
c
c       Check the selected option.
      no=idef(ne,ns,isys)
      if(h(1:1).eq.' ')go to 230
      if(h(2:2).eq.' ')read(h(1:1),'(i1)',err=210)no
      if(h(2:2).ne.' ')read(h(1:2),'(i2)',err=210)no
      if(no.gt.0.and.no.lt.i)go to 230
  210 write(*,220)
  220 format(/41h ILLEGAL OPTION.  Press <CR> to continue.)
      read(*,'(a)')h
      go to 150
  230 if(ns+ne.ne.2)go to 250
      if(no.eq.isys)go to 30
c
c       If a new system is chosen, reset the check option flags.
      hoptn(idef(1,1,isys),3,1,1)='off'
      isys=no
      hoptn(idef(1,1,isys),3,1,1)='on'
      do 240 i=1,nsec
      do 240 j=1,neps(i)
  240 ichk(j,i)=0
      go to 30
c
c       Check for system consistency and update the main menu.
```


INFORMATION ONLY

```
  250 do 280 i=1,mxnu
      if(iopt(1,i,isys).eq.0)go to 290
      if(ns.ne.iopt(1,i,isys).or.ne.ne.iopt(2,i,isys).or.
     1   no.ne.iopt(3,i,isys))go to 280
      hc=hmesg(abs(iopt(4,i,isys)))
      hp=hmenu(1,1,1)
      write(*,260)hc(1:leng(hc)),hp(1:leng(hp))
  260 format(/1h ,a,1x,a,8h system.)
      write(*,270)
  270 format(/24h Press <CR> to continue.)
      read(*,'(a)')h
      if(iopt(4,i,isys).lt.0)go to 290
      go to 150
  280 continue
  290 idef(ne,ns,isys)=no
      ichk(ne,ns)=1
      if(ipar(1,no,ne,ns).eq.0)go to 30
c
c       Print parameters associated with this option.
  300 do 330 i=1,3
      if(ipar(i,no,ne,ns).eq.0)go to 340
      n=ipar(i,no,ne,ns)
      hc=hmesg(ipms(n))
      write(*,310)i,hparm(isys,n),hc(1:leng(hc))
  310 format(/28h Default value of parameter ,i1,1h:,//1h ,a,//1h ,a)
      read(*,'(a)')hc
      ha=hc(1:40)
      if(hc(41:len(hc)).eq.' ')go to 330
      write(*,320)hparm(isys,n)
  320 format(/53h FATAL.  Input exceeds 40 characters - current value:,
     1 //1h ,a,//30h Enter [R]etype or (C)ontinue:)
      go to 470
  330 if(ha.ne.' ')hparm(isys,n)=ha
c
c       Verify the option parameters.
  340 hb=hparm(isys,n)
      go to(30,350,30,390,400,390,390,390,390,410,30,420)n
  350 hparm(isys,n)='mdas=4000000'
      hc=hb
      do 360 i=1,leng(hb)
  360 if(index('1234567890-+',hb(i:i)).ne.0)go to 370
```


INFORMATION ONLY

```
      go to 450
  370 hfmt='(i9)'
      l=index(hb(i:len(hb)),' ')-1
      if(l.lt.0)l=len(hb)-i+1
      if(l.ge.10)go to 450
      write(hfmt(3:3),'(i1)')l
      read(hb(i:i+l-1),hfmt,err=450)m
      if(m.le.0)go to 450
      write(hparm(isys,n),'(5hmdas=,i10)')m
      if(m.ge.100000.and.m.le.8000000)go to 30
      write(*,380)hparm(isys,n)
  380 format(/54h WARNING.  MDAS parameter appears incorrect - current ,
     1 6hvalue:,//1h ,a25,//30h Enter [R]etype or (C)ontinue:)
      go to 470
  390 hc=hparm(isys,3)
      ha=hc(1:leng(hc))//hsymb(1,isys)(1:1)
      if(isys.eq.5)ha=hc(1:leng(hc))
      m=index(hb,',')
      if(m.eq.0)m=index(hb(1:leng(hb)),' ')
      if(m.gt.0)hb(m:leng(hb))=' '
      go to 430
  400 ha=hb(1:leng(hb))//hsymb(1,isys)(1:1)
      if(isys.eq.5)ha=hb(1:leng(hb))
      hb='X11'//hsymb(1,isys)(1:1)//'Xlib.h'
      if(isys.eq.5)hb='Xlib.h'
      go to 430
  410 ha=hb(1:leng(hb))//hsymb(1,isys)(1:1)
      if(isys.eq.5)ha=hb(1:leng(hb))
      hb='xsdir'
      go to 430
  420 ha=hparm(isys,11)(1:leng(hparm(isys,11)))//hsymb(1,isys)(1:1)
      if(isys.eq.5)ha=hparm(isys,11)(1:leng(hparm(isys,11)))
      m=index(hb,',')
      if(m.eq.0)m=index(hb(1:leng(hb)),' ')
      if(m.gt.0)hb(m:leng(hb))=' '
  430 hc=ha(1:leng(ha))//hb(1:leng(hb))
      inquire(file=hc(1:leng(hc)),exist=lv)
      if(.not.lv.and.hb.eq.'xsdir')inquire(file=hb(1:leng(hb)),exist=lv)
      if(.not.lv)go to 450
  440 if(n.ne.5)go to 30
      n=4
```


INFORMATION ONLY

```
      go to 340
c
c       Recover from an invalid input.
  450 write(*,460)hc(1:leng(hc))
  460 format(/54h FATAL.  Error verifying parameter(s) - current value:,
     1 //1h ,a,//30h Enter [R]etype or (C)ontinue:)
  470 read(*,'(a)')h
      if(h.eq.' '.or.index('Rr',h(1:1)).ne.0)go to 300
      if(index('Cc',h(1:1)).ne.0)go to 440
      go to 450
c
c >>>>> Process the main menu data into system files.
c
c       Check parameters that haven't been altered.
  480 write(*,490)
  490 format(/32h Verifying option parameters ...)
      if(hmenu(3,1,3).eq.'off'.and.hmenu(3,2,3).eq.'off')ichk(3,3)=1
      do 690 ns=1,nsec
      do 690 ne=1,neps(ns)
      if(ne+ns.eq.2.or.ichk(ne,ns).ne.0)go to 690
      no=idef(ne,ns,isys)
      if(ipar(1,no,ne,ns).eq.0)go to 690
      ic=0
c
c       If necessary, print parameters associated with this option.
  500 do 540 i=1,3
      if(ipar(i,no,ne,ns).eq.0)go to 550
      n=ipar(i,no,ne,ns)
      if(ic.eq.0)go to 540
      hc=hmesg(ipms(n))
      write(*,510)i,hparm(isys,n),hc(1:leng(hc))
  510 format(/28h Default value of parameter ,i1,1h:,//1h ,a,//1h ,a)
      read(*,'(a)')hc
      ha=hc(1:40)
      if(hc(41:len(hc)).eq.' ')go to 530
      write(*,520)hparm(isys,n)
  520 format(/53h FATAL.  Input exceeds 40 characters - current value:,
     1 //1h ,a,//44h Enter [R]etype, (C)ontinue, or (M)ain menu:)
      go to 680
  530 if(ha.ne.' ')hparm(isys,n)=ha
  540 continue
```


INFORMATION ONLY

```
c
c       Verify the option parameters.
 550 hb=hparm(isys,n)
     go to(690,560,690,600,610,600,600,600,600,620,690,630)n
 560 hparm(isys,n)='mdas=4000000'
     hc=hb
     do 570 i=1,leng(hb)
 570 if(index('1234567890-+',hb(i:i)).ne.0)go to 580
     go to 660
 580 hfmt='(i9)'
     l=index(hb(i:len(hb)),' ')-1
     if(l.lt.0)l=len(hb)-i+1
     if(l.ge.10)go to 660
     write(hfmt(3:3),'(i1)')l
     read(hb(i:i+l-1),hfmt,err=660)m
     if(m.le.0)go to 660
     write(hparm(isys,n),'(5hmdas=,i10)')m
     if(m.ge.100000.and.m.le.8000000)go to 690
     write(*,590)hparm(isys,n)
 590 format(/54h WARNING.  MDAS parameter appears incorrect - current ,
    1 6hvalue:,//1h ,a25,
    2 //44h Enter [R]etype, (C)ontinue, or (M)ain menu:)
     go to 680
 600 hc=hparm(isys,3)
     ha=hc(1:leng(hc))//hsymb(1,isys)(1:1)
     if(isys.eq.5)ha=hc(1:leng(hc))
     m=index(hb,',')
     if(m.eq.0)m=index(hb(1:leng(hb)),' ')
     if(m.gt.0)hb(m:leng(hb))=' '
     go to 640
 610 ha=hb(1:leng(hb))//hsymb(1,isys)(1:1)
     if(isys.eq.5)ha=hb(1:leng(hb))
     hb='X11'//hsymb(1,isys)(1:1)//'Xlib.h'
     if(isys.eq.5)hb='Xlib.h'
     go to 640
 620 ha=hb(1:leng(hb))//hsymb(1,isys)(1:1)
     if(isys.eq.5)ha=hb(1:leng(hb))
     hb='xsdir'
     go to 640
 630 ha=hparm(isys,11)(1:leng(hparm(isys,11)))//hsymb(1,isys)(1:1)
     if(isys.eq.5)ha=hparm(isys,11)(1:leng(hparm(isys,11)))
```


INFORMATION ONLY

```
      m=index(hb,',')
      if(m.eq.0)m=index(hb(1:leng(hb)),' ')
      if(m.gt.0)hb(m:leng(hb))=' '
  640 hc=ha(1:leng(ha))//hb(1:leng(hb))
      inquire(file=hc(1:leng(hc)),exist=lv)
      if(.not.lv.and.hb.eq.'xsdir')inquire(file=hb(1:leng(hb)),exist=lv)
      if(.not.lv)go to 660
  650 if(n.ne.5)ichk(ne,ns)=1
      if(n.ne.5)go to 690
      n=4
      go to 550
c
c       Recover from an invalid input.
  660 write(*,670)hc(1:leng(hc))
  670 format(/54h FATAL.  Error verifying parameter(s) - current value:,
     1 //1h ,a,//44h Enter [R]etype, (C)ontinue, or (M)ain menu:)
  680 read(*,'(a)')h
      ic=1
      if(h.eq.' '.or.index('Rr',h(1:1)).ne.0)go to 500
      if(index('Cc',h(1:1)).ne.0)go to 650
      if(index('Mm',h(1:1)).ne.0)go to 30
      go to 660
  690 continue
c
c       Create new lines for internal changes.
      write(*,700)
  700 format(/25h Writing system files ...)
      do 850 i=1,mxnf
      if(ifix(1,i,isys).eq.0)go to 850
      go to(710,730,760,780,790,800,710)i
c
c       Create the PATCHC and PATCHF *define line.
  710 hd='*define'
      if(hmenu(3,1,3).eq.'off'.and.hmenu(3,2,3).eq.'off')
     1 hmenu(3,3,3)='off'
      do 720 j=1,nsec
      do 720 k=1,neps(j)
      hf=hd
  720 if(hmenu(2,k,j).ne.'*****'.and.hmenu(3,k,j).eq.'on')
     1 hd=hf(1:leng(hf))//',//hmenu(2,k,j)
      hd(8:8)=' '
```


INFORMATION ONLY

```
      go to 850
c
c     Create the PATCHF mdas= line.
  730 hd=' '
      if(idef(3,2,isys).ne.2)go to 850
      hf=hparm(isys,ipar(1,idef(3,2,isys),3,2))
      do 740 j=1,leng(hf)
  740 if(index('1234567890',hf(j:j)).ne.0)go to 750
      j=1
      hf='4000000'
  750 hd='      parameter (mdas='//hf(j:leng(hf))//')'
      go to 850
c
c     Create the PATCHF DATAPATH line.
  760 hd=' '
      hf=hparm(isys,ipar(1,idef(1,4,isys),1,4))
      if(hf.eq.' ')go to 850
      write(h,770)
  770 format(3h'/,)
      hd='    3 hdpath/'//h(1:1)//hf(1:leng(hf))//h
      go to 850
c
c     Alter the MAKEMCNP.SYS C compile line.
  780 hd=' '
      if(idef(3,3,isys).ne.1)go to 850
      hf=hparm(isys,ipar(3,idef(3,3,isys),3,3))
      hd=hsymb(2,isys)(1:3)//hf(1:leng(hf))
      go to 850
c
c     Alter the MAKEMCNP.SYS FORTRAN compile line.
  790 hd=' '
      if(isys.eq.2.and.idef(3,2,isys).eq.1)hd=' -O2'
      go to 850
c
c     Alter the MAKEMCNP.SYS FORTRAN link line.
c     Add the graphics and PVM libraries, if requested.
  800 hd=' '
      do 840 k=1,2
      if(k.eq.1.and.hmenu(3,3,3).eq.'off')go to 840
      if(k.eq.2.and.idef(1,5,isys).ne.2)go to 840
      ne=5-2*k
```


INFORMATION ONLY

```
      ns=2*k+1
      ha=hparm(isys,ipar(1,idef(ne,ns,isys),ne,ns))
      if(ha.eq.' ')go to 840
      hb=hparm(isys,ipar(2,idef(ne,ns,isys),ne,ns))
      if(hb.eq.' ')go to 840
      hc=' '
      j=1
c
c     Loop over all libraries listed on this parameter.
  810 l=index(hb(j:leng(hb)),'.')
      if(l.eq.0)l=leng(hb)-j+2
      m=index(hb(j:leng(hb)),',')
      if(m.eq.0)m=leng(hb)-j+2
      n=min(l-1,m-1)+j-1
      if(isys.ne.5.and.isys.ne.7)j=j+3
      if(hc.ne.' ')go to 820
      hc=hsymb(4,isys)(1:3)//hb(j:n)
      if(isys.eq.5)hc=hb(j:n)//hsymb(4,isys)(1:2)
      if(isys.eq.7)hc=hsymb(4,isys)(1:4)//hb(j:n)
      go to 830
  820 if(isys.ne.5.and.isys.ne.7)hc=hc(1:leng(hc))//hsymb(4,isys)(1:3)
     1 //hb(j:n)
      if(isys.eq.5)hc=hc(1:leng(hc))//','//hb(j:n)//hsymb(4,isys)(1:2)
      if(isys.eq.7)hc=hc(1:leng(hc))//hsymb(4,isys)(1:4)//hb(j:n)
  830 j=n+1
      if(l.lt.m)j=j+m+1-l
      if(j.lt.leng(hb))go to 810
c
c     Combine the library paths and libraries.
      j=3
      if(isys.eq.5)j=1
      if(isys.eq.7)j=7
      if(k.eq.1)hd=hsymb(3,isys)(1:j)//ha(1:leng(ha))//hc(1:leng(hc))
      if(k.ne.1)hd=hd(1:leng(hd))//hsymb(3,isys)(1:j)//ha(1:leng(ha))
     1 //hc(1:leng(hc))
  840 continue
  850 hfixs(i)=hd
c
c     Write the changes to an internal fix file.
      open(ius,status='scratch')
      do 870 i=1,mxnf
```


INFORMATION ONLY

```
      if(ifix(1,i,isys).eq.0)go to 870
      write(ius,860)(ifix(j,i,isys),j=1,4)
  860 format(4i5)
      write(ius,'(a)')hfixs(i)
  870 continue
c
c     Add the external fix file if it exists.
      inquire(file='install.fix',exist=lv)
      if(.not.lv)go to 960
      open(iuf,file='install.fix',status='old')
      rewind(iuf)
  880 read(iuf,'(a)',end=950)hd
      if(hd.eq.' '.or.index('Cc',hd(1:1)).ne.0)go to 880
      n=1
      do 910 i=1,5
      do 890 j=n,leng(hd)
  890 if(index('0123456789+-',hd(j:j)).ne.0)go to 900
      if(i.ne.5.or.ib(4).gt.2)go to 930
      ib(5)=0
      go to 910
  900 hfmt='(i9)'
      m=index(hd(j:len(hd)),' ')-1
      if(m.lt.0)m=len(hd)-j+1
      if(m.ge.10)go to 930
      write(hfmt(3:3),'(i1)')m
      read(hd(j:j+m-1),hfmt,err=930)ib(i)
      if(ib(i).lt.ifxl(1,i).or.ib(i).gt.ifxl(2,i))go to 930
  910 n=j+m+1
      if(ib(1).eq.0.or.ib(1).eq.isys)write(ius,860)(ib(k),k=2,5)
      if(ib(4).eq.3)ib(5)=1
      if(ib(4).eq.4)go to 880
      if(ib(5).eq.0)ib(5)=1000000
      do 920 i=1,ib(5)
      read(iuf,'(a)',end=930)hd
      if(ib(1).eq.0.or.ib(1).eq.isys)write(ius,'(a)')hd(1:leng(hd))
  920 if(ib(5).eq.1000000.and.hd.eq.' ')go to 880
      go to 880
  930 if(ib(5).eq.1000000)go to 950
      write(*,940)
  940 format(/51h FATAL.  Format error while reading the INSTALL.FIX,
     1 6h file.)
```


INFORMATION ONLY

```
      go to 1130
  950 close(iuf)
c
c       Write the system files.
  960 do 1050 i=1,3
      open(iuo,file=hname(isys,i),status='unknown')
      id=0
      do 1045 j=1,mxnl
      if(j.le.id)go to 1045
      if(i.eq.1)hd=hpatf(j)
      if(i.eq.2)hd=hmake(j,isys)
      if(i.eq.3)hd=hpatc(j)
      if(hd.eq.' ')go to 1050
      rewind(ius)
  970 read(ius,860,end=1040)(ib(k),k=1,4)
      m=ib(3)
      if(ib(1).ne.i.or.ib(2).ne.j)m=0
      if(ib(3).lt.3.and.ib(4).eq.0)ib(4)=1000000
      go to(980,1000,1000,1020,1035)m+1
c
c       m=0  Wrong system or line number.
  980 if(ib(3).eq.3)ib(4)=1
      if(ib(3).eq.4)go to 970
      do 990 k=1,ib(4)
      read(ius,'(a)',end=1040)hf
  990 if(ib(4).eq.1000000.and.hf.eq.' ')go to 970
      go to 970
c
c       m=1,2  Insert lines or replace a line.
 1000 do 1010 k=1,ib(4)
      read(ius,'(a)',end=1016)hf
      if(hf.eq.' ')go to 1010
      if(m.eq.2)hd=hf
      write(iuo,'(a)')hf(1:leng(hf))
 1010 if(ib(4).eq.1000000.and.hf.eq.' ')go to 1014
      if(hf.eq.' ')go to 970
 1014 if(m.eq.2)backspace(iuo)
      go to 970
 1016 if(m.eq.2)backspace(iuo)
      go to 1040
c
```


INFORMATION ONLY

```
c       m=3  Alter a line.
 1020 read(ius,'(a)')hc
      if(hc.eq.' ')go to 970
      l=0
      do 1030 k=1,ib(4)
      l=min(l+1,leng(hd)+1)
 1030 l=l+index(hd(l:leng(hd)+1),' ')-1
      if(ib(4).eq.0)hf=hc(1:leng(hc)+1)//hd(1:leng(hd))
      if(ib(4).ne.0)hf=hd(1:l-1)//hc(1:leng(hc))//
     1 hd(min(l,leng(hd)+1):leng(hd)+1)
      hd=hf
      go to 970
c
c       m=4  Delete line(s).
 1035 id=ib(4)
      go to 1045
 1040 write(iuo,'(a)')hd(1:leng(hd))
 1045 continue
 1050 close(iuo)
c
c       Setup complete - write the answer file.
      open(iuw,file='install.ans',status='unknown')
      do 1110 ns=1,nsec
      do 1110 ne=1,neps(ns)
      write(iuw,'(i1,1h.,i1)')ns,ne
      no=idef(ne,ns,isys)
      if(no.lt.10)write(iuw,'(i1)')no
      if(no.ge.10)write(iuw,'(i2)')no
      if(ns+ne.eq.2)go to 1110
      do 1060 i=1,mxnu
      if(ns.ne.iopt(1,i,isys).or.ne.ne.iopt(2,i,isys).or.
     1   no.ne.iopt(3,i,isys))go to 1060
      write(iuw,'(1h )')
      go to 1070
 1060 continue
 1070 do 1100 i=1,3
      n=ipar(i,no,ne,ns)
      if(n.eq.0)go to 1110
      write(iuw,'(a)')hparm(isys,n)
      if(n.ne.2)go to 1100
      hb=hparm(isys,n)
```


INFORMATION ONLY

```
      do 1080 j=1,leng(hb)
 1080 if(index('1234567890-+',hb(j:j)).ne.0)go to 1090
 1090 hfmt='(i9)'
      l=index(hb(j:len(hb)),' ')-1
      if(l.lt.0)l=len(hb)-j+1
      write(hfmt(3:3),'(i1)')l
      read(hb(j:j+l-1),hfmt)m
      if(m.lt.100000.or.m.gt.8000000)write(iuw,'(1hc)')
 1100 continue
 1110 continue
      write(iuw,'(1hp)')
      write(*,1120)
 1120 format(/16h Setup complete.)
 1130 stop
      end
      function leng(h)
      character h*(*)
      do 10 leng=len(h),1,-1
   10 if(h(leng:leng).ne.' ')return
      return
      end
```

Fsplit.for file for PC desktop computer

```
C     Last change:  JAM   5 Jan 98   11:05 am
      program fsplit
c
c     fsplit separates a large fortran program into sections
c     incrementing the file name, respectively.
c
      CHARACTER*80 card, blnk
      CHARACTER*9  outfil
      CHARACTER*10 subnam
      CHARACTER*6  NAME(5)
c
      DATA outfil /'mcnp0.for'/
      DATA name   /'xact  ', 'kcalc ', 3*'      '/
      DATA subnam /'subroutine'/
      data blnk   /'                          '/
c
      open (UNIT=15,FILE='compile',ACCESS='sequential', STATUS='old')
```


INFORMATION ONLY

```
      nfil   = 1
      write (outfil(5:5),'(i1)') nfil
      open (UNIT=16,FILE=outfil,ACCESS='sequential',STATUS='new')
   10 continue
      read (UNIT=15,FMT=2001,END=1001) card
   15 continue
      IF (card .EQ. blnk) GO TO 1001
      if (card(7:16) .ne. subnam) then
        write (UNIT=16, FMT=2001) card
      else
        do 20 i = 1,5
        if (card(18:23) .eq. NAME(i)) then
          close (UNIT=16, STATUS='keep')
          nfil = nfil + 1
          write (outfil(5:5),'(i1)') nfil
          open (UNIT=16,FILE=outfil,ACCESS='sequential',STATUS='new')
          GO TO 25
        end if
   20   continue
   25 write (UNIT=16, FMT=2001) card
      end if
      go to 10
c
1001  continue
      close (UNIT=15,STATUS='keep')
      close (UNIT=16,STATUS='keep')
c
2001  FORMAT (a80)
      end program
```

"ANSWER.std" file for PC desktop MCNP4B installation

```
1.1
7
2.1
2
2.2
1
2.3
2
mdas=  4000000
```


INFORMATION ONLY

```
3.1
1
3.2
1
3.3
5
c:\lf9035\lib
lf90.lib
4.1
1
d:\mcnp4b
4.2
2
5.1
1
p
```

"ANSWER.x" file for PC desktop MCNP4B installation

```
1.1
7
2.1
2
2.2
1
2.3
2
mdas=  9600000
c
3.1
1
3.2
1
3.3
5
c:\lf9035\lib
lf90.lib
4.1
1
d:\mcnp4b
4.2
```


INFORMATION ONLY

2
5.1
1
p

INFORMATION ONLY

Attachment III: MCNP4B2 Directory And File Listing

The following files are required for execution of the MCNP4B2 code system. These have been placed under the control of the appropriate systems administrator to provide write protection for these files.

HP Workstations
MCNP4B2 - MCNP executable version 4B2 for the HP 9000 series workstations, 1458176 bytes, created on 03/30/98, located in the directory /opt/neut/MCNP4B.

SUN Ultra-2 Workstation
MCNP4B2 - MCNP executable version 4B2 for the SUN Ultra-2 workstation, 2104584 bytes, created on 03/30/98, located in the directory /usr2/mcnp4b.

PC's
MCNP4B2.EXE - MCNP executable version 4B2 for the PC desktop computer, 18,130,471 bytes, 04/01/98

PC's
MCNP4B2x.EXE - MCNP executable version 4B2x for the PC desktop computer, 40,531,471 bytes, 04/01/98

INFORMATION ONLY

HP 9000 DIRECTORY LISTING

This attachment contains actual listing of the MCNP4B2 executable and library files contained in subdirectories /opt/neut/MCNP4B and /opt/neut/MCNP4B/xslib on the QUICHE HP 9000 workstation. The list is created by invoking the Unix command "ls -la". These files were created during the installation process. Upon approval of this SQR all files other than those controlled by the systems administrator and selected test case input files will be removed after they have been electronically archived. This is done to conserve storage on the workstation.

Directory listing of /opt/neut/MCNP4B

```
total 5736
drwxr-xr-x   4 root     sys        1024 Mar 30 09:54 .
drwxr-xr-x  11 root     root       1024 Nov 25 15:20 ..
-rwxr-xr-x   1 root     sys     1458176 Dec 19 16:11 mcnp
drwxr-xr-x   7 root     sys        1024 May 21  1997 mcnp.Unix
-rwxr-xr-x   1 root     sys     1458176 Mar 30 09:54 mcnp4b2
drwxr-xr-x   2 root     sys        1024 Dec 17 16:29 xslib
```

Directory listing of /opt/neut/MCNP4B/xslib

```
total 189492
drwxr-xr-x   2 root       sys          1024 Dec 17 16:29 .
drwxr-xr-x   4 root       sys          1024 Dec 19 17:01 ..
-rw-r--r--   1 root       sys       3590144 Dec 17 16:18 100xs2
-rw-r--r--   1 root       sys        305152 Dec 17 16:21 531dos2
-rw-r--r--   1 root       sys        874496 Dec 17 16:21 532dos2
-rw-r--r--   1 root       sys       2680832 Dec 17 16:21 dre52
-rw-r--r--   1 root       sys       5093376 Dec 17 16:20 drmccs2
-rw-r--r--   1 root       sys        770048 Dec 17 16:21 el2
-rw-r--r--   1 root       sys       2846720 Dec 17 16:19 endf5mt2
-rw-r--r--   1 root       sys       5736448 Dec 17 16:16 endf5p2
-rw-r--r--   1 root       sys       5937152 Dec 17 16:17 endf5u2
-rw-r--r--   1 root       sys      36685824 Dec 17 16:14 endf602
-rw-r--r--   1 root       sys       5859328 Dec 17 16:19 endl852
-rw-r--r--   1 root       sys       1259520 Dec 17 16:17 kidman2
-rw-r--r--   1 root       sys       1687552 Dec 17 16:21 lll2os2
-rw-r--r--   1 root       sys        577536 Dec 17 16:21 mcplib022
-rw-r--r--   1 root       sys        440320 Dec 17 16:21 mcplib2
-rw-r--r--   1 root       sys       1628160 Dec 17 16:21 mgxsnp2
-rw-r--r--   1 root       sys       3840000 Dec 17 16:17 misc5xs2
-rw-r--r--   1 root       sys       1812480 Dec 17 16:14 newxs2
-rw-r--r--   1 root       sys        716800 Dec 17 16:19 newxsd2
-rw-r--r--   1 root       sys       8196096 Dec 17 16:15 rmccs2
```


INFORMATION ONLY

```
-rw-r--r--   1 root     sys      3532800 Dec 17 16:15 rmccsa2
-rw-r--r--   1 root     sys        90112 Dec 17 16:21 therxs2
-rw-r--r--   1 root     sys      2416640 Dec 17 16:21 tmccs2
-rw-r--r--   1 root     sys       146966 Dec 19 17:03 xsdir
```


INFORMATION ONLY

SUN Ultra-2 DIRECTORY LISTING

This attachment contains actual listing of the MCNP4B2 executable and library files contained in subdirectories /usr2/mcnp4b and /usr2/mcnp4b/xslib on the OTIS SUN Ultra-2 workstation. The list is created by invoking the Unix command "ls -la". These files were created during the installation process. Upon approval of this SQR all files other than those controlled by the systems administrator and selected test case input files will be removed after they have been electronically archived. This is done to conserve storage on the workstation.

Directory listing of /usr2/mcnp4b

```
total 6024
drwxr-xr-x   3 goluoglu users       512 Mar 31 15:25 ./
drwxr-xr-x   4 root     root        512 Feb 13 16:07 ../
-r--r--r--   1 goluoglu users    304084 Mar 30 13:34 libF77.so.3
-r--r--r--   1 goluoglu users    637768 Mar 30 13:32 libsunmath.so.1
lrwxrwxrwx   1 goluoglu users         7 Mar 30 13:33 mcnp -> mcnp4b2*
-r-xr-xr-x   1 goluoglu users   2104584 Mar 30 13:32 mcnp4b2*
drwxr-xr-x   2 root     sys        1024 Jan 14 10:34 xslib/
```

Directory Listing of /usr2/mcnp4b/xslib

```
total 190096
drwxr-xr-x   2 root     sys        1024 Jan 14 10:34 ./
drwxr-xr-x   3 goluoglu users       512 Mar 31 15:26 ../
-rwxr-xr-x   1 root     sys     3590144 Jan 14 10:03 100xs2*
-rwxr-xr-x   1 root     sys      305152 Jan 14 10:03 531dos2*
-rwxr-xr-x   1 root     sys      874496 Jan 14 10:03 532dos2*
-rwxr-xr-x   1 root     sys        9265 Jan 14 10:34 README*
-rwxr-xr-x   1 root     sys       20759 Jan 14 10:34 README_ENDF60*
-rwxr-xr-x   1 root     sys     2680832 Jan 14 10:04 dre52*
-rwxr-xr-x   1 root     sys     5093376 Jan 14 10:05 drmccs2*
-rwxr-xr-x   1 root     sys      770048 Jan 14 10:05 el2*
-rwxr-xr-x   1 root     sys     2846720 Jan 14 10:06 endf5mt2*
-rwxr-xr-x   1 root     sys     5736448 Jan 14 10:07 endf5p2*
-rwxr-xr-x   1 root     sys     5937152 Jan 14 10:09 endf5u2*
-rwxr-xr-x   1 root     sys    36685824 Jan 14 10:22 endf602*
-rwxr-xr-x   1 root     sys     5859328 Jan 14 10:24 endl852*
-rwxr-xr-x   1 root     sys     1259520 Jan 14 10:24 kidman2*
-rwxr-xr-x   1 root     sys     1687552 Jan 14 10:25 lll dos2*
-rwxr-xr-x   1 root     sys      577536 Jan 14 10:25 mcplib022*
-rwxr-xr-x   1 root     sys      440320 Jan 14 10:26 mcplib2*
-rwxr-xr-x   1 root     sys     1628160 Jan 14 10:26 mgxsnp2*
-rwxr-xr-x   1 root     sys     3840000 Jan 14 10:28 misc5xs2*
```


INFORMATION ONLY

```
-rwxr-xr-x   1 root     sys      1812480 Jan 14 10:29 newxs2*
-rwxr-xr-x   1 root     sys       716800 Jan 14 10:29 newxsd2*
-rwxr-xr-x   1 root     sys      8196096 Jan 14 10:32 rmccs2*
-rwxr-xr-x   1 root     sys      3532800 Jan 14 10:33 rmccsa2*
-rwxr-xr-x   1 root     sys          523 Jan 14 10:33 specs*
-rwxr-xr-x   1 root     sys        90112 Jan 14 10:33 therxs2*
-rwxr-xr-x   1 root     sys      2416640 Jan 14 10:33 tmccs2*
-rwxr-xr-x   1 root     sys         5416 Jan 14 10:34 tprint*
-rwxr-xr-x   1 root     sys       146962 Feb 13 16:14 xsdir*
-rwxr-xr-x   1 root     sys        98714 Jan 14 10:34 xsdir1.org*
-rwxr-xr-x   1 root     sys       146934 Jan 14 10:34 xsdir2*
```


INFORMATION ONLY

PC DESKTOP COMPUTER DIRECTORY LISTING

This attachment contains a listing of the MCNP4B2 executable and library files contained in subdirectories d:\mcnp4b\exe and d:\mcnp4b.xc on the GATEWAY2000 P5-166 PC desktop computer. These files were created during the installation process. Upon approval of this SQR all files other than those controlled by the systems administrator and selected test case input files will be removed after they have been electronically archived. This is done to conserve storage on the computer hard drive.

```
 Directory for MCNP4B2

 Volume in drive D has no label
 Volume Serial Number is 2353-07C6
 Directory of D:\MCNP4B

README  TXT       1,313  01-15-98 11:32a readme.TXT
RUNMCNP BAT       1,500  04-10-98  9:51a runmcnp.bat
RUNMCNPX BAT      1,503  04-10-98  9:49a runmcnpx.bat
XSDIR           129,390  01-07-98 11:41a xsdir


 Volume in drive D has no label
 Volume Serial Number is 2353-07C6
 Directory of D:\MCNP4B\EXE

.        <DIR>      01-15-98  8:37a .
..       <DIR>      01-15-98  8:37a ..

MCNP4B2 EXE    18,130,741  04-01-98  1:11p MCNP4B2.EXE
MCNP4B2X EXE   40,530,741  04-01-98  2:19p MCNP4B2X.EXE
MCNPEXE DIR            0  04-10-98  8:56a mcnpexe.dir
README  TXT        1,405  01-07-98  3:16p readme.TXT
RUNMCNP BAT        1,245  02-25-98  7:09a runmcnp.bat
SPECS                893  01-07-98  8:54a Specs
TPRINT  DIF          100  01-07-98 10:40a tprint.dif
XSDIR1           100,581  01-02-98  2:19p Xsdir1


 Volume in drive D has no label
 Volume Serial Number is 2353-07C6
 Directory of D:\MCNP4B\Install

.        <DIR>      03-31-98  9:51a .
..       <DIR>      03-31-98  9:51a ..
ANSWER  STD          255  04-01-98  1:03p answer.std
ANSWER               258  04-01-98  2:12p answer
```


INFORMATION ONLY

```
FIX4B2  TXT      10,452 03-27-98  3:40p fix4b2.txt
FSPLIT  BAK       1,399 01-05-98 10:54a fsplit.BAK
FSPLIT  EXE     291,381 01-05-98 11:08a FSPLIT.EXE
FSPLIT  FOR       1,401 01-05-98 11:05a fsplit.for
GETFILES            923 02-10-97 10:20a GETFILES
INSTALL LOG   1,162,009 04-01-98  2:19p install.log
INSTALL BAT       5,486 03-31-98 11:18a install.bat
INSTALL FIX      10,927 04-01-98  2:09p install.fix
INSTAL~1 STD  1,162,008 04-01-98  1:11p install.log.std
INSTAL~2 STD     10,883 04-01-98  1:01p install.fix.std
MAKEMCNP BAK        948 12-19-97 10:15a Makemcnp.BAK
MAKEMCNP BAT      1,391 04-01-98  2:12p MAKEMCNP.BAT
MAKXS   ID       51,585 12-19-97 11:17a MAKXS.ID
MAKXSF  MAP      20,474 04-01-98  2:12p MAKXSF.MAP
MAKXSF  EXE     318,293 04-01-98  2:12p MAKXSF.EXE
MAKXSI~1 ORG     51,042 12-19-97 11:13a Makxs.id.org
MCNP4B  ORG   4,067,098 02-06-97 12:49p mcnp4b.org
MCNP4B  ID    4,110,365 03-31-98  4:17p Mcnp4b.id
MCNPC   ID       66,552 02-06-97  1:19p MCNPC.ID
MCSETUP EXE     453,733 04-01-98  2:10p MCSETUP.EXE
MCSETUP MAP      20,281 04-01-98  2:10p MCSETUP.MAP
MCSETUP FOR      41,937 04-01-98  2:07p Mcsetup.for
NEWID         4,110,757 04-01-98  2:12p NEWID
PATCHC              131 04-01-98  2:12p PATCHC
PATCHF            7,463 04-01-98  2:12p PATCHF
PATCHF  BAK       3,393 12-19-97  2:44p Patchf.BAK
PLOT    FOR         268 01-05-98  3:11p plot.for
PRPR    EXE     518,373 04-01-98  2:12p PRPR.EXE
PRPR    ID        8,443 12-18-97  4:49p PRPR.ID
PRPR    MAP      19,596 04-01-98  2:12p PRPR.MAP
READMAAG         13,492 02-14-97  8:23a READMAAG
README~1 TXT     15,166 03-27-98  3:39p readme4b2.txt


Volume in drive D has no label
Volume Serial Number is 2353-07C6
Directory of D:\mcnp4b.xc

.         <DIR>      01-15-98  8:37a .
..        <DIR>      01-15-98  8:37a ..
100XS2      3,592,192 01-07-98 10:33a 100XS2
531DOS2       307,200 01-07-98 10:36a 531DOS2
532DOS2       876,544 01-07-98 10:36a 532DOS2
DRMCCS2     5,095,424 01-07-98 10:35a DRMCCS2
EL2           774,144 01-07-98 10:36a EL2
ENDF5MT2    2,848,768 01-07-98 10:34a ENDF5MT2
ENDF5P2     5,738,496 01-07-98 10:32a ENDF5P2
ENDF5U2     5,939,200 01-07-98 10:32a ENDF5U2
```


INFORMATION ONLY

ENDF602	36,687,872	01-07-98	10:29a ENDF602
ENDL852	5,861,376	01-07-98	10:34a ENDL852
KIDMAN2	1,261,568	01-07-98	10:33a KIDMAN2
LLLDOS2	1,689,600	01-07-98	10:36a LLLDOS2
MCPLIB2	442,368	01-07-98	10:36a MCPLIB2
MCPLIB22	579,584	01-07-98	10:36a MCPLIB22
MGXSNP2	1,630,208	01-07-98	10:36a MGXSNP2
MISC5XS2	3,842,048	01-07-98	10:33a MISC5XS2
NEWXS2	1,814,528	01-07-98	10:29a NEWXS2
NEWXSD2	718,848	01-07-98	10:34a NEWXSD2
RMCCS2	8,198,144	01-07-98	10:30a RMCCS2
RMCCSA2	3,534,848	01-07-98	10:31a RMCCSA2
THERXS2	92,160	01-07-98	10:36a THERXS2
TMCCS2	2,418,688	01-07-98	10:36a TMCCS2

INFORMATION ONLY

Attachment IV: Table of Contents of Electronic Medias MOY-980421-19 (MI: 30056-M03-001), MOY-980421-18 (MI: 30057-M03-001), and MOY-980421-20 (MI: 30055-M72-001)

The following is a list of the files that are used during installation verification and validation and included in the corresponding data tapes. Unix tapes are created using the Unix tar command. The files can be restored by entering:

tar -xvf *<device>* mcnp4b2.SYS

where *<device>* is the device name for the backup derive and SYS is the system name (e.g., spuds, opus, otis). The restored file is also a tar file which containes all files used and created on the corresponding system. All or parts of the mcnp4b2.SYS file can be restored depending on the need of the user. If the users system is identical to one of the systems used in this SQR, the user may only copy the executable under mcnp4b/exec directory along with the cross section libraries under mcnp4b/xslib. Note that the cross section libraries on otis are under mcnp4b/exec/xslib.

Files from OPUS on HP backup tape MOY-980421-19 (MI: 30056-M03-001)

Verification test problems are located in mcnp4b/exec . Criticality validation test problems are located in mcnp4b/ver-val/endf5. Criticality validation test problems are located in mcnp4b/ver-val/endf6. Shielding validation test problems are located in mcnp4b/ver-val/shield. Coincident planes verification test problem is located in mcnp4b/ver-val/4b2fix.

