AVAILABILITY

The services and computer codes described in this brochure are available to subscribers to the **ANSWERS** service. The codes are available for use on selected bureau machines or for rental on member's in-house computers.

In addition to leasing the **ANSWERS** software packages, members of the **ANSWERS** service receive:

- A high standard of documentation.
- User support.
- Training seminars and hands-on workshops.
- Consultancy and design assessment.
- Local commissioning of software.

FUTURE DEVELOPMENTS

ANSWERS members benefit from continual enhancement of software and methodology. The current major development is the **MONK7** code, based on the Winfrith Revised Modular Scheme.

This offers an enhanced thermalisation treatment, extended geometric capabilities, completely overhauled **FORTRAN** source code and a compatable user-image with the **ANSWERS** shielding Monte Carlo code **MCBEND**. In addition **MONK7** is supported by a user-friendly 2D and 3D graphics package.

MONK7 is uniquely equipped to take advantage of the continual developments in computer hardware with versions available for both serial and parallel processing machines.

For further details contact
the ANSWERS Manager.
ANSWERS Business Centre
AEA Thermal Reactor Services
Winfrith Technology Centre
Dorchester, Dorset DT2 8DH
Tel: Dorchester (0305) 202352
Telex 41231
Fax: (0305) 202746

AEA TECHNOLOGY

CURRENT STATUS OF THE ANSWERS VERSION OF MONK6

1. FUNCTION OF DOCUMENT

This document defines the status of the current version of the Monte Carlo criticality code MONK6 available through the ANSWERS Service; it will be reissued as appropriate to reflect any changes made to the code, data libraries or documentation.

2. DESCRIPTION OF CODE

MONK6 is a Monte Carlo neutronics computer code written to assist in the study of nuclear criticality safety problems. The code contains a powerful user-friendly geometry package enabling three-dimensional models of almost any complexity to be readily created. In addition a detailed continuous energy collision processing package provides an accurate account of the neutron interaction processes; alternatively access to a range of world-standard multigroup data libraries is available.

3. METHOD OF SOLUTION

The primary objective of MONK6 is to calculate the reactivity of systems by the computer simulation of the birth, migration and ultimate fate of a finite sample of neutrons. The actual number of samples followed determines the statistical accuracy of the final scored parameters, which include a minimum variance estimate of k-effective, neutron fluxes, geometry boundary crossings and reaction rates.

MONK6 estimates the multiplication constant k-effective using a staged calculation with each stage consisting of a fixed number of superhistories. A neutron superhistory is the set of tracks followed by the neutron and its fission progeny from birth to absorption or leakage through to a fixed maximum number of fission generations (normally 10); by this means a stable calculation of the scored parameters is produced which is essentially free from sampling bias. Superhistories are tracked through the specified system by sampling from known probabilistic laws based on measured parameters using a series of random numbers .

The MONK6 