```
rwxr-xr-x 229/20      0 Mar 31 16:45 1998 ./mcnp4b/
rwxr-xr-x 229/20      0 Dec 17 11:39 1997 ./mcnp4b/INSTALL/
r-xr-xr-x 229/20   3971 Dec 17 10:46 1997 ./mcnp4b/INSTALL/INSTALL
r-xr-xr-x 229/20   4523 Dec 17 10:46 1997 ./mcnp4b/INSTALL/INSTALL.VMS
r-xr-xr-x 229/20  51042 Dec 17 10:46 1997 ./mcnp4b/INSTALL/MAKXS.ID
r-xr-xr-x 229/20 4067098 Dec 17 10:47 1997 ./mcnp4b/INSTALL/MCNP4B.ID
r-xr-xr-x 229/20   8443 Dec 17 10:47 1997 ./mcnp4b/INSTALL/PRPR.ID
r-xr-xr-x 229/20   2918 Dec 17 10:46 1997 ./mcnp4b/INSTALL/INSTALL.FIX.old
r-xr-xr-x 229/20  66552 Dec 17 10:47 1997 ./mcnp4b/INSTALL/MCNPC.ID
r-xr-xr-x 229/20  38920 Dec 17 10:47 1997 ./mcnp4b/INSTALL/MCSETUP.FOR
r-xr-xr-x 229/20  13492 Dec 17 10:47 1997 ./mcnp4b/INSTALL/READMAAG
r-xr-xr-x 229/20    923 Dec 17 10:46 1997 ./mcnp4b/INSTALL/GETFILES
rw-r--r-- 229/20   6603 Dec 17 11:38 1997 ./mcnp4b/INSTALL/INSTALL.FIX
rwxr-xr-x 229/20      0 Mar 31 15:49 1998 ./mcnp4b/exec/
rwxr-xr-x 229/20   6070 Mar 27 14:57 1998 ./mcnp4b/exec/RUNPROB.VMS
rwxr-xr-x 229/20 235520 Mar 27 14:57 1998 ./mcnp4b/exec/TESTMCTL.AIX
rwxr-xr-x 229/20 227840 Mar 27 14:57 1998 ./mcnp4b/exec/TESTMCTL.SUN
rwxr-xr-x 229/20 290304 Mar 27 14:57 1998 ./mcnp4b/exec/TESTMCTL.VMS
rwxr-xr-x 229/20 2048000 Mar 27 14:57 1998 ./mcnp4b/exec/TESTOUTP.AIX
rwxr-xr-x 229/20 2040320 Mar 27 14:57 1998 ./mcnp4b/exec/TESTOUTP.SUN
rwxr-xr-x 229/20 2354688 Mar 27 14:57 1998 ./mcnp4b/exec/TESTOUTP.VMS
rw-rw-rw- 229/20    230 Mar 27 15:28 1998 ./mcnp4b/exec/answer
rwxr-xr-x 229/20    923 Mar 27 14:57 1998 ./mcnp4b/exec/getfiles
rwxr-xr-x 229/20  66552 Mar 27 15:25 1998 ./mcnp4b/exec/mcnpc.id
rw-r----- 229/20  10184 Mar 27 15:09 1998 ./mcnp4b/exec/install.fix
rwxr-xr-x 229/20 4067098 Mar 27 15:27 1998 ./mcnp4b/exec/mcnpf.id
rwxrwxrwx 229/20      0 Mar 27 15:38 1998 ./mcnp4b/exec/flib/
rw-rw-rw- 229/20  32485 Mar 27 15:28 1998 ./mcnp4b/exec/flib/abvals.f
rw-rw-rw- 229/20  42851 Mar 27 15:28 1998 ./mcnp4b/exec/flib/acecas.f
```


INFORMATION ONLY

```
rw-rw-rw- 229/20  35113 Mar 27 15:28 1998 ./mcnp4b/exec/flib/acecol.f
rw-rw-rw- 229/20  23506 Mar 27 15:28 1998 ./mcnp4b/exec/flib/acecos.f
rw-rw-rw- 229/20  26353 Mar 27 15:28 1998 ./mcnp4b/exec/flib/acecs6.f
rw-rw-rw- 229/20  24601 Mar 27 15:28 1998 ./mcnp4b/exec/flib/acefcn.f
rw-rw-rw- 229/20  24163 Mar 27 15:28 1998 ./mcnp4b/exec/flib/acefpt.f
rw-rw-rw- 229/20  38471 Mar 27 15:28 1998 ./mcnp4b/exec/flib/acegam.f
rw-rw-rw- 229/20  22265 Mar 27 15:28 1998 ./mcnp4b/exec/flib/acenu.f
rw-rw-rw- 229/20  23798 Mar 27 15:28 1998 ./mcnp4b/exec/flib/acetbl.f
rw-rw-rw- 229/20  34091 Mar 27 15:28 1998 ./mcnp4b/exec/flib/acetot.f
rw-rw-rw- 229/20  37084 Mar 27 15:28 1998 ./mcnp4b/exec/flib/action.f
rw-rw-rw- 229/20  29127 Mar 27 15:28 1998 ./mcnp4b/exec/flib/addtfc.f
rw-rw-rw- 229/20  21681 Mar 27 15:28 1998 ./mcnp4b/exec/flib/advijk.f
rw-rw-rw- 229/20  28178 Mar 27 15:28 1998 ./mcnp4b/exec/flib/amatrx.f
rw-rw-rw- 229/20  29419 Mar 27 15:28 1998 ./mcnp4b/exec/flib/angl.f
rw-rw-rw- 229/20   1679 Mar 27 15:28 1998 ./mcnp4b/exec/flib/arbobv.f
rw-rw-rw- 229/20  33580 Mar 27 15:28 1998 ./mcnp4b/exec/flib/axis.f
rw-rw-rw- 229/20  26353 Mar 27 15:28 1998 ./mcnp4b/exec/flib/axlabl.f
rw-rw-rw- 229/20  22630 Mar 27 15:28 1998 ./mcnp4b/exec/flib/backup.f
rw-rw-rw- 229/20  29492 Mar 27 15:28 1998 ./mcnp4b/exec/flib/bankit.f
rw-rw-rw- 229/20  23506 Mar 27 15:28 1998 ./mcnp4b/exec/flib/barplt.f
rw-rw-rw- 229/20  21389 Mar 27 15:28 1998 ./mcnp4b/exec/flib/begone.f
rw-rw-rw- 229/20  34018 Mar 27 15:28 1998 ./mcnp4b/exec/flib/binlin.f
rw-rw-rw- 229/20  26353 Mar 27 15:28 1998 ./mcnp4b/exec/flib/binval.f
rw-rw-rw- 229/20  11607 Mar 27 15:28 1998 ./mcnp4b/exec/flib/blkdat.f
rw-rw-rw- 229/20  28397 Mar 27 15:28 1998 ./mcnp4b/exec/flib/brang.f
rw-rw-rw- 229/20  29054 Mar 27 15:28 1998 ./mcnp4b/exec/flib/brem.f
rw-rw-rw- 229/20  33872 Mar 27 15:28 1998 ./mcnp4b/exec/flib/brems.f
rw-rw-rw- 229/20  23871 Mar 27 15:28 1998 ./mcnp4b/exec/flib/broadn.f
rw-rw-rw- 229/20  49056 Mar 27 15:28 1998 ./mcnp4b/exec/flib/calcps.f
rw-rw-rw- 229/20  35770 Mar 27 15:28 1998 ./mcnp4b/exec/flib/calcva.f
rw-rw-rw- 229/20  36938 Mar 27 15:28 1998 ./mcnp4b/exec/flib/celnbr.f
rw-rw-rw- 229/20  29054 Mar 27 15:28 1998 ./mcnp4b/exec/flib/celpar.f
rw-rw-rw- 229/20  41756 Mar 27 15:28 1998 ./mcnp4b/exec/flib/celsrf.f
rw-rw-rw- 229/20  46136 Mar 27 15:28 1998 ./mcnp4b/exec/flib/chekcs.f
rw-rw-rw- 229/20  83950 Mar 27 15:28 1998 ./mcnp4b/exec/flib/chekit.f
rw-rw-rw- 229/20   1168 Mar 27 15:28 1998 ./mcnp4b/exec/flib/chgmem.f
rw-rw-rw- 229/20  30879 Mar 27 15:28 1998 ./mcnp4b/exec/flib/chkcel.f
rw-rw-rw- 229/20  28324 Mar 27 15:28 1998 ./mcnp4b/exec/flib/chkprb.f
rw-rw-rw- 229/20  25915 Mar 27 15:28 1998 ./mcnp4b/exec/flib/chksrc.f
rw-rw-rw- 229/20  51684 Mar 27 15:28 1998 ./mcnp4b/exec/flib/chkxss.f
rw-rw-rw- 229/20  23798 Mar 27 15:28 1998 ./mcnp4b/exec/flib/chqcel.f
rw-rw-rw- 229/20    949 Mar 27 15:28 1998 ./mcnp4b/exec/flib/chrhol.f
rw-rw-rw- 229/20   1095 Mar 27 15:28 1998 ./mcnp4b/exec/flib/ckchar.f
rw-rw-rw- 229/20  28105 Mar 27 15:28 1998 ./mcnp4b/exec/flib/colidk.f
rw-rw-rw- 229/20  36865 Mar 27 15:28 1998 ./mcnp4b/exec/flib/colidn.f
rw-rw-rw- 229/20  41391 Mar 27 15:28 1998 ./mcnp4b/exec/flib/colidp.f
rw-rw-rw- 229/20  36062 Mar 27 15:28 1998 ./mcnp4b/exec/flib/colinp.f
rw-rw-rw- 229/20   3577 Mar 27 15:28 1998 ./mcnp4b/exec/flib/confid.f
rw-rw-rw- 229/20  38106 Mar 27 15:28 1998 ./mcnp4b/exec/flib/contr.f
rw-rw-rw- 229/20   6132 Mar 27 15:28 1998 ./mcnp4b/exec/flib/covar.f
rw-rw-rw- 229/20  31901 Mar 27 15:28 1998 ./mcnp4b/exec/flib/cprinp.f
rw-rw-rw- 229/20    730 Mar 27 15:28 1998 ./mcnp4b/exec/flib/crspro.f
rw-rw-rw- 229/20  29054 Mar 27 15:28 1998 ./mcnp4b/exec/flib/crtcze.f
rw-rw-rw- 229/20  26937 Mar 27 15:28 1998 ./mcnp4b/exec/flib/dbmin.f
rw-rw-rw- 229/20  24674 Mar 27 15:28 1998 ./mcnp4b/exec/flib/dddat.f
rw-rw-rw- 229/20  25988 Mar 27 15:28 1998 ./mcnp4b/exec/flib/dddiag.f
rw-rw-rw- 229/20  22265 Mar 27 15:28 1998 ./mcnp4b/exec/flib/dddlev.f
rw-rw-rw- 229/20  23725 Mar 27 15:28 1998 ./mcnp4b/exec/flib/dosef.f
rw-rw-rw- 229/20    584 Mar 27 15:28 1998 ./mcnp4b/exec/flib/dotpro.f
rw-rw-rw- 229/20  25331 Mar 27 15:28 1998 ./mcnp4b/exec/flib/dotrcl.f
rw-rw-rw- 229/20  29711 Mar 27 15:28 1998 ./mcnp4b/exec/flib/dplinf.f
rw-rw-rw- 229/20  23214 Mar 27 15:28 1998 ./mcnp4b/exec/flib/dunlev.f
rw-rw-rw- 229/20  26353 Mar 27 15:28 1998 ./mcnp4b/exec/flib/dxdiag.f
rw-rw-rw- 229/20  37668 Mar 27 15:28 1998 ./mcnp4b/exec/flib/dxtran.f
rw-rw-rw- 229/20  24601 Mar 27 15:28 1998 ./mcnp4b/exec/flib/echkcl.f
rw-rw-rw- 229/20  37230 Mar 27 15:28 1998 ./mcnp4b/exec/flib/electr.f
rw-rw-rw- 229/20  38544 Mar 27 15:28 1998 ./mcnp4b/exec/flib/emaker.f
rw-rw-rw- 229/20  21754 Mar 27 15:28 1998 ./mcnp4b/exec/flib/entwwg.f
rw-rw-rw- 229/20  31901 Mar 27 15:28 1998 ./mcnp4b/exec/flib/eqpbbn.f
rw-rw-rw- 229/20   4891 Mar 27 15:28 1998 ./mcnp4b/exec/flib/erf2.f
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INFORMATION ONLY

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rw-rw-rw- 229/20  23506 Mar 27 15:28 1998 ./mcnp4b/exec/flib/ergimp.f
rw-rw-rw- 229/20  24893 Mar 27 15:28 1998 ./mcnp4b/exec/flib/erprnt.f
rw-rw-rw- 229/20  24528 Mar 27 15:28 1998 ./mcnp4b/exec/flib/errbar.f
rw-rw-rw- 229/20  23506 Mar 27 15:28 1998 ./mcnp4b/exec/flib/errprn.f
rw-rw-rw- 229/20  24455 Mar 27 15:28 1998 ./mcnp4b/exec/flib/esloss.f
rw-rw-rw- 229/20  28324 Mar 27 15:28 1998 ./mcnp4b/exec/flib/eventp.f
rw-rw-rw- 229/20  34456 Mar 27 15:28 1998 ./mcnp4b/exec/flib/exemes.f
rw-rw-rw- 229/20  22119 Mar 27 15:28 1998 ./mcnp4b/exec/flib/exmg.f
rw-rw-rw- 229/20  34675 Mar 27 15:28 1998 ./mcnp4b/exec/flib/exord.f
rw-rw-rw- 229/20  26426 Mar 27 15:28 1998 ./mcnp4b/exec/flib/exordp.f
rw-rw-rw- 229/20  24382 Mar 27 15:28 1998 ./mcnp4b/exec/flib/expire.f
rw-rw-rw- 229/20  21754 Mar 27 15:28 1998 ./mcnp4b/exec/flib/expirx.f
rw-rw-rw- 229/20  57451 Mar 27 15:28 1998 ./mcnp4b/exec/flib/expung.f
rw-rw-rw- 229/20  21900 Mar 27 15:28 1998 ./mcnp4b/exec/flib/extran.f
rw-rw-rw- 229/20  47012 Mar 27 15:28 1998 ./mcnp4b/exec/flib/extrct.f
rw-rw-rw- 229/20   3212 Mar 27 15:28 1998 ./mcnp4b/exec/flib/fastdr.f
rw-rw-rw- 229/20  21243 Mar 27 15:28 1998 ./mcnp4b/exec/flib/ffstch.f
rw-rw-rw- 229/20  25258 Mar 27 15:28 1998 ./mcnp4b/exec/flib/findel.f
rw-rw-rw- 229/20  24528 Mar 27 15:28 1998 ./mcnp4b/exec/flib/findlv.f
rw-rw-rw- 229/20  23798 Mar 27 15:28 1998 ./mcnp4b/exec/flib/finpht.f
rw-rw-rw- 229/20  27740 Mar 27 15:28 1998 ./mcnp4b/exec/flib/forcol.f
rw-rw-rw- 229/20   4307 Mar 27 15:28 1998 ./mcnp4b/exec/flib/fshort.f
rw-rw-rw- 229/20   1168 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gacwk.f
rw-rw-rw- 229/20    876 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gclks.f
rw-rw-rw- 229/20    949 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gclrwk.f
rw-rw-rw- 229/20   1241 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gclwk.f
rw-rw-rw- 229/20    949 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gdawk.f
rw-rw-rw- 229/20    949 Mar 27 15:28 1998 ./mcnp4b/exec/flib/getexm.f
rw-rw-rw- 229/20    949 Mar 27 15:28 1998 ./mcnp4b/exec/flib/getidt.f
rw-rw-rw- 229/20  29200 Mar 27 15:28 1998 ./mcnp4b/exec/flib/getxs.f
rw-rw-rw- 229/20  40734 Mar 27 15:28 1998 ./mcnp4b/exec/flib/getxst.f
rw-rw-rw- 229/20   1679 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gfa.f
rw-rw-rw- 229/20    876 Mar 27 15:28 1998 ./mcnp4b/exec/flib/ginlc.f
rw-rw-rw- 229/20  26426 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gmgww.f
rw-rw-rw- 229/20   2044 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gopks.f
rw-rw-rw- 229/20   1533 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gopwk.f
rw-rw-rw- 229/20   5183 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gpl.f
rw-rw-rw- 229/20    949 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gqcf.f
rw-rw-rw- 229/20    949 Mar 27 15:28 1998 ./mcnp4b/exec/flib/grqlc.f
rw-rw-rw- 229/20   1022 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gschh.f
rw-rw-rw- 229/20   1095 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gschup.f
rw-rw-rw- 229/20    803 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gschxp.f
rw-rw-rw- 229/20   1022 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gscr.f
rw-rw-rw- 229/20    803 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gsds.f
rw-rw-rw- 229/20    803 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gselnt.f
rw-rw-rw- 229/20   1241 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gsfaci.f
rw-rw-rw- 229/20    803 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gsfais.f
rw-rw-rw- 229/20    876 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gsln.f
rw-rw-rw- 229/20    876 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gslwsc.f
rw-rw-rw- 229/20   1241 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gsplci.f
rw-rw-rw- 229/20   1241 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gstxci.f
rw-rw-rw- 229/20    803 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gstxfp.f
rw-rw-rw- 229/20    949 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gsvp.f
rw-rw-rw- 229/20   1825 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gswkwn.f
rw-rw-rw- 229/20   1460 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gswn.f
rw-rw-rw- 229/20   3066 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gtx.f
rw-rw-rw- 229/20    949 Mar 27 15:28 1998 ./mcnp4b/exec/flib/guwk.f
rw-rw-rw- 229/20  31901 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gxaxis.f
rw-rw-rw- 229/20  21389 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gxhome.f
rw-rw-rw- 229/20   2920 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gxlims.f
rw-rw-rw- 229/20  21316 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gxoff.f
rw-rw-rw- 229/20  25696 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gxon.f
rw-rw-rw- 229/20  21754 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gxquit.f
rw-rw-rw- 229/20  21316 Mar 27 15:28 1998 ./mcnp4b/exec/flib/gxskip.f
rw-rw-rw- 229/20  23506 Mar 27 15:28 1998 ./mcnp4b/exec/flib/hgram.f
rw-rw-rw- 229/20  24236 Mar 27 15:28 1998 ./mcnp4b/exec/flib/hpsort.f
rw-rw-rw- 229/20  45260 Mar 27 15:28 1998 ./mcnp4b/exec/flib/hstory.f
rw-rw-rw- 229/20  13505 Mar 27 15:28 1998 ./mcnp4b/exec/flib/ibldat.f
rw-rw-rw- 229/20  25988 Mar 27 15:28 1998 ./mcnp4b/exec/flib/igeom.f
rw-rw-rw- 229/20  48399 Mar 27 15:28 1998 ./mcnp4b/exec/flib/imcn.f
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INFORMATION ONLY

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rw-rw-rw- 229/20  30441 Mar 27 15:28 1998 ./mcnp4b/exec/flib/inpert.f
rw-rw-rw- 229/20    730 Mar 27 15:28 1998 ./mcnp4b/exec/flib/inqire.f
rw-rw-rw- 229/20  38106 Mar 27 15:28 1998 ./mcnp4b/exec/flib/inter.f
rw-rw-rw- 229/20  33507 Mar 27 15:28 1998 ./mcnp4b/exec/flib/intsec.f
rw-rw-rw- 229/20  36938 Mar 27 15:28 1998 ./mcnp4b/exec/flib/ipbc.f
rw-rw-rw- 229/20  23068 Mar 27 15:28 1998 ./mcnp4b/exec/flib/isheet.f
rw-rw-rw- 229/20   3358 Mar 27 15:28 1998 ./mcnp4b/exec/flib/isos.f
rw-rw-rw- 229/20  23871 Mar 27 15:28 1998 ./mcnp4b/exec/flib/isourc.f
rw-rw-rw- 229/20  32047 Mar 27 15:28 1998 ./mcnp4b/exec/flib/issrc.f
rw-rw-rw- 229/20  87892 Mar 27 15:28 1998 ./mcnp4b/exec/flib/itally.f
rw-rw-rw- 229/20  38398 Mar 27 15:28 1998 ./mcnp4b/exec/flib/italpr.f
rw-rw-rw- 229/20  30733 Mar 27 15:28 1998 ./mcnp4b/exec/flib/items.f
rw-rw-rw- 229/20  30879 Mar 27 15:28 1998 ./mcnp4b/exec/flib/iwtwnd.f
rw-rw-rw- 229/20  40734 Mar 27 15:28 1998 ./mcnp4b/exec/flib/ixsdir.f
rw-rw-rw- 229/20  22922 Mar 27 15:28 1998 ./mcnp4b/exec/flib/jbin.f
rw-rw-rw- 229/20  45260 Mar 27 15:28 1998 ./mcnp4b/exec/flib/jdecod.f
rw-rw-rw- 229/20  44968 Mar 27 15:28 1998 ./mcnp4b/exec/flib/jsourc.f
rw-rw-rw- 229/20  24236 Mar 27 15:28 1998 ./mcnp4b/exec/flib/jtskpt.f
rw-rw-rw- 229/20  31171 Mar 27 15:28 1998 ./mcnp4b/exec/flib/kbatch.f
rw-rw-rw- 229/20  34821 Mar 27 15:28 1998 ./mcnp4b/exec/flib/kcalc.f
rw-rw-rw- 229/20   2336 Mar 27 15:28 1998 ./mcnp4b/exec/flib/kdarg.f
rw-rw-rw- 229/20   2409 Mar 27 15:28 1998 ./mcnp4b/exec/flib/kdata.f
rw-rw-rw- 229/20   3358 Mar 27 15:28 1998 ./mcnp4b/exec/flib/klein.f
rw-rw-rw- 229/20  28470 Mar 27 15:28 1998 ./mcnp4b/exec/flib/knock.f
rw-rw-rw- 229/20  41464 Mar 27 15:28 1998 ./mcnp4b/exec/flib/knorm.f
rw-rw-rw- 229/20  43800 Mar 27 15:28 1998 ./mcnp4b/exec/flib/kprint.f
rw-rw-rw- 229/20  35113 Mar 27 15:28 1998 ./mcnp4b/exec/flib/kskcyc.f
rw-rw-rw- 229/20  23944 Mar 27 15:28 1998 ./mcnp4b/exec/flib/ksrctp.f
rw-rw-rw- 229/20  24601 Mar 27 15:28 1998 ./mcnp4b/exec/flib/ktable.f
rw-rw-rw- 229/20  24601 Mar 27 15:28 1998 ./mcnp4b/exec/flib/kxray.f
rw-rw-rw- 229/20  82928 Mar 27 15:28 1998 ./mcnp4b/exec/flib/landau.f
rw-rw-rw- 229/20  51903 Mar 27 15:28 1998 ./mcnp4b/exec/flib/landct.f
rw-rw-rw- 229/20  30952 Mar 27 15:28 1998 ./mcnp4b/exec/flib/latcon.f
rw-rw-rw- 229/20  23433 Mar 27 15:28 1998 ./mcnp4b/exec/flib/lblocs.f
rw-rw-rw- 229/20    657 Mar 27 15:28 1998 ./mcnp4b/exec/flib/leng.f
rw-rw-rw- 229/20  28689 Mar 27 15:28 1998 ./mcnp4b/exec/flib/levcel.f
rw-rw-rw- 229/20  31098 Mar 27 15:28 1998 ./mcnp4b/exec/flib/levchk.f
rw-rw-rw- 229/20   2482 Mar 27 15:28 1998 ./mcnp4b/exec/flib/lgeval.f
rw-rw-rw- 229/20  31317 Mar 27 15:28 1998 ./mcnp4b/exec/flib/likebt.f
rw-rw-rw- 229/20    803 Mar 27 15:28 1998 ./mcnp4b/exec/flib/ljusti.f
rw-rw-rw- 229/20  27667 Mar 27 15:28 1998 ./mcnp4b/exec/flib/mapmaz.f
rw-rw-rw- 229/20   1679 Mar 27 15:28 1998 ./mcnp4b/exec/flib/matmpy.f
rw-rw-rw- 229/20  35916 Mar 27 15:28 1998 ./mcnp4b/exec/flib/mcnp.f
rw-rw-rw- 229/20  32266 Mar 27 15:28 1998 ./mcnp4b/exec/flib/mcplot.f
rw-rw-rw- 229/20  25915 Mar 27 15:28 1998 ./mcnp4b/exec/flib/mcrun.f
rw-rw-rw- 229/20  40588 Mar 27 15:28 1998 ./mcnp4b/exec/flib/mctalr.f
rw-rw-rw- 229/20  28397 Mar 27 15:28 1998 ./mcnp4b/exec/flib/mctalw.f
rw-rw-rw- 229/20  61831 Mar 27 15:28 1998 ./mcnp4b/exec/flib/mdecod.f
rw-rw-rw- 229/20  31974 Mar 27 15:28 1998 ./mcnp4b/exec/flib/mgacol.f
rw-rw-rw- 229/20  36354 Mar 27 15:28 1998 ./mcnp4b/exec/flib/mgcoln.f
rw-rw-rw- 229/20  26937 Mar 27 15:28 1998 ./mcnp4b/exec/flib/mgcolp.f
rw-rw-rw- 229/20  39128 Mar 27 15:28 1998 ./mcnp4b/exec/flib/mgimps.f
rw-rw-rw- 229/20  34894 Mar 27 15:28 1998 ./mcnp4b/exec/flib/mgxspt.f
rw-rw-rw- 229/20  25258 Mar 27 15:28 1998 ./mcnp4b/exec/flib/midpnt.f
rw-rw-rw- 229/20  23068 Mar 27 15:28 1998 ./mcnp4b/exec/flib/movlat.f
rw-rw-rw- 229/20  29127 Mar 27 15:28 1998 ./mcnp4b/exec/flib/mreset.f
rw-rw-rw- 229/20  22630 Mar 27 15:28 1998 ./mcnp4b/exec/flib/namchg.f
rw-rw-rw- 229/20  24163 Mar 27 15:28 1998 ./mcnp4b/exec/flib/namrsd.f
rw-rw-rw- 229/20  37522 Mar 27 15:28 1998 ./mcnp4b/exec/flib/newcdl.f
rw-rw-rw- 229/20  36573 Mar 27 15:28 1998 ./mcnp4b/exec/flib/newcel.f
rw-rw-rw- 229/20  50443 Mar 27 15:28 1998 ./mcnp4b/exec/flib/newcrd.f
rw-rw-rw- 229/20  85702 Mar 27 15:28 1998 ./mcnp4b/exec/flib/nextit.f
rw-rw-rw- 229/20  30003 Mar 27 15:28 1998 ./mcnp4b/exec/flib/norma.f
rw-rw-rw- 229/20  31463 Mar 27 15:28 1998 ./mcnp4b/exec/flib/normh.f
rw-rw-rw- 229/20  60371 Mar 27 15:28 1998 ./mcnp4b/exec/flib/nxtitl.f
rw-rw-rw- 229/20   2409 Mar 27 15:28 1998 ./mcnp4b/exec/flib/nxtsym.f
rw-rw-rw- 229/20  36865 Mar 27 15:28 1998 ./mcnp4b/exec/flib/oldcdl.f
rw-rw-rw- 229/20  58254 Mar 27 15:28 1998 ./mcnp4b/exec/flib/oldcrd.f
rw-rw-rw- 229/20  27083 Mar 27 15:28 1998 ./mcnp4b/exec/flib/output.f
rw-rw-rw- 229/20  27375 Mar 27 15:28 1998 ./mcnp4b/exec/flib/outwwg.f
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INFORMATION ONLY

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rw-rw-rw- 229/20   1241 Mar 27 15:28 1998 ./mcnp4b/exec/flib/pareto.f
rw-rw-rw- 229/20  27448 Mar 27 15:28 1998 ./mcnp4b/exec/flib/passl.f
rw-rw-rw- 229/20  25769 Mar 27 15:28 1998 ./mcnp4b/exec/flib/photp.f
rw-rw-rw- 229/20  25769 Mar 27 15:28 1998 ./mcnp4b/exec/flib/pathmz.f
rw-rw-rw- 229/20   4891 Mar 27 15:28 1998 ./mcnp4b/exec/flib/pbldat.f
rw-rw-rw- 229/20  23798 Mar 27 15:28 1998 ./mcnp4b/exec/flib/pconst.f
rw-rw-rw- 229/20  25696 Mar 27 15:28 1998 ./mcnp4b/exec/flib/pertub.f
rw-rw-rw- 229/20  25331 Mar 27 15:28 1998 ./mcnp4b/exec/flib/photot.f
rw-rw-rw- 229/20  28397 Mar 27 15:28 1998 ./mcnp4b/exec/flib/pieces.f
rw-rw-rw- 229/20  24893 Mar 27 15:28 1998 ./mcnp4b/exec/flib/plin.f
rw-rw-rw- 229/20  29930 Mar 27 15:28 1998 ./mcnp4b/exec/flib/plot2d.f
rw-rw-rw- 229/20  27886 Mar 27 15:28 1998 ./mcnp4b/exec/flib/plotcn.f
rw-rw-rw- 229/20  33434 Mar 27 15:28 1998 ./mcnp4b/exec/flib/plotg.f
rw-rw-rw- 229/20  31025 Mar 27 15:28 1998 ./mcnp4b/exec/flib/pltdxt.f
rw-rw-rw- 229/20  26280 Mar 27 15:28 1998 ./mcnp4b/exec/flib/pltitl.f
rw-rw-rw- 229/20  33361 Mar 27 15:28 1998 ./mcnp4b/exec/flib/pltsrf.f
rw-rw-rw- 229/20  36938 Mar 27 15:28 1998 ./mcnp4b/exec/flib/polhed.f
rw-rw-rw- 229/20  40077 Mar 27 15:28 1998 ./mcnp4b/exec/flib/prhpdf.f
rw-rw-rw- 229/20  34456 Mar 27 15:28 1998 ./mcnp4b/exec/flib/prinv.f
rw-rw-rw- 229/20  32704 Mar 27 15:28 1998 ./mcnp4b/exec/flib/prlost.f
rw-rw-rw- 229/20   2993 Mar 27 15:28 1998 ./mcnp4b/exec/flib/prodhh.f
rw-rw-rw- 229/20  31974 Mar 27 15:28 1998 ./mcnp4b/exec/flib/prplot.f
rw-rw-rw- 229/20  30441 Mar 27 15:28 1998 ./mcnp4b/exec/flib/prsdft.f
rw-rw-rw- 229/20  32266 Mar 27 15:28 1998 ./mcnp4b/exec/flib/prsdst.f
rw-rw-rw- 229/20  25112 Mar 27 15:28 1998 ./mcnp4b/exec/flib/prssrj.f
rw-rw-rw- 229/20  38179 Mar 27 15:28 1998 ./mcnp4b/exec/flib/prstat.f
rw-rw-rw- 229/20  35697 Mar 27 15:28 1998 ./mcnp4b/exec/flib/prtfcc.f
rw-rw-rw- 229/20  34456 Mar 27 15:28 1998 ./mcnp4b/exec/flib/psurf.f
rw-rw-rw- 229/20  31901 Mar 27 15:28 1998 ./mcnp4b/exec/flib/ptfc.f
rw-rw-rw- 229/20  22046 Mar 27 15:28 1998 ./mcnp4b/exec/flib/ptimin.f
rw-rw-rw- 229/20  24747 Mar 27 15:28 1998 ./mcnp4b/exec/flib/ptost.f
rw-rw-rw- 229/20  46720 Mar 27 15:28 1998 ./mcnp4b/exec/flib/ptrak.f
rw-rw-rw- 229/20  21462 Mar 27 15:28 1998 ./mcnp4b/exec/flib/pttyin.f
rw-rw-rw- 229/20  25039 Mar 27 15:28 1998 ./mcnp4b/exec/flib/putlbl.f
rw-rw-rw- 229/20  27740 Mar 27 15:28 1998 ./mcnp4b/exec/flib/putnq.f
rw-rw-rw- 229/20   6205 Mar 27 15:28 1998 ./mcnp4b/exec/flib/qnc7.f
rw-rw-rw- 229/20   2117 Mar 27 15:28 1998 ./mcnp4b/exec/flib/qpol.f
rw-rw-rw- 229/20  23944 Mar 27 15:28 1998 ./mcnp4b/exec/flib/qttyin.f
rw-rw-rw- 229/20   2336 Mar 27 15:28 1998 ./mcnp4b/exec/flib/quad.f
rw-rw-rw- 229/20  11826 Mar 27 15:28 1998 ./mcnp4b/exec/flib/quart.f
rw-rw-rw- 229/20  24893 Mar 27 15:28 1998 ./mcnp4b/exec/flib/random.f
rw-rw-rw- 229/20  21973 Mar 27 15:28 1998 ./mcnp4b/exec/flib/rang.f
rw-rw-rw- 229/20  28251 Mar 27 15:28 1998 ./mcnp4b/exec/flib/rdprob.f
rw-rw-rw- 229/20  25185 Mar 27 15:28 1998 ./mcnp4b/exec/flib/reflec.f
rw-rw-rw- 229/20  22192 Mar 27 15:28 1998 ./mcnp4b/exec/flib/refpbc.f
rw-rw-rw- 229/20  38690 Mar 27 15:28 1998 ./mcnp4b/exec/flib/regula.f
rw-rw-rw- 229/20  30660 Mar 27 15:28 1998 ./mcnp4b/exec/flib/rhoden.f
rw-rw-rw- 229/20  33945 Mar 27 15:28 1998 ./mcnp4b/exec/flib/ronge.f
rw-rw-rw- 229/20   6132 Mar 27 15:28 1998 ./mcnp4b/exec/flib/rotas.f
rw-rw-rw- 229/20  22484 Mar 27 15:28 1998 ./mcnp4b/exec/flib/rslmaz.f
rw-rw-rw- 229/20  23944 Mar 27 15:28 1998 ./mcnp4b/exec/flib/runtpq.f
rw-rw-rw- 229/20  22192 Mar 27 15:28 1998 ./mcnp4b/exec/flib/runtpr.f
rw-rw-rw- 229/20  21754 Mar 27 15:28 1998 ./mcnp4b/exec/flib/runtpw.f
rw-rw-rw- 229/20  26353 Mar 27 15:28 1998 ./mcnp4b/exec/flib/sabcol.f
rw-rw-rw- 229/20  23798 Mar 27 15:28 1998 ./mcnp4b/exec/flib/scat.f
rw-rw-rw- 229/20  27010 Mar 27 15:28 1998 ./mcnp4b/exec/flib/scatt.f
rw-rw-rw- 229/20   1679 Mar 27 15:28 1998 ./mcnp4b/exec/flib/screen.f
rw-rw-rw- 229/20    730 Mar 27 15:28 1998 ./mcnp4b/exec/flib/secnd.f
rw-rw-rw- 229/20  23798 Mar 27 15:28 1998 ./mcnp4b/exec/flib/setcel.f
rw-rw-rw- 229/20  41099 Mar 27 15:28 1998 ./mcnp4b/exec/flib/setdas.f
rw-rw-rw- 229/20  30149 Mar 27 15:28 1998 ./mcnp4b/exec/flib/sfiles.f
rw-rw-rw- 229/20  29054 Mar 27 15:28 1998 ./mcnp4b/exec/flib/shade.f
rw-rw-rw- 229/20   3066 Mar 27 15:28 1998 ./mcnp4b/exec/flib/simint.f
rw-rw-rw- 229/20  28981 Mar 27 15:28 1998 ./mcnp4b/exec/flib/simplx.f
rw-rw-rw- 229/20  32485 Mar 27 15:28 1998 ./mcnp4b/exec/flib/sing.f
rw-rw-rw- 229/20  34456 Mar 27 15:28 1998 ./mcnp4b/exec/flib/skcode.f
rw-rw-rw- 229/20   8030 Mar 27 15:28 1998 ./mcnp4b/exec/flib/smevev.f
rw-rw-rw- 229/20   6643 Mar 27 15:28 1998 ./mcnp4b/exec/flib/smhhtr.f
rw-rw-rw- 229/20  32120 Mar 27 15:28 1998 ./mcnp4b/exec/flib/smpsrc.f
rw-rw-rw- 229/20  49129 Mar 27 15:28 1998 ./mcnp4b/exec/flib/sourcb.f
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INFORMATION ONLY

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rw-rw-rw- 229/20  21535 Mar 27 15:28 1998 ./mcnp4b/exec/flib/source.f
rw-rw-rw- 229/20  23287 Mar 27 15:28 1998 ./mcnp4b/exec/flib/sourck.f
rw-rw-rw- 229/20  25258 Mar 27 15:28 1998 ./mcnp4b/exec/flib/spec.f
rw-rw-rw- 229/20  25842 Mar 27 15:28 1998 ./mcnp4b/exec/flib/splins.f
rw-rw-rw- 229/20  39858 Mar 27 15:28 1998 ./mcnp4b/exec/flib/sprob.f
rw-rw-rw- 229/20  24601 Mar 27 15:28 1998 ./mcnp4b/exec/flib/sqqint.f
rw-rw-rw- 229/20  21097 Mar 27 15:28 1998 ./mcnp4b/exec/flib/srcdx.f
rw-rw-rw- 229/20  24236 Mar 27 15:28 1998 ./mcnp4b/exec/flib/srcsrf.f
rw-rw-rw- 229/20  25185 Mar 27 15:28 1998 ./mcnp4b/exec/flib/sread.f
rw-rw-rw- 229/20  27886 Mar 27 15:28 1998 ./mcnp4b/exec/flib/ssmsrc.f
rw-rw-rw- 229/20  38909 Mar 27 15:28 1998 ./mcnp4b/exec/flib/startp.f
rw-rw-rw- 229/20  27010 Mar 27 15:28 1998 ./mcnp4b/exec/flib/status.f
rw-rw-rw- 229/20  26645 Mar 27 15:28 1998 ./mcnp4b/exec/flib/sttop.f
rw-rw-rw- 229/20  36938 Mar 27 15:28 1998 ./mcnp4b/exec/flib/stuff.f
rw-rw-rw- 229/20  23360 Mar 27 15:28 1998 ./mcnp4b/exec/flib/sufwrt.f
rw-rw-rw- 229/20  39931 Mar 27 15:28 1998 ./mcnp4b/exec/flib/sumary.f
rw-rw-rw- 229/20  31828 Mar 27 15:28 1998 ./mcnp4b/exec/flib/surfac.f
rw-rw-rw- 229/20  36573 Mar 27 15:28 1998 ./mcnp4b/exec/flib/sursrc.f
rw-rw-rw- 229/20  29711 Mar 27 15:28 1998 ./mcnp4b/exec/flib/talloc.f
rw-rw-rw- 229/20  49056 Mar 27 15:28 1998 ./mcnp4b/exec/flib/tally.f
rw-rw-rw- 229/20  47377 Mar 27 15:28 1998 ./mcnp4b/exec/flib/tallyd.f
rw-rw-rw- 229/20  26061 Mar 27 15:28 1998 ./mcnp4b/exec/flib/tallyh.f
rw-rw-rw- 229/20  34091 Mar 27 15:28 1998 ./mcnp4b/exec/flib/tallyp.f
rw-rw-rw- 229/20  26499 Mar 27 15:28 1998 ./mcnp4b/exec/flib/tallyq.f
rw-rw-rw- 229/20  21462 Mar 27 15:28 1998 ./mcnp4b/exec/flib/tallyx.f
rw-rw-rw- 229/20  26864 Mar 27 15:28 1998 ./mcnp4b/exec/flib/talph.f
rw-rw-rw- 229/20  27302 Mar 27 15:28 1998 ./mcnp4b/exec/flib/talshf.f
rw-rw-rw- 229/20  22849 Mar 27 15:28 1998 ./mcnp4b/exec/flib/tarea.f
rw-rw-rw- 229/20  32266 Mar 27 15:28 1998 ./mcnp4b/exec/flib/tekdvr.f
rw-rw-rw- 229/20  24382 Mar 27 15:28 1998 ./mcnp4b/exec/flib/tgtvel.f
rw-rw-rw- 229/20  21024 Mar 27 15:28 1998 ./mcnp4b/exec/flib/timint.f
rw-rw-rw- 229/20  26207 Mar 27 15:28 1998 ./mcnp4b/exec/flib/torus.f
rw-rw-rw- 229/20  32120 Mar 27 15:28 1998 ./mcnp4b/exec/flib/tpefil.f
rw-rw-rw- 229/20  43800 Mar 27 15:28 1998 ./mcnp4b/exec/flib/track.f
rw-rw-rw- 229/20  25477 Mar 27 15:28 1998 ./mcnp4b/exec/flib/transm.f
rw-rw-rw- 229/20  34018 Mar 27 15:28 1998 ./mcnp4b/exec/flib/trfmat.f
rw-rw-rw- 229/20  32850 Mar 27 15:28 1998 ./mcnp4b/exec/flib/trfsrf.f
rw-rw-rw- 229/20  27667 Mar 27 15:28 1998 ./mcnp4b/exec/flib/trnspt.f
rw-rw-rw- 229/20  27521 Mar 27 15:28 1998 ./mcnp4b/exec/flib/ttbr.f
rw-rw-rw- 229/20    438 Mar 27 15:28 1998 ./mcnp4b/exec/flib/ttyint.f
rw-rw-rw- 229/20  25185 Mar 27 15:28 1998 ./mcnp4b/exec/flib/ufiles.f
rw-rw-rw- 229/20  36354 Mar 27 15:28 1998 ./mcnp4b/exec/flib/unimar.f
rw-rw-rw- 229/20   1898 Mar 27 15:28 1998 ./mcnp4b/exec/flib/unique.f
rw-rw-rw- 229/20  22703 Mar 27 15:28 1998 ./mcnp4b/exec/flib/uplev.f
rw-rw-rw- 229/20  22265 Mar 27 15:28 1998 ./mcnp4b/exec/flib/uplpos.f
rw-rw-rw- 229/20  22776 Mar 27 15:28 1998 ./mcnp4b/exec/flib/utask.f
rw-rw-rw- 229/20  43143 Mar 27 15:28 1998 ./mcnp4b/exec/flib/viewz.f
rw-rw-rw- 229/20  24163 Mar 27 15:28 1998 ./mcnp4b/exec/flib/voidcd.f
rw-rw-rw- 229/20  33288 Mar 27 15:28 1998 ./mcnp4b/exec/flib/volume.f
rw-rw-rw- 229/20  24090 Mar 27 15:28 1998 ./mcnp4b/exec/flib/vtask.f
rw-rw-rw- 229/20  28032 Mar 27 15:28 1998 ./mcnp4b/exec/flib/wgtul.f
rw-rw-rw- 229/20  22119 Mar 27 15:28 1998 ./mcnp4b/exec/flib/wgtwwg.f
rw-rw-rw- 229/20  24966 Mar 27 15:28 1998 ./mcnp4b/exec/flib/wrwssa.f
rw-rw-rw- 229/20  30806 Mar 27 15:28 1998 ./mcnp4b/exec/flib/wtcalc.f
rw-rw-rw- 229/20  30733 Mar 27 15:28 1998 ./mcnp4b/exec/flib/wtmult.f
rw-rw-rw- 229/20  24236 Mar 27 15:28 1998 ./mcnp4b/exec/flib/wtwndo.f
rw-rw-rw- 229/20  28324 Mar 27 15:28 1998 ./mcnp4b/exec/flib/wwfile.f
rw-rw-rw- 229/20  31390 Mar 27 15:28 1998 ./mcnp4b/exec/flib/wwval.f
rw-rw-rw- 229/20  24747 Mar 27 15:28 1998 ./mcnp4b/exec/flib/xact.f
rw-rw-rw- 229/20  22484 Mar 27 15:28 1998 ./mcnp4b/exec/flib/xsec.f
rw-rw-rw- 229/20  32339 Mar 27 15:28 1998 ./mcnp4b/exec/flib/xsgen.f
rw-rw-rw- 229/20   7154 Mar 27 15:28 1998 ./mcnp4b/exec/flib/xsprmr.f
rw-rw-rw- 229/20  25696 Mar 27 15:28 1998 ./mcnp4b/exec/flib/ypbssp.f
rw-rw-rw- 229/20   1241 Mar 27 15:28 1998 ./mcnp4b/exec/flib/zaid.f
rw-rw-rw- 229/20  11826 Mar 27 15:28 1998 ./mcnp4b/exec/flib/zbldat.f
rw-rw-rw- 229/20  39128 Mar 27 15:28 1998 ./mcnp4b/exec/flib/mcnpc.c
rwx------ 229/20   1396 Mar  1 13:23 1996 ./mcnp4b/exec/inp01
rwxr-xr-x 229/20 188416 Mar 27 15:28 1998 ./mcnp4b/exec/mcsetup
rwxr-xr-x 229/20  38920 Mar 27 14:57 1998 ./mcnp4b/exec/mcsetup.for
rw-rw-rw- 229/20  74991 Mar 27 15:48 1998 ./mcnp4b/exec/install.log
```


INFORMATION ONLY

```
rwxrwxrwx 229/20 1458176 Mar 27 15:39 1998 ./mcnp4b/exec/mcnp
rwxr-xr-x 229/20    4871 Mar 27 14:57 1998 ./mcnp4b/exec/runpraad
rwxr-xr-x 229/20    3264 Mar 27 14:57 1998 ./mcnp4b/exec/runprob
rwxr-xr-x 229/20   22914 Mar 27 14:57 1998 ./mcnp4b/exec/testdir
rwxr-xr-x 229/20  196608 Mar 27 14:57 1998 ./mcnp4b/exec/testinp.tar
rwxr-xr-x 229/20  262144 Mar 27 14:57 1998 ./mcnp4b/exec/testmaae
rwxr-xr-x 229/20  235520 Mar 27 14:57 1998 ./mcnp4b/exec/testmctl.hp
rwxr-xr-x 229/20 2097152 Mar 27 14:57 1998 ./mcnp4b/exec/testoaaf
rwxr-xr-x 229/20 2048000 Mar 27 14:57 1998 ./mcnp4b/exec/testoutp.hp
rwxr-xr-x 229/20    2918 Mar 27 14:57 1998 ./mcnp4b/exec/INSTALL.FIX.old
rwx------ 229/20    1963 Mar  2 12:09 1996 ./mcnp4b/exec/inp02
rwxr-xr-x 229/20   51042 Mar 27 14:58 1998 ./mcnp4b/exec/makxs.id
rw-rw-rw- 229/20    6924 Mar 27 15:28 1998 ./mcnp4b/exec/patchf
rwxr-xr-x 229/20    8443 Mar 27 14:58 1998 ./mcnp4b/exec/prpr.id
rw-rw-rw- 229/20     137 Mar 27 15:28 1998 ./mcnp4b/exec/patchc
rwxr-xr-x 229/20  135168 Mar 27 15:28 1998 ./mcnp4b/exec/makxsf
rwxr-xr-x 229/20  258048 Mar 27 15:28 1998 ./mcnp4b/exec/prpr
rwxrwxrwx 229/20       0 Mar 27 15:39 1998 ./mcnp4b/exec/olib/
rw-rw-rw- 229/20    4348 Mar 27 15:28 1998 ./mcnp4b/exec/olib/abvals.o
rw-rw-rw- 229/20    9816 Mar 27 15:29 1998 ./mcnp4b/exec/olib/acecas.o
rw-rw-rw- 229/20    6356 Mar 27 15:29 1998 ./mcnp4b/exec/olib/acecol.o
rw-rw-rw- 229/20    1724 Mar 27 15:29 1998 ./mcnp4b/exec/olib/acecos.o
rw-rw-rw- 229/20    2540 Mar 27 15:29 1998 ./mcnp4b/exec/olib/acecs6.o
rw-rw-rw- 229/20    1644 Mar 27 15:29 1998 ./mcnp4b/exec/olib/acefcn.o
rw-rw-rw- 229/20    2328 Mar 27 15:29 1998 ./mcnp4b/exec/olib/acefpt.o
rw-rw-rw- 229/20    8868 Mar 27 15:29 1998 ./mcnp4b/exec/olib/acegam.o
rw-rw-rw- 229/20    1288 Mar 27 15:29 1998 ./mcnp4b/exec/olib/acenu.o
rw-rw-rw- 229/20    1432 Mar 27 15:29 1998 ./mcnp4b/exec/olib/acetbl.o
rw-rw-rw- 229/20    6300 Mar 27 15:29 1998 ./mcnp4b/exec/olib/acetot.o
rw-rw-rw- 229/20   16440 Mar 27 15:29 1998 ./mcnp4b/exec/olib/action.o
rw-rw-rw- 229/20    4780 Mar 27 15:29 1998 ./mcnp4b/exec/olib/addtfc.o
rw-rw-rw- 229/20    1320 Mar 27 15:29 1998 ./mcnp4b/exec/olib/advijk.o
rw-rw-rw- 229/20    2684 Mar 27 15:29 1998 ./mcnp4b/exec/olib/amatrx.o
rw-rw-rw- 229/20    3148 Mar 27 15:29 1998 ./mcnp4b/exec/olib/angl.o
rw-rw-rw- 229/20     964 Mar 27 15:29 1998 ./mcnp4b/exec/olib/arbobv.o
rw-rw-rw- 229/20    4312 Mar 27 15:29 1998 ./mcnp4b/exec/olib/axis.o
rw-rw-rw- 229/20    4732 Mar 27 15:29 1998 ./mcnp4b/exec/olib/axlabl.o
rw-rw-rw- 229/20    1444 Mar 27 15:29 1998 ./mcnp4b/exec/olib/backup.o
rw-rw-rw- 229/20    4356 Mar 27 15:29 1998 ./mcnp4b/exec/olib/bankit.o
rw-rw-rw- 229/20    1372 Mar 27 15:29 1998 ./mcnp4b/exec/olib/barplt.o
rw-rw-rw- 229/20    1344 Mar 27 15:29 1998 ./mcnp4b/exec/olib/begone.o
rw-rw-rw- 229/20   10932 Mar 27 15:29 1998 ./mcnp4b/exec/olib/binlin.o
rw-rw-rw- 229/20    4320 Mar 27 15:29 1998 ./mcnp4b/exec/olib/binval.o
rw-rw-rw- 229/20    4228 Mar 27 15:29 1998 ./mcnp4b/exec/olib/blkdat.o
rw-rw-rw- 229/20    5696 Mar 27 15:29 1998 ./mcnp4b/exec/olib/brang.o
rw-rw-rw- 229/20    5824 Mar 27 15:29 1998 ./mcnp4b/exec/olib/brem.o
rw-rw-rw- 229/20    6252 Mar 27 15:29 1998 ./mcnp4b/exec/olib/brems.o
rw-rw-rw- 229/20    2080 Mar 27 15:29 1998 ./mcnp4b/exec/olib/broadn.o
rw-rw-rw- 229/20   12636 Mar 27 15:29 1998 ./mcnp4b/exec/olib/calcps.o
rw-rw-rw- 229/20    7820 Mar 27 15:29 1998 ./mcnp4b/exec/olib/calcva.o
rw-rw-rw- 229/20    6740 Mar 27 15:29 1998 ./mcnp4b/exec/olib/celnbr.o
rw-rw-rw- 229/20    6040 Mar 27 15:29 1998 ./mcnp4b/exec/olib/celpar.o
rw-rw-rw- 229/20   15868 Mar 27 15:29 1998 ./mcnp4b/exec/olib/celsrf.o
rw-rw-rw- 229/20   12552 Mar 27 15:30 1998 ./mcnp4b/exec/olib/chekcs.o
rw-rw-rw- 229/20   54648 Mar 27 15:30 1998 ./mcnp4b/exec/olib/chekit.o
rw-rw-rw- 229/20    1628 Mar 27 15:30 1998 ./mcnp4b/exec/olib/chgmem.o
rw-rw-rw- 229/20    3984 Mar 27 15:30 1998 ./mcnp4b/exec/olib/chkcel.o
rw-rw-rw- 229/20    3376 Mar 27 15:30 1998 ./mcnp4b/exec/olib/chkprb.o
rw-rw-rw- 229/20    5144 Mar 27 15:30 1998 ./mcnp4b/exec/olib/chksrc.o
rw-rw-rw- 229/20   16252 Mar 27 15:30 1998 ./mcnp4b/exec/olib/chkxss.o
rw-rw-rw- 229/20    1716 Mar 27 15:30 1998 ./mcnp4b/exec/olib/chqcel.o
rw-rw-rw- 229/20    1132 Mar 27 15:30 1998 ./mcnp4b/exec/olib/chrhol.o
rw-rw-rw- 229/20    1848 Mar 27 15:30 1998 ./mcnp4b/exec/olib/ckchar.o
rw-rw-rw- 229/20    3880 Mar 27 15:30 1998 ./mcnp4b/exec/olib/colidk.o
rw-rw-rw- 229/20    7440 Mar 27 15:30 1998 ./mcnp4b/exec/olib/colidn.o
rw-rw-rw- 229/20    7744 Mar 27 15:30 1998 ./mcnp4b/exec/olib/colidp.o
rw-rw-rw- 229/20   10488 Mar 27 15:30 1998 ./mcnp4b/exec/olib/colinp.o
rw-rw-rw- 229/20    2472 Mar 27 15:30 1998 ./mcnp4b/exec/olib/confid.o
rw-rw-rw- 229/20    5244 Mar 27 15:30 1998 ./mcnp4b/exec/olib/contr.o
rw-rw-rw- 229/20    1976 Mar 27 15:30 1998 ./mcnp4b/exec/olib/covar.o
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INFORMATION ONLY

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rw-rw-rw- 229/20   7868 Mar 27 15:30 1998 ./mcnp4b/exec/olib/cprinp.o
rw-rw-rw- 229/20    576 Mar 27 15:30 1998 ./mcnp4b/exec/olib/crspro.o
rw-rw-rw- 229/20   7176 Mar 27 15:30 1998 ./mcnp4b/exec/olib/crtcze.o
rw-rw-rw- 229/20   2700 Mar 27 15:30 1998 ./mcnp4b/exec/olib/dbmin.o
rw-rw-rw- 229/20   2220 Mar 27 15:30 1998 ./mcnp4b/exec/olib/dddet.o
rw-rw-rw- 229/20   6328 Mar 27 15:30 1998 ./mcnp4b/exec/olib/dddiag.o
rw-rw-rw- 229/20   1700 Mar 27 15:30 1998 ./mcnp4b/exec/olib/dddlev.o
rw-rw-rw- 229/20   1708 Mar 27 15:30 1998 ./mcnp4b/exec/olib/dosef.o
rw-rw-rw- 229/20    580 Mar 27 15:30 1998 ./mcnp4b/exec/olib/dotpro.o
rw-rw-rw- 229/20   3012 Mar 27 15:30 1998 ./mcnp4b/exec/olib/dotrcl.o
rw-rw-rw- 229/20   8428 Mar 27 15:30 1998 ./mcnp4b/exec/olib/dplinf.o
rw-rw-rw- 229/20   1780 Mar 27 15:30 1998 ./mcnp4b/exec/olib/dunlev.o
rw-rw-rw- 229/20   7116 Mar 27 15:30 1998 ./mcnp4b/exec/olib/dxdiag.o
rw-rw-rw- 229/20   8476 Mar 27 15:30 1998 ./mcnp4b/exec/olib/dxtran.o
rw-rw-rw- 229/20   1436 Mar 27 15:30 1998 ./mcnp4b/exec/olib/echkcl.o
rw-rw-rw- 229/20   7912 Mar 27 15:30 1998 ./mcnp4b/exec/olib/electr.o
rw-rw-rw- 229/20   8468 Mar 27 15:30 1998 ./mcnp4b/exec/olib/emaker.o
rw-rw-rw- 229/20   1444 Mar 27 15:30 1998 ./mcnp4b/exec/olib/entwwg.o
rw-rw-rw- 229/20   9176 Mar 27 15:31 1998 ./mcnp4b/exec/olib/eqpbbn.o
rw-rw-rw- 229/20   1824 Mar 27 15:31 1998 ./mcnp4b/exec/olib/erf2.o
rw-rw-rw- 229/20   1744 Mar 27 15:31 1998 ./mcnp4b/exec/olib/ergimp.o
rw-rw-rw- 229/20   3216 Mar 27 15:31 1998 ./mcnp4b/exec/olib/erprnt.o
rw-rw-rw- 229/20   1892 Mar 27 15:31 1998 ./mcnp4b/exec/olib/errbar.o
rw-rw-rw- 229/20   3892 Mar 27 15:31 1998 ./mcnp4b/exec/olib/errprn.o
rw-rw-rw- 229/20   2980 Mar 27 15:31 1998 ./mcnp4b/exec/olib/esloss.o
rw-rw-rw- 229/20   9984 Mar 27 15:31 1998 ./mcnp4b/exec/olib/eventp.o
rw-rw-rw- 229/20  10012 Mar 27 15:31 1998 ./mcnp4b/exec/olib/exemes.o
rw-rw-rw- 229/20   2048 Mar 27 15:31 1998 ./mcnp4b/exec/olib/exmg.o
rw-rw-rw- 229/20   5628 Mar 27 15:31 1998 ./mcnp4b/exec/olib/exord.o
rw-rw-rw- 229/20   2292 Mar 27 15:31 1998 ./mcnp4b/exec/olib/exordp.o
rw-rw-rw- 229/20   3260 Mar 27 15:31 1998 ./mcnp4b/exec/olib/expire.o
rw-rw-rw- 229/20   1196 Mar 27 15:31 1998 ./mcnp4b/exec/olib/expirx.o
rw-rw-rw- 229/20  17004 Mar 27 15:31 1998 ./mcnp4b/exec/olib/expung.o
rw-rw-rw- 229/20   1536 Mar 27 15:31 1998 ./mcnp4b/exec/olib/extran.o
rw-rw-rw- 229/20  10360 Mar 27 15:31 1998 ./mcnp4b/exec/olib/extrct.o
rw-rw-rw- 229/20   1412 Mar 27 15:31 1998 ./mcnp4b/exec/olib/fastdr.o
rw-rw-rw- 229/20   1304 Mar 27 15:31 1998 ./mcnp4b/exec/olib/ffetch.o
rw-rw-rw- 229/20   2536 Mar 27 15:31 1998 ./mcnp4b/exec/olib/findel.o
rw-rw-rw- 229/20   2264 Mar 27 15:31 1998 ./mcnp4b/exec/olib/findlv.o
rw-rw-rw- 229/20   2496 Mar 27 15:31 1998 ./mcnp4b/exec/olib/finpht.o
rw-rw-rw- 229/20   3840 Mar 27 15:31 1998 ./mcnp4b/exec/olib/forcol.o
rw-rw-rw- 229/20   2992 Mar 27 15:31 1998 ./mcnp4b/exec/olib/fshort.o
rw-rw-rw- 229/20    676 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gacwk.o
rw-rw-rw- 229/20    576 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gclks.o
rw-rw-rw- 229/20    644 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gclrwk.o
rw-rw-rw- 229/20    964 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gclwk.o
rw-rw-rw- 229/20    660 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gdawk.o
rw-rw-rw- 229/20    916 Mar 27 15:31 1998 ./mcnp4b/exec/olib/getexm.o
rw-rw-rw- 229/20   1424 Mar 27 15:31 1998 ./mcnp4b/exec/olib/getidt.o
rw-rw-rw- 229/20   4152 Mar 27 15:31 1998 ./mcnp4b/exec/olib/getxs.o
rw-rw-rw- 229/20  15540 Mar 27 15:31 1998 ./mcnp4b/exec/olib/getxst.o
rw-rw-rw- 229/20   1520 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gfa.o
rw-rw-rw- 229/20    528 Mar 27 15:31 1998 ./mcnp4b/exec/olib/ginlc.o
rw-rw-rw- 229/20   5480 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gmgww.o
rw-rw-rw- 229/20    808 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gopks.o
rw-rw-rw- 229/20   1060 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gopwk.o
rw-rw-rw- 229/20   3308 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gpl.o
rw-rw-rw- 229/20    596 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gqcf.o
rw-rw-rw- 229/20    596 Mar 27 15:31 1998 ./mcnp4b/exec/olib/grqlc.o
rw-rw-rw- 229/20    664 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gschh.o
rw-rw-rw- 229/20    668 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gschup.o
rw-rw-rw- 229/20    528 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gschxp.o
rw-rw-rw- 229/20    624 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gscr.o
rw-rw-rw- 229/20    528 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gsds.o
rw-rw-rw- 229/20    528 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gselnt.o
rw-rw-rw- 229/20   1120 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gsfaci.o
rw-rw-rw- 229/20    528 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gsfais.o
rw-rw-rw- 229/20    600 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gsln.o
rw-rw-rw- 229/20    584 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gslwsc.o
rw-rw-rw- 229/20   1144 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gsplci.o
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INFORMATION ONLY

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rw-rw-rw- 229/20   1120 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gstxci.o
rw-rw-rw- 229/20    528 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gstxfp.o
rw-rw-rw- 229/20    608 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gsvp.o
rw-rw-rw- 229/20   1648 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gswkwn.o
rw-rw-rw- 229/20    740 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gswn.o
rw-rw-rw- 229/20   2604 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gtx.o
rw-rw-rw- 229/20    892 Mar 27 15:31 1998 ./mcnp4b/exec/olib/guwk.o
rw-rw-rw- 229/20   7164 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gxaxis.o
rw-rw-rw- 229/20   1248 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gxhome.o
rw-rw-rw- 229/20   1368 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gxlims.o
rw-rw-rw- 229/20    984 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gxoff.o
rw-rw-rw- 229/20   3152 Mar 27 15:31 1998 ./mcnp4b/exec/olib/gxon.o
rw-rw-rw- 229/20   1200 Mar 27 15:32 1998 ./mcnp4b/exec/olib/gxquit.o
rw-rw-rw- 229/20   1060 Mar 27 15:32 1998 ./mcnp4b/exec/olib/gxskip.o
rw-rw-rw- 229/20   1760 Mar 27 15:32 1998 ./mcnp4b/exec/olib/hgram.o
rw-rw-rw- 229/20   1664 Mar 27 15:32 1998 ./mcnp4b/exec/olib/hpsort.o
rw-rw-rw- 229/20  10948 Mar 27 15:32 1998 ./mcnp4b/exec/olib/hstory.o
rw-rw-rw- 229/20   4316 Mar 27 15:32 1998 ./mcnp4b/exec/olib/ibldat.o
rw-rw-rw- 229/20   3044 Mar 27 15:32 1998 ./mcnp4b/exec/olib/igeom.o
rw-rw-rw- 229/20  15540 Mar 27 15:32 1998 ./mcnp4b/exec/olib/imcn.o
rw-rw-rw- 229/20   5076 Mar 27 15:32 1998 ./mcnp4b/exec/olib/inpert.o
rw-rw-rw- 229/20    804 Mar 27 15:32 1998 ./mcnp4b/exec/olib/inqire.o
rw-rw-rw- 229/20   8908 Mar 27 15:32 1998 ./mcnp4b/exec/olib/inter.o
rw-rw-rw- 229/20   5708 Mar 27 15:32 1998 ./mcnp4b/exec/olib/intsec.o
rw-rw-rw- 229/20   8840 Mar 27 15:32 1998 ./mcnp4b/exec/olib/ipbc.o
rw-rw-rw- 229/20   1684 Mar 27 15:32 1998 ./mcnp4b/exec/olib/isheet.o
rw-rw-rw- 229/20    880 Mar 27 15:32 1998 ./mcnp4b/exec/olib/isos.o
rw-rw-rw- 229/20   2840 Mar 27 15:32 1998 ./mcnp4b/exec/olib/isourc.o
rw-rw-rw- 229/20   9800 Mar 27 15:32 1998 ./mcnp4b/exec/olib/issrc.o
rw-rw-rw- 229/20  41336 Mar 27 15:32 1998 ./mcnp4b/exec/olib/itally.o
rw-rw-rw- 229/20  15572 Mar 27 15:32 1998 ./mcnp4b/exec/olib/italpr.o
rw-rw-rw- 229/20   4828 Mar 27 15:32 1998 ./mcnp4b/exec/olib/items.o
rw-rw-rw- 229/20  10608 Mar 27 15:32 1998 ./mcnp4b/exec/olib/iwtwnd.o
rw-rw-rw- 229/20  14216 Mar 27 15:32 1998 ./mcnp4b/exec/olib/ixsdir.o
rw-rw-rw- 229/20   2028 Mar 27 15:32 1998 ./mcnp4b/exec/olib/jbin.o
rw-rw-rw- 229/20  12888 Mar 27 15:33 1998 ./mcnp4b/exec/olib/jdecod.o
rw-rw-rw- 229/20  20216 Mar 27 15:33 1998 ./mcnp4b/exec/olib/jsourc.o
rw-rw-rw- 229/20   1624 Mar 27 15:33 1998 ./mcnp4b/exec/olib/jtskpt.o
rw-rw-rw- 229/20   7104 Mar 27 15:33 1998 ./mcnp4b/exec/olib/kbatch.o
rw-rw-rw- 229/20   9748 Mar 27 15:33 1998 ./mcnp4b/exec/olib/kcalc.o
rw-rw-rw- 229/20   1736 Mar 27 15:33 1998 ./mcnp4b/exec/olib/kdarg.o
rw-rw-rw- 229/20   1044 Mar 27 15:33 1998 ./mcnp4b/exec/olib/kdata.o
rw-rw-rw- 229/20   1520 Mar 27 15:33 1998 ./mcnp4b/exec/olib/klein.o
rw-rw-rw- 229/20   4288 Mar 27 15:33 1998 ./mcnp4b/exec/olib/knock.o
rw-rw-rw- 229/20  17200 Mar 27 15:33 1998 ./mcnp4b/exec/olib/knorm.o
rw-rw-rw- 229/20  20580 Mar 27 15:33 1998 ./mcnp4b/exec/olib/kprint.o
rw-rw-rw- 229/20   9900 Mar 27 15:33 1998 ./mcnp4b/exec/olib/kskcyc.o
rw-rw-rw- 229/20   4292 Mar 27 15:33 1998 ./mcnp4b/exec/olib/ksrctp.o
rw-rw-rw- 229/20   4720 Mar 27 15:33 1998 ./mcnp4b/exec/olib/ktable.o
rw-rw-rw- 229/20   3540 Mar 27 15:33 1998 ./mcnp4b/exec/olib/kxray.o
rw-rw-rw- 229/20  44548 Mar 27 15:33 1998 ./mcnp4b/exec/olib/landau.o
rw-rw-rw- 229/20  27100 Mar 27 15:33 1998 ./mcnp4b/exec/olib/landct.o
rw-rw-rw- 229/20   4912 Mar 27 15:33 1998 ./mcnp4b/exec/olib/latcon.o
rw-rw-rw- 229/20   3616 Mar 27 15:33 1998 ./mcnp4b/exec/olib/lblocs.o
rw-rw-rw- 229/20    676 Mar 27 15:33 1998 ./mcnp4b/exec/olib/leng.o
rw-rw-rw- 229/20   4124 Mar 27 15:33 1998 ./mcnp4b/exec/olib/levcel.o
rw-rw-rw- 229/20   3660 Mar 27 15:33 1998 ./mcnp4b/exec/olib/levchk.o
rw-rw-rw- 229/20    716 Mar 27 15:33 1998 ./mcnp4b/exec/olib/lgeval.o
rw-rw-rw- 229/20   6444 Mar 27 15:33 1998 ./mcnp4b/exec/olib/likebt.o
rw-rw-rw- 229/20    816 Mar 27 15:33 1998 ./mcnp4b/exec/olib/ljusti.o
rw-rw-rw- 229/20   5368 Mar 27 15:33 1998 ./mcnp4b/exec/olib/mapmaz.o
rw-rw-rw- 229/20   1396 Mar 27 15:33 1998 ./mcnp4b/exec/olib/matmpy.o
rw-rw-rw- 229/20   8636 Mar 27 15:33 1998 ./mcnp4b/exec/olib/mcnp.o
rw-rw-rw- 229/20  20272 Mar 27 15:28 1998 ./mcnp4b/exec/olib/mcnpc.o
rw-rw-rw- 229/20   5588 Mar 27 15:33 1998 ./mcnp4b/exec/olib/mcplot.o
rw-rw-rw- 229/20   4376 Mar 27 15:33 1998 ./mcnp4b/exec/olib/mcrun.o
rw-rw-rw- 229/20   7368 Mar 27 15:33 1998 ./mcnp4b/exec/olib/mctalr.o
rw-rw-rw- 229/20   9688 Mar 27 15:33 1998 ./mcnp4b/exec/olib/mctalw.o
rw-rw-rw- 229/20  18816 Mar 27 15:34 1998 ./mcnp4b/exec/olib/mdecod.o
rw-rw-rw- 229/20   6392 Mar 27 15:34 1998 ./mcnp4b/exec/olib/mgacol.o
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INFORMATION ONLY

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rw-rw-rw- 229/20   9164 Mar 27 15:34 1998 ./mcnp4b/exec/olib/mgcoln.o
rw-rw-rw- 229/20   4012 Mar 27 15:34 1998 ./mcnp4b/exec/olib/mgcolp.o
rw-rw-rw- 229/20  12616 Mar 27 15:34 1998 ./mcnp4b/exec/olib/mgimps.o
rw-rw-rw- 229/20  10724 Mar 27 15:34 1998 ./mcnp4b/exec/olib/mgxspt.o
rw-rw-rw- 229/20   1852 Mar 27 15:34 1998 ./mcnp4b/exec/olib/midpnt.o
rw-rw-rw- 229/20   1672 Mar 27 15:34 1998 ./mcnp4b/exec/olib/movlat.o
rw-rw-rw- 229/20   3564 Mar 27 15:34 1998 ./mcnp4b/exec/olib/mreset.o
rw-rw-rw- 229/20   1208 Mar 27 15:34 1998 ./mcnp4b/exec/olib/namchg.o
rw-rw-rw- 229/20   1724 Mar 27 15:34 1998 ./mcnp4b/exec/olib/namrsd.o
rw-rw-rw- 229/20   6224 Mar 27 15:34 1998 ./mcnp4b/exec/olib/newcd1.o
rw-rw-rw- 229/20   5824 Mar 27 15:34 1998 ./mcnp4b/exec/olib/newce1.o
rw-rw-rw- 229/20  19780 Mar 27 15:34 1998 ./mcnp4b/exec/olib/newcrd.o
rw-rw-rw- 229/20  37284 Mar 27 15:34 1998 ./mcnp4b/exec/olib/nextit.o
rw-rw-rw- 229/20   8868 Mar 27 15:35 1998 ./mcnp4b/exec/olib/norma.o
rw-rw-rw- 229/20   7784 Mar 27 15:35 1998 ./mcnp4b/exec/olib/normh.o
rw-rw-rw- 229/20  17604 Mar 27 15:35 1998 ./mcnp4b/exec/olib/nxtit1.o
rw-rw-rw- 229/20   1232 Mar 27 15:35 1998 ./mcnp4b/exec/olib/nxtsym.o
rw-rw-rw- 229/20   5272 Mar 27 15:35 1998 ./mcnp4b/exec/olib/oldcd1.o
rw-rw-rw- 229/20  30628 Mar 27 15:35 1998 ./mcnp4b/exec/olib/oldcrd.o
rw-rw-rw- 229/20   3448 Mar 27 15:35 1998 ./mcnp4b/exec/olib/output.o
rw-rw-rw- 229/20   7272 Mar 27 15:35 1998 ./mcnp4b/exec/olib/outwwg.o
rw-rw-rw- 229/20    972 Mar 27 15:35 1998 ./mcnp4b/exec/olib/pareto.o
rw-rw-rw- 229/20   3668 Mar 27 15:35 1998 ./mcnp4b/exec/olib/pass1.o
rw-rw-rw- 229/20   3016 Mar 27 15:35 1998 ./mcnp4b/exec/olib/pathmz.o
rw-rw-rw- 229/20   1104 Mar 27 15:35 1998 ./mcnp4b/exec/olib/pbldat.o
rw-rw-rw- 229/20   7084 Mar 27 15:35 1998 ./mcnp4b/exec/olib/pconst.o
rw-rw-rw- 229/20   2924 Mar 27 15:35 1998 ./mcnp4b/exec/olib/pertub.o
rw-rw-rw- 229/20   2528 Mar 27 15:35 1998 ./mcnp4b/exec/olib/photot.o
rw-rw-rw- 229/20   5432 Mar 27 15:35 1998 ./mcnp4b/exec/olib/photp.o
rw-rw-rw- 229/20   2980 Mar 27 15:35 1998 ./mcnp4b/exec/olib/pieces.o
rw-rw-rw- 229/20   1672 Mar 27 15:35 1998 ./mcnp4b/exec/olib/plin.o
rw-rw-rw- 229/20   6208 Mar 27 15:35 1998 ./mcnp4b/exec/olib/plot2d.o
rw-rw-rw- 229/20   5056 Mar 27 15:35 1998 ./mcnp4b/exec/olib/plotcn.o
rw-rw-rw- 229/20   7596 Mar 27 15:35 1998 ./mcnp4b/exec/olib/plotg.o
rw-rw-rw- 229/20   4600 Mar 27 15:35 1998 ./mcnp4b/exec/olib/pltdxt.o
rw-rw-rw- 229/20   3840 Mar 27 15:35 1998 ./mcnp4b/exec/olib/pltitl.o
rw-rw-rw- 229/20   6072 Mar 27 15:35 1998 ./mcnp4b/exec/olib/pltsrf.o
rw-rw-rw- 229/20   7832 Mar 27 15:35 1998 ./mcnp4b/exec/olib/polhed.o
rw-rw-rw- 229/20  14764 Mar 27 15:35 1998 ./mcnp4b/exec/olib/prhpdf.o
rw-rw-rw- 229/20  11092 Mar 27 15:35 1998 ./mcnp4b/exec/olib/prinv.o
rw-rw-rw- 229/20  11280 Mar 27 15:35 1998 ./mcnp4b/exec/olib/prlost.o
rw-rw-rw- 229/20   1588 Mar 27 15:35 1998 ./mcnp4b/exec/olib/prodhh.o
rw-rw-rw- 229/20   6512 Mar 27 15:35 1998 ./mcnp4b/exec/olib/prplot.o
rw-rw-rw- 229/20   7960 Mar 27 15:35 1998 ./mcnp4b/exec/olib/prsdft.o
rw-rw-rw- 229/20  11288 Mar 27 15:35 1998 ./mcnp4b/exec/olib/prsdst.o
rw-rw-rw- 229/20   5796 Mar 27 15:35 1998 ./mcnp4b/exec/olib/prssrj.o
rw-rw-rw- 229/20  13516 Mar 27 15:35 1998 ./mcnp4b/exec/olib/prstat.o
rw-rw-rw- 229/20   9240 Mar 27 15:35 1998 ./mcnp4b/exec/olib/prtfcc.o
rw-rw-rw- 229/20   5168 Mar 27 15:35 1998 ./mcnp4b/exec/olib/psurf.o
rw-rw-rw- 229/20  12756 Mar 27 15:36 1998 ./mcnp4b/exec/olib/ptfc.o
rw-rw-rw- 229/20   1344 Mar 27 15:36 1998 ./mcnp4b/exec/olib/ptimin.o
rw-rw-rw- 229/20   2316 Mar 27 15:36 1998 ./mcnp4b/exec/olib/ptost.o
rw-rw-rw- 229/20  14496 Mar 27 15:36 1998 ./mcnp4b/exec/olib/ptrak.o
rw-rw-rw- 229/20   1276 Mar 27 15:36 1998 ./mcnp4b/exec/olib/pttyin.o
rw-rw-rw- 229/20   2316 Mar 27 15:36 1998 ./mcnp4b/exec/olib/putlbl.o
rw-rw-rw- 229/20   3716 Mar 27 15:36 1998 ./mcnp4b/exec/olib/putnq.o
rw-rw-rw- 229/20   2156 Mar 27 15:36 1998 ./mcnp4b/exec/olib/qnc7.o
rw-rw-rw- 229/20   1100 Mar 27 15:36 1998 ./mcnp4b/exec/olib/qpol.o
rw-rw-rw- 229/20   3708 Mar 27 15:36 1998 ./mcnp4b/exec/olib/qttyin.o
rw-rw-rw- 229/20    932 Mar 27 15:36 1998 ./mcnp4b/exec/olib/quad.o
rw-rw-rw- 229/20   3544 Mar 27 15:36 1998 ./mcnp4b/exec/olib/quart.o
rw-rw-rw- 229/20   3352 Mar 27 15:36 1998 ./mcnp4b/exec/olib/random.o
rw-rw-rw- 229/20   1332 Mar 27 15:36 1998 ./mcnp4b/exec/olib/rang.o
rw-rw-rw- 229/20   3712 Mar 27 15:36 1998 ./mcnp4b/exec/olib/rdprob.o
rw-rw-rw- 229/20   2804 Mar 27 15:36 1998 ./mcnp4b/exec/olib/reflec.o
rw-rw-rw- 229/20   1564 Mar 27 15:36 1998 ./mcnp4b/exec/olib/refpbc.o
rw-rw-rw- 229/20   9584 Mar 27 15:36 1998 ./mcnp4b/exec/olib/regula.o
rw-rw-rw- 229/20   7356 Mar 27 15:36 1998 ./mcnp4b/exec/olib/rhoden.o
rw-rw-rw- 229/20   8672 Mar 27 15:36 1998 ./mcnp4b/exec/olib/ronge.o
rw-rw-rw- 229/20   2000 Mar 27 15:36 1998 ./mcnp4b/exec/olib/rotas.o
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INFORMATION ONLY

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rw-rw-rw- 229/20   1836 Mar 27 15:36 1998 ./mcnp4b/exec/olib/rslmaz.o
rw-rw-rw- 229/20   2176 Mar 27 15:36 1998 ./mcnp4b/exec/olib/runtpq.o
rw-rw-rw- 229/20   1852 Mar 27 15:36 1998 ./mcnp4b/exec/olib/runtpr.o
rw-rw-rw- 229/20   1968 Mar 27 15:36 1998 ./mcnp4b/exec/olib/runtpw.o
rw-rw-rw- 229/20   3164 Mar 27 15:36 1998 ./mcnp4b/exec/olib/sabcol.o
rw-rw-rw- 229/20   2040 Mar 27 15:36 1998 ./mcnp4b/exec/olib/scat.o
rw-rw-rw- 229/20   4040 Mar 27 15:36 1998 ./mcnp4b/exec/olib/scatt.o
rw-rw-rw- 229/20    668 Mar 27 15:36 1998 ./mcnp4b/exec/olib/secnd.o
rw-rw-rw- 229/20   1264 Mar 27 15:36 1998 ./mcnp4b/exec/olib/screen.o
rw-rw-rw- 229/20   1984 Mar 27 15:36 1998 ./mcnp4b/exec/olib/setcel.o
rw-rw-rw- 229/20   8336 Mar 27 15:36 1998 ./mcnp4b/exec/olib/setdas.o
rw-rw-rw- 229/20   9688 Mar 27 15:36 1998 ./mcnp4b/exec/olib/sfiles.o
rw-rw-rw- 229/20   2984 Mar 27 15:36 1998 ./mcnp4b/exec/olib/shade.o
rw-rw-rw- 229/20   1836 Mar 27 15:36 1998 ./mcnp4b/exec/olib/simint.o
rw-rw-rw- 229/20   2640 Mar 27 15:36 1998 ./mcnp4b/exec/olib/simplx.o
rw-rw-rw- 229/20   9112 Mar 27 15:36 1998 ./mcnp4b/exec/olib/sing.o
rw-rw-rw- 229/20   6220 Mar 27 15:36 1998 ./mcnp4b/exec/olib/skcode.o
rw-rw-rw- 229/20   2808 Mar 27 15:36 1998 ./mcnp4b/exec/olib/smevev.o
rw-rw-rw- 229/20   2728 Mar 27 15:36 1998 ./mcnp4b/exec/olib/smhhtr.o
rw-rw-rw- 229/20   7024 Mar 27 15:36 1998 ./mcnp4b/exec/olib/smpsrc.o
rw-rw-rw- 229/20  12968 Mar 27 15:36 1998 ./mcnp4b/exec/olib/sourcb.o
rw-rw-rw- 229/20   1156 Mar 27 15:36 1998 ./mcnp4b/exec/olib/source.o
rw-rw-rw- 229/20   1708 Mar 27 15:36 1998 ./mcnp4b/exec/olib/sourck.o
rw-rw-rw- 229/20   2004 Mar 27 15:36 1998 ./mcnp4b/exec/olib/spec.o
rw-rw-rw- 229/20   3196 Mar 27 15:36 1998 ./mcnp4b/exec/olib/splins.o
rw-rw-rw- 229/20  17972 Mar 27 15:37 1998 ./mcnp4b/exec/olib/sprob.o
rw-rw-rw- 229/20   2060 Mar 27 15:37 1998 ./mcnp4b/exec/olib/sqqint.o
rw-rw-rw- 229/20    836 Mar 27 15:37 1998 ./mcnp4b/exec/olib/srcdx.o
rw-rw-rw- 229/20   1704 Mar 27 15:37 1998 ./mcnp4b/exec/olib/srcsrf.o
rw-rw-rw- 229/20   5568 Mar 27 15:37 1998 ./mcnp4b/exec/olib/sread.o
rw-rw-rw- 229/20   3048 Mar 27 15:37 1998 ./mcnp4b/exec/olib/ssmsrc.o
rw-rw-rw- 229/20  12052 Mar 27 15:37 1998 ./mcnp4b/exec/olib/startp.o
rw-rw-rw- 229/20   9420 Mar 27 15:37 1998 ./mcnp4b/exec/olib/status.o
rw-rw-rw- 229/20   4228 Mar 27 15:37 1998 ./mcnp4b/exec/olib/sttop.o
rw-rw-rw- 229/20   9656 Mar 27 15:37 1998 ./mcnp4b/exec/olib/stuff.o
rw-rw-rw- 229/20   2788 Mar 27 15:37 1998 ./mcnp4b/exec/olib/sufwrt.o
rw-rw-rw- 229/20  22384 Mar 27 15:37 1998 ./mcnp4b/exec/olib/sumary.o
rw-rw-rw- 229/20   4952 Mar 27 15:37 1998 ./mcnp4b/exec/olib/surfac.o
rw-rw-rw- 229/20   6244 Mar 27 15:37 1998 ./mcnp4b/exec/olib/sursrc.o
rw-rw-rw- 229/20   4440 Mar 27 15:37 1998 ./mcnp4b/exec/olib/talloc.o
rw-rw-rw- 229/20  12952 Mar 27 15:37 1998 ./mcnp4b/exec/olib/tally.o
rw-rw-rw- 229/20  12680 Mar 27 15:37 1998 ./mcnp4b/exec/olib/tallyd.o
rw-rw-rw- 229/20   5936 Mar 27 15:37 1998 ./mcnp4b/exec/olib/tallyh.o
rw-rw-rw- 229/20   9072 Mar 27 15:37 1998 ./mcnp4b/exec/olib/tallyp.o
rw-rw-rw- 229/20   5136 Mar 27 15:37 1998 ./mcnp4b/exec/olib/tallyq.o
rw-rw-rw- 229/20   1272 Mar 27 15:37 1998 ./mcnp4b/exec/olib/tallyx.o
rw-rw-rw- 229/20   3724 Mar 27 15:37 1998 ./mcnp4b/exec/olib/talph.o
rw-rw-rw- 229/20   3604 Mar 27 15:37 1998 ./mcnp4b/exec/olib/talshf.o
rw-rw-rw- 229/20   1180 Mar 27 15:37 1998 ./mcnp4b/exec/olib/tarea.o
rw-rw-rw- 229/20   8900 Mar 27 15:37 1998 ./mcnp4b/exec/olib/tekdvr.o
rw-rw-rw- 229/20   2296 Mar 27 15:37 1998 ./mcnp4b/exec/olib/tgtvel.o
rw-rw-rw- 229/20    836 Mar 27 15:37 1998 ./mcnp4b/exec/olib/timint.o
rw-rw-rw- 229/20   2688 Mar 27 15:37 1998 ./mcnp4b/exec/olib/torus.o
rw-rw-rw- 229/20  10868 Mar 27 15:37 1998 ./mcnp4b/exec/olib/tpefil.o
rw-rw-rw- 229/20   6828 Mar 27 15:38 1998 ./mcnp4b/exec/olib/track.o
rw-rw-rw- 229/20   2396 Mar 27 15:38 1998 ./mcnp4b/exec/olib/transm.o
rw-rw-rw- 229/20   5004 Mar 27 15:38 1998 ./mcnp4b/exec/olib/trfmat.o
rw-rw-rw- 229/20   5148 Mar 27 15:38 1998 ./mcnp4b/exec/olib/trfsrf.o
rw-rw-rw- 229/20   3884 Mar 27 15:38 1998 ./mcnp4b/exec/olib/trnspt.o
rw-rw-rw- 229/20   4168 Mar 27 15:38 1998 ./mcnp4b/exec/olib/ttbr.o
rw-rw-rw- 229/20    692 Mar 27 15:38 1998 ./mcnp4b/exec/olib/ttyint.o
rw-rw-rw- 229/20   4036 Mar 27 15:38 1998 ./mcnp4b/exec/olib/ufiles.o
rw-rw-rw- 229/20   5428 Mar 27 15:38 1998 ./mcnp4b/exec/olib/unimaz.o
rw-rw-rw- 229/20   2096 Mar 27 15:38 1998 ./mcnp4b/exec/olib/unique.o
rw-rw-rw- 229/20   1812 Mar 27 15:38 1998 ./mcnp4b/exec/olib/uplev.o
rw-rw-rw- 229/20   1204 Mar 27 15:38 1998 ./mcnp4b/exec/olib/uplpos.o
rw-rw-rw- 229/20   1436 Mar 27 15:38 1998 ./mcnp4b/exec/olib/utask.o
rw-rw-rw- 229/20   9688 Mar 27 15:38 1998 ./mcnp4b/exec/olib/viewz.o
rw-rw-rw- 229/20   1672 Mar 27 15:38 1998 ./mcnp4b/exec/olib/voidcd.o
rw-rw-rw- 229/20   6324 Mar 27 15:38 1998 ./mcnp4b/exec/olib/volume.o
```


INFORMATION ONLY

```
rw-rw-rw- 229/20    1988 Mar 27 15:38 1998 ./mcnp4b/exec/olib/vtask.o
rw-rw-rw- 229/20    2768 Mar 27 15:38 1998 ./mcnp4b/exec/olib/wgtul.o
rw-rw-rw- 229/20    1472 Mar 27 15:38 1998 ./mcnp4b/exec/olib/wgtwwg.o
rw-rw-rw- 229/20    5036 Mar 27 15:38 1998 ./mcnp4b/exec/olib/wrwssa.o
rw-rw-rw- 229/20    4012 Mar 27 15:38 1998 ./mcnp4b/exec/olib/wtcalc.o
rw-rw-rw- 229/20    4416 Mar 27 15:38 1998 ./mcnp4b/exec/olib/wtmult.o
rw-rw-rw- 229/20    1960 Mar 27 15:38 1998 ./mcnp4b/exec/olib/wtwndo.o
rw-rw-rw- 229/20    5580 Mar 27 15:38 1998 ./mcnp4b/exec/olib/wwfile.o
rw-rw-rw- 229/20    3648 Mar 27 15:38 1998 ./mcnp4b/exec/olib/wwval.o
rw-rw-rw- 229/20    4096 Mar 27 15:38 1998 ./mcnp4b/exec/olib/xact.o
rw-rw-rw- 229/20    2020 Mar 27 15:38 1998 ./mcnp4b/exec/olib/xssc.o
rw-rw-rw- 229/20    9092 Mar 27 15:38 1998 ./mcnp4b/exec/olib/xsgen.o
rw-rw-rw- 229/20    4412 Mar 27 15:38 1998 ./mcnp4b/exec/olib/xsprmr.o
rw-rw-rw- 229/20    3352 Mar 27 15:38 1998 ./mcnp4b/exec/olib/ypbssp.o
rw-rw-rw- 229/20    1268 Mar 27 15:38 1998 ./mcnp4b/exec/olib/zaid.o
rw-rw-rw- 229/20    4360 Mar 27 15:38 1998 ./mcnp4b/exec/olib/zbldat.o
rwxrwxrwx 229/20     632 Mar 27 15:28 1998 ./mcnp4b/exec/makemcnp
rwx------ 229/20    1911 Mar  1 13:26 1996 ./mcnp4b/exec/inp03
rwx------ 229/20    1052 Mar  1 13:31 1996 ./mcnp4b/exec/inp04
rwxr-xr-x 229/20 4067098 Mar 27 15:23 1998 ./mcnp4b/exec/mcnp4b.id
rwx------ 229/20    2164 Mar  1 13:31 1996 ./mcnp4b/exec/inp05
rwx------ 229/20    1599 Mar  1 13:32 1996 ./mcnp4b/exec/inp06
rwx------ 229/20    1539 Mar  1 13:32 1996 ./mcnp4b/exec/inp07
rwx------ 229/20    3287 Mar  4 08:53 1996 ./mcnp4b/exec/inp08
rwx------ 229/20    1261 Mar  1 15:56 1996 ./mcnp4b/exec/inp09
rwx------ 229/20    1004 Mar  1 13:34 1996 ./mcnp4b/exec/inp10
rwx------ 229/20    2023 Mar  2 12:21 1996 ./mcnp4b/exec/inp11
rwx------ 229/20   46304 Mar  4 09:00 1996 ./mcnp4b/exec/inp12
rwx------ 229/20    1172 Mar  1 11:10 1996 ./mcnp4b/exec/inp13
rwx------ 229/20    2459 Mar  1 13:52 1996 ./mcnp4b/exec/inp14
rwx------ 229/20    1104 Mar  1 13:53 1996 ./mcnp4b/exec/inp15
rwx------ 229/20    2220 Mar  1 13:54 1996 ./mcnp4b/exec/inp16
rwx------ 229/20     968 Mar  1 13:54 1996 ./mcnp4b/exec/inp17
rwx------ 229/20    4323 Mar  4 07:50 1996 ./mcnp4b/exec/inp18
rwx------ 229/20     567 Mar  1 13:55 1996 ./mcnp4b/exec/inp19
rwx------ 229/20    1171 Mar  1 13:56 1996 ./mcnp4b/exec/inp20
rwx------ 229/20    8134 Mar  2 12:03 1996 ./mcnp4b/exec/inp21
rwx------ 229/20    7496 Mar  1 15:25 1996 ./mcnp4b/exec/inp22
rwx------ 229/20    5496 Mar  1 15:26 1996 ./mcnp4b/exec/inp23
rwx------ 229/20    2096 Mar  1 13:13 1996 ./mcnp4b/exec/inp24
rwx------ 229/20      42 Feb 29 14:35 1996 ./mcnp4b/exec/inp25
rwx------ 229/20      42 Feb 29 14:35 1996 ./mcnp4b/exec/inp26
rwx------ 229/20     917 Mar  1 15:27 1996 ./mcnp4b/exec/inp27
rwx------ 229/20    5756 Feb 29 14:35 1996 ./mcnp4b/exec/inp28
rwx------ 229/20     839 Mar  4 08:00 1996 ./mcnp4b/exec/inp29
rw-r--r-- 229/20    6853 Jan  6 14:04 1997 ./mcnp4b/exec/mct101
rw-r--r-- 229/20   15297 Jan  6 14:04 1997 ./mcnp4b/exec/mct102
rw-r--r-- 229/20    1793 Jan  6 14:04 1997 ./mcnp4b/exec/mct103
rw-r--r-- 229/20   11301 Jan  6 14:04 1997 ./mcnp4b/exec/mct104
rw-r--r-- 229/20    2199 Jan  6 14:04 1997 ./mcnp4b/exec/mct105
rw-r--r-- 229/20    4956 Jan  6 14:04 1997 ./mcnp4b/exec/mct106
rw-r--r-- 229/20    1472 Jan  6 14:04 1997 ./mcnp4b/exec/mct107
rw-r--r-- 229/20    3457 Jan  6 14:04 1997 ./mcnp4b/exec/mct108
rw-r--r-- 229/20   17893 Jan  6 14:04 1997 ./mcnp4b/exec/mct109
rw-r--r-- 229/20     748 Jan  6 14:04 1997 ./mcnp4b/exec/mct110
rw-r--r-- 229/20    4562 Jan  6 14:04 1997 ./mcnp4b/exec/mct111
rw-r--r-- 229/20    3600 Jan  6 14:04 1997 ./mcnp4b/exec/mct112
rw-r--r-- 229/20    2889 Jan  6 14:04 1997 ./mcnp4b/exec/mct113
rw-r--r-- 229/20    3212 Jan  6 14:04 1997 ./mcnp4b/exec/mct114
rw-r--r-- 229/20     771 Jan  6 14:04 1997 ./mcnp4b/exec/mct115
rw-r--r-- 229/20    1366 Jan  6 14:04 1997 ./mcnp4b/exec/mct116
rw-r--r-- 229/20   11346 Jan  6 14:04 1997 ./mcnp4b/exec/mct117
rw-r--r-- 229/20    8487 Jan  6 14:04 1997 ./mcnp4b/exec/mct118
rw-r--r-- 229/20    2414 Jan  6 14:04 1997 ./mcnp4b/exec/mct119
rw-r--r-- 229/20    9663 Jan  6 14:04 1997 ./mcnp4b/exec/mct120
rw-r--r-- 229/20   23069 Jan  6 14:04 1997 ./mcnp4b/exec/mct121
rw-r--r-- 229/20    1503 Jan  6 14:04 1997 ./mcnp4b/exec/mct122
rw-r--r-- 229/20    2944 Jan  6 14:04 1997 ./mcnp4b/exec/mct123
rw-r--r-- 229/20    1240 Jan  6 14:04 1997 ./mcnp4b/exec/mct124
rw-r--r-- 229/20    1472 Jan  6 14:04 1997 ./mcnp4b/exec/mct125
```


INFORMATION ONLY

```
rw-r--r-- 229/20  18897 Jan  6 14:04 1997 ./mcnp4b/exec/mct126
rw-r--r-- 229/20   3062 Jan  6 14:04 1997 ./mcnp4b/exec/mct127
rw-r--r-- 229/20  37974 Jan  6 14:04 1997 ./mcnp4b/exec/mct128
rw-r--r-- 229/20   1380 Jan  6 14:04 1997 ./mcnp4b/exec/mct129
rw-r--r-- 229/20 109352 Jan  6 14:04 1997 ./mcnp4b/exec/outp01
rw-r--r-- 229/20 116665 Jan  6 14:04 1997 ./mcnp4b/exec/outp02
rw-r--r-- 229/20  19769 Jan  6 14:04 1997 ./mcnp4b/exec/outp03
rw-r--r-- 229/20 144259 Jan  6 14:04 1997 ./mcnp4b/exec/outp04
rw-r--r-- 229/20  22577 Jan  6 14:04 1997 ./mcnp4b/exec/outp05
rw-r--r-- 229/20  34544 Jan  6 14:04 1997 ./mcnp4b/exec/outp06
rw-r--r-- 229/20  75653 Jan  6 14:04 1997 ./mcnp4b/exec/outp07
rw-r--r-- 229/20 176554 Jan  6 14:04 1997 ./mcnp4b/exec/outp08
rw-r--r-- 229/20  57202 Jan  6 14:04 1997 ./mcnp4b/exec/outp09
rw-r--r-- 229/20  31787 Jan  6 14:04 1997 ./mcnp4b/exec/outp10
rw-r--r-- 229/20  56608 Jan  6 14:04 1997 ./mcnp4b/exec/outp11
rw-r--r-- 229/20 170494 Jan  6 14:04 1997 ./mcnp4b/exec/outp12
rw-r--r-- 229/20  89657 Jan  6 14:04 1997 ./mcnp4b/exec/outp13
rw-r--r-- 229/20  31715 Jan  6 14:04 1997 ./mcnp4b/exec/outp14
rw-r--r-- 229/20  44841 Jan  6 14:04 1997 ./mcnp4b/exec/outp15
rw-r--r-- 229/20  51524 Jan  6 14:04 1997 ./mcnp4b/exec/outp16
rw-r--r-- 229/20 107636 Jan  6 14:04 1997 ./mcnp4b/exec/outp17
rw-r--r-- 229/20  77712 Jan  6 14:04 1997 ./mcnp4b/exec/outp18
rw-r--r-- 229/20  14787 Jan  6 14:04 1997 ./mcnp4b/exec/outp19
rw-r--r-- 229/20  54656 Jan  6 14:04 1997 ./mcnp4b/exec/outp20
rw-r--r-- 229/20  81680 Jan  6 14:04 1997 ./mcnp4b/exec/outp21
rw-r--r-- 229/20  52192 Jan  6 14:04 1997 ./mcnp4b/exec/outp22
rw-r--r-- 229/20  91245 Jan  6 14:04 1997 ./mcnp4b/exec/outp23
rw-r--r-- 229/20  33164 Jan  6 14:04 1997 ./mcnp4b/exec/outp24
rw-r--r-- 229/20  17877 Jan  6 14:04 1997 ./mcnp4b/exec/outp25
rw-r--r-- 229/20  57594 Jan  6 14:04 1997 ./mcnp4b/exec/outp26
rw-r--r-- 229/20  17907 Jan  6 14:04 1997 ./mcnp4b/exec/outp27
rwxr-xr-x 229/20  13492 Mar 27 14:59 1998 ./mcnp4b/exec/readmaag
rw-r--r-- 229/20 144379 Jan  6 14:04 1997 ./mcnp4b/exec/outp28
rw-r--r-- 229/20  36905 Jan  6 14:04 1997 ./mcnp4b/exec/outp29
rw-rw-rw- 229/20 109352 Mar 27 15:39 1998 ./mcnp4b/exec/inp01o
rw-rw-rw- 229/20  33468 Mar 27 15:39 1998 ./mcnp4b/exec/inp01p
rw-rw-rw- 229/20 116665 Mar 27 15:39 1998 ./mcnp4b/exec/inp02o
rw-rw-rw- 229/20   6853 Mar 27 15:39 1998 ./mcnp4b/exec/inp01m
rw-rw-rw- 229/20      0 Mar 27 15:39 1998 ./mcnp4b/exec/difm01
rw-rw-rw- 229/20      0 Mar 27 15:39 1998 ./mcnp4b/exec/difo01
rw-rw-rw- 229/20  25038 Mar 27 15:39 1998 ./mcnp4b/exec/inp02p
rw-rw-rw- 229/20  19769 Mar 27 15:40 1998 ./mcnp4b/exec/inp03o
rw-rw-rw- 229/20  15297 Mar 27 15:39 1998 ./mcnp4b/exec/inp02m
rw-rw-rw- 229/20      0 Mar 27 15:39 1998 ./mcnp4b/exec/difm02
rw-rw-rw- 229/20      0 Mar 27 15:39 1998 ./mcnp4b/exec/difo02
rw-rw-rw- 229/20 144259 Mar 27 15:40 1998 ./mcnp4b/exec/inp04o
rw-rw-rw- 229/20   1793 Mar 27 15:40 1998 ./mcnp4b/exec/inp03m
rw-rw-rw- 229/20      0 Mar 27 15:40 1998 ./mcnp4b/exec/difm03
rw-rw-rw- 229/20      0 Mar 27 15:40 1998 ./mcnp4b/exec/difo03
rw-rw-rw- 229/20  22577 Mar 27 15:40 1998 ./mcnp4b/exec/inp05o
rw-rw-rw- 229/20  11301 Mar 27 15:40 1998 ./mcnp4b/exec/inp04m
rw-rw-rw- 229/20      0 Mar 27 15:40 1998 ./mcnp4b/exec/difm04
rw-rw-rw- 229/20      0 Mar 27 15:40 1998 ./mcnp4b/exec/difo04
rw-rw-rw- 229/20  34544 Mar 27 15:40 1998 ./mcnp4b/exec/inp06o
rw-rw-rw- 229/20   2199 Mar 27 15:40 1998 ./mcnp4b/exec/inp05m
rw-rw-rw- 229/20      0 Mar 27 15:40 1998 ./mcnp4b/exec/difm05
rw-rw-rw- 229/20      0 Mar 27 15:40 1998 ./mcnp4b/exec/difo05
rw-rw-rw- 229/20  75653 Mar 27 15:41 1998 ./mcnp4b/exec/inp07o
rw-rw-rw- 229/20   4956 Mar 27 15:40 1998 ./mcnp4b/exec/inp06m
rw-rw-rw- 229/20      0 Mar 27 15:40 1998 ./mcnp4b/exec/difm06
rw-rw-rw- 229/20      0 Mar 27 15:40 1998 ./mcnp4b/exec/difo06
rw-rw-rw- 229/20   1472 Mar 27 15:41 1998 ./mcnp4b/exec/inp07m
rw-rw-rw- 229/20 176554 Mar 27 15:41 1998 ./mcnp4b/exec/inp08o
rw-rw-rw- 229/20 481295 Mar 27 15:41 1998 ./mcnp4b/exec/inp07w
rw-rw-rw- 229/20      0 Mar 27 15:41 1998 ./mcnp4b/exec/difm07
rw-rw-rw- 229/20      0 Mar 27 15:41 1998 ./mcnp4b/exec/difo07
rw-rw-rw- 229/20    812 Mar 27 15:41 1998 ./mcnp4b/exec/inp08p
rw-rw-rw- 229/20  57202 Mar 27 15:41 1998 ./mcnp4b/exec/inp09o
rw-rw-rw- 229/20   3457 Mar 27 15:41 1998 ./mcnp4b/exec/inp08m
rw-rw-rw- 229/20      0 Mar 27 15:41 1998 ./mcnp4b/exec/difm08
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INFORMATION ONLY

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rw-rw-rw- 229/20      0 Mar 27 15:41 1998 ./mcnp4b/exec/difo08
rw-rw-rw- 229/20  17893 Mar 27 15:41 1998 ./mcnp4b/exec/inp09m
rw-rw-rw- 229/20 180036 Mar 27 15:41 1998 ./mcnp4b/exec/inp09s
rw-rw-rw- 229/20  17907 Mar 27 15:47 1998 ./mcnp4b/exec/inp27o
rw-rw-rw- 229/20 180036 Mar 27 15:47 1998 ./mcnp4b/exec/inp26s
rw-rw-rw- 229/20      0 Mar 27 15:41 1998 ./mcnp4b/exec/difm09
rw-rw-rw- 229/20      0 Mar 27 15:41 1998 ./mcnp4b/exec/difo09
rw-rw-rw- 229/20  31787 Mar 27 15:42 1998 ./mcnp4b/exec/inp10o
rw-rw-rw- 229/20  56608 Mar 27 15:42 1998 ./mcnp4b/exec/inp11o
rw-rw-rw- 229/20    748 Mar 27 15:42 1998 ./mcnp4b/exec/inp10m
rw-rw-rw- 229/20      0 Mar 27 15:42 1998 ./mcnp4b/exec/difm10
rw-rw-rw- 229/20      0 Mar 27 15:42 1998 ./mcnp4b/exec/difo10
rw-rw-rw- 229/20 170494 Mar 27 15:43 1998 ./mcnp4b/exec/inp12o
rw-rw-rw- 229/20   4562 Mar 27 15:42 1998 ./mcnp4b/exec/inp11m
rw-rw-rw- 229/20      0 Mar 27 15:42 1998 ./mcnp4b/exec/difm11
rw-rw-rw- 229/20      0 Mar 27 15:42 1998 ./mcnp4b/exec/difo11
rw-rw-rw- 229/20  89657 Mar 27 15:43 1998 ./mcnp4b/exec/inp13o
rw-rw-rw- 229/20   3600 Mar 27 15:43 1998 ./mcnp4b/exec/inp12m
rw-rw-rw- 229/20      0 Mar 27 15:43 1998 ./mcnp4b/exec/difm12
rw-rw-rw- 229/20      0 Mar 27 15:43 1998 ./mcnp4b/exec/difo12
rw-rw-rw- 229/20  31715 Mar 27 15:43 1998 ./mcnp4b/exec/inp14o
rw-rw-rw- 229/20   2889 Mar 27 15:43 1998 ./mcnp4b/exec/inp13m
rw-rw-rw- 229/20      0 Mar 27 15:43 1998 ./mcnp4b/exec/difm13
rw-rw-rw- 229/20      0 Mar 27 15:43 1998 ./mcnp4b/exec/difo13
rw-rw-rw- 229/20  44841 Mar 27 15:43 1998 ./mcnp4b/exec/inp15o
rw-rw-rw- 229/20   3212 Mar 27 15:43 1998 ./mcnp4b/exec/inp14m
rw-rw-rw- 229/20      0 Mar 27 15:43 1998 ./mcnp4b/exec/difm14
rw-rw-rw- 229/20      0 Mar 27 15:43 1998 ./mcnp4b/exec/difo14
rw-rw-rw- 229/20  51524 Mar 27 15:43 1998 ./mcnp4b/exec/inp16o
rw-rw-rw- 229/20    771 Mar 27 15:43 1998 ./mcnp4b/exec/inp15m
rw-rw-rw- 229/20      0 Mar 27 15:43 1998 ./mcnp4b/exec/difm15
rw-rw-rw- 229/20      0 Mar 27 15:43 1998 ./mcnp4b/exec/difo15
rw-rw-rw- 229/20  77712 Mar 27 15:44 1998 ./mcnp4b/exec/inp18o
rw-rw-rw- 229/20   1366 Mar 27 15:43 1998 ./mcnp4b/exec/inp16m
rw-rw-rw- 229/20      0 Mar 27 15:43 1998 ./mcnp4b/exec/difm16
rw-rw-rw- 229/20      0 Mar 27 15:43 1998 ./mcnp4b/exec/difo16
rw-rw-rw- 229/20 107636 Mar 27 15:44 1998 ./mcnp4b/exec/inp17o
rw-rw-rw- 229/20 180036 Mar 27 15:44 1998 ./mcnp4b/exec/inp18s
rw-rw-rw- 229/20  11346 Mar 27 15:44 1998 ./mcnp4b/exec/inp17m
rw-rw-rw- 229/20      0 Mar 27 15:44 1998 ./mcnp4b/exec/difm17
rw-rw-rw- 229/20      0 Mar 27 15:44 1998 ./mcnp4b/exec/difo17
rw-rw-rw- 229/20   1443 Mar 27 15:44 1998 ./mcnp4b/exec/inp18p
rw-rw-rw- 229/20  14787 Mar 27 15:45 1998 ./mcnp4b/exec/inp19o
rw-rw-rw- 229/20   8487 Mar 27 15:44 1998 ./mcnp4b/exec/inp18m
rw-rw-rw- 229/20      0 Mar 27 15:44 1998 ./mcnp4b/exec/difm18
rw-rw-rw- 229/20      0 Mar 27 15:44 1998 ./mcnp4b/exec/difo18
rw-rw-rw- 229/20  54656 Mar 27 15:45 1998 ./mcnp4b/exec/inp20o
rw-rw-rw- 229/20   2414 Mar 27 15:45 1998 ./mcnp4b/exec/inp19m
rw-rw-rw- 229/20      0 Mar 27 15:45 1998 ./mcnp4b/exec/difm19
rw-rw-rw- 229/20      0 Mar 27 15:45 1998 ./mcnp4b/exec/difo19
rw-rw-rw- 229/20  81680 Mar 27 15:46 1998 ./mcnp4b/exec/inp21o
rw-rw-rw- 229/20   9663 Mar 27 15:45 1998 ./mcnp4b/exec/inp20m
rw-rw-rw- 229/20      0 Mar 27 15:45 1998 ./mcnp4b/exec/difm20
rw-rw-rw- 229/20      0 Mar 27 15:45 1998 ./mcnp4b/exec/difo20
rw-rw-rw- 229/20  23069 Mar 27 15:46 1998 ./mcnp4b/exec/inp21m
rw-rw-rw- 229/20  52192 Mar 27 15:46 1998 ./mcnp4b/exec/inp22o
rw-rw-rw- 229/20 3420431 Mar 27 15:46 1998 ./mcnp4b/exec/inp21w
rw-rw-rw- 229/20      0 Mar 27 15:46 1998 ./mcnp4b/exec/difm21
rw-rw-rw- 229/20      0 Mar 27 15:46 1998 ./mcnp4b/exec/difo21
rw-rw-rw- 229/20  91245 Mar 27 15:47 1998 ./mcnp4b/exec/inp23o
rw-rw-rw- 229/20   1503 Mar 27 15:46 1998 ./mcnp4b/exec/inp22m
rw-rw-rw- 229/20      0 Mar 27 15:46 1998 ./mcnp4b/exec/difm22
rw-rw-rw- 229/20      0 Mar 27 15:46 1998 ./mcnp4b/exec/difo22
rw-rw-rw- 229/20  31209 Mar 27 15:47 1998 ./mcnp4b/exec/inp23p
rw-rw-rw- 229/20  33164 Mar 27 15:47 1998 ./mcnp4b/exec/inp24o
rw-rw-rw- 229/20   2944 Mar 27 15:47 1998 ./mcnp4b/exec/inp23m
rw-rw-rw- 229/20      0 Mar 27 15:47 1998 ./mcnp4b/exec/difm23
rw-rw-rw- 229/20      0 Mar 27 15:47 1998 ./mcnp4b/exec/difo23
rw-rw-rw- 229/20 180036 Mar 27 15:47 1998 ./mcnp4b/exec/inp24s
rw-rw-rw- 229/20  57594 Mar 27 15:47 1998 ./mcnp4b/exec/inp26o
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INFORMATION ONLY

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rw-rw-rw- 229/20   1240 Mar 27 15:47 1998 ./mcnp4b/exec/inp24m
rw-rw-rw- 229/20      0 Mar 27 15:47 1998 ./mcnp4b/exec/difm24
rw-rw-rw- 229/20      0 Mar 27 15:47 1998 ./mcnp4b/exec/difo24
rw-rw-rw- 229/20  17877 Mar 27 15:47 1998 ./mcnp4b/exec/inp25o
rw-rw-rw- 229/20 180036 Mar 27 15:47 1998 ./mcnp4b/exec/inp25s
rw-rw-rw- 229/20   1472 Mar 27 15:47 1998 ./mcnp4b/exec/inp25m
rw-rw-rw- 229/20      0 Mar 27 15:47 1998 ./mcnp4b/exec/difm25
rw-rw-rw- 229/20      0 Mar 27 15:47 1998 ./mcnp4b/exec/difo25
rwxr-xr-x 229/20   3971 Mar 27 14:59 1998 ./mcnp4b/exec/install
rw-rw-rw- 229/20  18897 Mar 27 15:47 1998 ./mcnp4b/exec/inp26m
rw-rw-rw- 229/20 644815 Mar 27 15:47 1998 ./mcnp4b/exec/inp09w
rw-rw-rw- 229/20      0 Mar 27 15:47 1998 ./mcnp4b/exec/difm26
rw-rw-rw- 229/20      0 Mar 27 15:47 1998 ./mcnp4b/exec/difo26
rw-rw-rw- 229/20  37974 Mar 27 15:47 1998 ./mcnp4b/exec/inp28m
rw-rw-rw- 229/20   3062 Mar 27 15:47 1998 ./mcnp4b/exec/inp27m
rw-rw-rw- 229/20      0 Mar 27 15:47 1998 ./mcnp4b/exec/difm27
rw-rw-rw- 229/20      0 Mar 27 15:47 1998 ./mcnp4b/exec/difo27
rw-rw-rw- 229/20  36905 Mar 27 15:48 1998 ./mcnp4b/exec/inp29o
rw-rw-rw- 229/20      0 Mar 27 15:47 1998 ./mcnp4b/exec/difm28
rw-rw-rw- 229/20 144379 Mar 27 15:47 1998 ./mcnp4b/exec/inp28o
rw-rw-rw- 229/20      0 Mar 27 15:47 1998 ./mcnp4b/exec/difo28
rwxr-xr-x 229/20   4523 Mar 27 14:59 1998 ./mcnp4b/exec/INSTALL.VMS
rwxr-xr-x 229/20 193536 Mar 27 14:59 1998 ./mcnp4b/exec/TESTINP.VMS
rwxr-xr-x 229/20 16038097 Mar 27 14:59 1998 ./mcnp4b/exec/testlib1
rw-rw-rw- 229/20   1380 Mar 27 15:48 1998 ./mcnp4b/exec/inp29m
rw-rw-rw- 229/20      0 Mar 27 15:48 1998 ./mcnp4b/exec/difm29
rw-rw-rw- 229/20      0 Mar 27 15:48 1998 ./mcnp4b/exec/difo29
rwxr-xr-x 229/20      0 Mar 31 08:17 1998 ./mcnp4b/ver-val/
rwxr-x--- 229/20      0 Mar 31 15:58 1998 ./mcnp4b/ver-val/shield/
rwxrwxrwx 229/20      0 Mar 27 16:55 1998 ./mcnp4b/ver-val/shield/mcnp symbolic link to
../../exec/mcnp
rw-rw-rw- 229/20 430511 Mar 30 18:18 1998 ./mcnp4b/ver-val/shield/mc10newo
rw-rw-rw- 229/20  25500 Mar 30 08:25 1998 ./mcnp4b/ver-val/shield/ueki.1o
rwxr-xr-x 229/20    146 Mar 27 16:57 1998 ./mcnp4b/ver-val/shield/runshld1
rwxr-xr-x 229/20    145 Mar 27 16:57 1998 ./mcnp4b/ver-val/shield/runshld2
rwxrwxrwx 229/20      0 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/
rw-r--r-- 229/20     63 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/mc10rg2c.Z
rw-r--r-- 229/20     53 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/mc10rgdc.Z
rw-r----- 229/20    940 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.11.Z
rw-r----- 229/20    970 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.12.Z
rw-r----- 229/20   1090 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.13.Z
rw-r----- 229/20   6866 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/mc10rg2.Z
rw-r--r-- 229/20  32943 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/mc10newpz.xwd.Z
rw-r----- 229/20   8098 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/mc10rgd.Z
rw-r--r-- 229/20  32469 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/mc10rg2pz.xwd.Z
rw-r----- 229/20   1268 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.15.Z
rw-r----- 229/20    910 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.2.Z
rw-r----- 229/20   1076 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.21.Z
rw-r----- 229/20   1198 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.22.Z
rw-r----- 229/20   1382 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.25.Z
rw-r----- 229/20   1483 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.26.Z
rw-r----- 229/20   1961 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.27.Z
rw-r----- 229/20   1024 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.3.Z
rw-r----- 229/20    921 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.32.Z
rw-r----- 229/20   1036 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.33.Z
rw-r----- 229/20   1125 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.34.Z
rw-r----- 229/20   1213 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.35.Z
rw-r----- 229/20   1215 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.5.Z
rw-r--r-- 229/20  10681 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki1.xwd.Z
rwxr-xr-x 229/20 1080292 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/mcnp.Z
rw-r--r-- 229/20  12524 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki2.xwd.Z
rw-r----- 229/20   8098 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/mc10rgd2.Z
rw-r--r-- 229/20  11661 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki3.xwd.Z
rw-r--r-- 229/20  26171 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/mc10rg2o.Z
rw-r--r-- 229/20  11060 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki4.xwd.Z
rw-r--r-- 229/20  33335 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/mc10rgdo.Z
rw-r--r-- 229/20  11388 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki5.xwd.Z
rw-r--r-- 229/20  30500 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/mc10newo.Z
rw-r----- 229/20    884 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.1.Z
rw-r----- 229/20   1175 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.14.Z
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INFORMATION ONLY

```
rw-r----- 229/20   8133 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/mc10new.Z
rw-r--r-- 229/20     53 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/mc10newc.Z
rw-r--r-- 229/20  23733 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/mc10newpx.xwd.Z
rw-r--r-- 229/20  23388 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/mc10rg2px.xwd.Z
rw-r----- 229/20   1321 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.24.Z
rw-r----- 229/20    895 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.31.Z
rw-r----- 229/20   1124 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki.4.Z
rw-r--r-- 229/20   9563 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/plots/ueki11.xwd.Z
rw-r----- 229/20   1457 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.1
rw-r----- 229/20   1575 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.11
rw-r----- 229/20   1639 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.12
rw-r----- 229/20   1898 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.13
rw-rw-rw- 229/20  26811 Mar 30 08:29 1998 ./mcnp4b/ver-val/shield/ueki.11o
rw-r----- 229/20   2117 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.14
rw-r----- 229/20   2361 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.15
rw-r----- 229/20   1521 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.2
rw-r----- 229/20   1857 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.21
rw-rw-rw- 229/20  22074 Mar 30 08:33 1998 ./mcnp4b/ver-val/shield/ueki.12o
rw-r----- 229/20   2123 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.22
rw-r----- 229/20   2412 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.24
rw-rw-rw- 229/20  30015 Mar 30 08:37 1998 ./mcnp4b/ver-val/shield/ueki.13o
rw-r----- 229/20   2598 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.25
rw-r----- 229/20   2855 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.26
rw-rw-rw- 229/20  26703 Mar 30 08:47 1998 ./mcnp4b/ver-val/shield/ueki.14o
rw-r----- 229/20   4103 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.27
rw-r----- 229/20   1780 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.3
rw-r----- 229/20   1479 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.31
rw-r----- 229/20   1543 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.32
rw-rw-rw- 229/20  29488 Mar 30 09:36 1998 ./mcnp4b/ver-val/shield/ueki.15o
rw-r----- 229/20   1802 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.33
rw-r----- 229/20   2021 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.34
rw-rw-rw- 229/20  20896 Mar 30 09:40 1998 ./mcnp4b/ver-val/shield/ueki.2o
rw-r----- 229/20   2265 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.35
rw-r----- 229/20   1999 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.4
rw-r----- 229/20   2248 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/ueki.5
rw-rw-rw- 229/20  23023 Mar 30 11:48 1998 ./mcnp4b/ver-val/shield/ueki.3o
rw-r--r-- 229/20 146966 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/xsdir
rw-rw-rw- 229/20  28831 Mar 30 09:41 1998 ./mcnp4b/ver-val/shield/ueki.21o
rw-r----- 229/20  36661 Mar 27 15:53 1998 ./mcnp4b/ver-val/shield/mc10new
rw-rw-rw- 229/20  26284 Mar 30 09:57 1998 ./mcnp4b/ver-val/shield/ueki.22o
rw-rw-rw- 229/20  28784 Mar 30 10:20 1998 ./mcnp4b/ver-val/shield/ueki.24o
rw-rw-rw- 229/20  30020 Mar 30 10:42 1998 ./mcnp4b/ver-val/shield/ueki.25o
rw-rw-rw- 229/20  32832 Mar 30 11:15 1998 ./mcnp4b/ver-val/shield/ueki.26o
rw-rw-rw- 229/20  49473 Mar 30 11:44 1998 ./mcnp4b/ver-val/shield/ueki.27o
rw-rw-rw- 229/20  25727 Mar 30 11:52 1998 ./mcnp4b/ver-val/shield/ueki.31o
rw-rw-rw- 229/20  26333 Mar 30 11:56 1998 ./mcnp4b/ver-val/shield/ueki.32o
rw-rw-rw- 229/20  29570 Mar 30 12:01 1998 ./mcnp4b/ver-val/shield/ueki.33o
rw-rw-rw- 229/20  33195 Mar 30 12:17 1998 ./mcnp4b/ver-val/shield/ueki.34o
rw-rw-rw- 229/20  35983 Mar 30 13:21 1998 ./mcnp4b/ver-val/shield/ueki.35o
rw-rw-rw- 229/20  25594 Mar 30 13:33 1998 ./mcnp4b/ver-val/shield/ueki.4o
rw-rw-rw- 229/20  29286 Mar 30 15:29 1998 ./mcnp4b/ver-val/shield/ueki.5o
rw-rw-rw- 229/20 6942720 Mar 31 08:24 1998 ./mcnp4b/ver-val/smlset.opus
rwxr-xr-x 229/20      0 Mar 31 15:51 1998 ./mcnp4b/ver-val/endf5/
rw-rw-rw- 229/20 1953907 Mar 27 19:07 1998 ./mcnp4b/ver-val/endf5/exp2o
rw-rw-rw- 229/20 1850069 Mar 27 17:14 1998 ./mcnp4b/ver-val/endf5/exp1o
rw-r--r-- 229/20   5160 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf5/exp22
rw-r--r-- 229/20   5259 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf5/exp23
rw-rw-rw- 229/20 1869170 Mar 27 21:15 1998 ./mcnp4b/ver-val/endf5/exp3o
rw-r--r-- 229/20   6146 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf5/exp25
rw-r--r-- 229/20   5420 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf5/exp26
rw-r--r-- 229/20   6474 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf5/exp27
rw-rw-rw- 229/20 1872296 Mar 27 23:20 1998 ./mcnp4b/ver-val/endf5/exp4o
rwxr-xr-x 229/20   1012 Mar 30 08:18 1998 ./mcnp4b/ver-val/endf5/runexp
rwxrwxrwx 229/20      0 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf5/mcnp symbolic link to
../../exec/mcnp
rw-r--r-- 229/20    418 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf5/LA2X5
rw-rw-rw- 229/20 907337 Mar 28 01:44 1998 ./mcnp4b/ver-val/endf5/exp22o
rw-rw-rw- 229/20 241429 Mar 28 12:38 1998 ./mcnp4b/ver-val/endf5/LA1X5o
rw-r--r-- 229/20   4283 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf5/LA3X5
rw-r--r-- 229/20 146972 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf5/xsdir
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INFORMATION ONLY

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rw-r--r-- 229/20   5723 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf5/exp1
rw-rw-rw- 229/20 935571 Mar 28 03:32 1998 ./mcnp4b/ver-val/endf5/exp23o
rw-r--r-- 229/20   7650 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf5/exp2
rw-r--r-- 229/20   7117 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf5/exp24a
rw-r--r-- 229/20   6813 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf5/exp3
rw-r--r-- 229/20   7127 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf5/exp4
rw-rw-rw- 229/20 4108542 Mar 28 05:35 1998 ./mcnp4b/ver-val/endf5/exp24ao
rw-r--r-- 229/20    325 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf5/LA1X5
rw-rw-rw- 229/20 944032 Mar 28 06:50 1998 ./mcnp4b/ver-val/endf5/exp25o
rw-rw-rw- 229/20 853564 Mar 28 08:54 1998 ./mcnp4b/ver-val/endf5/exp26o
rw-rw-rw- 229/20 903521 Mar 28 10:07 1998 ./mcnp4b/ver-val/endf5/exp27o
rw-rw-rw- 229/20 209766 Mar 28 12:47 1998 ./mcnp4b/ver-val/endf5/LA2X5o
rw-rw-rw- 229/20 271384 Mar 28 13:07 1998 ./mcnp4b/ver-val/endf5/LA3X5o
rwxr-xr-x 229/20      0 Mar 31 15:54 1998 ./mcnp4b/ver-val/endf6/
rw-rw-rw- 229/20 325631 Mar 27 17:48 1998 ./mcnp4b/ver-val/endf6/prob1o
rw-rw-rw- 229/20 175648 Mar 30 07:25 1998 ./mcnp4b/ver-val/endf6/godivao
rw-rw-rw- 229/20 371751 Mar 27 23:45 1998 ./mcnp4b/ver-val/endf6/prob3no
rwxrwxrwx 229/20      0 Mar 27 16:12 1998 ./mcnp4b/ver-val/endf6/mcnp symbolic link to
../../exec/mcnp
rw-r--r-- 229/20   4094 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf6/prob12
rw-rw-rw- 229/20 175420 Mar 30 07:30 1998 ./mcnp4b/ver-val/endf6/jez20o
rw-r--r-- 229/20   1603 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf6/prob13
rw-r--r-- 229/20   2383 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf6/prob14
rw-rw-rw- 229/20 295003 Mar 27 23:52 1998 ./mcnp4b/ver-val/endf6/prob6o
rw-r--r-- 229/20   1866 Mar 27 15:54 1998 ./mcnp4b/ver-val/endf6/prob16
rw-rw-rw- 229/20 110017 Mar 30 07:35 1998 ./mcnp4b/ver-val/endf6/jez4.5o
rw-r--r-- 229/20   4174 Mar 27 15:54 1998 ./mcnp4b/ver-val/endf6/prob18
rw-r--r-- 229/20   3109 Mar 27 15:54 1998 ./mcnp4b/ver-val/endf6/prob20
rw-rw-rw- 229/20 295226 Mar 28 00:02 1998 ./mcnp4b/ver-val/endf6/prob7o
rw-r--r-- 229/20   4270 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf6/prob3
rw-r--r-- 229/20   1755 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf6/prob7
rwxr-xr-x 229/20   1238 Mar 27 16:22 1998 ./mcnp4b/ver-val/endf6/rune6
rw-r--r-- 229/20   4269 Mar 27 15:54 1998 ./mcnp4b/ver-val/endf6/prob3n
rw-r--r-- 229/20    325 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf6/LA1X
rw-r--r-- 229/20    475 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf6/LA2X
rw-r--r-- 229/20   1689 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf6/prob6
rw-r--r-- 229/20   5050 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf6/LA3
rw-r--r-- 229/20    223 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf6/godiva
rw-r--r-- 229/20 146972 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf6/xsdir
rw-rw-rw- 229/20 317231 Mar 28 00:26 1998 ./mcnp4b/ver-val/endf6/prob12o
rw-r--r-- 229/20    221 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf6/jez20
rw-r--r-- 229/20    228 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf6/jez4.5
rw-rw-rw- 229/20 305270 Mar 28 00:35 1998 ./mcnp4b/ver-val/endf6/prob13o
rw-r--r-- 229/20   1440 Mar 27 15:54 1998 ./mcnp4b/ver-val/endf6/prob15
rw-rw-rw- 229/20 308612 Mar 28 00:43 1998 ./mcnp4b/ver-val/endf6/prob14o
rw-r--r-- 229/20   3169 Mar 27 15:53 1998 ./mcnp4b/ver-val/endf6/prob1
rw-rw-rw- 229/20 277380 Mar 28 05:00 1998 ./mcnp4b/ver-val/endf6/prob15o
rw-rw-rw- 229/20 310377 Mar 28 05:45 1998 ./mcnp4b/ver-val/endf6/prob16o
rw-rw-rw- 229/20 313701 Mar 28 10:10 1998 ./mcnp4b/ver-val/endf6/prob18o
rw-rw-rw- 229/20 325398 Mar 28 10:43 1998 ./mcnp4b/ver-val/endf6/prob20o
rw-rw-rw- 229/20 241421 Mar 28 12:52 1998 ./mcnp4b/ver-val/endf6/LA1Xo
rw-rw-rw- 229/20 210075 Mar 28 13:02 1998 ./mcnp4b/ver-val/endf6/LA2Xo
rw-rw-rw- 229/20 287883 Mar 28 13:14 1998 ./mcnp4b/ver-val/endf6/LA3o
rwxrwxrwx 229/20      0 Mar 31 08:24 1998 ./mcnp4b/ver-val/smlset/
rwxr-x--x 229/20    232 Mar 31 08:22 1998 ./mcnp4b/ver-val/smlset/runset
rw-r--r-- 229/20   5723 Mar 31 08:15 1998 ./mcnp4b/ver-val/smlset/exp1
rw-rw-rw- 229/20 1850069 Mar 31 08:15 1998 ./mcnp4b/ver-val/smlset/exp1o
rw-r--r-- 229/20   6474 Mar 31 08:15 1998 ./mcnp4b/ver-val/smlset/exp27
rw-rw-rw- 229/20 903521 Mar 31 08:15 1998 ./mcnp4b/ver-val/smlset/exp27o
rw-r--r-- 229/20   3169 Mar 31 08:16 1998 ./mcnp4b/ver-val/smlset/prob1
rw-rw-rw- 229/20 325631 Mar 31 08:16 1998 ./mcnp4b/ver-val/smlset/prob1o
rw-r--r-- 229/20   3109 Mar 31 08:16 1998 ./mcnp4b/ver-val/smlset/prob20
rw-rw-rw- 229/20 325398 Mar 31 08:16 1998 ./mcnp4b/ver-val/smlset/prob20o
rw-r--r-- 229/20    325 Mar 31 08:16 1998 ./mcnp4b/ver-val/smlset/LA1X
rw-rw-rw- 229/20 241421 Mar 31 08:16 1998 ./mcnp4b/ver-val/smlset/LA1Xo
rw-r--r-- 229/20   5050 Mar 31 08:16 1998 ./mcnp4b/ver-val/smlset/LA3
rw-rw-rw- 229/20 287883 Mar 31 08:16 1998 ./mcnp4b/ver-val/smlset/LA3o
rw-r--r-- 229/20    223 Mar 31 08:16 1998 ./mcnp4b/ver-val/smlset/godiva
rw-rw-rw- 229/20 175648 Mar 31 08:16 1998 ./mcnp4b/ver-val/smlset/godivao
rw-r--r-- 229/20    228 Mar 31 08:16 1998 ./mcnp4b/ver-val/smlset/jez4.5
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INFORMATION ONLY

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rw-rw-rw- 229/20 110017 Mar 31 08:16 1998 ./mcnp4b/ver-val/smlset/jez4.5o
rw-r----- 229/20  36661 Mar 31 08:16 1998 ./mcnp4b/ver-val/smlset/mc10new
rw-rw-rw- 229/20 430511 Mar 31 08:16 1998 ./mcnp4b/ver-val/smlset/mc10newo
rw-r----- 229/20   2117 Mar 31 08:17 1998 ./mcnp4b/ver-val/smlset/ueki.14
rw-rw-rw- 229/20  26703 Mar 31 08:17 1998 ./mcnp4b/ver-val/smlset/ueki.14o
rw-r----- 229/20   2412 Mar 31 08:17 1998 ./mcnp4b/ver-val/smlset/ueki.24
rw-rw-rw- 229/20  28784 Mar 31 08:17 1998 ./mcnp4b/ver-val/smlset/ueki.24o
rw-r----- 229/20   2021 Mar 31 08:17 1998 ./mcnp4b/ver-val/smlset/ueki.34
rw-rw-rw- 229/20  33195 Mar 31 08:17 1998 ./mcnp4b/ver-val/smlset/ueki.34o
rw-r----- 229/20   1999 Mar 31 08:17 1998 ./mcnp4b/ver-val/smlset/ueki.4
rw-rw-rw- 229/20  25594 Mar 31 08:17 1998 ./mcnp4b/ver-val/smlset/ueki.4o
rw-rw-rw- 229/20   8851 Mar 31 08:24 1998 ./mcnp4b/ver-val/smlset/bug4b2
rw-rw-rw- 229/20 2072332 Mar 31 08:24 1998 ./mcnp4b/ver-val/smlset/bug4b2o
rwxrwxrwx 229/20       0 Mar 31 16:19 1998 ./mcnp4b/ver-val/4b2fix/
rw-rw-rw- 229/20   8851 Mar 27 15:55 1998 ./mcnp4b/ver-val/4b2fix/bug4b2
rw-rw-rw- 229/20 2072332 Mar 27 16:14 1998 ./mcnp4b/ver-val/4b2fix/bug4b2o
rwxr-xr-x 229/20       0 Mar  2 15:27 1998 ./mcnp4b/xslib/
rw-r--r-- 229/20 2680832 Dec 17 16:21 1997 ./mcnp4b/xslib/dre52
rw-r--r-- 229/20 305152 Dec 17 16:21 1997 ./mcnp4b/xslib/531dos2
rw-r--r-- 229/20 36685824 Dec 17 16:14 1997 ./mcnp4b/xslib/endf602
rw-r--r-- 229/20 1812480 Dec 17 16:18 1997 ./mcnp4b/xslib/newxs2
rw-r--r-- 229/20 8196096 Dec 17 16:15 1997 ./mcnp4b/xslib/rmccs2
rw-r--r-- 229/20 3532800 Dec 17 16:15 1997 ./mcnp4b/xslib/rmccsa2
rw-r--r-- 229/20 5736448 Dec 17 16:16 1997 ./mcnp4b/xslib/endf5p2
rw-r--r-- 229/20 5937152 Dec 17 16:17 1997 ./mcnp4b/xslib/endf5u2
rw-r--r-- 229/20 3840000 Dec 17 16:17 1997 ./mcnp4b/xslib/misc5xs2
rw-r--r-- 229/20 1259520 Dec 17 16:17 1997 ./mcnp4b/xslib/kidman2
rw-r--r-- 229/20 3590144 Dec 17 16:18 1997 ./mcnp4b/xslib/100xs2
rw-r--r-- 229/20 5859328 Dec 17 16:19 1997 ./mcnp4b/xslib/endl852
rw-r--r-- 229/20 2846720 Dec 17 16:19 1997 ./mcnp4b/xslib/endf5mt2
rw-r--r-- 229/20 716800 Dec 17 16:19 1997 ./mcnp4b/xslib/newxsd2
rw-r--r-- 229/20 5093376 Dec 17 16:20 1997 ./mcnp4b/xslib/drmccs2
rw-r--r-- 229/20 2416640 Dec 17 16:21 1997 ./mcnp4b/xslib/tmccs2
rw-r--r-- 229/20  90112 Dec 17 16:21 1997 ./mcnp4b/xslib/therxs2
rw-r--r-- 229/20 874496 Dec 17 16:21 1997 ./mcnp4b/xslib/532dos2
rw-r--r-- 229/20 1687552 Dec 17 16:21 1997 ./mcnp4b/xslib/111dos2
rw-r--r-- 229/20 1628160 Dec 17 16:21 1997 ./mcnp4b/xslib/mgxsnp2
rw-r--r-- 229/20 577536 Dec 17 16:21 1997 ./mcnp4b/xslib/mcplib022
rw-r--r-- 229/20 440320 Dec 17 16:21 1997 ./mcnp4b/xslib/mcplib2
rw-r--r-- 229/20 770048 Dec 17 16:21 1997 ./mcnp4b/xslib/el2
rw-r--r-- 229/20 146972 Dec 18 07:46 1997 ./mcnp4b/xslib/xsdir
```

Files from SPUDS on HP backup tape MOY-980421-19 (MI: 30056-M03-001)

Verification test problems are located in mcnp4b/exec. Criticality validation test problems are located in mcnp4b/ver-val/endf5. Criticality validation test problems are located in mcnp4b/ver-val/endf6. Shielding validation test problems are located in mcnp4b/ver-val/shield. Coincident planes verification test problem is located in mcnp4b/ver-val/4b2fix.

```
rwxrwxrwx 229/20       0 Jan 16 14:54 1998 ./mcnp4b/
rwxrwxrwx 229/20       0 Dec 18 08:40 1997 ./mcnp4b/xslib/
rw-rw-rw- 229/20 3590144 Dec 18 08:39 1997 ./mcnp4b/xslib/100xs2
rw-rw-rw- 229/20 305152 Dec 18 08:39 1997 ./mcnp4b/xslib/531dos2
rw-rw-rw- 229/20 874496 Dec 18 08:39 1997 ./mcnp4b/xslib/532dos2
rw-rw-rw- 229/20 2680832 Dec 18 08:39 1997 ./mcnp4b/xslib/dre52
rw-rw-rw- 229/20 5093376 Dec 18 08:39 1997 ./mcnp4b/xslib/drmccs2
rw-rw-rw- 229/20 770048 Dec 18 08:39 1997 ./mcnp4b/xslib/el2
rw-rw-rw- 229/20 2846720 Dec 18 08:39 1997 ./mcnp4b/xslib/endf5mt2
rw-rw-rw- 229/20 5736448 Dec 18 08:39 1997 ./mcnp4b/xslib/endf5p2
rw-rw-rw- 229/20 5937152 Dec 18 08:39 1997 ./mcnp4b/xslib/endf5u2
rw-rw-rw- 229/20 36685824 Dec 18 08:40 1997 ./mcnp4b/xslib/endf602
rw-rw-rw- 229/20 5859328 Dec 18 08:40 1997 ./mcnp4b/xslib/endl852
rw-rw-rw- 229/20 1259520 Dec 18 08:40 1997 ./mcnp4b/xslib/kidman2
rw-rw-rw- 229/20 1687552 Dec 18 08:40 1997 ./mcnp4b/xslib/111dos2
rw-rw-rw- 229/20 577536 Dec 18 08:40 1997 ./mcnp4b/xslib/mcplib022
rw-rw-rw- 229/20 440320 Dec 18 08:40 1997 ./mcnp4b/xslib/mcplib2
```


INFORMATION ONLY

```
rw-rw-rw- 229/20 1628160 Dec 18 08:40 1997 ./mcnp4b/xslib/mgxsnp2
rw-rw-rw- 229/20 3840000 Dec 18 08:40 1997 ./mcnp4b/xslib/misc5xs2
rw-rw-rw- 229/20 1812480 Dec 18 08:40 1997 ./mcnp4b/xslib/newxs2
rw-rw-rw- 229/20 716800 Dec 18 08:40 1997 ./mcnp4b/xslib/newxsd2
rw-rw-rw- 229/20 8196096 Dec 18 08:40 1997 ./mcnp4b/xslib/rmccs2
rw-rw-rw- 229/20 3532800 Dec 18 08:40 1997 ./mcnp4b/xslib/rmccsa2
rw-rw-rw- 229/20  90112 Dec 18 08:40 1997 ./mcnp4b/xslib/therxs2
rw-rw-rw- 229/20 2416640 Dec 18 08:40 1997 ./mcnp4b/xslib/tmccs2
rw-rw-rw- 229/20 146971 Dec 18 08:41 1997 ./mcnp4b/xslib/xsdir
rwxrwxrwx 229/20      0 Apr  1 10:26 1998 ./mcnp4b/exec/
rw-rw-rw- 229/20   2918 Dec 18 08:31 1997 ./mcnp4b/exec/INSTALL.FIX.old
rw-rw-rw- 229/20   4523 Dec 18 08:31 1997 ./mcnp4b/exec/INSTALL.VMS
rw-rw-rw- 229/20   6070 Dec 18 08:31 1997 ./mcnp4b/exec/RUNPROB.VMS
rw-rw-rw- 229/20 193437 Dec 18 08:31 1997 ./mcnp4b/exec/TESTINP.VMS
rw-rw-rw- 229/20 235520 Dec 18 08:31 1997 ./mcnp4b/exec/TESTMCTL.AIX
rw-rw-rw- 229/20 227840 Dec 18 08:31 1997 ./mcnp4b/exec/TESTMCTL.SUN
rw-rw-rw- 229/20 290288 Dec 18 08:31 1997 ./mcnp4b/exec/TESTMCTL.VMS
rw-rw-rw- 229/20 2048000 Dec 18 08:31 1997 ./mcnp4b/exec/TESTOUTP.AIX
rw-rw-rw- 229/20 2040320 Dec 18 08:31 1997 ./mcnp4b/exec/TESTOUTP.SUN
rw-rw-rw- 229/20 2354588 Dec 18 08:31 1997 ./mcnp4b/exec/TESTOUTP.VMS
rw-rw-rw- 229/20    230 Dec 18 08:31 1997 ./mcnp4b/exec/answer
rwxrwxrwx 229/20   2241 Dec 18 09:12 1997 ./mcnp4b/exec/runtest
rwx------ 229/20   1396 Mar  1 13:23 1996 ./mcnp4b/exec/inp01
rwx------ 229/20   1963 Mar  2 12:09 1996 ./mcnp4b/exec/inp02
rwx------ 229/20   1911 Mar  1 13:26 1996 ./mcnp4b/exec/inp03
rwx------ 229/20   1052 Mar  1 13:31 1996 ./mcnp4b/exec/inp04
rwx------ 229/20   2164 Mar  1 13:31 1996 ./mcnp4b/exec/inp05
rwx------ 229/20   1599 Mar  1 13:32 1996 ./mcnp4b/exec/inp06
rwx------ 229/20   1539 Mar  1 13:32 1996 ./mcnp4b/exec/inp07
rwx------ 229/20   3287 Mar  4 08:53 1996 ./mcnp4b/exec/inp08
rwx------ 229/20   1261 Mar  1 15:56 1996 ./mcnp4b/exec/inp09
rwx------ 229/20   1004 Mar  1 13:34 1996 ./mcnp4b/exec/inp10
rwx------ 229/20   2023 Mar  2 12:21 1996 ./mcnp4b/exec/inp11
rwx------ 229/20  46304 Mar  4 09:00 1996 ./mcnp4b/exec/inp12
rwx------ 229/20   1172 Mar  1 11:10 1996 ./mcnp4b/exec/inp13
rwx------ 229/20   2459 Mar  1 13:52 1996 ./mcnp4b/exec/inp14
rwx------ 229/20   1104 Mar  1 13:53 1996 ./mcnp4b/exec/inp15
rwx------ 229/20   2220 Mar  1 13:54 1996 ./mcnp4b/exec/inp16
rwx------ 229/20    968 Mar  1 13:54 1996 ./mcnp4b/exec/inp17
rwx------ 229/20   4323 Mar  4 07:50 1996 ./mcnp4b/exec/inp18
rwx------ 229/20    567 Mar  1 13:55 1996 ./mcnp4b/exec/inp19
rwx------ 229/20   1171 Mar  1 13:56 1996 ./mcnp4b/exec/inp20
rwx------ 229/20   8134 Mar  2 12:03 1996 ./mcnp4b/exec/inp21
rwx------ 229/20   7496 Mar  1 15:25 1996 ./mcnp4b/exec/inp22
rwx------ 229/20   5496 Mar  1 15:26 1996 ./mcnp4b/exec/inp23
rwx------ 229/20   2096 Mar  1 13:13 1996 ./mcnp4b/exec/inp24
rwx------ 229/20     42 Feb 29 14:35 1996 ./mcnp4b/exec/inp25
rwx------ 229/20     42 Feb 29 14:35 1996 ./mcnp4b/exec/inp26
rwx------ 229/20    917 Mar  1 15:27 1996 ./mcnp4b/exec/inp27
rwx------ 229/20   5756 Feb 29 14:35 1996 ./mcnp4b/exec/inp28
rwx------ 229/20    839 Mar  4 08:00 1996 ./mcnp4b/exec/inp29
rw-r--r-- 229/20   6853 Jan  6 14:04 1997 ./mcnp4b/exec/mctl01
rw-r--r-- 229/20  15297 Jan  6 14:04 1997 ./mcnp4b/exec/mctl02
rw-r--r-- 229/20   1793 Jan  6 14:04 1997 ./mcnp4b/exec/mctl03
rw-r--r-- 229/20  11301 Jan  6 14:04 1997 ./mcnp4b/exec/mctl04
rw-r--r-- 229/20   2199 Jan  6 14:04 1997 ./mcnp4b/exec/mctl05
rw-r--r-- 229/20   4956 Jan  6 14:04 1997 ./mcnp4b/exec/mctl06
rw-r--r-- 229/20   1472 Jan  6 14:04 1997 ./mcnp4b/exec/mctl07
rw-r--r-- 229/20   3457 Jan  6 14:04 1997 ./mcnp4b/exec/mctl08
rw-r--r-- 229/20  17893 Jan  6 14:04 1997 ./mcnp4b/exec/mctl09
rw-r--r-- 229/20    748 Jan  6 14:04 1997 ./mcnp4b/exec/mctl10
rw-r--r-- 229/20   4562 Jan  6 14:04 1997 ./mcnp4b/exec/mctl11
rw-r--r-- 229/20   3600 Jan  6 14:04 1997 ./mcnp4b/exec/mctl12
rw-r--r-- 229/20   2889 Jan  6 14:04 1997 ./mcnp4b/exec/mctl13
rw-r--r-- 229/20   3212 Jan  6 14:04 1997 ./mcnp4b/exec/mctl14
rw-r--r-- 229/20    771 Jan  6 14:04 1997 ./mcnp4b/exec/mctl15
rw-r--r-- 229/20   1366 Jan  6 14:04 1997 ./mcnp4b/exec/mctl16
rw-r--r-- 229/20  11346 Jan  6 14:04 1997 ./mcnp4b/exec/mctl17
rw-r--r-- 229/20   8487 Jan  6 14:04 1997 ./mcnp4b/exec/mctl18
rw-r--r-- 229/20   2414 Jan  6 14:04 1997 ./mcnp4b/exec/mctl19
```


INFORMATION ONLY

```
rw-r--r-- 229/20   9663 Jan  6 14:04 1997 ./mcnp4b/exec/mct120
rw-r--r-- 229/20  23069 Jan  6 14:04 1997 ./mcnp4b/exec/mct121
rw-r--r-- 229/20   1503 Jan  6 14:04 1997 ./mcnp4b/exec/mct122
rw-r--r-- 229/20   2944 Jan  6 14:04 1997 ./mcnp4b/exec/mct123
rw-r--r-- 229/20   1240 Jan  6 14:04 1997 ./mcnp4b/exec/mct124
rw-r--r-- 229/20   1472 Jan  6 14:04 1997 ./mcnp4b/exec/mct125
rw-r--r-- 229/20  18897 Jan  6 14:04 1997 ./mcnp4b/exec/mct126
rw-r--r-- 229/20   3062 Jan  6 14:04 1997 ./mcnp4b/exec/mct127
rw-rw-rw- 229/20    923 Dec 18 08:32 1997 ./mcnp4b/exec/getfiles
rw-r--r-- 229/20  37974 Jan  6 14:04 1997 ./mcnp4b/exec/mct128
rw-r--r-- 229/20   1380 Jan  6 14:04 1997 ./mcnp4b/exec/mct129
rw-r--r-- 229/20 109352 Jan  6 14:04 1997 ./mcnp4b/exec/outp01
rw-r--r-- 229/20 116665 Jan  6 14:04 1997 ./mcnp4b/exec/outp02
rw-r--r-- 229/20  19769 Jan  6 14:04 1997 ./mcnp4b/exec/outp03
rw-r--r-- 229/20 144259 Jan  6 14:04 1997 ./mcnp4b/exec/outp04
rw-r--r-- 229/20  22577 Jan  6 14:04 1997 ./mcnp4b/exec/outp05
rw-r--r-- 229/20  34544 Jan  6 14:04 1997 ./mcnp4b/exec/outp06
rw-r--r-- 229/20  75653 Jan  6 14:04 1997 ./mcnp4b/exec/outp07
rw-r--r-- 229/20 176554 Jan  6 14:04 1997 ./mcnp4b/exec/outp08
rw-r--r-- 229/20  57202 Jan  6 14:04 1997 ./mcnp4b/exec/outp09
rw-r--r-- 229/20  31787 Jan  6 14:04 1997 ./mcnp4b/exec/outp10
rw-r--r-- 229/20  56608 Jan  6 14:04 1997 ./mcnp4b/exec/outp11
rw-r--r-- 229/20 170494 Jan  6 14:04 1997 ./mcnp4b/exec/outp12
rw-r--r-- 229/20  89657 Jan  6 14:04 1997 ./mcnp4b/exec/outp13
rw-r--r-- 229/20  31715 Jan  6 14:04 1997 ./mcnp4b/exec/outp14
rw-r--r-- 229/20  44841 Jan  6 14:04 1997 ./mcnp4b/exec/outp15
rw-r--r-- 229/20  51524 Jan  6 14:04 1997 ./mcnp4b/exec/outp16
rw-r--r-- 229/20 107636 Jan  6 14:04 1997 ./mcnp4b/exec/outp17
rw-r--r-- 229/20  77712 Jan  6 14:04 1997 ./mcnp4b/exec/outp18
rw-r--r-- 229/20  14787 Jan  6 14:04 1997 ./mcnp4b/exec/outp19
rw-r--r-- 229/20  54656 Jan  6 14:04 1997 ./mcnp4b/exec/outp20
rw-r--r-- 229/20  81680 Jan  6 14:04 1997 ./mcnp4b/exec/outp21
rw-r--r-- 229/20  52192 Jan  6 14:04 1997 ./mcnp4b/exec/outp22
rw-r--r-- 229/20  91245 Jan  6 14:04 1997 ./mcnp4b/exec/outp23
rw-r--r-- 229/20  33164 Jan  6 14:04 1997 ./mcnp4b/exec/outp24
rw-r--r-- 229/20  17877 Jan  6 14:04 1997 ./mcnp4b/exec/outp25
rw-r--r-- 229/20  57594 Jan  6 14:04 1997 ./mcnp4b/exec/outp26
rw-r--r-- 229/20  17907 Jan  6 14:04 1997 ./mcnp4b/exec/outp27
rw-r--r-- 229/20 144379 Jan  6 14:04 1997 ./mcnp4b/exec/outp28
rw-r--r-- 229/20  36905 Jan  6 14:04 1997 ./mcnp4b/exec/outp29
rw-rw-rw- 229/20  53893 Dec 18 09:20 1997 ./mcnp4b/exec/runtest.log
rw-r--r-- 229/20 109352 Mar 27 16:32 1998 ./mcnp4b/exec/inp01o
rw-r--r-- 229/20  33468 Mar 27 16:32 1998 ./mcnp4b/exec/inp01p
rw-r--r-- 229/20 116665 Mar 27 16:32 1998 ./mcnp4b/exec/inp02o
rw-r--r-- 229/20   6853 Mar 27 16:32 1998 ./mcnp4b/exec/inp01m
rw-rw-rw- 229/20      0 Mar 27 16:32 1998 ./mcnp4b/exec/difm01
rw-rw-rw- 229/20    258 Mar 27 16:32 1998 ./mcnp4b/exec/difo01
rw-r--r-- 229/20  25038 Mar 27 16:32 1998 ./mcnp4b/exec/inp02p
rw-r--r-- 229/20  19769 Mar 27 16:33 1998 ./mcnp4b/exec/inp03o
rw-r--r-- 229/20  15297 Mar 27 16:32 1998 ./mcnp4b/exec/inp02m
rw-rw-rw- 229/20      0 Mar 27 16:32 1998 ./mcnp4b/exec/difm02
rw-rw-rw- 229/20      0 Mar 27 16:32 1998 ./mcnp4b/exec/difo02
rw-r--r-- 229/20 144259 Mar 27 16:33 1998 ./mcnp4b/exec/inp04o
rw-r--r-- 229/20   1793 Mar 27 16:33 1998 ./mcnp4b/exec/inp03m
rw-rw-rw- 229/20      0 Mar 27 16:33 1998 ./mcnp4b/exec/difm03
rw-rw-rw- 229/20      0 Mar 27 16:33 1998 ./mcnp4b/exec/difo03
rw-r--r-- 229/20  22577 Mar 27 16:33 1998 ./mcnp4b/exec/inp05o
rw-r--r-- 229/20  11301 Mar 27 16:33 1998 ./mcnp4b/exec/inp04m
rw-rw-rw- 229/20      0 Mar 27 16:33 1998 ./mcnp4b/exec/difm04
rw-rw-rw- 229/20      0 Mar 27 16:33 1998 ./mcnp4b/exec/difo04
rw-r--r-- 229/20  34544 Mar 27 16:33 1998 ./mcnp4b/exec/inp06o
rw-r--r-- 229/20   2199 Mar 27 16:33 1998 ./mcnp4b/exec/inp05m
rw-rw-rw- 229/20      0 Mar 27 16:33 1998 ./mcnp4b/exec/difm05
rw-rw-rw- 229/20      0 Mar 27 16:33 1998 ./mcnp4b/exec/difo05
rw-r--r-- 229/20  75653 Mar 27 16:34 1998 ./mcnp4b/exec/inp07o
rw-r--r-- 229/20   4956 Mar 27 16:33 1998 ./mcnp4b/exec/inp06m
rw-rw-rw- 229/20      0 Mar 27 16:33 1998 ./mcnp4b/exec/difm06
rw-rw-rw- 229/20      0 Mar 27 16:33 1998 ./mcnp4b/exec/difo06
rw-r--r-- 229/20   1472 Mar 27 16:34 1998 ./mcnp4b/exec/inp07m
rw-r--r-- 229/20 176554 Mar 27 16:34 1998 ./mcnp4b/exec/inp08o
```


INFORMATION ONLY

```
rw-r--r-- 229/20 481295 Mar 27 16:34 1998 ./mcnp4b/exec/inp07w
rw-rw-rw- 229/20      0 Mar 27 16:34 1998 ./mcnp4b/exec/difm07
rw-rw-rw- 229/20      0 Mar 27 16:34 1998 ./mcnp4b/exec/difo07
rw-r--r-- 229/20    812 Mar 27 16:34 1998 ./mcnp4b/exec/inp08p
rw-r--r-- 229/20  57202 Mar 27 16:35 1998 ./mcnp4b/exec/inp09o
rw-r--r-- 229/20   3457 Mar 27 16:34 1998 ./mcnp4b/exec/inp08m
rw-rw-rw- 229/20      0 Mar 27 16:34 1998 ./mcnp4b/exec/difm08
rw-rw-rw- 229/20      0 Mar 27 16:34 1998 ./mcnp4b/exec/difo08
rw-r--r-- 229/20  17893 Mar 27 16:35 1998 ./mcnp4b/exec/inp09m
rw-r--r-- 229/20 180036 Mar 27 16:35 1998 ./mcnp4b/exec/inp09s
rw-r--r-- 229/20  17907 Mar 27 16:42 1998 ./mcnp4b/exec/inp27o
rw-r--r-- 229/20 180036 Mar 27 16:42 1998 ./mcnp4b/exec/inp26s
rw-rw-rw- 229/20      0 Mar 27 16:35 1998 ./mcnp4b/exec/difm09
rw-rw-rw- 229/20      0 Mar 27 16:35 1998 ./mcnp4b/exec/difo09
rw-r--r-- 229/20  31787 Mar 27 16:35 1998 ./mcnp4b/exec/inp10o
rw-r--r-- 229/20  56608 Mar 27 16:36 1998 ./mcnp4b/exec/inp11o
rw-r--r-- 229/20    748 Mar 27 16:35 1998 ./mcnp4b/exec/inp10m
rw-rw-rw- 229/20      0 Mar 27 16:35 1998 ./mcnp4b/exec/difm10
rw-rw-rw- 229/20      0 Mar 27 16:35 1998 ./mcnp4b/exec/difo10
rw-r--r-- 229/20 170494 Mar 27 16:37 1998 ./mcnp4b/exec/inp12o
rw-r--r-- 229/20   4562 Mar 27 16:36 1998 ./mcnp4b/exec/inp11m
rw-rw-rw- 229/20      0 Mar 27 16:36 1998 ./mcnp4b/exec/difm11
rw-rw-rw- 229/20      0 Mar 27 16:36 1998 ./mcnp4b/exec/difo11
rw-r--r-- 229/20  89657 Mar 27 16:37 1998 ./mcnp4b/exec/inp13o
rw-r--r-- 229/20   3600 Mar 27 16:37 1998 ./mcnp4b/exec/inp12m
rw-rw-rw- 229/20      0 Mar 27 16:37 1998 ./mcnp4b/exec/difm12
rw-rw-rw- 229/20      0 Mar 27 16:37 1998 ./mcnp4b/exec/difo12
rw-r--r-- 229/20  31715 Mar 27 16:37 1998 ./mcnp4b/exec/inp14o
rw-r--r-- 229/20   2889 Mar 27 16:37 1998 ./mcnp4b/exec/inp13m
rw-rw-rw- 229/20      0 Mar 27 16:37 1998 ./mcnp4b/exec/difm13
rw-rw-rw- 229/20      0 Mar 27 16:37 1998 ./mcnp4b/exec/difo13
rw-r--r-- 229/20  44841 Mar 27 16:37 1998 ./mcnp4b/exec/inp15o
rw-r--r-- 229/20   3212 Mar 27 16:37 1998 ./mcnp4b/exec/inp14m
rw-rw-rw- 229/20      0 Mar 27 16:37 1998 ./mcnp4b/exec/difm14
rw-rw-rw- 229/20      0 Mar 27 16:37 1998 ./mcnp4b/exec/difo14
rw-r--r-- 229/20  51524 Mar 27 16:37 1998 ./mcnp4b/exec/inp16o
rw-r--r-- 229/20    771 Mar 27 16:37 1998 ./mcnp4b/exec/inp15m
rw-rw-rw- 229/20      0 Mar 27 16:37 1998 ./mcnp4b/exec/difm15
rw-rw-rw- 229/20      0 Mar 27 16:37 1998 ./mcnp4b/exec/difo15
rw-rw-rw- 229/20   3971 Dec 18 08:32 1997 ./mcnp4b/exec/install
rw-rw-rw- 229/20   6603 Dec 18 08:32 1997 ./mcnp4b/exec/install.fix
rw-rw-rw- 229/20  74983 Dec 18 08:32 1997 ./mcnp4b/exec/install.log
rw-rw-rw- 229/20    632 Dec 18 08:32 1997 ./mcnp4b/exec/makemcnp
rw-rw-rw- 229/20 135165 Dec 18 08:32 1997 ./mcnp4b/exec/makxsf
rwxrwxrwx 229/20 1458176 Mar 27 16:29 1998 ./mcnp4b/exec/mcnp
rw-rw-rw- 229/20 188412 Dec 18 08:32 1997 ./mcnp4b/exec/mcsetup
rw-rw-rw- 229/20  38920 Dec 18 08:32 1997 ./mcnp4b/exec/mcsetup.for
rw-r--r-- 229/20  77712 Mar 27 16:38 1998 ./mcnp4b/exec/inp18o
rw-r--r-- 229/20   1366 Mar 27 16:37 1998 ./mcnp4b/exec/inp16m
rw-rw-rw- 229/20      0 Mar 27 16:37 1998 ./mcnp4b/exec/difm16
rw-rw-rw- 229/20      0 Mar 27 16:37 1998 ./mcnp4b/exec/difo16
rw-r--r-- 229/20 107636 Mar 27 16:38 1998 ./mcnp4b/exec/inp17o
rw-r--r-- 229/20 180036 Mar 27 16:38 1998 ./mcnp4b/exec/inp18s
rw-r--r-- 229/20  11346 Mar 27 16:38 1998 ./mcnp4b/exec/inp17m
rw-rw-rw- 229/20      0 Mar 27 16:38 1998 ./mcnp4b/exec/difm17
rw-rw-rw- 229/20      0 Mar 27 16:38 1998 ./mcnp4b/exec/difo17
rw-r--r-- 229/20   1443 Mar 27 16:38 1998 ./mcnp4b/exec/inp18p
rw-r--r-- 229/20  14787 Mar 27 16:39 1998 ./mcnp4b/exec/inp19o
rw-r--r-- 229/20   8487 Mar 27 16:38 1998 ./mcnp4b/exec/inp18m
rw-rw-rw- 229/20      0 Mar 27 16:38 1998 ./mcnp4b/exec/difm18
rw-rw-rw- 229/20      0 Mar 27 16:38 1998 ./mcnp4b/exec/difo18
rw-r--r-- 229/20  54656 Mar 27 16:39 1998 ./mcnp4b/exec/inp20o
rw-r--r-- 229/20   2414 Mar 27 16:39 1998 ./mcnp4b/exec/inp19m
rw-rw-rw- 229/20      0 Mar 27 16:39 1998 ./mcnp4b/exec/difm19
rw-rw-rw- 229/20      0 Mar 27 16:39 1998 ./mcnp4b/exec/difo19
rw-r--r-- 229/20  81680 Mar 27 16:40 1998 ./mcnp4b/exec/inp21o
rw-r--r-- 229/20   9663 Mar 27 16:39 1998 ./mcnp4b/exec/inp20m
rw-rw-rw- 229/20      0 Mar 27 16:39 1998 ./mcnp4b/exec/difm20
rw-rw-rw- 229/20    256 Mar 27 16:39 1998 ./mcnp4b/exec/difo20
rw-r--r-- 229/20  23069 Mar 27 16:40 1998 ./mcnp4b/exec/inp21m
```


INFORMATION ONLY

```
rw-r--r-- 229/20  52192 Mar 27 16:40 1998 ./mcnp4b/exec/inp22o
rw-r--r-- 229/20 3420431 Mar 27 16:40 1998 ./mcnp4b/exec/inp21w
rw-rw-rw- 229/20      0 Mar 27 16:40 1998 ./mcnp4b/exec/difm21
rw-rw-rw- 229/20    468 Mar 27 16:40 1998 ./mcnp4b/exec/difo21
rw-r--r-- 229/20  91245 Mar 27 16:41 1998 ./mcnp4b/exec/inp23o
rw-r--r-- 229/20   1503 Mar 27 16:40 1998 ./mcnp4b/exec/inp22m
rw-rw-rw- 229/20      0 Mar 27 16:40 1998 ./mcnp4b/exec/difm22
rw-rw-rw- 229/20      0 Mar 27 16:40 1998 ./mcnp4b/exec/difo22
rw-r--r-- 229/20  31209 Mar 27 16:41 1998 ./mcnp4b/exec/inp23p
rw-r--r-- 229/20  33164 Mar 27 16:41 1998 ./mcnp4b/exec/inp24o
rw-r--r-- 229/20   2944 Mar 27 16:41 1998 ./mcnp4b/exec/inp23m
rw-rw-rw- 229/20      0 Mar 27 16:41 1998 ./mcnp4b/exec/difm23
rw-rw-rw- 229/20    388 Mar 27 16:41 1998 ./mcnp4b/exec/difo23
rw-r--r-- 229/20 180036 Mar 27 16:41 1998 ./mcnp4b/exec/inp24s
rw-r--r-- 229/20  57594 Mar 27 16:42 1998 ./mcnp4b/exec/inp26o
rw-r--r-- 229/20   1240 Mar 27 16:41 1998 ./mcnp4b/exec/inp24m
rw-rw-rw- 229/20      0 Mar 27 16:41 1998 ./mcnp4b/exec/difm24
rw-rw-rw- 229/20      0 Mar 27 16:41 1998 ./mcnp4b/exec/difo24
rw-r--r-- 229/20  17877 Mar 27 16:41 1998 ./mcnp4b/exec/inp25o
rw-r--r-- 229/20 180036 Mar 27 16:41 1998 ./mcnp4b/exec/inp25s
rw-r--r-- 229/20   1472 Mar 27 16:41 1998 ./mcnp4b/exec/inp25m
rw-rw-rw- 229/20      0 Mar 27 16:41 1998 ./mcnp4b/exec/difm25
rw-rw-rw- 229/20      0 Mar 27 16:41 1998 ./mcnp4b/exec/difo25
rw-r--r-- 229/20  18897 Mar 27 16:42 1998 ./mcnp4b/exec/inp26m
rw-r--r-- 229/20 644815 Mar 27 16:41 1998 ./mcnp4b/exec/inp09w
rw-rw-rw- 229/20      0 Mar 27 16:42 1998 ./mcnp4b/exec/difm26
rw-rw-rw- 229/20      0 Mar 27 16:42 1998 ./mcnp4b/exec/difo26
rw-r--r-- 229/20  37974 Mar 27 16:42 1998 ./mcnp4b/exec/inp28m
rw-r--r-- 229/20   3062 Mar 27 16:42 1998 ./mcnp4b/exec/inp27m
rw-rw-rw- 229/20      0 Mar 27 16:42 1998 ./mcnp4b/exec/difm27
rw-rw-rw- 229/20      0 Mar 27 16:42 1998 ./mcnp4b/exec/difo27
rw-r--r-- 229/20 144379 Mar 27 16:42 1998 ./mcnp4b/exec/inp28o
rw-rw-rw- 229/20      0 Mar 27 16:42 1998 ./mcnp4b/exec/difm28
rw-r--r-- 229/20  36905 Mar 27 16:43 1998 ./mcnp4b/exec/inp29o
rw-rw-rw- 229/20 258045 Dec 18 08:32 1997 ./mcnp4b/exec/prpr
rw-rw-rw- 229/20  13492 Dec 18 08:32 1997 ./mcnp4b/exec/readmaag
rw-rw-rw- 229/20   4871 Dec 18 08:32 1997 ./mcnp4b/exec/runpraad
rwxrwxrwx 229/20   3264 Dec 18 08:32 1997 ./mcnp4b/exec/runprob
rw-rw-rw- 229/20  22914 Dec 18 08:32 1997 ./mcnp4b/exec/testdir
rw-rw-rw- 229/20 196608 Dec 18 08:36 1997 ./mcnp4b/exec/testinp.tar
rw-rw-rw- 229/20 16038097 Dec 18 08:36 1997 ./mcnp4b/exec/testlibl
rw-rw-rw- 229/20 262144 Dec 18 08:33 1997 ./mcnp4b/exec/testmaae
rw-rw-rw- 229/20 235520 Dec 18 08:33 1997 ./mcnp4b/exec/testmctl.hp
rw-rw-rw- 229/20 2097152 Dec 18 08:33 1997 ./mcnp4b/exec/testoaaf
rw-rw-rw- 229/20 2048000 Dec 18 08:33 1997 ./mcnp4b/exec/testoutp.hp
rw-rw-rw- 229/20      0 Mar 27 16:42 1998 ./mcnp4b/exec/difo28
rw-r--r-- 229/20   1380 Mar 27 16:43 1998 ./mcnp4b/exec/inp29m
rw-rw-rw- 229/20      0 Mar 27 16:43 1998 ./mcnp4b/exec/difm29
rw-rw-rw- 229/20      0 Mar 27 16:43 1998 ./mcnp4b/exec/difo29
rwxrwxrwx 229/20      0 Apr  1 08:13 1998 ./mcnp4b/ver-val/
rwxrwxrwx 229/20      0 Mar 31 16:13 1998 ./mcnp4b/ver-val/endf5/
rw-rw-rw- 229/20   5723 Dec 18 09:27 1997 ./mcnp4b/ver-val/endf5/exp1
rw-rw-rw- 229/20   7650 Dec 18 09:27 1997 ./mcnp4b/ver-val/endf5/exp2
rw-rw-rw- 229/20   6813 Dec 18 09:27 1997 ./mcnp4b/ver-val/endf5/exp3
rw-rw-rw- 229/20   7127 Dec 18 09:27 1997 ./mcnp4b/ver-val/endf5/exp4
rw-rw-rw- 229/20   5160 Dec 18 14:18 1997 ./mcnp4b/ver-val/endf5/exp22
rw-rw-rw- 229/20   5259 Dec 18 14:18 1997 ./mcnp4b/ver-val/endf5/exp23
rw-rw-rw- 229/20   7117 Dec 18 14:18 1997 ./mcnp4b/ver-val/endf5/exp24a
rw-rw-rw- 229/20   6146 Dec 18 14:18 1997 ./mcnp4b/ver-val/endf5/exp25
rw-rw-rw- 229/20   5420 Dec 18 14:19 1997 ./mcnp4b/ver-val/endf5/exp26
rw-rw-rw- 229/20   6474 Dec 18 14:19 1997 ./mcnp4b/ver-val/endf5/exp27
rwxr-xr-x 229/20   1012 Mar 30 08:58 1998 ./mcnp4b/ver-val/endf5/runexp
rw-r--r-- 229/20 1849757 Mar 27 18:01 1998 ./mcnp4b/ver-val/endf5/exp1o
rw-r--r-- 229/20 1953283 Mar 27 19:30 1998 ./mcnp4b/ver-val/endf5/exp2o
rw-r--r-- 229/20 1868546 Mar 27 21:03 1998 ./mcnp4b/ver-val/endf5/exp3o
rwxr-xr-x 229/20      0 Mar 27 16:53 1998 ./mcnp4b/ver-val/endf5/mcnp symbolic link to
../../exec/mcnp
rwxrwxrwx 229/20      0 Dec 18 09:28 1997 ./mcnp4b/ver-val/endf5/xsdir symbolic link to
../../xslib/xsdir
rw-r--r-- 229/20 1871778 Mar 27 22:34 1998 ./mcnp4b/ver-val/endf5/exp4o
```


INFORMATION ONLY

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rw-r--r-- 229/20 907025 Mar 28 00:22 1998 ./mcnp4b/ver-val/endf5/exp22o
rw-r--r-- 229/20 935259 Mar 28 01:44 1998 ./mcnp4b/ver-val/endf5/exp23o
rw-r--r-- 229/20   4283 Dec 19 10:19 1997 ./mcnp4b/ver-val/endf5/LA3X5
rw-r--r-- 229/20 4108230 Mar 28 03:28 1998 ./mcnp4b/ver-val/endf5/exp24ao
rw-r--r-- 229/20 943720 Mar 28 04:30 1998 ./mcnp4b/ver-val/endf5/exp25o
rw-r--r-- 229/20 853252 Mar 28 06:12 1998 ./mcnp4b/ver-val/endf5/exp26o
rw-r--r-- 229/20 903209 Mar 28 07:15 1998 ./mcnp4b/ver-val/endf5/exp27o
rw-r--r-- 229/20 240805 Mar 28 09:14 1998 ./mcnp4b/ver-val/endf5/LA1X5o
rw-r--r-- 229/20 209766 Mar 28 09:21 1998 ./mcnp4b/ver-val/endf5/LA2X5o
rw-r--r-- 229/20 271384 Mar 28 09:39 1998 ./mcnp4b/ver-val/endf5/LA3X5o
rw-r--r-- 229/20    418 Dec 19 08:41 1997 ./mcnp4b/ver-val/endf5/LA2X5
rw-r--r-- 229/20    325 Dec 19 08:35 1997 ./mcnp4b/ver-val/endf5/LA1X5
rwxrwxrwx 229/20      0 Mar 31 16:13 1998 ./mcnp4b/ver-val/endf6/
rw-r--r-- 229/20   3169 Dec 18 11:01 1997 ./mcnp4b/ver-val/endf6/prob1
rwxr-xr-x 229/20      0 Mar 27 16:53 1998 ./mcnp4b/ver-val/endf6/mcnp symbolic link to
../../exec/mcnp
rw-r--r-- 229/20   4094 Dec 18 11:01 1997 ./mcnp4b/ver-val/endf6/prob12
rw-r--r-- 229/20 325631 Mar 27 17:48 1998 ./mcnp4b/ver-val/endf6/prob1o
rw-r--r-- 229/20   1603 Dec 18 11:01 1997 ./mcnp4b/ver-val/endf6/prob13
rw-r--r-- 229/20   2694 Mar 31 16:13 1998 ./mcnp4b/ver-val/endf6/gak
rw-r--r-- 229/20   2383 Dec 18 11:01 1997 ./mcnp4b/ver-val/endf6/prob14
rw-r--r-- 229/20   1440 Dec 18 11:01 1997 ./mcnp4b/ver-val/endf6/prob15
rw-r--r-- 229/20   1866 Dec 18 11:01 1997 ./mcnp4b/ver-val/endf6/prob16
rw-r--r-- 229/20 369635 Mar 27 23:00 1998 ./mcnp4b/ver-val/endf6/prob3no
rw-r--r-- 229/20   4174 Dec 18 11:01 1997 ./mcnp4b/ver-val/endf6/prob18
rw-r--r-- 229/20   3109 Dec 18 11:01 1997 ./mcnp4b/ver-val/endf6/prob20
rw-r--r-- 229/20   4270 Dec 18 11:01 1997 ./mcnp4b/ver-val/endf6/prob3
rw-r--r-- 229/20   1689 Dec 18 11:01 1997 ./mcnp4b/ver-val/endf6/prob6
rw-r--r-- 229/20   1755 Dec 18 11:01 1997 ./mcnp4b/ver-val/endf6/prob7
rw-r--r-- 229/20 295003 Mar 27 23:07 1998 ./mcnp4b/ver-val/endf6/prob6o
rw-r--r-- 229/20    325 Dec 18 11:02 1997 ./mcnp4b/ver-val/endf6/LA1X
rw-r--r-- 229/20    475 Dec 18 11:02 1997 ./mcnp4b/ver-val/endf6/LA2X
rw-r--r-- 229/20   5050 Dec 18 11:02 1997 ./mcnp4b/ver-val/endf6/LA3
rwxr-x--x 229/20   1238 Mar 27 16:53 1998 ./mcnp4b/ver-val/endf6/rune6
rw-r--r-- 229/20 295226 Mar 27 23:17 1998 ./mcnp4b/ver-val/endf6/prob7o
rwxrwxrwx 229/20      0 Dec 18 18:08 1997 ./mcnp4b/ver-val/endf6/xsdir symbolic link to
../../xslib/xsdir
rw-r--r-- 229/20   4269 Dec 19 16:09 1997 ./mcnp4b/ver-val/endf6/prob3n
rw-r--r-- 229/20 317231 Mar 27 23:38 1998 ./mcnp4b/ver-val/endf6/prob12o
rw-r--r-- 229/20 305270 Mar 27 23:46 1998 ./mcnp4b/ver-val/endf6/prob13o
rw-r--r-- 229/20 308612 Mar 27 23:55 1998 ./mcnp4b/ver-val/endf6/prob14o
rw-r--r-- 229/20 276132 Mar 28 03:34 1998 ./mcnp4b/ver-val/endf6/prob15o
rw-r--r-- 229/20 310065 Mar 28 04:11 1998 ./mcnp4b/ver-val/endf6/prob16o
rw-r--r-- 229/20 312453 Mar 28 07:33 1998 ./mcnp4b/ver-val/endf6/prob18o
rw-r--r-- 229/20 325086 Mar 28 08:00 1998 ./mcnp4b/ver-val/endf6/prob20o
rw-r--r-- 229/20 240797 Mar 28 09:39 1998 ./mcnp4b/ver-val/endf6/LA1Xo
rw-r--r-- 229/20 210075 Mar 28 09:44 1998 ./mcnp4b/ver-val/endf6/LA2Xo
rw-r--r-- 229/20 287883 Mar 28 09:56 1998 ./mcnp4b/ver-val/endf6/LA3o
rw-r--r-- 229/20 175648 Mar 28 09:59 1998 ./mcnp4b/ver-val/endf6/godivao
rw-r--r-- 229/20 175420 Mar 28 10:01 1998 ./mcnp4b/ver-val/endf6/jez20o
rw-r--r-- 229/20 110017 Mar 28 10:02 1998 ./mcnp4b/ver-val/endf6/jez4.5o
rw-r--r-- 229/20    221 Dec 19 09:35 1997 ./mcnp4b/ver-val/endf6/jez20
rw-r--r-- 229/20    228 Dec 19 09:35 1997 ./mcnp4b/ver-val/endf6/jez4.5
rw-r--r-- 229/20    223 Dec 19 09:35 1997 ./mcnp4b/ver-val/endf6/godiva
rwxr-xr-x 229/20      0 Jan  7 10:59 1998 ./mcnp4b/ver-val/plots/
rw-r--r-- 229/20   5723 Jan  5 17:09 1998 ./mcnp4b/ver-val/plots/exp1
rwxr-xr-x 229/20      0 Jan  5 16:50 1998 ./mcnp4b/ver-val/plots/mcnp symbolic link to
/opt/neut/MCNP4B/mcnp
rwxr-xr-x 229/20      0 Jan  5 16:51 1998 ./mcnp4b/ver-val/plots/xsdir symbolic link to
/opt/neut/MCNP4B/xslib/xsdir
rw-r--r-- 229/20   5160 Jan  6 08:25 1998 ./mcnp4b/ver-val/plots/exp22
rw-r--r-- 229/20   5259 Jan  6 08:25 1998 ./mcnp4b/ver-val/plots/exp23
rw-r--r-- 229/20   6146 Jan  6 08:25 1998 ./mcnp4b/ver-val/plots/exp25
rw-r--r-- 229/20   7650 Jan  5 17:09 1998 ./mcnp4b/ver-val/plots/exp2
rw-r--r-- 229/20   6813 Jan  5 17:09 1998 ./mcnp4b/ver-val/plots/exp3
rw-r--r-- 229/20   7127 Jan  5 17:09 1998 ./mcnp4b/ver-val/plots/exp4
rw-r--r-- 229/20   5420 Jan  6 08:25 1998 ./mcnp4b/ver-val/plots/exp26
rw-r--r-- 229/20   6474 Jan  6 08:25 1998 ./mcnp4b/ver-val/plots/exp27
rw-r--r-- 229/20  30633 Jan  7 10:38 1998 ./mcnp4b/ver-val/plots/exp22o
rw-r--r-- 229/20      0 Jan  7 10:33 1998 ./mcnp4b/ver-val/plots/exp22s
```


INFORMATION ONLY

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rw-r--r-- 229/20   1377 Jan  7 10:38 1998 ./mcnp4b/ver-val/plots/exp22c
rw-r--r-- 229/20  29553 Jan  7 10:39 1998 ./mcnp4b/ver-val/plots/exp23o
rw-r--r-- 229/20      0 Jan  7 10:38 1998 ./mcnp4b/ver-val/plots/exp23s
rw-r--r-- 229/20    243 Jan  7 10:39 1998 ./mcnp4b/ver-val/plots/exp23c
rw-r--r-- 229/20  31403 Jan  7 10:40 1998 ./mcnp4b/ver-val/plots/exp24ao
rw-r--r-- 229/20 897537 Jan  5 17:01 1998 ./mcnp4b/ver-val/plots/exp1xy.xwd
rw-r--r-- 229/20 897537 Jan  5 17:06 1998 ./mcnp4b/ver-val/plots/exp1xz.xwd
rw-r--r-- 229/20 897537 Jan  5 17:07 1998 ./mcnp4b/ver-val/plots/exp1yz.xwd
rw-r--r-- 229/20 897537 Jan  5 17:11 1998 ./mcnp4b/ver-val/plots/exp2xy.xwd
rw-r--r-- 229/20 897537 Jan  5 17:16 1998 ./mcnp4b/ver-val/plots/exp2xz.xwd
rw-r--r-- 229/20 897537 Jan  5 17:18 1998 ./mcnp4b/ver-val/plots/exp2yz.xwd
rw-r--r-- 229/20 897537 Jan  6 08:01 1998 ./mcnp4b/ver-val/plots/exp3xy.xwd
rw-r--r-- 229/20 897537 Jan  6 08:07 1998 ./mcnp4b/ver-val/plots/exp3xz.xwd
rw-r--r-- 229/20 897537 Jan  6 08:08 1998 ./mcnp4b/ver-val/plots/exp3yz.xwd
rw-r--r-- 229/20 897537 Jan  6 08:15 1998 ./mcnp4b/ver-val/plots/exp4xy.xwd
rw-r--r-- 229/20 897537 Jan  6 08:19 1998 ./mcnp4b/ver-val/plots/exp4xz.xwd
rw-r--r-- 229/20      0 Jan  7 10:39 1998 ./mcnp4b/ver-val/plots/exp24as
rw-r--r-- 229/20    162 Jan  7 10:40 1998 ./mcnp4b/ver-val/plots/exp24ac
rw-r--r-- 229/20  29553 Jan  7 10:41 1998 ./mcnp4b/ver-val/plots/exp25o
rw-r--r-- 229/20      0 Jan  7 10:40 1998 ./mcnp4b/ver-val/plots/exp25s
rw-r--r-- 229/20    243 Jan  7 10:41 1998 ./mcnp4b/ver-val/plots/exp25c
rw-r--r-- 229/20  29173 Jan  7 10:41 1998 ./mcnp4b/ver-val/plots/exp26o
rw-r--r-- 229/20      0 Jan  7 10:41 1998 ./mcnp4b/ver-val/plots/exp26s
rw-r--r-- 229/20    243 Jan  7 10:41 1998 ./mcnp4b/ver-val/plots/exp26c
rw-r--r-- 229/20   7117 Jan  6 08:53 1998 ./mcnp4b/ver-val/plots/exp24a
rw-r--r-- 229/20  30211 Jan  7 10:42 1998 ./mcnp4b/ver-val/plots/exp27o
rw-r--r-- 229/20      0 Jan  7 10:42 1998 ./mcnp4b/ver-val/plots/exp27s
rw-r--r-- 229/20    243 Jan  7 10:42 1998 ./mcnp4b/ver-val/plots/exp27c
rw-r--r-- 229/20 897537 Jan  6 08:32 1998 ./mcnp4b/ver-val/plots/exp22xy.xwd
rw-r--r-- 229/20 897537 Jan  6 08:39 1998 ./mcnp4b/ver-val/plots/exp22xz.xwd
rw-r--r-- 229/20 897537 Jan  6 08:41 1998 ./mcnp4b/ver-val/plots/exp22yz.xwd
rw-r--r-- 229/20 897537 Jan  6 08:45 1998 ./mcnp4b/ver-val/plots/exp23xy.xwd
rw-r--r-- 229/20 897537 Jan  6 08:57 1998 ./mcnp4b/ver-val/plots/exp24xy.xwd
rw-r--r-- 229/20 897537 Jan  6 08:48 1998 ./mcnp4b/ver-val/plots/exp25xy.xwd
rw-r--r-- 229/20 897537 Jan  6 08:50 1998 ./mcnp4b/ver-val/plots/exp26xy.xwd
rw-r--r-- 229/20 897537 Jan  6 08:52 1998 ./mcnp4b/ver-val/plots/exp27xy.xwd
rw-r--r-- 229/20  54022 Jan  7 09:18 1998 ./mcnp4b/ver-val/plots/exp1xy.gif
rw-r--r-- 229/20  95512 Jan  7 09:19 1998 ./mcnp4b/ver-val/plots/exp1xz.gif
rw-r--r-- 229/20  51060 Jan  7 09:20 1998 ./mcnp4b/ver-val/plots/exp1yz.gif
rw-r--r-- 229/20  69669 Jan  7 09:20 1998 ./mcnp4b/ver-val/plots/exp22xy.gif
rw-r--r-- 229/20  79441 Jan  7 09:21 1998 ./mcnp4b/ver-val/plots/exp22xz.gif
rw-r--r-- 229/20  79631 Jan  7 09:21 1998 ./mcnp4b/ver-val/plots/exp22yz.gif
rw-r--r-- 229/20  85422 Jan  7 09:42 1998 ./mcnp4b/ver-val/plots/exp23xy.gif
rw-r--r-- 229/20  59898 Jan  7 09:26 1998 ./mcnp4b/ver-val/plots/exp24xy.gif
rw-r--r-- 229/20  91121 Jan  7 09:27 1998 ./mcnp4b/ver-val/plots/exp25xy.gif
rw-r--r-- 229/20  85639 Jan  7 09:27 1998 ./mcnp4b/ver-val/plots/exp26xy.gif
rw-r--r-- 229/20  86663 Jan  7 09:28 1998 ./mcnp4b/ver-val/plots/exp27xy.gif
rw-r--r-- 229/20  54055 Jan  7 09:28 1998 ./mcnp4b/ver-val/plots/exp2xy.gif
rw-r--r-- 229/20  97436 Jan  7 09:29 1998 ./mcnp4b/ver-val/plots/exp2xz.gif
rw-r--r-- 229/20  51536 Jan  7 09:29 1998 ./mcnp4b/ver-val/plots/exp2yz.gif
rw-r--r-- 229/20  54000 Jan  7 09:29 1998 ./mcnp4b/ver-val/plots/exp3xy.gif
rw-r--r-- 229/20  97078 Jan  7 09:30 1998 ./mcnp4b/ver-val/plots/exp3xz.gif
rw-r--r-- 229/20  51583 Jan  7 09:30 1998 ./mcnp4b/ver-val/plots/exp3yz.gif
rw-r--r-- 229/20  53775 Jan  7 09:31 1998 ./mcnp4b/ver-val/plots/exp4xy.gif
rw-r--r-- 229/20  96591 Jan  7 09:31 1998 ./mcnp4b/ver-val/plots/exp4xz.gif
rw-r--r-- 229/20  32011 Jan  7 10:44 1998 ./mcnp4b/ver-val/plots/exp1o
rw-r--r-- 229/20      0 Jan  7 10:43 1998 ./mcnp4b/ver-val/plots/exp1s
rw-r--r-- 229/20    324 Jan  7 10:44 1998 ./mcnp4b/ver-val/plots/exp1c
rw-r--r-- 229/20  44122 Jan  7 10:45 1998 ./mcnp4b/ver-val/plots/exp2o
rw-r--r-- 229/20      0 Jan  7 10:44 1998 ./mcnp4b/ver-val/plots/exp2s
rw-r--r-- 229/20    324 Jan  7 10:45 1998 ./mcnp4b/ver-val/plots/exp2c
rw-r--r-- 229/20  38806 Jan  7 10:47 1998 ./mcnp4b/ver-val/plots/exp3o
rw-r--r-- 229/20      0 Jan  7 10:45 1998 ./mcnp4b/ver-val/plots/exp3s
rw-r--r-- 229/20    324 Jan  7 10:47 1998 ./mcnp4b/ver-val/plots/exp3c
rw-r--r-- 229/20  40453 Jan  7 10:49 1998 ./mcnp4b/ver-val/plots/exp4o
rw-r--r-- 229/20      0 Jan  7 10:47 1998 ./mcnp4b/ver-val/plots/exp4s
rw-r--r-- 229/20    324 Jan  7 10:49 1998 ./mcnp4b/ver-val/plots/exp4c
rw-r--r-- 229/20 897537 Jan  7 10:43 1998 ./mcnp4b/ver-val/plots/xelxy.xwd
rw-r--r-- 229/20 897537 Jan  7 10:44 1998 ./mcnp4b/ver-val/plots/xelxz.xwd
rw-r--r-- 229/20 897537 Jan  7 10:44 1998 ./mcnp4b/ver-val/plots/xelyz.xwd
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INFORMATION ONLY

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rw-r--r-- 229/20 897537 Jan  7 10:32 1998 ./mcnp4b/ver-val/plots/xe22xy.xwd
rw-r--r-- 229/20 897537 Jan  7 10:36 1998 ./mcnp4b/ver-val/plots/xe22xz.xwd
rw-r--r-- 229/20 897537 Jan  7 10:37 1998 ./mcnp4b/ver-val/plots/xe22yz.xwd
rw-r--r-- 229/20 897537 Jan  7 10:39 1998 ./mcnp4b/ver-val/plots/xe23xy.xwd
rw-r--r-- 229/20 897537 Jan  7 10:40 1998 ./mcnp4b/ver-val/plots/xe24axy.xwd
rw-r--r-- 229/20 897537 Jan  7 10:41 1998 ./mcnp4b/ver-val/plots/xe25xy.xwd
rw-r--r-- 229/20 897537 Jan  7 10:41 1998 ./mcnp4b/ver-val/plots/xe26xy.xwd
rw-r--r-- 229/20 897537 Jan  7 10:42 1998 ./mcnp4b/ver-val/plots/xe27xy.xwd
rw-r--r-- 229/20 897537 Jan  7 10:45 1998 ./mcnp4b/ver-val/plots/xe2xy.xwd
rw-r--r-- 229/20 897537 Jan  7 10:45 1998 ./mcnp4b/ver-val/plots/xe2xz.xwd
rw-r--r-- 229/20 897537 Jan  7 10:45 1998 ./mcnp4b/ver-val/plots/xe2yz.xwd
rw-r--r-- 229/20 897537 Jan  7 10:46 1998 ./mcnp4b/ver-val/plots/xe3xy.xwd
rw-r--r-- 229/20 897537 Jan  7 10:47 1998 ./mcnp4b/ver-val/plots/xe3xz.xwd
rw-r--r-- 229/20 897537 Jan  7 10:47 1998 ./mcnp4b/ver-val/plots/xe3yz.xwd
rw-r--r-- 229/20 897537 Jan  7 10:48 1998 ./mcnp4b/ver-val/plots/xe4xy.xwd
rw-r--r-- 229/20 897537 Jan  7 10:48 1998 ./mcnp4b/ver-val/plots/xe4xz.xwd
rw-r--r-- 229/20 897537 Jan  7 10:48 1998 ./mcnp4b/ver-val/plots/xe4yz.xwd
rw-r--r-- 229/20  13688 Jan  7 10:50 1998 ./mcnp4b/ver-val/plots/xe1xy.gif
rw-r--r-- 229/20  19937 Jan  7 10:51 1998 ./mcnp4b/ver-val/plots/xe1xz.gif
rw-r--r-- 229/20  11054 Jan  7 10:52 1998 ./mcnp4b/ver-val/plots/xe1yz.gif
rw-r--r-- 229/20  16208 Jan  7 10:52 1998 ./mcnp4b/ver-val/plots/xe22xy.gif
rw-r--r-- 229/20  18808 Jan  7 10:53 1998 ./mcnp4b/ver-val/plots/xe22xz.gif
rw-r--r-- 229/20  18238 Jan  7 10:53 1998 ./mcnp4b/ver-val/plots/xe22yz.gif
rw-r--r-- 229/20  17034 Jan  7 10:53 1998 ./mcnp4b/ver-val/plots/xe23xy.gif
rw-r--r-- 229/20  13346 Jan  7 10:54 1998 ./mcnp4b/ver-val/plots/xe24axy.gif
rw-r--r-- 229/20  21022 Jan  7 10:54 1998 ./mcnp4b/ver-val/plots/xe25xy.gif
rw-r--r-- 229/20  15173 Jan  7 10:55 1998 ./mcnp4b/ver-val/plots/xe26xy.gif
rw-r--r-- 229/20  17581 Jan  7 10:55 1998 ./mcnp4b/ver-val/plots/xe27xy.gif
rw-r--r-- 229/20  14431 Jan  7 10:56 1998 ./mcnp4b/ver-val/plots/xe2xy.gif
rw-r--r-- 229/20  21050 Jan  7 10:56 1998 ./mcnp4b/ver-val/plots/xe2xz.gif
rw-r--r-- 229/20  11490 Jan  7 10:57 1998 ./mcnp4b/ver-val/plots/xe2yz.gif
rw-r--r-- 229/20  14098 Jan  7 10:57 1998 ./mcnp4b/ver-val/plots/xe3xy.gif
rw-r--r-- 229/20  20600 Jan  7 10:58 1998 ./mcnp4b/ver-val/plots/xe3xz.gif
rw-r--r-- 229/20  11382 Jan  7 10:58 1998 ./mcnp4b/ver-val/plots/xe3yz.gif
rw-r--r-- 229/20  14040 Jan  7 10:58 1998 ./mcnp4b/ver-val/plots/xe4xy.gif
rw-r--r-- 229/20  20612 Jan  7 10:59 1998 ./mcnp4b/ver-val/plots/xe4xz.gif
rw-r--r-- 229/20  11386 Jan  7 10:59 1998 ./mcnp4b/ver-val/plots/xe4yz.gif
rwxr-xr-x 229/20      0 Mar 31 16:22 1998 ./mcnp4b/ver-val/4b2fix/
rw-r--r-- 229/20   8851 Mar 30 14:49 1998 ./mcnp4b/ver-val/4b2fix/bug4b2
rw-r--r-- 229/20 2072332 Mar 30 15:02 1998 ./mcnp4b/ver-val/4b2fix/bug4b2o
rwxr-xr-x 229/20      0 Mar 30 14:49 1998 ./mcnp4b/ver-val/4b2fix/xsdir symbolic link to
/opt/neut/MCNP4B/xslib/xsdir
rwxr-x--- 229/20      0 Mar 31 16:19 1998 ./mcnp4b/ver-val/shield/
rw-r----- 229/20  36661 Feb 13 14:37 1998 ./mcnp4b/ver-val/shield/mc10new
rw-r----- 229/20   1457 Feb 13 14:37 1998 ./mcnp4b/ver-val/shield/ueki.1
rw-r----- 229/20   1575 Feb 13 14:37 1998 ./mcnp4b/ver-val/shield/ueki.11
rw-r----- 229/20   1639 Feb 13 14:37 1998 ./mcnp4b/ver-val/shield/ueki.12
rw-r----- 229/20   1898 Feb 13 14:37 1998 ./mcnp4b/ver-val/shield/ueki.13
rw-r----- 229/20   2117 Feb 13 14:37 1998 ./mcnp4b/ver-val/shield/ueki.14
rw-r----- 229/20   2361 Feb 13 14:37 1998 ./mcnp4b/ver-val/shield/ueki.15
rw-r----- 229/20   1521 Feb 13 14:37 1998 ./mcnp4b/ver-val/shield/ueki.2
rw-r----- 229/20   1857 Feb 13 14:37 1998 ./mcnp4b/ver-val/shield/ueki.21
rw-r----- 229/20   2123 Feb 13 14:37 1998 ./mcnp4b/ver-val/shield/ueki.22
rw-r----- 229/20   2412 Feb 13 14:37 1998 ./mcnp4b/ver-val/shield/ueki.24
rw-r----- 229/20   2598 Feb 13 14:37 1998 ./mcnp4b/ver-val/shield/ueki.25
rw-r----- 229/20   2855 Feb 13 14:37 1998 ./mcnp4b/ver-val/shield/ueki.26
rw-r----- 229/20   4103 Feb 13 14:37 1998 ./mcnp4b/ver-val/shield/ueki.27
rw-r----- 229/20   1780 Feb 13 14:37 1998 ./mcnp4b/ver-val/shield/ueki.3
rw-r----- 229/20   1479 Feb 13 14:37 1998 ./mcnp4b/ver-val/shield/ueki.31
rw-r----- 229/20   1543 Feb 13 14:37 1998 ./mcnp4b/ver-val/shield/ueki.32
rw-r----- 229/20   1802 Feb 13 14:37 1998 ./mcnp4b/ver-val/shield/ueki.33
rw-r----- 229/20   2021 Feb 13 14:37 1998 ./mcnp4b/ver-val/shield/ueki.34
rw-r----- 229/20   2265 Feb 20 13:38 1998 ./mcnp4b/ver-val/shield/ueki.35
rw-r----- 229/20   1999 Feb 13 14:37 1998 ./mcnp4b/ver-val/shield/ueki.4
rw-r----- 229/20   2248 Feb 20 14:31 1998 ./mcnp4b/ver-val/shield/ueki.5
rwxr-xr-x 229/20      0 Feb 24 09:39 1998 ./mcnp4b/ver-val/shield/plots/
rw-r----- 229/20  36661 Feb 13 15:00 1998 ./mcnp4b/ver-val/shield/plots/mc10new
rw-r----- 229/20  33048 Feb 13 14:40 1998 ./mcnp4b/ver-val/shield/plots/mc10rg2
rw-r----- 229/20  36380 Feb 13 14:40 1998 ./mcnp4b/ver-val/shield/plots/mc10rgd2
rw-r----- 229/20   1457 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.1
```


INFORMATION ONLY

```
rwxr-xr-x 229/20     0 Feb 23 14:14 1998 ./mcnp4b/ver-val/shield/plots/mcnp symbolic link to
/opt/neut/MCNP4B/mcnp
rw-r----- 229/20  1575 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.11
rw-r----- 229/20  1639 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.12
rw-r--r-- 229/20 897537 Feb 13 15:06 1998 ./mcnp4b/ver-val/shield/plots/mc10newpz.xwd
rw-r--r-- 229/20 897537 Feb 13 15:07 1998 ./mcnp4b/ver-val/shield/plots/mc10newpx.xwd
rw-r--r-- 229/20 897537 Feb 13 14:49 1998 ./mcnp4b/ver-val/shield/plots/mc10rg2pz.xwd
rw-r--r-- 229/20 897537 Feb 13 14:59 1998 ./mcnp4b/ver-val/shield/plots/mc10rg2px.xwd
rw-r----- 229/20  1898 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.13
rw-r----- 229/20  2117 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.14
rw-r----- 229/20  2361 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.15
rw-r----- 229/20  1521 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.2
rw-r----- 229/20  1857 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.21
rw-r----- 229/20  2123 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.22
rw-r----- 229/20  2412 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.24
rw-r----- 229/20  2598 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.25
rw-r----- 229/20  2855 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.26
rw-r----- 229/20  4103 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.27
rw-r----- 229/20  1780 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.3
rw-r----- 229/20  1479 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.31
rw-r----- 229/20  1543 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.32
rw-r----- 229/20  1802 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.33
rw-r----- 229/20  2021 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.34
rw-r----- 229/20  2265 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.35
rw-r----- 229/20  1999 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.4
rw-r----- 229/20  2243 Feb 13 15:08 1998 ./mcnp4b/ver-val/shield/plots/ueki.5
rwxr-xr-x 229/20     0 Feb 18 11:48 1998 ./mcnp4b/ver-val/shield/plots/mc10rgd symbolic link to
mc10rgd2
rwxr-xr-x 229/20     0 Feb 23 14:14 1998 ./mcnp4b/ver-val/shield/plots/xsdir symbolic link to
/opt/neut/MCNP4B/xslib/xsdir
rw-r--r-- 229/20 12860 Feb 23 09:58 1998 ./mcnp4b/ver-val/shield/plots/ueki.26o
rw-r--r-- 229/20 897537 Feb 13 15:21 1998 ./mcnp4b/ver-val/shield/plots/ueki1.xwd
rw-r--r-- 229/20 115783 Feb 18 11:45 1998 ./mcnp4b/ver-val/shield/plots/mc10rg2o
rw-r--r-- 229/20 897537 Feb 13 15:21 1998 ./mcnp4b/ver-val/shield/plots/ueki2.xwd
rw-r--r-- 229/20   243 Feb 18 11:45 1998 ./mcnp4b/ver-val/shield/plots/mc10rg2c
rw-r--r-- 229/20 897537 Feb 13 15:22 1998 ./mcnp4b/ver-val/shield/plots/ueki3.xwd
rw-r--r-- 229/20 114545 Feb 23 14:30 1998 ./mcnp4b/ver-val/shield/plots/mc10newpx.gif
rw-r--r-- 229/20 897537 Feb 13 15:23 1998 ./mcnp4b/ver-val/shield/plots/ueki4.xwd
rw-r--r-- 229/20  94604 Feb 23 14:32 1998 ./mcnp4b/ver-val/shield/plots/mc10newpz.gif
rw-r--r-- 229/20 897537 Feb 13 15:24 1998 ./mcnp4b/ver-val/shield/plots/ueki5.xwd
rw-r--r-- 229/20   810 Feb 23 09:58 1998 ./mcnp4b/ver-val/shield/plots/ueki.26c
rw-r--r-- 229/20 139141 Feb 18 11:49 1998 ./mcnp4b/ver-val/shield/plots/mc10rgdo
rw-r--r-- 229/20   162 Feb 18 11:49 1998 ./mcnp4b/ver-val/shield/plots/mc10rgdc
rw-r--r-- 229/20 130761 Feb 18 11:47 1998 ./mcnp4b/ver-val/shield/plots/mc10newo
rw-r--r-- 229/20 897537 Feb 13 15:26 1998 ./mcnp4b/ver-val/shield/plots/ueki11.xwd
rw-r--r-- 229/20   162 Feb 18 11:47 1998 ./mcnp4b/ver-val/shield/plots/mc10newc
rwxr-xr-x 229/20     0 Feb 23 15:29 1998 ./mcnp4b/ver-val/shield/xsdir symbolic link to
/opt/neut/MCNP4B/xslib/xsdir
rwxr-xr-x 229/20     0 Mar 27 16:58 1998 ./mcnp4b/ver-val/shield/mcnp symbolic link to
../../exec/mcnp
rw-r--r-- 229/20 25500 Mar 30 08:34 1998 ./mcnp4b/ver-val/shield/ueki.1o
rw-r--r-- 229/20 429535 Mar 30 14:31 1998 ./mcnp4b/ver-val/shield/mc10newo
rwxr-xr-x 229/20   116 Mar 27 17:01 1998 ./mcnp4b/ver-val/shield/runshld2
rw-r--r-- 229/20 26811 Mar 30 08:36 1998 ./mcnp4b/ver-val/shield/ueki.11o
rwxr-xr-x 229/20   117 Mar 27 17:01 1998 ./mcnp4b/ver-val/shield/runshld1
rw-r--r-- 229/20 22074 Mar 30 08:38 1998 ./mcnp4b/ver-val/shield/ueki.12o
rw-r--r-- 229/20 30015 Mar 30 08:41 1998 ./mcnp4b/ver-val/shield/ueki.13o
rw-r--r-- 229/20 26703 Mar 30 08:46 1998 ./mcnp4b/ver-val/shield/ueki.14o
rw-r--r-- 229/20 29000 Mar 30 09:14 1998 ./mcnp4b/ver-val/shield/ueki.15o
rw-r--r-- 229/20 20896 Mar 30 09:16 1998 ./mcnp4b/ver-val/shield/ueki.2o
rw-r--r-- 229/20 28831 Mar 30 09:16 1998 ./mcnp4b/ver-val/shield/ueki.21o
rw-r--r-- 229/20 26284 Mar 30 09:23 1998 ./mcnp4b/ver-val/shield/ueki.22o
rw-r--r-- 229/20 28540 Mar 30 09:34 1998 ./mcnp4b/ver-val/shield/ueki.24o
rw-r--r-- 229/20 29776 Mar 30 09:48 1998 ./mcnp4b/ver-val/shield/ueki.25o
rw-r--r-- 229/20 32588 Mar 30 10:10 1998 ./mcnp4b/ver-val/shield/ueki.26o
rw-r--r-- 229/20 49473 Mar 30 10:29 1998 ./mcnp4b/ver-val/shield/ueki.27o
rw-r--r-- 229/20 23023 Mar 30 10:31 1998 ./mcnp4b/ver-val/shield/ueki.3o
rw-r--r-- 229/20 25727 Mar 30 10:33 1998 ./mcnp4b/ver-val/shield/ueki.31o
rw-r--r-- 229/20 26333 Mar 30 10:36 1998 ./mcnp4b/ver-val/shield/ueki.32o
rw-r--r-- 229/20 29570 Mar 30 10:39 1998 ./mcnp4b/ver-val/shield/ueki.33o
```


INFORMATION ONLY

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rw-r--r-- 229/20  32951 Mar 30 10:47 1998 ./mcnp4b/ver-val/shield/ueki.34o
rw-r--r-- 229/20  35495 Mar 30 11:23 1998 ./mcnp4b/ver-val/shield/ueki.35o
rw-r--r-- 229/20  25594 Mar 30 11:30 1998 ./mcnp4b/ver-val/shield/ueki.4o
rw-r--r-- 229/20  28554 Mar 30 12:34 1998 ./mcnp4b/ver-val/shield/ueki.5o
rwxr-xr-x 229/20      0 Mar 31 08:16 1998 ./mcnp4b/ver-val/smlset/
rw-r--r-- 229/20   8851 Mar 31 08:01 1998 ./mcnp4b/ver-val/smlset/bug4b2
rw-r--r-- 229/20   5723 Mar 31 08:03 1998 ./mcnp4b/ver-val/smlset/exp1
rw-r--r-- 229/20 2072332 Mar 31 08:01 1998 ./mcnp4b/ver-val/smlset/bug4b2o
rw-r--r-- 229/20 1849757 Mar 31 08:03 1998 ./mcnp4b/ver-val/smlset/exp1o
rw-r--r-- 229/20   6474 Mar 31 08:03 1998 ./mcnp4b/ver-val/smlset/exp27
rw-r--r-- 229/20 903209 Mar 31 08:03 1998 ./mcnp4b/ver-val/smlset/exp27o
rw-r--r-- 229/20   3169 Mar 31 08:04 1998 ./mcnp4b/ver-val/smlset/prob1
rw-r--r-- 229/20 325631 Mar 31 08:04 1998 ./mcnp4b/ver-val/smlset/prob1o
rw-r--r-- 229/20   3109 Mar 31 08:04 1998 ./mcnp4b/ver-val/smlset/prob20
rw-r--r-- 229/20 325086 Mar 31 08:04 1998 ./mcnp4b/ver-val/smlset/prob20o
rw-r--r-- 229/20    325 Mar 31 08:04 1998 .7mcnp4b/ver-val/smlset/LA1X
rw-r--r-- 229/20 240797 Mar 31 08:04 1998 ./mcnp4b/ver-val/smlset/LA1Xo
rw-r--r-- 229/20   5050 Mar 31 08:04 1998 ./mcnp4b/ver-val/smlset/LA3
rw-r--r-- 229/20 287883 Mar 31 08:04 1998 ./mcnp4b/ver-val/smlset/LA3o
rw-r--r-- 229/20    223 Mar 31 08:04.1998 ./mcnp4b/ver-val/smlset/godiva
rw-r--r-- 229/20 175648 Mar 31 08:04 1998 ./mcnp4b/ver-val/smlset/godivao
rw-r--r-- 229/20    228 Mar 31 08:05 1998 ./mcnp4b/ver-val/smlset/jez4.5
rw-r--r-- 229/20 110017 Mar 31 08:05 1998 ./mcnp4b/ver-val/smlset/jez4.5o
rw-r----- 229/20   1999 Mar 31 08:09 1998 ./mcnp4b/ver-val/smlset/ueki.4
rw-r--r-- 229/20  25594 Mar 31 08:09 1998 ./mcnp4b/ver-val/smlset/ueki.4o
rw-r----- 229/20   2117 Mar 31 08:09 1998 ./mcnp4b/ver-val/smlset/ueki.14
rw-r--r-- 229/20  26703 Mar 31 08:09 1998 ./mcnp4b/ver-val/smlset/ueki.14o
rw-r----- 229/20   2412 Mar 31 08:09 1998 ./mcnp4b/ver-val/smlset/ueki.24
rw-r--r-- 229/20  28540 Mar 31 08:09 1998 ./mcnp4b/ver-val/smlset/ueki.24o
rw-r----- 229/20   2021 Mar 31 08:09 1998 ./mcnp4b/ver-val/smlset/ueki.34
rw-r--r-- 229/20  32951 Mar 31 08:09 1998 ./mcnp4b/ver-val/smlset/ueki.34o
rwxr-xr-x 229/20    232 Mar 31 08:27 1998 ./mcnp4b/ver-val/smlset/runset
rw-r--r-- 229/20     93 Mar 31 08:11 1998 ./mcnp4b/ver-val/smlset/list
rw-r----- 229/20  36661 Mar 31 08:07 1998 ./mcnp4b/ver-val/smlset/mc10new
rw-r--r-- 229/20 429535 Mar 31 08:07 1998 ./mcnp4b/ver-val/smlset/mc10newo
rw-r--r-- 229/20 6942720 Mar 31 08:27 1998 ./mcnp4b/ver-val/smlset.spuds
```

Files from OTIS on HP backup tape MOY-980421-18 (MI: 30057-M03-001)

Verification test problems are located in mcnp4b/test. Criticality validation test problems are located in mcnp4b/ver-val/endf5. Criticality validation test problems are located in mcnp4b/ver-val/endf6. Shielding validation test problems are located in mcnp4b/ver-val/shield. Coincident planes verification test problem is located in mcnp4b/ver-val/4b2fix.

```
rwxr-xr-x 229/20      0 Apr  8 15:44 1998 ./mcnp4b/
rwxr-xr-x 229/20      0 Mar 30 15:56 1998 ./mcnp4b/ver-val/
rwxr-xr-x 229/20      0 Mar 31 16:29 1998 ./mcnp4b/ver-val/endf5/
rw-r--r-- 229/20    325 Feb  5 12:19 1998 ./mcnp4b/ver-val/endf5/LA1X5
rwxrwxrwx 229/20      0 Feb 13 16:17 1998 ./mcnp4b/ver-val/endf5/mcnp symbolic link to
/usr2/mcnp4b/mcnp
rw-r--r-- 229/20    418 Feb  5 12:19 1998 ./mcnp4b/ver-val/endf5/LA2X5
rwxrwxrwx 229/20      0 Feb 13 16:18 1998 ./mcnp4b/ver-val/endf5/xsdir symbolic link to
/usr2/mcnp4b/xslib/xsdir
rw-r--r-- 229/20   4283 Feb  5 12:19 1998 ./mcnp4b/ver-val/endf5/LA3X5
rwxr-xr-x 229/20   1012 Mar 30 13:36 1998 ./mcnp4b/ver-val/endf5/runexp
rw-r--r-- 229/20   5723 Feb  5 12:19 1998 ./mcnp4b/ver-val/endf5/exp1
rw-r--r-- 229/20 1849486 Mar 30 14:02 1998 ./mcnp4b/ver-val/endf5/exp1o
rw-r--r-- 229/20   7650 Feb  5 12:19 1998 ./mcnp4b/ver-val/endf5/exp2
rw-r--r-- 229/20   5160 Feb  5 12:19 1998 ./mcnp4b/ver-val/endf5/exp22
rw-r--r-- 229/20 1953218 Mar 30 14:28 1998 ./mcnp4b/ver-val/endf5/exp2o
rw-r--r-- 229/20   5259 Feb  5 12:19 1998 ./mcnp4b/ver-val/endf5/exp23
rw-r--r-- 229/20 1868375 Mar 30 14:55 1998 ./mcnp4b/ver-val/endf5/exp3o
rw-r--r-- 229/20   7117 Feb  5 12:19 1998 ./mcnp4b/ver-val/endf5/exp24a
rw-r--r-- 229/20   6146 Feb  5 12:19 1998 ./mcnp4b/ver-val/endf5/exp25
rw-r--r-- 229/20 1871713 Mar 30 15:21 1998 ./mcnp4b/ver-val/endf5/exp4o
rw-r--r-- 229/20   5420 Feb  5 12:19 1998 ./mcnp4b/ver-val/endf5/exp26
rw-r--r-- 229/20   6474 Feb  5 12:19 1998 ./mcnp4b/ver-val/endf5/exp27
```


INFORMATION ONLY

```
rw-r--r-- 229/20 903144 Mar 30 18:33 1998 ./mcnp4b/ver-val/endf5/exp27o
rw-r--r-- 229/20   6813 Feb  5 12:19 1998 ./mcnp4b/ver-val/endf5/exp3
rw-r--r-- 229/20   7127 Feb  5 12:19 1998 ./mcnp4b/ver-val/endf5/exp4
rw-r--r-- 229/20 906960 Mar 30 16:01 1998 ./mcnp4b/ver-val/endf5/exp22o
rwxr-xr-x 229/20    231 Feb  5 12:27 1998 ./mcnp4b/ver-val/endf5/rune5
rw-r--r-- 229/20 935194 Mar 30 16:24 1998 ./mcnp4b/ver-val/endf5/exp23o
rw-r--r-- 229/20 4107853 Mar 30 16:54 1998 ./mcnp4b/ver-val/endf5/exp24ao
rw-r--r-- 229/20 943655 Mar 30 17:12 1998 ./mcnp4b/ver-val/endf5/exp25o
rw-r--r-- 229/20 853187 Mar 30 17:44 1998 ./mcnp4b/ver-val/endf5/exp26o
rw-r--r-- 229/20 240781 Mar 30 20:32 1998 ./mcnp4b/ver-val/endf5/LA1X5o
rw-r--r-- 229/20 209604 Mar 30 20:40 1998 ./mcnp4b/ver-val/endf5/LA2X5o
rw-r--r-- 229/20 271270 Mar 30 20:57 1998 ./mcnp4b/ver-val/endf5/LA3X5o
rwxr-xr-x 229/20      0 Mar 31 16:40 1998 ./mcnp4b/ver-val/4b2fix/
rw-r--r-- 229/20   8851 Mar 30 15:21 1998 ./mcnp4b/ver-val/4b2fix/bug4b2
rwxrwxrwx 229/20      0 Mar 30 15:21 1998 ./mcnp4b/ver-val/4b2fix/xsdir symbolic link to
/usr2/mcnp4b/xslib/xsdir
rw-r--r-- 229/20 2072371 Mar 30 15:38 1998 ./mcnp4b/ver-val/4b2fix/bug4b2o
rwxr-xr-x 229/20      0 Mar 31 16:31 1998 ./mcnp4b/ver-val/endf6/
rw-r--r-- 229/20    325 Feb  5 12:20 1998 ./mcnp4b/ver-val/endf6/LA1X
rwxrwxrwx 229/20      0 Feb 13 16:19 1998 ./mcnp4b/ver-val/endf6/xsdir symbolic link to
/usr2/mcnp4b/xslib/xsdir
rwxrwxrwx 229/20      0 Feb 13 16:19 1998 ./mcnp4b/ver-val/endf6/mcnp symbolic link to
/usr2/mcnp4b/mcnp
rw-r--r-- 229/20    475 Feb  5 12:20 1998 ./mcnp4b/ver-val/endf6/LA2X
rw-r--r-- 229/20 325372 Mar 30 17:57 1998 ./mcnp4b/ver-val/endf6/prob1o
rw-r--r-- 229/20   5050 Feb  5 12:20 1998 ./mcnp4b/ver-val/endf6/LA3
rw-r--r-- 229/20    223 Feb  5 12:20 1998 ./mcnp4b/ver-val/endf6/godiva
rw-r--r-- 229/20 369064 Mar 30 22:26 1998 ./mcnp4b/ver-val/endf6/prob3no
rw-r--r-- 229/20    221 Feb  5 12:20 1998 ./mcnp4b/ver-val/endf6/jez20
rw-r--r-- 229/20    228 Feb  5 12:20 1998 ./mcnp4b/ver-val/endf6/jez4.5
rw-r--r-- 229/20 294744 Mar 30 22:32 1998 ./mcnp4b/ver-val/endf6/prob6o
rw-r--r-- 229/20   3169 Feb  5 12:20 1998 ./mcnp4b/ver-val/endf6/prob1
rw-r--r-- 229/20   4094 Feb  5 12:20 1998 ./mcnp4b/ver-val/endf6/prob12
rw-r--r-- 229/20 294967 Mar 30 22:39 1998 ./mcnp4b/ver-val/endf6/prob7o
rw-r--r-- 229/20   1603 Feb  5 12:20 1998 ./mcnp4b/ver-val/endf6/prob13
rw-r--r-- 229/20   2383 Feb  5 12:20 1998 ./mcnp4b/ver-val/endf6/prob14
rw-r--r-- 229/20   1440 Feb  5 12:20 1998 ./mcnp4b/ver-val/endf6/prob15
rw-r--r-- 229/20 316975 Mar 30 22:51 1998 ./mcnp4b/ver-val/endf6/prob12o
rw-r--r-- 229/20   1866 Feb  5 12:20 1998 ./mcnp4b/ver-val/endf6/prob16
rw-r--r-- 229/20   4174 Feb  5 12:20 1998 ./mcnp4b/ver-val/endf6/prob18
rw-r--r-- 229/20 305015 Mar 30 22:57 1998 ./mcnp4b/ver-val/endf6/prob13o
rw-r--r-- 229/20   3109 Feb  5 12:20 1998 ./mcnp4b/ver-val/endf6/prob20
rw-r--r-- 229/20   4270 Feb  5 12:20 1998 ./mcnp4b/ver-val/endf6/prob3
rw-r--r-- 229/20   4269 Feb  5 12:20 1998 ./mcnp4b/ver-val/endf6/prob3n
rw-r--r-- 229/20   1689 Feb  5 12:20 1998 ./mcnp4b/ver-val/endf6/prob6
rw-r--r-- 229/20 308353 Mar 30 23:02 1998 ./mcnp4b/ver-val/endf6/prob14o
rw-r--r-- 229/20   1755 Feb  5 12:21 1998 ./mcnp4b/ver-val/endf6/prob7
rwxr-xr-x 229/20   1238 Mar 30 13:38 1998 ./mcnp4b/ver-val/endf6/rune6
rw-r--r-- 229/20 275642 Mar 31 01:33 1998 ./mcnp4b/ver-val/endf6/prob15o
rw-r--r-- 229/20 175535 Mar 31 05:03 1998 ./mcnp4b/ver-val/endf6/godivao
rw-r--r-- 229/20 309810 Mar 31 02:00 1998 ./mcnp4b/ver-val/endf6/prob16o
rw-r--r-- 229/20 311865 Mar 31 04:09 1998 ./mcnp4b/ver-val/endf6/prob18o
rw-r--r-- 229/20 324830 Mar 31 04:19 1998 ./mcnp4b/ver-val/endf6/prob20o
rw-r--r-- 229/20 240773 Mar 31 04:53 1998 ./mcnp4b/ver-val/endf6/LA1Xo
rw-r--r-- 229/20 209913 Mar 31 04:56 1998 ./mcnp4b/ver-val/endf6/LA2Xo
rw-r--r-- 229/20 287769 Mar 31 05:01 1998 ./mcnp4b/ver-val/endf6/LA3o
rw-r--r-- 229/20 175307 Mar 31 05:04 1998 ./mcnp4b/ver-val/endf6/jez20o
rw-r--r-- 229/20 109968 Mar 31 05:04 1998 ./mcnp4b/ver-val/endf6/jez4.5o
rwxr-xr-x 229/20      0 Mar 31 16:32 1998 ./mcnp4b/ver-val/shield/
rw-r--r-- 229/20  36661 Feb 13 16:33 1998 ./mcnp4b/ver-val/shield/mc10new
rw-r--r-- 229/20  25474 Mar 30 18:04 1998 ./mcnp4b/ver-val/shield/ueki.1o
rwxr-xr-x 229/20    142 Feb 13 16:36 1998 ./mcnp4b/ver-val/shield/runshld
rw-r--r-- 229/20   1457 Feb 13 16:33 1998 ./mcnp4b/ver-val/shield/ueki.1
rw-r--r-- 229/20   1575 Feb 13 16:33 1998 ./mcnp4b/ver-val/shield/ueki.11
rw-r--r-- 229/20   1639 Feb 13 16:33 1998 ./mcnp4b/ver-val/shield/ueki.12
rw-r--r-- 229/20   1898 Feb 13 16:33 1998 ./mcnp4b/ver-val/shield/ueki.13
rw-r--r-- 229/20   2117 Feb 13 16:33 1998 ./mcnp4b/ver-val/shield/ueki.14
rw-r--r-- 229/20   2361 Feb 13 16:33 1998 ./mcnp4b/ver-val/shield/ueki.15
rw-r--r-- 229/20   1521 Feb 13 16:33 1998 ./mcnp4b/ver-val/shield/ueki.2
rw-r--r-- 229/20   1857 Feb 13 16:33 1998 ./mcnp4b/ver-val/shield/ueki.21
```


INFORMATION ONLY

```
rw-r--r-- 229/20   2123 Feb 13 16:33 1998 ./mcnp4b/ver-val/shield/ueki.22
rw-r--r-- 229/20   2412 Feb 13 16:33 1998 ./mcnp4b/ver-val/shield/ueki.24
rw-r--r-- 229/20   2598 Feb 13 16:33 1998 ./mcnp4b/ver-val/shield/ueki.25
rw-r--r-- 229/20   2855 Feb 13 16:33 1998 ./mcnp4b/ver-val/shield/ueki.26
rw-r--r-- 229/20   4103 Feb 13 16:33 1998 ./mcnp4b/ver-val/shield/ueki.27
rw-r--r-- 229/20   1780 Feb 13 16:33 1998 ./mcnp4b/ver-val/shield/ueki.3
rw-r--r-- 229/20   1479 Feb 13 16:33 1998 ./mcnp4b/ver-val/shield/ueki.31
rw-r--r-- 229/20   1543 Feb 13 16:33 1998 ./mcnp4b/ver-val/shield/ueki.32
rw-r--r-- 229/20   1802 Feb 13 16:33 1998 ./mcnp4b/ver-val/shield/ueki.33
rw-r--r-- 229/20   2021 Feb 13 16:33 1998 ./mcnp4b/ver-val/shield/ueki.34
rw-r--r-- 229/20   2268 Feb 20 13:53 1998 ./mcnp4b/ver-val/shield/ueki.35
rw-r--r-- 229/20   1999 Feb 13 16:33 1998 ./mcnp4b/ver-val/shield/ueki.4
rw-r--r-- 229/20   2248 Feb 20 14:38 1998 ./mcnp4b/ver-val/shield/ueki.5
rwxrwxrwx 229/20      0 Feb 14 13:00 1998 ./mcnp4b/ver-val/shield/xsdir symbolic link to
/usr2/mcnp4b/xslib/xsdir
rw-r--r-- 229/20  26785 Mar 30 18:09 1998 ./mcnp4b/ver-val/shield/ueki.11o
rw-r--r-- 229/20  22048 Mar 30 18:14 1998 ./mcnp4b/ver-val/shield/ueki.12o
rw-r--r-- 229/20  29989 Mar 30 18:20 1998 ./mcnp4b/ver-val/shield/ueki.13o
rw-r--r-- 229/20  26657 Mar 30 18:34 1998 ./mcnp4b/ver-val/shield/ueki.14o
rw-r--r-- 229/20  28954 Mar 30 19:40 1998 ./mcnp4b/ver-val/shield/ueki.15o
rw-r--r-- 229/20  20870 Mar 30 19:45 1998 ./mcnp4b/ver-val/shield/ueki.2o
rw-r--r-- 229/20  28805 Mar 30 19:46 1998 ./mcnp4b/ver-val/shield/ueki.21o
rw-r--r-- 229/20  26240 Mar 30 20:01 1998 ./mcnp4b/ver-val/shield/ueki.22o
rw-r--r-- 229/20  28496 Mar 30 20:25 1998 ./mcnp4b/ver-val/shield/ueki.24o
rw-r--r-- 229/20  29732 Mar 30 20:58 1998 ./mcnp4b/ver-val/shield/ueki.25o
rw-r--r-- 229/20  32544 Mar 30 21:31 1998 ./mcnp4b/ver-val/shield/ueki.26o
rw-r--r-- 229/20  49185 Mar 30 21:58 1998 ./mcnp4b/ver-val/shield/ueki.27o
rw-r--r-- 229/20  22997 Mar 30 22:02 1998 ./mcnp4b/ver-val/shield/ueki.3o
rw-r--r-- 229/20  25701 Mar 30 22:05 1998 ./mcnp4b/ver-val/shield/ueki.31o
rw-r--r-- 229/20  26307 Mar 30 22:09 1998 ./mcnp4b/ver-val/shield/ueki.32o
rw-r--r-- 229/20  29544 Mar 30 22:13 1998 ./mcnp4b/ver-val/shield/ueki.33o
rw-r--r-- 229/20  32905 Mar 30 22:28 1998 ./mcnp4b/ver-val/shield/ueki.34o
rw-r--r-- 229/20  35449 Mar 30 23:38 1998 ./mcnp4b/ver-val/shield/ueki.35o
rw-r--r-- 229/20  25548 Mar 30 23:49 1998 ./mcnp4b/ver-val/shield/ueki.4o
rw-r--r-- 229/20  28264 Mar 31 01:38 1998 ./mcnp4b/ver-val/shield/ueki.5o
rw-r--r-- 229/20 429369 Mar 31 04:09 1998 ./mcnp4b/ver-val/shield/mc10newo
rwxr-xr-x 229/20      0 Mar 30 13:14 1998 ./mcnp4b/exec/
r-xr-xr-x 229/20      0 Jan 14 10:34 1998 ./mcnp4b/exec/xslib/
r--r--r-- 229/20 3590144 Jan 14 10:03 1998 ./mcnp4b/exec/xslib/100xs2
r--r--r-- 229/20 305152 Jan 14 10:03 1998 ./mcnp4b/exec/xslib/531dos2
r--r--r-- 229/20 874496 Jan 14 10:03 1998 ./mcnp4b/exec/xslib/532dos2
r--r--r-- 229/20   9265 Jan 14 10:34 1998 ./mcnp4b/exec/xslib/README
r--r--r-- 229/20  20759 Jan 14 10:34 1998 ./mcnp4b/exec/xslib/README_ENDF60
r--r--r-- 229/20 2680832 Jan 14 10:04 1998 ./mcnp4b/exec/xslib/dre52
r--r--r-- 229/20 5093376 Jan 14 10:05 1998 ./mcnp4b/exec/xslib/drmccs2
r--r--r-- 229/20 770048 Jan 14 10:05 1998 ./mcnp4b/exec/xslib/el2
r--r--r-- 229/20 2846720 Jan 14 10:06 1998 ./mcnp4b/exec/xslib/endf5mt2
r--r--r-- 229/20 5736448 Jan 14 10:07 1998 ./mcnp4b/exec/xslib/endf5p2
r--r--r-- 229/20 5937152 Jan 14 10:09 1998 ./mcnp4b/exec/xslib/endf5u2
r--r--r-- 229/20 36685824 Jan 14 10:22 1998 ./mcnp4b/exec/xslib/endf602
r--r--r-- 229/20 5859328 Jan 14 10:24 1998 ./mcnp4b/exec/xslib/endl852
r--r--r-- 229/20 1259520 Jan 14 10:24 1998 ./mcnp4b/exec/xslib/kidman2
r--r--r-- 229/20 1687552 Jan 14 10:25 1998 ./mcnp4b/exec/xslib/lllds02
r--r--r-- 229/20 577536 Jan 14 10:25 1998 ./mcnp4b/exec/xslib/mcplib022
r--r--r-- 229/20 440320 Jan 14 10:26 1998 ./mcnp4b/exec/xslib/mcplib2
r--r--r-- 229/20 1628160 Jan 14 10:26 1998 ./mcnp4b/exec/xslib/mgxsnp2
r--r--r-- 229/20 3840000 Jan 14 10:28 1998 ./mcnp4b/exec/xslib/misc5xs2
r--r--r-- 229/20 1812480 Jan 14 10:29 1998 ./mcnp4b/exec/xslib/newxs2
r--r--r-- 229/20 716800 Jan 14 10:29 1998 ./mcnp4b/exec/xslib/newxsd2
r--r--r-- 229/20 8196096 Jan 14 10:32 1998 ./mcnp4b/exec/xslib/rmccs2
r--r--r-- 229/20 3532800 Jan 14 10:33 1998 ./mcnp4b/exec/xslib/rmccsa2
r--r--r-- 229/20    523 Jan 14 10:33 1998 ./mcnp4b/exec/xslib/specs
r--r--r-- 229/20  90112 Jan 14 10:33 1998 ./mcnp4b/exec/xslib/therxs2
r--r--r-- 229/20 2416640 Jan 14 10:33 1998 ./mcnp4b/exec/xslib/tmccs2
r--r--r-- 229/20   5416 Jan 14 10:34 1998 ./mcnp4b/exec/xslib/tprint
r--r--r-- 229/20 146976 Jan 14 10:36 1998 ./mcnp4b/exec/xslib/xsdir
r--r--r-- 229/20  98714 Jan 14 10:34 1998 ./mcnp4b/exec/xslib/xsdir1.org
r--r--r-- 229/20 146934 Jan 14 10:34 1998 ./mcnp4b/exec/xslib/xsdir2
r--r--r-- 229/20 304084 Jan 16 11:45 1998 ./mcnp4b/exec/libF77.so.3
r-xr-xr-x 229/20 2104584 Mar 30 13:17 1998 ./mcnp4b/exec/mcnp4b2
```


INFORMATION ONLY

```
r--r--r-- 229/20 637768 Mar 30 13:14 1998 ./mcnp4b/exec/libsunmath.so.1
rwxr-xr-x 229/20      0 Mar 31 16:25 1998 ./mcnp4b/test/
rw-r--r-- 229/20 2040320 Feb  5 11:37 1998 ./mcnp4b/test/testoutp.sun
rwx------ 229/20   1396 Mar  1 13:23 1996 ./mcnp4b/test/inp01
rw-r--r-- 229/20 196608 Feb  5 11:37 1998 ./mcnp4b/test/testinp.tar
rw-r--r-- 229/20 16038097 Feb  5 11:37 1998 ./mcnp4b/test/testlib1
rwxr-xr-x 229/20   3264 Feb  5 11:37 1998 ./mcnp4b/test/runprob
rwxr-xr-x 229/20      0 Feb  5 12:09 1998 ./mcnp4b/test/trns-set/
rw-r--r-- 229/20 227840 Feb  5 12:09 1998 ./mcnp4b/test/trns-set/testmctl.sun
rw-r--r-- 229/20 2040320 Feb  5 12:09 1998 ./mcnp4b/test/trns-set/testoutp.sun
rw-r--r-- 229/20   3264 Feb  5 11:39 1998 ./mcnp4b/test/trns-set/runprob
rw-r--r-- 229/20 196608 Feb  5 11:39 1998 ./mcnp4b/test/trns-set/testinp.tar
rw-r--r-- 229/20 16038097 Feb  5 11:39 1998 ./mcnp4b/test/trns-set/testlib1
rw-r--r-- 229/20  22914 Feb  5 11:44 1998 ./mcnp4b/test/trns-set/testdir
rwxr-xr-x 229/20   2241 Feb  5 12:09 1998 ./mcnp4b/test/trns-set/runtest
rw-r--r-- 229/20 227840 Feb  5 11:37 1998 ./mcnp4b/test/testmctl.sun
rwxr-xr-x 229/20   2241 Feb  5 11:58 1998 ./mcnp4b/test/runtest
rwx------ 229/20   1963 Mar  2 12:09 1996 ./mcnp4b/test/inp02
rwx------ 229/20   1911 Mar  1 13:26 1996 ./mcnp4b/test/inp03
rwx------ 229/20   1052 Mar  1 13:31 1996 ./mcnp4b/test/inp04
rwx------ 229/20   2164 Mar  1 13:31 1996 ./mcnp4b/test/inp05
rwx------ 229/20   1599 Mar  1 13:32 1996 ./mcnp4b/test/inp06
rwx------ 229/20   1539 Mar  1 13:32 1996 ./mcnp4b/test/inp07
rwx------ 229/20   3287 Mar  4 08:53 1996 ./mcnp4b/test/inp08
rwx------ 229/20   1261 Mar  1 15:56 1996 ./mcnp4b/test/inp09
rwx------ 229/20   1004 Mar  1 13:34 1996 ./mcnp4b/test/inp10
rwx------ 229/20   2023 Mar  2 12:21 1996 ./mcnp4b/test/inp11
rwx------ 229/20  46304 Mar  4 09:00 1996 ./mcnp4b/test/inp12
rwx------ 229/20   1172 Mar  1 11:10 1996 ./mcnp4b/test/inp13
rwx------ 229/20   2459 Mar  1 13:52 1996 ./mcnp4b/test/inp14
rwx------ 229/20   1104 Mar  1 13:53 1996 ./mcnp4b/test/inp15
rwx------ 229/20   2220 Mar  1 13:54 1996 ./mcnp4b/test/inp16
rwx------ 229/20    968 Mar  1 13:54 1996 ./mcnp4b/test/inp17
rwx------ 229/20   4323 Mar  4 07:50 1996 ./mcnp4b/test/inp18
rwx------ 229/20    567 Mar  1 13:55 1996 ./mcnp4b/test/inp19
rwx------ 229/20   1171 Mar  1 13:56 1996 ./mcnp4b/test/inp20
rwx------ 229/20   8134 Mar  2 12:03 1996 ./mcnp4b/test/inp21
rwx------ 229/20   7496 Mar  1 15:25 1996 ./mcnp4b/test/inp22
rwx------ 229/20   5496 Mar  1 15:26 1996 ./mcnp4b/test/inp23
rwx------ 229/20   2096 Mar  1 13:13 1996 ./mcnp4b/test/inp24
rwx------ 229/20     42 Feb 29 14:35 1996 ./mcnp4b/test/inp25
rwx------ 229/20     42 Feb 29 14:35 1996 ./mcnp4b/test/inp26
rwx------ 229/20    917 Mar  1 15:27 1996 ./mcnp4b/test/inp27
rwx------ 229/20   5756 Feb 29 14:35 1996 ./mcnp4b/test/inp28
rwx------ 229/20    839 Mar  4 08:00 1996 ./mcnp4b/test/inp29
rw------- 229/20   6853 Dec 24 07:33 1996 ./mcnp4b/test/mctl01
rw------- 229/20  15297 Dec 24 07:34 1996 ./mcnp4b/test/mctl02
rw------- 229/20   1793 Dec 24 07:35 1996 ./mcnp4b/test/mctl03
rw------- 229/20  11301 Dec 24 07:37 1996 ./mcnp4b/test/mctl04
rw------- 229/20   2199 Dec 24 07:37 1996 ./mcnp4b/test/mctl05
rw------- 229/20   4956 Dec 24 07:37 1996 ./mcnp4b/test/mctl06
rw------- 229/20   1472 Dec 24 07:39 1996 ./mcnp4b/test/mctl07
rw------- 229/20   3457 Dec 24 07:39 1996 ./mcnp4b/test/mctl08
rw------- 229/20  17893 Dec 24 07:40 1996 ./mcnp4b/test/mctl09
rw------- 229/20    748 Dec 24 07:41 1996 ./mcnp4b/test/mctl10
rw------- 229/20   4562 Dec 24 07:43 1996 ./mcnp4b/test/mctl11
rw------- 229/20   3600 Dec 24 07:45 1996 ./mcnp4b/test/mctl12
rw------- 229/20   2889 Dec 24 07:46 1996 ./mcnp4b/test/mctl13
rw------- 229/20   3212 Dec 24 07:46 1996 ./mcnp4b/test/mctl14
rw------- 229/20    771 Dec 24 07:46 1996 ./mcnp4b/test/mctl15
rw------- 229/20   1366 Dec 24 07:47 1996 ./mcnp4b/test/mctl16
rw------- 229/20  11346 Dec 24 07:48 1996 ./mcnp4b/test/mctl17
rw------- 229/20   8487 Dec 24 07:50 1996 ./mcnp4b/test/mctl18
rw------- 229/20   2414 Dec 24 07:51 1996 ./mcnp4b/test/mctl19
rw------- 229/20   9663 Dec 24 07:52 1996 ./mcnp4b/test/mctl20
rw------- 229/20  23069 Dec 24 07:54 1996 ./mcnp4b/test/mctl21
rw------- 229/20   1503 Dec 24 07:55 1996 ./mcnp4b/test/mctl22
rw------- 229/20   2944 Dec 24 07:56 1996 ./mcnp4b/test/mctl23
rw------- 229/20   1240 Dec 24 07:57 1996 ./mcnp4b/test/mctl24
rw------- 229/20   1472 Dec 24 07:58 1996 ./mcnp4b/test/mctl25
```


INFORMATION ONLY

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rw------- 229/20  18897 Dec 24 07:58 1996 ./mcnp4b/test/mctl26
rw------- 229/20   3062 Dec 24 07:58 1996 ./mcnp4b/test/mctl27
rw------- 229/20  37974 Dec 24 07:59 1996 ./mcnp4b/test/mctl28
rw------- 229/20   1380 Dec 24 08:01 1996 ./mcnp4b/test/mctl29
rw------- 229/20 109022 Dec 24 07:34 1996 ./mcnp4b/test/outp01
rw------- 229/20 116319 Dec 24 07:34 1996 ./mcnp4b/test/outp02
rw------- 229/20  19734 Dec 24 07:35 1996 ./mcnp4b/test/outp03
rw------- 229/20 144172 Dec 24 07:37 1996 ./mcnp4b/test/outp04
rw------- 229/20  22497 Dec 24 07:37 1996 ./mcnp4b/test/outp05
rw------- 229/20  34471 Dec 24 07:37 1996 ./mcnp4b/test/outp06
rw------- 229/20  75601 Dec 24 07:39 1996 ./mcnp4b/test/outp07
rw------- 229/20 176440 Dec 24 07:39 1996 ./mcnp4b/test/outp08
rw------- 229/20  57143 Dec 24 07:40 1996 ./mcnp4b/test/outp09
rw------- 229/20  31745 Dec 24 07:41 1996 ./mcnp4b/test/outp10
rw------- 229/20  56456 Dec 24 07:43 1996 ./mcnp4b/test/outp11
rw------- 229/20 170414 Dec 24 07:45 1996 ./mcnp4b/test/outp12
rw------- 229/20  89562 Dec 24 07:46 1996 ./mcnp4b/test/outp13
rw------- 229/20  31665 Dec 24 07:46 1996 ./mcnp4b/test/outp14
rw------- 229/20  44797 Dec 24 07:46 1996 ./mcnp4b/test/outp15
rw------- 229/20  51488 Dec 24 07:47 1996 ./mcnp4b/test/outp16
rw------- 229/20 107566 Dec 24 07:48 1996 ./mcnp4b/test/outp17
rw------- 229/20  77612 Dec 24 07:50 1996 ./mcnp4b/test/outp18
rw------- 229/20  14740 Dec 24 07:51 1996 ./mcnp4b/test/outp19
rw------- 229/20  54507 Dec 24 07:52 1996 ./mcnp4b/test/outp20
rw------- 229/20  81600 Dec 24 07:54 1996 ./mcnp4b/test/outp21
rw------- 229/20  52150 Dec 24 07:55 1996 ./mcnp4b/test/outp22
rw------- 229/20  91175 Dec 24 07:56 1996 ./mcnp4b/test/outp23
rw------- 229/20  33123 Dec 24 07:57 1996 ./mcnp4b/test/outp24
rw------- 229/20  17836 Dec 24 07:58 1996 ./mcnp4b/test/outp25
rw------- 229/20  57469 Dec 24 07:58 1996 ./mcnp4b/test/outp26
rw------- 229/20  17851 Dec 24 07:58 1996 ./mcnp4b/test/outp27
rw------- 229/20 144311 Dec 24 07:59 1996 ./mcnp4b/test/outp28
rwxrwxrwx 229/20      0 Mar 30 10:16 1998 ./mcnp4b/test/mcnp symbolic link to ../exec/mcnp4b2
rw------- 229/20  36857 Dec 24 08:01 1996 ./mcnp4b/test/outp29
rw-r--r-- 229/20 109022 Mar 30 13:22 1998 ./mcnp4b/test/inp01o
rw-r--r-- 229/20  53496 Feb  5 12:05 1998 ./mcnp4b/test/runtest.log
rw-r--r-- 229/20  22914 Feb  5 11:44 1998 ./mcnp4b/test/testdir
rwxrwxrwx 229/20      0 Mar 30 13:15 1998 ./mcnp4b/test/libsunmath.so.1 symbolic link to
../exec/libsunmath.so.1
rw-r--r-- 229/20 116319 Mar 30 13:22 1998 ./mcnp4b/test/inp02o
rw-r--r-- 229/20   6853 Mar 30 13:22 1998 ./mcnp4b/test/inp01m
rw-r--r-- 229/20      0 Mar 30 13:22 1998 ./mcnp4b/test/difm01
rw-r--r-- 229/20      0 Mar 30 13:22 1998 ./mcnp4b/test/difo01
rw-r--r-- 229/20  19734 Mar 30 13:22 1998 ./mcnp4b/test/inp03o
rw-r--r-- 229/20  15297 Mar 30 13:22 1998 ./mcnp4b/test/inp02m
rw-r--r-- 229/20  33468 Mar 30 13:22 1998 ./mcnp4b/test/inp01p
rw-r--r-- 229/20      0 Mar 30 13:22 1998 ./mcnp4b/test/difm02
rw-r--r-- 229/20      0 Mar 30 13:22 1998 ./mcnp4b/test/difo02
rw-r--r-- 229/20 144172 Mar 30 13:23 1998 ./mcnp4b/test/inp04o
rw-r--r-- 229/20   1793 Mar 30 13:22 1998 ./mcnp4b/test/inp03m
rw-r--r-- 229/20  25038 Mar 30 13:22 1998 ./mcnp4b/test/inp02p
rw-r--r-- 229/20      0 Mar 30 13:22 1998 ./mcnp4b/test/difm03
rw-r--r-- 229/20      0 Mar 30 13:22 1998 ./mcnp4b/test/difo03
rw-r--r-- 229/20  22497 Mar 30 13:23 1998 ./mcnp4b/test/inp05o
rw-r--r-- 229/20  11301 Mar 30 13:23 1998 ./mcnp4b/test/inp04m
rw-r--r-- 229/20      0 Mar 30 13:23 1998 ./mcnp4b/test/difm04
rw-r--r-- 229/20      0 Mar 30 13:23 1998 ./mcnp4b/test/difo04
rw-r--r-- 229/20  34471 Mar 30 13:23 1998 ./mcnp4b/test/inp06o
rw-r--r-- 229/20   2199 Mar 30 13:23 1998 ./mcnp4b/test/inp05m
rw-r--r-- 229/20      0 Mar 30 13:23 1998 ./mcnp4b/test/difm05
rw-r--r-- 229/20      0 Mar 30 13:23 1998 ./mcnp4b/test/difo05
rw-r--r-- 229/20  75601 Mar 30 13:23 1998 ./mcnp4b/test/inp07o
rw-r--r-- 229/20   4956 Mar 30 13:23 1998 ./mcnp4b/test/inp06m
rw-r--r-- 229/20      0 Mar 30 13:23 1998 ./mcnp4b/test/difm06
rw-r--r-- 229/20      0 Mar 30 13:23 1998 ./mcnp4b/test/difo06
rw-r--r-- 229/20 176440 Mar 30 13:23 1998 ./mcnp4b/test/inp08o
rw-r--r-- 229/20 481295 Mar 30 13:23 1998 ./mcnp4b/test/inp07w
rw-r--r-- 229/20   1472 Mar 30 13:23 1998 ./mcnp4b/test/inp07m
rw-r--r-- 229/20      0 Mar 30 13:23 1998 ./mcnp4b/test/difm07
rw-r--r-- 229/20      0 Mar 30 13:23 1998 ./mcnp4b/test/difo07
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INFORMATION ONLY

```
rw-r--r-- 229/20  57143 Mar 30 13:23 1998 ./mcnp4b/test/inp09o
rw-r--r-- 229/20   3457 Mar 30 13:23 1998 ./mcnp4b/test/inp08m
rw-r--r-- 229/20      0 Mar 30 13:23 1998 ./mcnp4b/test/difm08
rw-r--r-- 229/20      0 Mar 30 13:23 1998 ./mcnp4b/test/difo08
rw-r--r-- 229/20  17851 Mar 30 13:26 1998 ./mcnp4b/test/inp27o
rw-r--r-- 229/20 180036 Mar 30 13:26 1998 ./mcnp4b/test/inp26s
rw-r--r-- 229/20    812 Mar 30 13:23 1998 ./mcnp4b/test/inp08p
rw-r--r-- 229/20  17893 Mar 30 13:23 1998 ./mcnp4b/test/inp09m
rw-r--r-- 229/20      0 Mar 30 13:23 1998 ./mcnp4b/test/difm09
rw-r--r-- 229/20      0 Mar 30 13:23 1998 ./mcnp4b/test/difo09
rw-r--r-- 229/20  31745 Mar 30 13:23 1998 ./mcnp4b/test/inp10o
rw-r--r-- 229/20 180036 Mar 30 13:23 1998 ./mcnp4b/test/inp09s
rw-r--r-- 229/20  56456 Mar 30 13:24 1998 ./mcnp4b/test/inp11o
rw-r--r-- 229/20    748 Mar 30 13:23 1998 ./mcnp4b/test/inp10m
rw-r--r-- 229/20      0 Mar 30 13:23 1998 ./mcnp4b/test/difm10
rw-r--r-- 229/20      0 Mar 30 13:23 1998 .7mcnp4b/test/difo10
rw-r--r-- 229/20 170414 Mar 30 13:24 1998 ./mcnp4b/test/inp12o
rw-r--r-- 229/20      0 Mar 30 13:24 1998 ./mcnp4b/test/difm11
rw-r--r-- 229/20   4562 Mar 30 13:24 1998 ./mcnp4b/test/inp11m
rw-r--r-- 229/20      0 Mar 30 13:24 1998 ./mcnp4b/test/difo11
rw-r--r-- 229/20  89562 Mar 30 13:24 1998 ./mcnp4b/test/inp13o
rw-r--r-- 229/20   3600 Mar 30 13:24 1998 ./mcnp4b/test/inp12m
rw-r--r-- 229/20      0 Mar 30 13:24 1998 ./mcnp4b/test/difm12
rw-r--r-- 229/20      0 Mar 30 13:24 1998 ./mcnp4b/test/difo12
rw-r--r-- 229/20      0 Mar 30 13:25 1998 ./mcnp4b/test/difm20
rw-r--r-- 229/20  31665 Mar 30 13:24 1998 ./mcnp4b/test/inp14o
rw-r--r-- 229/20   2889 Mar 30 13:24 1998 ./mcnp4b/test/inp13m
rw-r--r-- 229/20      0 Mar 30 13:24 1998 ./mcnp4b/test/difm13
rw-r--r-- 229/20      0 Mar 30 13:24 1998 ./mcnp4b/test/difo13
rw-r--r-- 229/20  44797 Mar 30 13:24 1998 ./mcnp4b/test/inp15o
rw-r--r-- 229/20   3212 Mar 30 13:24 1998 ./mcnp4b/test/inp14m
rw-r--r-- 229/20      0 Mar 30 13:24 1998 ./mcnp4b/test/difm14
rw-r--r-- 229/20      0 Mar 30 13:24 1998 ./mcnp4b/test/difo14
rw-r--r-- 229/20  51488 Mar 30 13:24 1998 ./mcnp4b/test/inp16o
rw-r--r-- 229/20    771 Mar 30 13:24 1998 ./mcnp4b/test/inp15m
rw-r--r-- 229/20      0 Mar 30 13:24 1998 ./mcnp4b/test/difm15
rw-r--r-- 229/20      0 Mar 30 13:24 1998 ./mcnp4b/test/difo15
rw-r--r-- 229/20  77612 Mar 30 13:25 1998 ./mcnp4b/test/inp18o
rw-r--r-- 229/20   1366 Mar 30 13:24 1998 ./mcnp4b/test/inp16m
rw-r--r-- 229/20      0 Mar 30 13:24 1998 ./mcnp4b/test/difm16
rw-r--r-- 229/20      0 Mar 30 13:24 1998 ./mcnp4b/test/difo16
rw-r--r-- 229/20 107566 Mar 30 13:24 1998 ./mcnp4b/test/inp17o
rw-r--r-- 229/20 180036 Mar 30 13:25 1998 ./mcnp4b/test/inp18s
rw-r--r-- 229/20  11346 Mar 30 13:24 1998 ./mcnp4b/test/inp17m
rw-r--r-- 229/20      0 Mar 30 13:24 1998 ./mcnp4b/test/difm17
rw-r--r-- 229/20      0 Mar 30 13:24 1998 ./mcnp4b/test/difo17
rw-r--r-- 229/20  14740 Mar 30 13:25 1998 ./mcnp4b/test/inp19o
rw-r--r-- 229/20   8487 Mar 30 13:25 1998 ./mcnp4b/test/inp18m
rw-r--r-- 229/20      0 Mar 30 13:25 1998 ./mcnp4b/test/difm18
rw-r--r-- 229/20      0 Mar 30 13:25 1998 ./mcnp4b/test/difo18
rw-r--r-- 229/20  54507 Mar 30 13:25 1998 ./mcnp4b/test/inp20o
rw-r--r-- 229/20   2414 Mar 30 13:25 1998 ./mcnp4b/test/inp19m
rw-r--r-- 229/20   1443 Mar 30 13:25 1998 ./mcnp4b/test/inp18p
rw-r--r-- 229/20      0 Mar 30 13:25 1998 ./mcnp4b/test/difm19
rw-r--r-- 229/20      0 Mar 30 13:25 1998 ./mcnp4b/test/difo19
rw-r--r-- 229/20  81600 Mar 30 13:25 1998 ./mcnp4b/test/inp21o
rw-r--r-- 229/20   9663 Mar 30 13:25 1998 ./mcnp4b/test/inp20m
rw-r--r-- 229/20      0 Mar 30 13:25 1998 ./mcnp4b/test/difo20
rw-r--r-- 229/20  52150 Mar 30 13:26 1998 ./mcnp4b/test/inp22o
rw-r--r-- 229/20 3420431 Mar 30 13:25 1998 ./mcnp4b/test/inp21w
rw-r--r-- 229/20  23069 Mar 30 13:25 1998 ./mcnp4b/test/inp21m
rw-r--r-- 229/20      0 Mar 30 13:25 1998 ./mcnp4b/test/difm21
rw-r--r-- 229/20      0 Mar 30 13:25 1998 ./mcnp4b/test/difo21
rw-r--r-- 229/20  91175 Mar 30 13:26 1998 ./mcnp4b/test/inp23o
rw-r--r-- 229/20   1503 Mar 30 13:26 1998 ./mcnp4b/test/inp22m
rw-r--r-- 229/20      0 Mar 30 13:26 1998 ./mcnp4b/test/difm22
rw-r--r-- 229/20      0 Mar 30 13:26 1998 ./mcnp4b/test/difo22
rw-r--r-- 229/20  33123 Mar 30 13:26 1998 ./mcnp4b/test/inp24o
rw-r--r-- 229/20   2944 Mar 30 13:26 1998 ./mcnp4b/test/inp23m
rw-r--r-- 229/20      0 Mar 30 13:26 1998 ./mcnp4b/test/difm23
```

INFORMATION ONLY

```
rw-r--r-- 229/20      0 Mar 30 13:26 1998 ./mcnp4b/test/difo23
rw-r--r-- 229/20  57469 Mar 30 13:26 1998 ./mcnp4b/test/inp26o
rw-r--r-- 229/20   1240 Mar 30 13:26 1998 ./mcnp4b/test/inp24m
rw-r--r-- 229/20  31209 Mar 30 13:26 1998 ./mcnp4b/test/inp23p
rw-r--r-- 229/20      0 Mar 30 13:26 1998 ./mcnp4b/test/difm24
rw-r--r-- 229/20      0 Mar 30 13:26 1998 ./mcnp4b/test/difo24
rw-r--r-- 229/20  17836 Mar 30 13:26 1998 ./mcnp4b/test/inp25o
rw-r--r-- 229/20 180036 Mar 30 13:26 1998 ./mcnp4b/test/inp24s
rw-r--r-- 229/20   1472 Mar 30 13:26 1998 ./mcnp4b/test/inp25m
rw-r--r-- 229/20      0 Mar 30 13:26 1998 ./mcnp4b/test/difm25
rw-r--r-- 229/20      0 Mar 30 13:26 1998 ./mcnp4b/test/difo25
rw-r--r-- 229/20 644815 Mar 30 13:26 1998 ./mcnp4b/test/inp09w
rw-r--r-- 229/20 180036 Mar 30 13:26 1998 ./mcnp4b/test/inp25s
rw-r--r-- 229/20  18897 Mar 30 13:26 1998 ./mcnp4b/test/inp26m
rw-r--r-- 229/20      0 Mar 30 13:26 1998 ./mcnp4b/test/difm26
rw-r--r-- 229/20      0 Mar 30 13:26 1998 ./mcnp4b/test/difo26
rw-r--r-- 229/20  37974 Mar 30 13:26 1998 ./mcnp4b/test/inp28m
rw-r--r-- 229/20   3062 Mar 30 13:26 1998 ./mcnp4b/test/inp27m
rw-r--r-- 229/20      0 Mar 30 13:26 1998 ./mcnp4b/test/difm27
rw-r--r-- 229/20      0 Mar 30 13:26 1998 ./mcnp4b/test/difo27
rw-r--r-- 229/20  36857 Mar 30 13:27 1998 ./mcnp4b/test/inp29o
rw-r--r-- 229/20      0 Mar 30 13:26 1998 ./mcnp4b/test/difm28
rw-r--r-- 229/20 144311 Mar 30 13:26 1998 ./mcnp4b/test/inp28o
rw-r--r-- 229/20      0 Mar 30 13:26 1998 ./mcnp4b/test/difo28
rw-r--r-- 229/20      0 Mar 30 13:27 1998 ./mcnp4b/test/difm29
rw-r--r-- 229/20   1380 Mar 30 13:27 1998 ./mcnp4b/test/inp29m
rw-r--r-- 229/20      0 Mar 30 13:27 1998 ./mcnp4b/test/difo29
```

Files from GATEWAY2000 P5-166 PC on HP colorado backup tape MOY-980421-20 (MI: 30055-M72-001)

D:\mcnp4b.xc\100XS2
D:\mcnp4b.xc\531DOS2
D:\mcnp4b.xc\532DOS2
D:\mcnp4b.xc\DRMCCS2
D:\mcnp4b.xc\EL2
D:\mcnp4b.xc\ENDF5MT2
D:\mcnp4b.xc\ENDF5P2
D:\mcnp4b.xc\ENDF5U2
D:\mcnp4b.xc\ENDF602
D:\mcnp4b.xc\ENDL852
D:\mcnp4b.xc\KIDMAN2
D:\mcnp4b.xc\LLLDOS2
D:\mcnp4b.xc\MCPLIB2
D:\mcnp4b.xc\MCPLIB22
D:\mcnp4b.xc\MGXSNP2
D:\mcnp4b.xc\MISCSXS2
D:\mcnp4b.xc\NEWXS2
D:\mcnp4b.xc\NEWXSD2
D:\mcnp4b.xc\RMCCS2
D:\mcnp4b.xc\RMCCSA2
D:\mcnp4b.xc\THERXS2
D:\mcnp4b.xc\TMCCS2
D:\mcnp4b\README.TXT
D:\mcnp4b\RUNMCNP.BAT
D:\mcnp4b\RUNMCNPX.BAT
D:\mcnp4b\XSDIR
D:\mcnp4b\exe\MCNP4B2.EXE
D:\mcnp4b\exe\MCNP4B2X.EXE
D:\mcnp4b\exe\README.TXT
D:\mcnp4b\exe\SPECS
D:\mcnp4b\exe\XSDIR1
D:\MCNP4b\TEST\mcnp7.exe
D:\MCNP4B\Install\ANSWER
D:\MCNP4B\Install\FSPLIT.FOR

INFORMATION ONLY

D:\MCNP4B\Install\NFSPLIT.EXE
D:\MCNP4B\Install\GETFILES
D:\MCNP4B\Install\INSTALL.LOG
D:\MCNP4B\Install\INSTALL.FIX
D:\MCNP4B\Install\INSTALL.BAT
D:\MCNP4B\Install\MAKEMCNP.BAT
D:\MCNP4B\Install\MAKXS.ID
D:\MCNP4B\Install\MAKXSF.EXE
D:\MCNP4B\Install\MCNP4B.ID
D:\MCNP4B\Install\MCSETUP.FOR
D:\MCNP4B\Install\MCSETUP.EXE
D:\MCNP4B\Install\PATCHC
D:\MCNP4B\Install\PATCHF
D:\MCNP4B\Install\PLOT.FOR
D:\MCNP4B\Install\PRPR.ID
D:\MCNP4B\Install\PRPR.EXE
D:\MCNP4B\Install\READMAAG
D:\MCNP4B\Install\readme4b2.txt
D:\MCNP4B\Install\fix4b2.txt
D:\MCNP4B\Install\answer.std
D:\MCNP4B\Install\install.log.std
D:\MCNP4B\Install\install.fix.std
D:\MCNP4B\Install\install.log.std
D:\MCNP4B\Install\plot.obj

INFORMATION ONLY

Attachment V: List of Output Files Archived on Electronic Media MOY-980414-11 (verification, validation, and regression testing files)

MCNP4B2 files from OPUS

```
 Volume in drive C is DELLWIN95
 Volume Serial Number is 205C-13FB
 Directory of C:\Work\mcnp4b2\ver-val-opus\endf5

LA1X5O             244,021  04-01-98  8:16a LA1X5o
LA2X5O             212,043  04-01-98  8:16a LA2X5o
LA3X5O             274,520  04-01-98  8:16a LA3X5o
EXP1O            1,875,869  04-01-98  8:16a exp1o
EXP22O             918,566  04-01-98  8:16a exp22o
EXP23O             947,216  04-01-98  8:17a exp23o
EXP24AO          4,169,253  04-01-98  8:17a exp24ao
EXP25O             955,767  04-01-98  8:17a exp25o
EXP26O             863,930  04-01-98  8:17a exp26o
EXP27O             914,641  04-01-98  8:17a exp27o
EXP2O            1,981,256  04-01-98  8:17a exp2o
EXP3O            1,895,181  04-01-98  8:17a exp3o
EXP4O            1,898,335  04-01-98  8:17a exp4o


 Volume in drive C is DELLWIN95
 Volume Serial Number is 205C-13FB
 Directory of C:\Work\mcnp4b2\ver-val-opus\endf6

LA1XO              244,009  04-01-98  8:18a LA1Xo
LA2XO              212,360  04-01-98  8:18a LA2Xo
LA3O               291,163  04-01-98  8:18a LA3o
GODIVAO            177,583  04-01-98  8:18a godivao
JEZ20O             177,352  04-01-98  8:18a jez20o
JEZ4      50       111,316  04-01-98  8:18a jez4.5o
PROB12O            320,682  04-01-98  8:18a prob12o
PROB13O            308,504  04-01-98  8:18a prob13o
PROB14O            311,903  04-01-98  8:18a prob14o
PROB15O            280,344  04-01-98  8:18a prob15o
PROB16O            313,649  04-01-98  8:18a prob16o
PROB18O            317,083  04-01-98  8:18a prob18o
PROB1O             329,059  04-01-98  8:18a prob1o
PROB20O            328,878  04-01-98  8:18a prob20o
PROB3NO            375,667  04-01-98  8:18a prob3no
PROB6O             298,164  04-01-98  8:18a prob6o
PROB7O             298,387  04-01-98  8:18a prob7o
```


INFORMATION ONLY

```
 Volume in drive C is DELLWIN95
 Volume Serial Number is 205C-13FB
 Directory of C:\Work\mcnp4b2\ver-val-opus\shield

MC10NEWO           435,752  04-01-98  8:18a mc10newo
UEKI     110        27,151  04-01-98  8:18a ueki.11o
UEKI     120        22,380  04-01-98  8:18a ueki.12o
UEKI     130        30,387  04-01-98  8:18a ueki.13o
UEKI     140        27,063  04-01-98  8:18a ueki.14o
UEKI     150        29,882  04-01-98  8:18a ueki.15o
UEKI     10         25,826  04-01-98  8:18a ueki.1o
UEKI     210        29,191  04-01-98  8:18a ueki.21o
UEKI     220        26,638  04-01-98  8:18a ueki.22o
UEKI     240        29,164  04-01-98  8:18a ueki.24o
UEKI     250        30,412  04-01-98  8:18a ueki.25o
UEKI     260        33,255  04-01-98  8:18a ueki.26o
UEKI     270        50,087  04-01-98  8:19a ueki.27o
UEKI     20         21,189  04-01-98  8:19a ueki.2o
UEKI     310        26,055  04-01-98  8:19a ueki.31o
UEKI     320        26,667  04-01-98  8:19a ueki.32o
UEKI     330        29,935  04-01-98  8:19a ueki.33o
UEKI     340        33,602  04-01-98  8:19a ueki.34o
UEKI     350        36,423  04-01-98  8:19a ueki.35o
UEKI     30         23,340  04-01-98  8:19a ueki.3o
UEKI     40         25,943  04-01-98  8:19a ueki.4o
UEKI     50         29,683  04-01-98  8:19a ueki.5o

 Volume in drive C is DELLWIN95
 Volume Serial Number is 205C-13FB
 Directory of C:\Work\mcnp4b2\ver-val-opus\4b2fix

BUG4B2O          2,100,815  04-01-98  8:16a bug4b2o
```


INFORMATION ONLY

MCNP4B2 files from SPUDS

```
 Volume in drive C is DELLWIN95
 Volume Serial Number is 205C-13FB
 Directory of C:\Work\mcnp4b2\ver-val-spuds\endf5

LA1X5O             243,385  04-01-98  8:21a LA1X5o
LA2X5O             212,043  04-01-98  8:21a LA2X5o
LA3X5O             274,520  04-01-98  8:21a LA3X5o
EXP1O            1,875,551  04-01-98  8:21a exp1o
EXP22O             918,248  04-01-98  8:21a exp22o
EXP23O             946,898  04-01-98  8:21a exp23o
EXP24AO          4,168,935  04-01-98  8:21a exp24ao
EXP25O             955,449  04-01-98  8:21a exp25o
EXP26O             863,612  04-01-98  8:21a exp26o
EXP27O             914,323  04-01-98  8:21a exp27o
EXP2O            1,980,620  04-01-98  8:21a exp2o
EXP3O            1,894,545  04-01-98  8:21a exp3o
EXP4O            1,897,805  04-01-98  8:21a exp4o


 Volume in drive C is DELLWIN95
 Volume Serial Number is 205C-13FB
 Directory of C:\Work\mcnp4b2\ver-val-spuds\endf6

LA1XO              243,373  04-01-98  8:21a LA1Xo
LA2XO              212,360  04-01-98  8:21a LA2Xo
LA3O               291,163  04-01-98  8:21a LA3o
GODIVAO            177,583  04-01-98  8:21a godivao
JEZ20O             177,352  04-01-98  8:21a jez20o
JEZ4      5O       111,316  04-01-98  8:21a jez4.5o
PROB12O            320,682  04-01-98  8:21a prob12o
PROB13O            308,504  04-01-98  8:21a prob13o
PROB14O            311,903  04-01-98  8:21a prob14o
PROB15O            279,072  04-01-98  8:21a prob15o
PROB16O            313,331  04-01-98  8:21a prob16o
PROB18O            315,811  04-01-98  8:21a prob18o
PROB1O             329,059  04-01-98  8:21a prob1o
PROB20O            328,560  04-01-98  8:21a prob20o
PROB3NO            373,511  04-01-98  8:21a prob3no
PROB6O             298,164  04-01-98  8:21a prob6o
PROB7O             298,387  04-01-98  8:22a prob7o


 Volume in drive C is DELLWIN95
 Volume Serial Number is 205C-13FB
 Directory of C:\Work\mcnp4b2\ver-val-spuds\shield

MC10NEWO           434,760  04-01-98  8:22a mc10newo
```


INFORMATION ONLY

```
UEKI       110          27,151  04-01-98   8:22a ueki.11o
UEKI       120          22,380  04-01-98   8:22a ueki.12o
UEKI       130          30,387  04-01-98   8:22a ueki.13o
UEKI       140          27,063  04-01-98   8:22a ueki.14o
UEKI       150          29,386  04-01-98   8:22a ueki.15o
UEKI       10           25,826  04-01-98   8:22a ueki.1o
UEKI       210          29,191  04-01-98   8:22a ueki.21o
UEKI       220          26,638  04-01-98   8:22a ueki.22o
UEKI       240          28,916  04-01-98   8:22a ueki.24o
UEKI       250          30,164  04-01-98   8:22a ueki.25o
UEKI       260          33,007  04-01-98   8:22a ueki.26o
UEKI       270          50,087  04-01-98   8:22a ueki.27o
UEKI       20           21,189  04-01-98   8:22a ueki.2o
UEKI       310          26,055  04-01-98   8:22a ueki.31o
UEKI       320          26,667  04-01-98   8:22a ueki.32o
UEKI       330          29,935  04-01-98   8:22a ueki.33o
UEKI       340          33,354  04-01-98   8:22a ueki.34o
UEKI       350          35,927  04-01-98   8:22a ueki.35o
UEKI       30           23,340  04-01-98   8:22a ueki.3o
UEKI       40           25,943  04-01-98   8:22a ueki.4o
UEKI       50           28,939  04-01-98   8:22a ueki.5o

 Volume in drive C is DELLWIN95
 Volume Serial Number is 205C-13FB
 Directory of C:\Work\mcnp4b2\ver-val-spuds\4b2fix

BUG4B2O         2,100,815  04-01-98   8:20a bug4b2o
```


INFORMATION ONLY

MCNP4B2 files from OTIS

```
 Volume in drive C is DELLWIN95
 Volume Serial Number is 205C-13FB
 Directory of C:\Work\mcnp4b2\ver-val-otis\endf5

LA1X5O             243,363  04-01-98  8:23a LA1X5o
LA2X5O             211,883  04-01-98  8:23a LA2X5o
LA3X5O             274,408  04-01-98  8:23a LA3X5o
EXP1O            1,875,276  04-01-98  8:23a exp1o
EXP22O             918,185  04-01-98  8:23a exp22o
EXP23O             946,835  04-01-98  8:23a exp23o
EXP24AO          4,168,554  04-01-98  8:24a exp24ao
EXP25O             955,386  04-01-98  8:24a exp25o
EXP26O             863,549  04-01-98  8:24a exp26o
EXP27O             914,260  04-01-98  8:24a exp27o
EXP2O            1,980,557  04-01-98  8:24a exp2o
EXP3O            1,894,376  04-01-98  8:24a exp3o
EXP4O            1,897,742  04-01-98  8:24a exp4o


 Volume in drive C is DELLWIN95
 Volume Serial Number is 205C-13FB
 Directory of C:\Work\mcnp4b2\ver-val-otis\endf6

LA1XO              243,351  04-01-98  8:24a LA1Xo
LA2XO              212,200  04-01-98  8:24a LA2Xo
LA3O               291,051  04-01-98  8:24a LA3o
GODIVAO            177,472  04-01-98  8:24a godivao
JEZ20O             177,241  04-01-98  8:24a jez20o
JEZ4      5O       111,269  04-01-98  8:24a jez4.5o
PROB12O            320,428  04-01-98  8:24a prob12o
PROB13O            308,251  04-01-98  8:24a prob13o
PROB14O            311,646  04-01-98  8:24a prob14o
PROB15O            278,578  04-01-98  8:24a prob15o
PROB16O            313,078  04-01-98  8:24a prob16o
PROB18O            315,219  04-01-98  8:24a prob18o
PROB1O             328,802  04-01-98  8:24a prob1o
PROB20O            328,306  04-01-98  8:24a prob20o
PROB3NO            372,936  04-01-98  8:24a prob3no
PROB6O             297,907  04-01-98  8:24a prob6o
PROB7O             298,130  04-01-98  8:24a prob7o


 Volume in drive C is DELLWIN95
 Volume Serial Number is 205C-13FB
 Directory of C:\Work\mcnp4b2\ver-val-otis\shield

MC10NEWO           434,593  04-01-98  8:24a mc10newo
```


INFORMATION ONLY

```
UEKI       110         27,127   04-01-98   8:24a ueki.11o
UEKI       120         22,356   04-01-98   8:24a ueki.12o
UEKI       130         30,363   04-01-98   8:24a ueki.13o
UEKI       140         27,019   04-01-98   8:24a ueki.14o
UEKI       150         29,342   04-01-98   8:24a ueki.15o
UEKI       10          25,802   04-01-98   8:24a ueki.1o
UEKI       210         29,167   04-01-98   8:24a ueki.21o
UEKI       220         26,596   04-01-98   8:24a ueki.22o
UEKI       240         28,874   04-01-98   8:24a ueki.24o
UEKI       250         30,122   04-01-98   8:24a ueki.25o
UEKI       260         32,965   04-01-98   8:24a ueki.26o
UEKI       270         49,797   04-01-98   8:24a ueki.27o
UEKI       20          21,165   04-01-98   8:24a ueki.2o
UEKI       310         26,031   04-01-98   8:24a ueki.31o
UEKI       320         26,643   04-01-98   8:24a ueki.32o
UEKI       330         29,911   04-01-98   8:24a ueki.33o
UEKI       340         33,310   04-01-98   8:24a ueki.34o
UEKI       350         35,883   04-01-98   8:24a ueki.35o
UEKI       30          23,316   04-01-98   8:24a ueki.3o
UEKI       40          25,899   04-01-98   8:24a ueki.4o
UEKI       50          28,647   04-01-98   8:24a ueki.5o

 Volume in drive C is DELLWIN95
 Volume Serial Number is 205C-13FB
 Directory of C:\Work\mcnp4b2\ver-val-otis\4b2fix

BUG4B2O          2,100,857   04-01-98   8:23a bug4b2o
```


INFORMATION ONLY

MCNP4B2X files from PC #112105

```
 Volume in drive D is DELLWIN95-2
 Volume Serial Number is 1BE3-2E60
 Directory of D:\MCNP4B\TEST\install

INP01              1,446  01-08-97  2:18p INP01
INP02              2,037  01-08-97  2:18p INP02
INP03              1,996  01-08-97  2:18p INP03
INP04              1,106  01-08-97  2:18p INP04
INP05              2,236  01-08-97  2:18p INP05
INP06              1,667  01-08-97  2:18p INP06
INP07              1,611  01-08-97  2:18p INP07
INP08              3,406  01-08-97  2:18p INP08
INP09              1,315  01-08-97  2:18p INP09
INP10              1,060  01-08-97  2:19p INP10
INP11              2,097  01-08-97  2:19p INP11
INP12             47,060  01-08-97  2:19p INP12
INP13              1,223  01-08-97  2:19p INP13
INP14              2,541  01-08-97  2:19p INP14
INP15              1,150  01-08-97  2:19p INP15
INP16              2,319  01-08-97  2:19p INP16
INP17              1,013  01-08-97  2:19p INP17
INP18              4,436  01-08-97  2:19p INP18
INP19                598  01-08-97  2:19p INP19
INP20              1,232  01-08-97  2:19p INP20
INP21              8,405  01-08-97  2:19p INP21
INP22              7,757  01-08-97  2:20p INP22
INP23              5,659  01-08-97  2:20p INP23
INP24              2,174  01-08-97  2:20p INP24
INP25                 45  01-08-97  2:20p INP25
INP26                 45  01-08-97  2:20p INP26
INP27                957  01-08-97  2:20p INP27
INP28              5,898  01-08-97  2:20p INP28
INP29                873  01-08-97  2:20p INP29
TESTLIB1      16,236,204  02-12-97  9:07a TESTLIB1
TESTDIR           23,199  02-12-97  9:07a TESTDIR
OUTP             110,633  04-03-98  4:49p OUTP
RUNTPE           101,512  04-03-98  4:49p RUNTPE
MCTAL              6,989  04-03-98  4:49p MCTAL
RUNPROB  BAT       3,641  04-03-98  5:14p runprob.bat
PTRAC             31,025  04-03-98  4:49p PTRAC
RUNPROB  DOS       3,177  02-12-97  9:07a RUNPROB.DOS
TESTIAAI DOS      46,586  02-12-97  9:07a TESTIAAI.DOS
TESTMAAJ DOS      58,271  02-12-97  9:07a TESTMAAJ.DOS
INSTALL  BAT       2,332  04-03-98  5:00p INSTALL.BAT
TESTOAAK DOS     540,472  02-12-97  9:07a TESTOAAK.DOS
PKARCAAM COM      19,573  02-19-97  3:10p PKARCAAM.COM
PKXARAAL COM      12,242  02-19-97  3:10p PKXARAAL.COM
```


INFORMATION ONLY

MCTL01	6,989	02-04-97 12:00p	MCTL01
MCTL02	15,554	02-04-97 12:00p	MCTL02
MCTL03	1,855	02-04-97 12:00p	MCTL03
MCTL04	11,483	02-04-97 12:01p	MCTL04
MCTL05	2,269	02-04-97 12:01p	MCTL05
MCTL06	5,098	02-04-97 12:02p	MCTL06
MCTL07	1,516	02-04-97 12:02p	MCTL07
MCTL08	3,589	02-04-97 12:03p	MCTL08
MCTL09	18,204	02-04-97 12:03p	MCTL09
MCTL10	780	02-04-97 12:04p	MCTL10
MCTL11	4,704	02-04-97 12:05p	MCTL11
MCTL12	3,694	02-04-97 12:06p	MCTL12
MCTL13	2,989	02-04-97 12:06p	MCTL13
MCTL14	3,278	02-04-97 12:06p	MCTL14
MCTL15	805	02-04-97 12:06p	MCTL15
MCTL16	1,417	02-04-97 12:07p	MCTL16
MCTL17	11,601	02-04-97 12:07p	MCTL17
MCTL18	8,618	02-04-97 12:09p	MCTL18
MCTL19	2,468	02-04-97 12:09p	MCTL19
MCTL20	9,890	02-04-97 12:10p	MCTL20
MCTL21	23,397	02-04-97 12:11p	MCTL21
MCTL22	1,545	02-04-97 12:11p	MCTL22
MCTL23	3,050	02-04-97 12:12p	MCTL23
MCTL24	1,272	02-04-97 12:12p	MCTL24
MCTL25	1,508	02-04-97 12:13p	MCTL25
MCTL26	19,226	02-04-97 12:13p	MCTL26
MCTL27	3,116	02-04-97 12:13p	MCTL27
MCTL28	38,462	02-04-97 12:13p	MCTL28
MCTL29	1,424	02-04-97 12:14p	MCTL29
OUTP01	110,633	02-04-97 12:00p	OUTP01
OUTP02	118,116	02-04-97 12:00p	OUTP02
OUTP03	20,004	02-04-97 12:00p	OUTP03
OUTP04	145,829	02-04-97 12:01p	OUTP04
OUTP05	22,776	02-04-97 12:01p	OUTP05
OUTP06	34,972	02-04-97 12:02p	OUTP06
OUTP07	76,680	02-04-97 12:02p	OUTP07
OUTP08	178,891	02-04-97 12:03p	OUTP08
OUTP09	57,775	02-04-97 12:03p	OUTP09
OUTP10	32,142	02-04-97 12:04p	OUTP10
OUTP11	57,334	02-04-97 12:05p	OUTP11
OUTP12	172,386	02-04-97 12:06p	OUTP12
OUTP13	90,499	02-04-97 12:06p	OUTP13
OUTP14	32,147	02-04-97 12:06p	OUTP14
OUTP15	45,291	02-04-97 12:06p	OUTP15
OUTP16	52,465	02-04-97 12:07p	OUTP16
OUTP17	109,124	02-04-97 12:07p	OUTP17
OUTP18	78,459	02-04-97 12:09p	OUTP18
OUTP19	14,953	02-04-97 12:09p	OUTP19
OUTP20	55,232	02-04-97 12:10p	OUTP20

INFORMATION ONLY

```
OUTP21      82,479  02-04-97 12:11p OUTP21
OUTP22      52,731  02-04-97 12:11p OUTP22
OUTP23      92,255  02-04-97 12:12p OUTP23
OUTP24      33,532  02-04-97 12:12p OUTP24
OUTP25      18,086  02-04-97 12:13p OUTP25
OUTP26      58,087  02-04-97 12:13p OUTP26
OUTP27      18,131  02-04-97 12:13p OUTP27
OUTP28     146,123  02-04-97 12:13p OUTP28
OUTP29      37,339  02-04-97 12:14p OUTP29
DIFM01          69  04-03-98  5:15p difm01
DIFO01          69  04-03-98  5:15p difo01
DIFM02          69  04-03-98  5:15p difm02
DIFO02         541  04-03-98  5:15p difo02
DIFM03          69  04-03-98  5:15p difm03
DIFO03          69  04-03-98  5:15p difo03
DIFM04          69  04-03-98  5:15p difm04
DIFO04       3,745  04-03-98  5:15p difo04
DIFM05          69  04-03-98  5:16p difm05
DIFO05          69  04-03-98  5:16p difo05
DIFM06          69  04-03-98  5:16p difm06
DIFO06          69  04-03-98  5:16p difo06
DIFM07          69  04-03-98  5:16p difm07
DIFO07          69  04-03-98  5:16p difo07
DIFM08          69  04-03-98  5:16p difm08
DIFO08         681  04-03-98  5:16p difo08
DIFM09          69  04-03-98  5:17p difm09
DIFO09       1,065  04-03-98  5:17p difo09
DIFM10          69  04-03-98  5:17p difm10
DIFO10          69  04-03-98  5:17p difo10
DIFM11          69  04-03-98  5:18p difm11
DIFO11          69  04-03-98  5:18p difo11
DIFM12          69  04-03-98  5:18p difm12
DIFO12         785  04-03-98  5:18p difo12
DIFM13          69  04-03-98  5:18p difm13
DIFO13       3,257  04-03-98  5:18p difo13
DIFM14          69  04-03-98  5:18p difm14
DIFO14          69  04-03-98  5:18p difo14
DIFM15          69  04-03-98  5:18p difm15
DIFO15         681  04-03-98  5:18p difo15
DIFM16          69  04-03-98  5:18p difm16
DIFO16          69  04-03-98  5:18p difo16
DIFM17          69  04-03-98  5:19p difm17
DIFO17          69  04-03-98  5:19p difo17
DIFM18          69  04-03-98  5:19p difm18
DIFO18         359  04-03-98  5:19p difo18
DIFM19          69  04-03-98  5:19p difm19
DIFO19          69  04-03-98  5:19p difo19
DIFM20          69  04-03-98  5:20p difm20
DIFO20          69  04-03-98  5:20p difo20
```

INFORMATION ONLY

DIFM21	69	04-03-98	5:20p	difm21
DIFO21	763	04-03-98	5:20p	difo21
DIFM22	69	04-03-98	5:21p	difm22
DIFO22	69	04-03-98	5:21p	difo22
DIFM23	69	04-03-98	5:21p	difm23
DIFO23	811	04-03-98	5:21p	difo23
DIFM24	69	04-03-98	5:21p	difm24
DIFO24	363	04-03-98	5:21p	difo24
DIFM25	69	04-03-98	5:21p	difm25
DIFO25	69	04-03-98	5:21p	difo25
DIFM26	69	04-03-98	5:21p	difm26
DIFO26	1,065	04-03-98	5:21p	difo26
DIFM27	69	04-03-98	5:22p	difm27
DIFO27	551	04-03-98	5:22p	difo27
DIFM28	69	04-03-98	5:22p	difm28
DIFO28	1,003	04-03-98	5:22p	difo28
DIFM29	69	04-03-98	5:22p	difm29
DIFO29	69	04-03-98	5:22p	difo29
INP01O	110,633	04-03-98	5:15p	INP01O
INP02O	118,116	04-03-98	5:15p	INP02O
INP01M	6,989	04-03-98	5:15p	INP01M
INP03O	20,004	04-03-98	5:15p	INP03O
INP02M	15,554	04-03-98	5:15p	INP02M
INP01P	31,025	04-03-98	5:15p	INP01P
INP04O	145,829	04-03-98	5:15p	INP04O
INP03M	1,855	04-03-98	5:15p	INP03M
INP02P	25,629	04-03-98	5:15p	INP02P
INP05O	22,776	04-03-98	5:16p	INP05O
INP04M	11,483	04-03-98	5:15p	INP04M
INP06O	34,972	04-03-98	5:16p	INP06O
INP05M	2,269	04-03-98	5:16p	INP05M
INP07O	76,680	04-03-98	5:16p	INP07O
INP06M	5,098	04-03-98	5:16p	INP06M
INP08O	178,891	04-03-98	5:16p	INP08O
INP07W	429,749	04-03-98	5:16p	INP07W
INP07M	1,516	04-03-98	5:16p	INP07M
INP09O	57,775	04-03-98	5:17p	INP09O
INP08M	3,589	04-03-98	5:16p	INP08M
INP27O	18,131	04-03-98	5:22p	INP27O
INP26S	180,030	04-03-98	5:22p	INP26S
INP08P	821	04-03-98	5:16p	INP08P
INP09M	18,204	04-03-98	5:17p	INP09M
INP10O	32,142	04-03-98	5:17p	INP10O
INP09S	180,030	04-03-98	5:17p	INP09S
INP11O	57,334	04-03-98	5:18p	INP11O
INP10M	780	04-03-98	5:17p	INP10M
INP12O	172,386	04-03-98	5:18p	INP12O
INP13O	90,499	04-03-98	5:18p	INP13O
INP11M	4,704	04-03-98	5:18p	INP11M

INFORMATION ONLY

```
INP12M              3,694  04-03-98  5:18p INP12M
INP14O             32,147  04-03-98  5:18p INP14O
INP13M              2,989  04-03-98  5:18p INP13M
INP15O             45,291  04-03-98  5:18p INP15O
INP14M              3,278  04-03-98  5:18p INP14M
INP16O             52,465  04-03-98  5:18p INP16O
INP15M                805  04-03-98  5:18p INP15M
INP17O            109,124  04-03-98  5:19p INP17O
INP16M              1,417  04-03-98  5:18p INP16M
INP18O             78,459  04-03-98  5:19p INP18O
INP19O             14,953  04-03-98  5:19p INP19O
INP18M              8,618  04-03-98  5:19p INP18M
INP17M             11,601  04-03-98  5:19p INP17M
INP20O             55,232  04-03-98  5:20p INP20O
INP18S            180,030  04-03-98  5:19p INP18S
INP19M              2,468  04-03-98  5:19p INP19M
INP18P              1,461  04-03-98  5:19p INP18P
INP21O             82,479  04-03-98  5:20p INP21O
INP20M              9,890  04-03-98  5:20p INP20M
INP22O             52,731  04-03-98  5:21p INP22O
INP21W          3,277,913  04-03-98  5:20p INP21W
INP21M             23,397  04-03-98  5:20p INP21M
INP23O             92,255  04-03-98  5:21p INP23O
INP22M              1,545  04-03-98  5:21p INP22M
INP24O             33,532  04-03-98  5:21p INP24O
INP23M              3,050  04-03-98  5:21p INP23M
INP26O             58,087  04-03-98  5:22p INP26O
INP24M              1,272  04-03-98  5:21p INP24M
INP23P             20,920  04-03-98  5:21p INP23P
INP25O             18,086  04-03-98  5:21p INP25O
INP24S            180,030  04-03-98  5:21p INP24S
INP25M              1,508  04-03-98  5:21p INP25M
INP09W            617,942  04-03-98  5:22p INP09W
INP26M             19,226  04-03-98  5:22p INP26M
INP25S            180,030  04-03-98  5:21p INP25S
INP29O             37,339  04-03-98  5:22p INP29O
INP27M              3,116  04-03-98  5:22p INP27M
INP28M             38,462  04-03-98  5:22p INP28M
INP28O            146,123  04-03-98  5:22p inp28o
INP29M              1,424  04-03-98  5:22p INP29M


 Volume in drive D is DELLWIN95-2
 Volume Serial Number is 1BE3-2E60
 Directory of D:\MCNP4B\TEST\endf5

EXP1     OUT     1,875,904  04-02-98  2:25p exp1.out
```


INFORMATION ONLY

```
EXP2       OUT      1,980,968  04-02-98   3:08p exp2.out
EXP22      OUT        918,671  04-02-98   4:04p exp22.out
EXP23      OUT        947,145  04-02-98   4:39p exp23.out
EXP24A     OUT      4,169,283  04-02-98   5:28p exp24a.out
EXP25      OUT        955,484  04-02-98   5:57p exp25.out
EXP26      OUT        863,953  04-02-98   6:46p exp26.out
EXP27      OUT        914,459  04-02-98   7:14p exp27.out
EXP3       OUT      1,894,792  04-02-98   7:58p exp3.out
EXP4       OUT      1,898,052  04-02-98   8:42p exp4.out
LA1X5      OUT        243,858  04-02-98   9:38p la1x5.out
LA2X5      OUT        212,065  04-02-98   9:42p la2x5.out
LA3X5      OUT        274,473  04-02-98   9:50p la3x5.out

 Volume in drive D is DELLWIN95-2
 Volume Serial Number is 1BE3-2E60
 Directory of D:\MCNP4B\TEST\endf6

PROB3      OUT         41,062  04-07-98  11:11a prob3.out
PROB1      OUT        318,243  04-07-98  11:11a prob1.out
PROB3N     OUT        373,746  04-08-98   6:02p prob3n.out
PROB6      OUT        298,699  04-07-98  11:16a prob6.out
PROB20     OUT        327,914  04-07-98  11:34a prob20.out
PROB7      OUT        307,817  04-07-98  11:40a prob7.out
PROB16     OUT        314,858  04-07-98  12:02p prob16.out
PROB18     OUT        316,263  04-07-98   1:55p prob18.out
PROB15     OUT        279,622  04-07-98   3:59p prob15.out
PROB14     OUT        300,925  04-07-98   4:05p prob14.out
PROB13     OUT        299,941  04-07-98   4:10p prob13.out
PROB12     OUT        321,011  04-07-98   4:22p prob12.out
GODIVA     OUT        177,624  04-07-98   4:25p godiva.out
LA3        OUT        291,130  04-07-98   4:34p la3.out
LA2X       OUT        213,185  04-07-98   4:38p la2x.out
LA1X       OUT        243,874  04-07-98   5:37p la1x.out
JEZ45~1    OUT        111,261  04-07-98   5:38p jez4.5.out
JEZ20      OUT        177,233  04-07-98   5:40p jez20.out

 Volume in drive D is DELLWIN95-2
 Volume Serial Number is 1BE3-2E60
 Directory of D:\MCNP4B\TEST\shielding

UEKI1~1    OUT         25,802  04-01-98   4:43p ueki.1.out
UEKI2~1    OUT         21,165  04-01-98   4:46p ueki.2.out
UEKI3~1    OUT         23,316  04-01-98   4:50p ueki.3.out
UEKI4~1    OUT         25,899  04-01-98   5:01p ueki.4.out
UEKI5~1    OUT         29,391  04-01-98   6:41p ueki.5.out
```


INFORMATION ONLY

```
UEKI11~2 OUT        27,127  04-01-98   6:45p ueki.11.out
UEKI12~2 OUT        22,356  04-01-98   6:48p ueki.12.out
UEKI13~2 OUT        30,363  04-01-98   6:52p ueki.13.out
UEKI14~2 OUT        27,019  04-01-98   7:01p ueki.14.out
UEKI15~2 OUT        29,590  04-01-98   7:42p ueki.15.out
MC10NEW  OUT       435,246  04-01-98   9:57p mc10new.out
UEKI21~2 OUT        29,167  04-01-98   9:57p ueki.21.out
UEKI22~2 OUT        26,596  04-01-98  10:06p ueki.22.out
UEKI24~2 OUT        28,874  04-01-98  10:20p ueki.24.out
UEKI25~2 OUT        30,358  04-01-98  10:39p ueki.25.out
UEKI26~2 OUT        33,213  04-02-98   7:37a ueki.26.out
UEKI27~2 OUT        57,748  04-02-98   8:04a ueki.27.out
UEKI31~2 OUT        26,031  04-02-98   8:07a ueki.31.out
UEKI32~2 OUT        26,643  04-02-98   8:11a ueki.32.out
UEKI33~2 OUT        29,911  04-02-98   8:15a ueki.33.out
UEKI34~2 OUT        33,310  04-02-98   8:29a ueki.34.out
UEKI35~2 OUT        36,131  04-02-98   9:24a ueki.35.out
```


INFORMATION ONLY

MCNP4B2 files from PC #112110

```
 Volume in drive D is DELLWIN95-2
 Volume Serial Number is 1BE3-2E60
 Directory of D:\mcnp4b\TEST\install

RUNMCNP  BAT           802  04-01-98  5:49p runmcnp.bat
INP01                1,446  01-08-97  2:18p INP01
INP02                2,037  01-08-97  2:18p INP02
INP03                1,996  01-08-97  2:18p INP03
INP04                1,106  01-08-97  2:18p INP04
INP05                2,236  01-08-97  2:18p INP05
INP06                1,667  01-08-97  2:18p INP06
INP07                1,611  01-08-97  2:18p INP07
INP08                3,406  01-08-97  2:18p INP08
INP09                1,315  01-08-97  2:18p INP09
INP10                1,060  01-08-97  2:19p INP10
INP11                2,097  01-08-97  2:19p INP11
INP12               47,060  01-08-97  2:19p INP12
INP13                1,223  01-08-97  2:19p INP13
INP14                2,541  01-08-97  2:19p INP14
INP15                1,150  01-08-97  2:19p INP15
INP16                2,319  01-08-97  2:19p INP16
INP17                1,013  01-08-97  2:19p INP17
INP18                4,436  01-08-97  2:19p INP18
INP19                  598  01-08-97  2:19p INP19
INP20                1,232  01-08-97  2:19p INP20
INP21                8,405  01-08-97  2:19p INP21
INP22                7,757  01-08-97  2:20p INP22
INP23                5,659  01-08-97  2:20p INP23
INP24                2,174  01-08-97  2:20p INP24
INP25                   45  01-08-97  2:20p INP25
INP26                   45  01-08-97  2:20p INP26
INP27                  957  01-08-97  2:20p INP27
INP28                5,898  01-08-97  2:20p INP28
INP29                  873  01-08-97  2:20p INP29
RUNPROB  BAT         3,612  04-03-98  5:19p runprob.bat
TESTDIR             23,199  02-12-97  9:07a TESTDIR
TESTLIB1        16,236,204  02-12-97  9:07a TESTLIB1
MCTL01               6,989  02-04-97 12:00p MCTL01
MCTL02              15,554  02-04-97 12:00p MCTL02
MCTL03               1,855  02-04-97 12:00p MCTL03
MCTL04              11,483  02-04-97 12:01p MCTL04
MCTL05               2,269  02-04-97 12:01p MCTL05
MCTL06               5,098  02-04-97 12:02p MCTL06
MCTL07               1,516  02-04-97 12:02p MCTL07
MCTL08               3,589  02-04-97 12:03p MCTL08
MCTL09              18,204  02-04-97 12:03p MCTL09
```


INFORMATION ONLY

MCTL10	780	02-04-97 12:04p	MCTL10
MCTL11	4,704	02-04-97 12:05p	MCTL11
MCTL12	3,694	02-04-97 12:06p	MCTL12
MCTL13	2,989	02-04-97 12:06p	MCTL13
MCTL14	3,278	02-04-97 12:06p	MCTL14
MCTL15	805	02-04-97 12:06p	MCTL15
MCTL16	1,417	02-04-97 12:07p	MCTL16
MCTL17	11,601	02-04-97 12:07p	MCTL17
MCTL18	8,618	02-04-97 12:09p	MCTL18
MCTL19	2,468	02-04-97 12:09p	MCTL19
MCTL20	9,890	02-04-97 12:10p	MCTL20
MCTL21	23,397	02-04-97 12:11p	MCTL21
MCTL22	1,545	02-04-97 12:11p	MCTL22
MCTL23	3,050	02-04-97 12:12p	MCTL23
MCTL24	1,272	02-04-97 12:12p	MCTL24
MCTL25	1,508	02-04-97 12:13p	MCTL25
MCTL26	19,226	02-04-97 12:13p	MCTL26
MCTL27	3,116	02-04-97 12:13p	MCTL27
MCTL28	38,462	02-04-97 12:13p	MCTL28
MCTL29	1,424	02-04-97 12:14p	MCTL29
OUTP01	110,633	02-04-97 12:00p	OUTP01
OUTP02	118,116	02-04-97 12:00p	OUTP02
OUTP03	20,004	02-04-97 12:00p	OUTP03
OUTP04	145,829	02-04-97 12:01p	OUTP04
OUTP05	22,776	02-04-97 12:01p	OUTP05
OUTP06	34,972	02-04-97 12:02p	OUTP06
OUTP07	76,680	02-04-97 12:02p	OUTP07
OUTP08	178,891	02-04-97 12:03p	OUTP08
OUTP09	57,775	02-04-97 12:03p	OUTP09
OUTP10	32,142	02-04-97 12:04p	OUTP10
OUTP11	57,334	02-04-97 12:05p	OUTP11
OUTP12	172,386	02-04-97 12:06p	OUTP12
OUTP13	90,499	02-04-97 12:06p	OUTP13
OUTP14	32,147	02-04-97 12:06p	OUTP14
OUTP15	45,291	02-04-97 12:06p	OUTP15
OUTP16	52,465	02-04-97 12:07p	OUTP16
OUTP17	109,124	02-04-97 12:07p	OUTP17
OUTP18	78,459	02-04-97 12:09p	OUTP18
OUTP19	14,953	02-04-97 12:09p	OUTP19
OUTP20	55,232	02-04-97 12:10p	OUTP20
OUTP21	82,479	02-04-97 12:11p	OUTP21
OUTP22	52,731	02-04-97 12:11p	OUTP22
OUTP23	92,255	02-04-97 12:12p	OUTP23
OUTP24	33,532	02-04-97 12:12p	OUTP24
OUTP25	18,086	02-04-97 12:13p	OUTP25
OUTP26	58,087	02-04-97 12:13p	OUTP26
OUTP27	18,131	02-04-97 12:13p	OUTP27
OUTP28	146,123	02-04-97 12:13p	OUTP28
OUTP29	37,339	02-04-97 12:14p	OUTP29

INFORMATION ONLY

INP01O	110,633	04-03-98	5:19p	INP01O
INP02O	118,116	04-03-98	5:20p	INP02O
INP01M	6,989	04-03-98	5:19p	INP01M
DIFM01	69	04-03-98	5:19p	difm01
INP01P	31,025	04-03-98	5:19p	INP01P
DIFO01	69	04-03-98	5:19p	difo01
INP03O	20,004	04-03-98	5:20p	INP03O
INP02M	15,554	04-03-98	5:20p	INP02M
DIFM02	69	04-03-98	5:20p	difm02
INP02P	25,629	04-03-98	5:20p	INP02P
DIFO02	541	04-03-98	5:20p	difo02
INP04O	145,829	04-03-98	5:20p	INP04O
INP03M	1,855	04-03-98	5:20p	INP03M
INP05O	22,776	04-03-98	5:20p	INP05O
DIFM03	69	04-03-98	5:20p	difm03
DIFO03	69	04-03-98	5:20p	difo03
INP04M	11,483	04-03-98	5:20p	INP04M
INP06O	34,972	04-03-98	5:20p	INP06O
DIFM04	69	04-03-98	5:20p	difm04
DIFO04	3,745	04-03-98	5:20p	difo04
INP05M	2,269	04-03-98	5:20p	INP05M
INP07O	76,680	04-03-98	5:21p	INP07O
DIFM05	69	04-03-98	5:20p	difm05
DIFO05	69	04-03-98	5:20p	difo05
INP06M	5,098	04-03-98	5:20p	INP06M
INP08O	178,891	04-03-98	5:21p	INP08O
DIFM06	69	04-03-98	5:20p	difm06
DIFO06	69	04-03-98	5:20p	difo06
INP07W	429,749	04-03-98	5:21p	INP07W
INP07M	1,516	04-03-98	5:21p	INP07M
INP09O	57,775	04-03-98	5:21p	INP09O
DIFM07	69	04-03-98	5:21p	difm07
DIFO07	69	04-03-98	5:21p	difo07
INP08M	3,589	04-03-98	5:21p	INP08M
DIFM08	69	04-03-98	5:21p	difm08
INP08P	821	04-03-98	5:21p	INP08P
DIFO08	681	04-03-98	5:21p	difo08
INP27O	18,131	04-06-98	11:21a	INP27O
INP26S	180,030	04-06-98	11:21a	INP26S
INP09M	18,204	04-03-98	5:21p	INP09M
INP10O	32,142	04-03-98	5:21p	INP10O
INP09S	180,030	04-03-98	5:21p	INP09S
DIFM09	69	04-03-98	5:21p	difm09
DIFO09	1,065	04-03-98	5:21p	difo09
INP11O	57,334	04-03-98	5:22p	INP11O
INP10M	780	04-03-98	5:21p	INP10M
INP12O	172,386	04-03-98	5:22p	INP12O
DIFM10	69	04-03-98	5:21p	difm10
DIFO10	69	04-03-98	5:21p	difo10

INFORMATION ONLY

INP13O	90,499	04-03-98	5:23p	INP13O
INP11M	4,704	04-03-98	5:22p	INP11M
DIFM11	69	04-03-98	5:22p	difm11
DIFO11	69	04-03-98	5:22p	difo11
INP12M	3,694	04-03-98	5:23p	INP12M
INP14O	32,147	04-03-98	5:23p	INP14O
DIFM12	69	04-03-98	5:23p	difm12
DIFO12	785	04-03-98	5:23p	difo12
INP13M	2,989	04-03-98	5:23p	INP13M
INP15O	45,291	04-03-98	5:23p	INP15O
DIFM13	69	04-03-98	5:23p	difm13
DIFO13	3,257	04-03-98	5:23p	difo13
INP14M	3,278	04-03-98	5:23p	INP14M
INP16O	52,465	04-03-98	5:23p	INP16O
DIFM14	69	04-03-98	5:23p	difm14
DIFO14	69	04-03-98	5:23p	difo14
INP15M	805	04-03-98	5:23p	INP15M
INP17O	109,124	04-03-98	5:23p	INP17O
DIFM15	69	04-03-98	5:23p	difm15
DIFO15	681	04-03-98	5:23p	difo15
INP16M	1,417	04-03-98	5:23p	INP16M
INP18O	78,459	04-06-98	11:16a	INP18O
DIFM16	69	04-03-98	5:23p	difm16
DIFO16	69	04-03-98	5:23p	difo16
INP19O	14,953	04-06-98	11:17a	INP19O
INP18M	8,618	04-06-98	11:16a	INP18M
INP17M	11,601	04-03-98	5:23p	INP17M
INP20O	55,232	04-06-98	11:18a	INP20O
DIFM17	69	04-03-98	5:23p	difm17
DIFO17	69	04-03-98	5:23p	difo17
INP18S	180,030	04-06-98	11:16a	INP18S
INP19M	2,468	04-06-98	11:17a	INP19M
INP18P	1,461	04-06-98	11:16a	INP18P
DIFM18	377	04-06-98	11:16a	difm18
DIFO18	359	04-06-98	11:16a	difo18
INP21O	82,479	04-06-98	11:19a	INP21O
DIFM19	69	04-06-98	11:17a	difm19
DIFO19	69	04-06-98	11:17a	difo19
INP20M	9,890	04-06-98	11:18a	INP20M
INP22O	52,731	04-06-98	11:19a	INP22O
DIFM20	69	04-06-98	11:18a	difm20
DIFO20	69	04-06-98	11:18a	difo20
INP21W	3,277,913	04-06-98	11:19a	INP21W
INP21M	23,397	04-06-98	11:19a	INP21M
INP23O	92,255	04-06-98	11:20a	INP23O
DIFM21	69	04-06-98	11:19a	difm21
DIFO21	763	04-06-98	11:19a	difo21
INP22M	1,545	04-06-98	11:19a	INP22M
INP24O	33,532	04-06-98	11:21a	INP24O

INFORMATION ONLY

```
DIFM22                  69  04-06-98 11:19a difm22
DIFO22                  69  04-06-98 11:19a difo22
INP23M               3,050  04-06-98 11:20a INP23M
DIFM23                  69  04-06-98 11:20a difm23
INP23P              20,920  04-06-98 11:20a INP23P
DIFO23                 811  04-06-98 11:20a difo23
INP26O              58,087  04-06-98 11:21a INP26O
INP24M               1,272  04-06-98 11:21a INP24M
INP25O              18,086  04-06-98 11:21a INP25O
INP24S             180,030  04-06-98 11:21a INP24S
DIFM24                  69  04-06-98 11:21a difm24
DIFO24                 363  04-06-98 11:21a difo24
INP25M               1,508  04-06-98 11:21a INP25M
DIFM25                  69  04-06-98 11:21a difm25
INP25S             180,030  04-06-98 11:21a INP25S
DIFO25                  69  04-06-98 11:21a difo25
INP09W             617,942  04-06-98 11:21a INP09W
INP26M              19,226  04-06-98 11:21a INP26M
DIFM26                  69  04-06-98 11:21a difm26
DIFO26               1,065  04-06-98 11:21a difo26
INP29O              37,339  04-06-98 11:23a INP29O
INP27M               3,116  04-06-98 11:21a INP27M
DIFM27                  69  04-06-98 11:21a difm27
DIFO27                 551  04-06-98 11:21a difo27
INP28M              38,462  04-06-98 11:22a INP28M
INP28O             146,123  04-06-98 11:21a inp28o
INP29M               1,424  04-06-98 11:23a INP29M
DIFM28                  69  04-06-98 11:22a difm28
DIFO28               1,003  04-06-98 11:22a difo28
DIFM29                  69  04-06-98 11:23a difm29
DIFO29                  69  04-06-98 11:23a difo29

 Volume in drive D is DELLWIN95-2
 Volume Serial Number is 1BE3-2E60
 Directory of D:\mcnp4b\TEST\endf5

EXP2      OUT    1,981,604  04-08-98  9:49a exp2.out
EXP22     OUT      919,943  04-08-98 11:48a exp22.out
EXP23     OUT      947,145  04-08-98 12:31p exp23.out
EXP27     OUT      916,049  04-02-98 11:09p exp27.out
EXP24A    OUT    4,169,919  04-08-98  1:59p exp24a.out
EXP1      OUT    1,877,812  04-03-98  1:32a exp1.out
EXP25     OUT      956,438  04-08-98  3:12p exp25.out
EXP26     OUT      864,907  04-08-98  4:56p exp26.out
EXP3      OUT    1,896,382  04-08-98  6:58p exp3.out
EXP4      OUT    1,899,642  04-08-98  8:52p exp4.out
LA1X5     OUT      246,332  04-08-98 11:50p la1x5.out
LA2X5     OUT      212,065  04-09-98 12:01a la2x5.out
```


INFORMATION ONLY

```
LA3X5     OUT        274,791  04-09-98 12:27a la3x5.out

 Volume in drive D is DELLWIN95-2
 Volume Serial Number is 1BE3-2E60
 Directory of D:\mcnp4b\TEST\endf6

PROB3     OUT         41,062  04-03-98 12:57p prob3.out
GODIVA    OUT        177,624  04-03-98 11:06p godiva.out
PROB6     OUT        298,699  04-03-98 12:57p prob6.out
PROB18    OUT        317,465  04-09-98 11:06a prob18.out
PROB3N    OUT        378,184  04-09-98  6:23p prob3n.out
LA3       OUT        291,130  04-03-98 11:19p la3.out
PROB20    OUT        327,970  04-03-98  1:36p prob20.out
PROB7     OUT        307,873  04-03-98  1:52p prob7.out
PROB16    OUT        314,858  04-03-98  2:18p prob16.out
PROB15    OUT        280,824  04-03-98 10:29p prob15.out
PROB14    OUT        300,925  04-03-98 10:37p prob14.out
PROB13    OUT        299,941  04-03-98 10:44p prob13.out
PROB12    OUT        321,329  04-03-98 11:02p prob12.out
LA2X      OUT        213,185  04-03-98 11:25p la2x.out
LA1X      OUT        244,192  04-07-98 12:40p la1x.out
JEZ45-1   OUT        111,261  04-07-98 12:42p jez4.5.out
JEZ20     OUT        177,233  04-07-98 12:44p jez20.out

 Volume in drive D is DELLWIN95-2
 Volume Serial Number is 1BE3-2E60
 Directory of D:\mcnp4b\TEST\shield

UEKI1-1   OUT         25,802  04-01-98  5:57p ueki.1.out
UEKI2-1   OUT         21,165  04-01-98  6:01p ueki.2.out
UEKI15-2  OUT         36,245  04-09-98  7:12p ueki.15.out
UEKI3-1   OUT         23,316  04-01-98  6:04p ueki.3.out
UEKI4-1   OUT         25,899  04-01-98  6:15p ueki.4.out
UEKI5-1   OUT         29,887  04-01-98  8:17p ueki.5.out
UEKI11-2  OUT         27,127  04-01-98  8:22p ueki.11.out
UEKI12-2  OUT         22,356  04-01-98  8:27p ueki.12.out
UEKI13-2  OUT         30,363  04-01-98  8:32p ueki.13.out
UEKI14-2  OUT         27,019  04-01-98  8:45p ueki.14.out
UEKI21-2  OUT         29,167  04-01-98  9:46p ueki.21.out
UEKI22-2  OUT         26,596  04-01-98  9:59p ueki.22.out
UEKI24-2  OUT         29,122  04-01-98 10:19p ueki.24.out
UEKI25-2  OUT         30,358  04-01-98 10:47p ueki.25.out
UEKI26-2  OUT         33,213  04-01-98 11:29p ueki.26.out
UEKI27-2  OUT         57,748  04-02-98  8:57a ueki.27.out
UEKI31-2  OUT         26,031  04-02-98  9:00a ueki.31.out
UEKI32-2  OUT         26,643  04-02-98  9:04a ueki.32.out
UEKI33-2  OUT         29,911  04-02-98  9:08a ueki.33.out
```


INFORMATION ONLY

```
UEKI34~2 OUT        33,310  04-02-98  9:21a ueki.34.out
UEKI35~2 OUT        36,379  04-02-98 10:30a ueki.35.out
MC10NEW  OUT       435,494  04-02-98  2:00p mc10new.out
```


INFORMATION ONLY

Attachment VI: Execution Instructions

From IOC LV.WP.SG.02/98-033: Execution of MCNP4B2 on WPO HP workstations

In order to perform analyses using MCNP4B2 on Waste Package Operations HP Unix workstations, the user may either enter:

/opt/neut/MCNP4B/mcnp *options*

where *options* is the command line options which also includes the input filename, e.g.,

/opt/neut/MCNP4B/mcnp name=input1

or

create a link to the executable by typing:

ln -s /opt/neut/MCNP4B/mcnp mcnp

and enter:

./mcnp *options*

where *options* is again the command line options which also includes the input filename.

Once mcnp is started it will look for a file called *xsdir* which has the cross section file information for all elements in all cross section libraries. In order to make sure correct cross sections are used, the user may set the ***DATAPATH*** environment variable by including the statement:

setenv DATAPATH /opt/neut/MCNP4B/xslib

in their login shell script. Earlier users of mcnp who have set this environment variable for MCNP4A need to change the variable in order to use the correct cross section sets. This can also be accomplished by creating a link to the *xsdir* file before running mcnp by entering:

ln -s /opt/neut/MCNP4B/xslib/xsdir xsdir

These steps will ensure that the most recent version of mcnp (Version 4B2) is used with the most recent cross section libraries. For other ways of setting up the environment to run mcnp, the user is referred to mcnp4b manual and HP Unix operating system manual.

INFORMATION ONLY

FROM IOC LV.WP.JAM.02/98-035 : Execution of MCNP4B2 on WPO PC Systems

This IOC is superseded by IOC LV.WP.JAM.02/98-039, and therefore not included explicitly. IOC LV.WP.JAM.02/98-039 contains all of the information contained in LV.WP.JAM.02/98-035.

FROM IOC LV.WP.JAM.02/98-039 : Execution of MCNP4B2 on WPO PC Systems: Update for Systems Without D Drive

In order to perform analyses using MCNP4B2 on Waste Package Operations PC computers, the user may access the lf90 executable module using a DOS command line (with the requisite path) or by executing a DOS script. Once started, MCNP looks for a file named *xsdir* in the directory D:\mcnp4b containing pointers to the qualified cross section information. The MCNP cross section library datapath is specified in the first line of the *xsdir* file from the MCNP4B2 code package. If a different hard drive is specified during installation, place the *xsdir* file and the MCNP Version 4B2 executable module in the same relative directories and make the appropriate change to the cross section library datapath in the *xsdir* file. If running from a DOS command line, the *xsdir* file must be in the local directory if using the X drive where "X" is a valid hard drive other than the "D" drive. The DOS script below will use either the D or "X" drive where "X" is assumed to be the "C" drive creating a local *xsdir* file as necessary.

Command line execution:

>X:\mcnp4b\exe\mcnp4b2 *options*

where

> X identifies the PC hard drive where the program is installed (usually C or D), and *options* include execution path designators and file name definitions.

Example: >D:\mcnp4b\exe\mcnp4b2 ixr inp=*input filename* out=*output filename*.

Continuation cases can only be run from a command line.

DOS script execution:

The following script (named RUNMCNP.BAT) will run multiple cases where the input file for each case is respectively specified as an argument for the batch command. File names must correspond to DOS name conventions, not Extended DOS conventions. Files created by MCNP are renamed using the input file name with postfixes. The script may be run from any drive or directory. Running cases from the same directory as used by the MCNP installation is not

INFORMATION ONLY

recommended but the script will preserve the installation *xsdir* file. The local *xsdir* file is deleted after running all cases except where the local directory is the one containing the installation *xsdir* file.

```
echo off
echo *
echo ************************************************
echo *                                              *
echo *  Run the MCNP lf90 Program...                *
echo *  graphics pkg not activated                  *
echo *                                              *
echo ************************************************
set xdir="no"
set ddir="no"
:start
if "%1" == "" goto end
rem
if exist %1.rtp  del %1.rtp
if exist %1.out  del %1.out
if exist %1.mct  del %1.mct
copy %1 inp
rem  XSDIR COPIED TO LOCAL DIRECTORY IF NOT ON D DRIVE
if  exist d:\mcnp4b\xsdir goto dual
rem NO COPY IF XSDIR LOCAL
if exist xsdir goto dual
if not exist c:\mcnp4b\xsdir goto errx
copy c:\mcnp4b\xsdir xsdir
set ddir="yes"
:dual
if not exist d:\mcnp4b\exe\mcnp4b2.exe goto cdrv
rem USING D DRIVE
d:\mcnp4b\exe\mcnp4b2 ixr inp=inp
goto cont
:cdrv
rem USING C DRIVE
c:\mcnp4b\exe\mcnp4b2 ixr inp=inp
:cont
copy outp  %1.out
copy mctal  %1.mct
if exist srctp copy srctp %1.stp
copy runtpe %1.run
```


INFORMATION ONLY.

```
rem
echo ************************
echo  delete temp files  *
echo ************************
del inp
del outp
if exist srctp del srctp
del mctal
del runtpe
shift
goto start
:end
if "%ddir%"=="%xdir%" goto fend
del xsdir
goto fend
:errx
echo ***************************
echo XSDIR FILE NOT FOUND
echo   TASK TERMINATED
echo ***************************
:fend
```

Example: >runmcnp case1 case2

The cross section library includes both ENDF/B-V and ENDF/B-VI data. The ENDF/B-V Zr data has been corrected for five ZAID's from the libraries RMCCS, DRMCCS, ENDFP5, DRES, and EPRIXS. These changes are summarized as follows:

Previous		Corrected
RMCCS	40000.51c	40000.57c
DRMCCS	40000.51d	40000.57d
ENDF5P	40000.50c	40000.56c
DRE5	40000.50d	40000.56d
EPRIXS	40000.53c	40000.58c.

The lf90 executable module for MCNP Version 4B2 does not include plotting capability as no graphics interface package between MCNP and the lf90 library is distributed with the code package. A non-qualified f77 MCNP Version 4B executable module is included with the installation which may be used only for graphical representation of models and not for analysis. Use of this module for graphical representation of models has no effect on results from the qualified version 4B2. This module may be accessed by the DOS command

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>X:\mcnp4b\test\mcnp7 *options*.

where

X identifies the PC hard drive where the program is installed (usually C or D), and *options* include execution path designators (*ip* only for this version) and file name definitions.

(Note: replace the MCNP executable name "mcnp4b2" with "mcnp4b2x" to run the large version)

INFORMATION ONLY

Attachment VII: Regression Testing Correspondence

To: J.Wesley Davis@CRWMS
cc: Sedat Goluoglu@CRWMS
Subject: Benchmarking of Corrected Version of MCNP4B2 on PC

MJA.98032

I have finished running the suite of MCNP4B2 validation test cases on my PC (CRWMS M&O ID #: 110831) and the purpose of this communication is to convey the results of that testing. The KCODE cases produced the following eigenvalues:

bug4b2	1.02033 ± 0.00338
exp1	0.99944 ± 0.00128
exp27	1.01018 ± 0.00142
godiva	0.99525 ± 0.00109
jez4.5	1.00568 ± 0.00174
la1x	1.00003 ± 0.00042
la3	0.99916 ± 0.00131
prob1	0.99365 ± 0.00087
prob20	0.99957 ± 0.00138

The tally results for the shielding test problems are:

mc10new	4.88537E-19 ± 0.0309 [a]
ueki.4	1.96888E-10 ± 0.0418
ueki.14	2.37314E-10 ± 0.0398
ueki.24	3.49114E-13 ± 0.0258
ueki.34	1.95087E-11 ± 0.1087

[a]. This tally is over the whole surface.

Regards,

Mike Anderson

INFORMATION ONLY

To: Sedat Goluoglu@CRWMS
cc:
Subject: MCNP VALID

Sedat,

I have finished running the suite of MCNP4B2 validation test cases on my PC (CRWMS M&O ID #: 112113) and the purpose of this communication is to convey the results of that testing. The KCODE cases produced the following eigenvalues:

MCNP4B2 Executable

bug4b2	1.02033 ± 0.00338
exp1	0.99944 ± 0.00128
exp27	1.01018 ± 0.00142
godiva	0.99525 ± 0.00108
jez4.5	1.00568 ± 0.00174
la1x	1.00003 ± 0.00042
la3	0.99916 ± 0.00131
prob1	0.99365 ± 0.00087
prob20	0.99957 ± 0.00138

The tally results for the shielding test problems are:

mc10new	4.88537E-19 ± 0.0309 [a]
ueki.4	1.96888E-10 ± 0.0418
ueki.14	2.37314E-10 ± 0.0398
ueki.24	3.49114E-13 ± 0.0258
ueki.34	1.95087E-11 ± 0.1087

MCNP4B2x Executable

bug4b2	1.02033 ± 0.00338
exp1	0.99944 ± 0.00128
exp27	1.01018 ± 0.00142
godiva	0.99525 ± 0.00109
jez4.5	1.00568 ± 0.00174
la1x	1.00003 ± 0.00042
la3	0.99916 ± 0.00131
prob1	0.99365 ± 0.00087
prob20	0.99957 ± 0.00138

The tally results for the shielding test problems are:

mc10new	4.88537E-19 ± 0.0309 [a]
ueki.4	1.96888E-10 ± 0.0418
ueki.14	2.37314E-10 ± 0.0398
ueki.24	3.49114E-13 ± 0.0258
ueki.34	1.95087E-11 ± 0.1087

INFORMATION ONLY

[a]. This tally is over the whole surface.

Thanks.

David Henderson
5-4485

INFORMATION ONLY

To: J.Wesley Davis@CRWMS
cc: Sedat Goluoglu@CRWMS
Subject: MCNP4B2 Test Results

The suite of MCNP4B2 test cases have finished running on the PC, CRWMS M&O Tag No.:110942. The results of the test cases are shown below.

CRITICALITY:

bug4b2 keff = 1.02033 with an estimated standard deviation of 0.00338
exp1 keff = 0.99944 with an estimated standard deviation of 0.00128
exp27 keff = 1.01018 with an estimated standard deviation of 0.00142
godiva keff = 0.99525 with an estimated standard deviation of 0.00108
jez4.5 keff = 1.00568 with an estimated standard deviation of 0.00174
la1x keff = 1.00003 with an estimated standard deviation of 0.00042
la3 keff = 0.99916 with an estimated standard deviation of 0.00131
prob1 keff = 0.99365 with an estimated standard deviation of 0.00087
prob20 keff = 0.99957 with an estimated standard deviation of 0.00138

SHIELDING:

mc10new	4.88537E-19	0.0309
ueki4	1.96888E-10	0.0418
ueki14	2.37314E-10	0.0398
ueki24	3.49114E-13	0.0258
ueki34	1.95087E-11	0.1087

INFORMATION ONLY

To: Sedat Goluoglu@CRWMS
cc: J.Wesley Davis@CRWMS
Subject: mcnp validation

MCNP4B2 validation test cases on my PC (CRWMS M&O ID #: 113132). The KCODE cases produced the following eigenvalues:

MCNP4B2 Executable

bug4b2	1.02033 ± 0.00338
exp1	0.99944 ± 0.00128
exp27	1.01018 ± 0.00142
godiva	0.99525 ± 0.00108
jez4.5	1.00568 ± 0.00174
la1x	1.00003 ± 0.00042
la3	0.99916 ± 0.00131
prob1	0.99365 ± 0.00087
prob20	0.99957 ± 0.00138

The tally results for the shielding test problems are:

mc10new	4.88537E-19 ± 0.0309 [a]
ueki.4	1.96888E-10 ± 0.0418
ueki.14	2.37314E-10 ± 0.0398
ueki.24	3.49114E-13 ± 0.0258
ueki.34	1.95087E-11 ± 0.1087

MCNP4B2x Executable

bug4b2	1.02033 ± 0.00338
exp1	0.99944 ± 0.00128
exp27	1.01018 ± 0.00142
godiva	0.99525 ± 0.00109
jez4.5	1.00568 ± 0.00174
la1x	1.00003 ± 0.00042
la3	0.99916 ± 0.00131
prob1	0.99365 ± 0.00087
prob20	0.99957 ± 0.00138

The tally results for the shielding test problems are:

mc10new	4.88537E-19 ± 0.0309 [a]
ueki.4	1.96888E-10 ± 0.0418
ueki.14	2.37314E-10 ± 0.0398
ueki.24	3.49114E-13 ± 0.0258
ueki.34	1.95087E-11 ± 0.1087

[a]. This tally is over the whole surface.

INFORMATION ONLY

To: Sedat Goluoglu@CRWMS
cc:
Subject: MCNP4B2 verification

The suite of MCNP4B2 test cases have finished running on the PC, CRWMS M&O Tag No.:112105. The results of the test cases are shown below.

CRITICALITY:

bug4b2 keff = 1.02033 with an estimated standard deviation of 0.00338
exp1 keff = 0.99944 with an estimated standard deviation of 0.00128
exp27 keff = 1.01018 with an estimated standard deviation of 0.00142
godiva keff = 0.99525 with an estimated standard deviation of 0.00108
jez4.5 keff = 1.00568 with an estimated standard deviation of 0.00174
la1x keff = 1.00003 with an estimated standard deviation of 0.00042
la3 keff = 0.99916 with an estimated standard deviation of 0.00131
prob1 keff = 0.99365 with an estimated standard deviation of 0.00087
prob20 keff = 0.99957 with an estimated standard deviation of 0.00138

SHIELDING:

mc10new 4.88537E-19 0.0309
ueki4 1.96888E-10 0.0418
ueki14 2.37314E-10 0.0398
ueki24 3.49114E-13 0.0258
ueki34 1.95087E-11 0.1087

INFORMATION ONLY

To: Sedat Goluoglu@CRWMS
cc:
Subject: MCNP cases

The suite of MCNP4B2 test cases have finished running on the PC, CRWMS M&O Tag No.:112110. The results of the test cases are shown below.

CRITICALITY:

bug4b2 keff = 1.02033 with an estimated standard deviation of 0.00338
exp1 keff = 0.99944 with an estimated standard deviation of 0.00128
exp27 keff = 1.01018 with an estimated standard deviation of 0.00142
godiva keff = 0.99525 with an estimated standard deviation of 0.00108
jez4.5 keff = 1.00568 with an estimated standard deviation of 0.00174
la1x keff = 1.00003 with an estimated standard deviation of 0.00042
la3 keff = 0.99916 with an estimated standard deviation of 0.00131
prob1 keff = 0.99365 with an estimated standard deviation of 0.00087
prob20 keff = 0.99957 with an estimated standard deviation of 0.00138

SHIELDING:

mc10new	4.88537E-19	0.0309
ueki4	1.96888E-10	0.0418
ueki14	2.37314E-10	0.0398
ueki24	3.49114E-13	0.0258
ueki34	1.95087E-11	0.1087

INFORMATION ONLY

To: Sedat Goluoglu@CRWMS
cc:
Subject: Re: MCNP4B2 Test Results

The suite of MCNP4B2 test cases have finished running on the PC, CRWMS M&O Tag No.:110837. The results of the test cases are shown below.

CRITICALITY:

bug4b2 keff = 1.02033 with an estimated standard deviation of 0.00338
exp1 keff = 0.99944 with an estimated standard deviation of 0.00128
exp27 keff = 1.01018 with an estimated standard deviation of 0.00142
godiva keff = 0.99525 with an estimated standard deviation of 0.00108
jez4.5 keff = 1.00568 with an estimated standard deviation of 0.00174
la1x keff = 1.00003 with an estimated standard deviation of 0.00042
la3 keff = 0.99916 with an estimated standard deviation of 0.00131
prob1 keff = 0.99365 with an estimated standard deviation of 0.00087
prob20 keff = 0.99957 with an estimated standard deviation of 0.00138

SHIELDING:

mc10new 4.88537E-19 0.0309
ueki4 1.96888E-10 0.0418
ueki14 2.37314E-10 0.0398
ueki24 3.49114E-13 0.0258
ueki34 1.95087E-11 0.1087

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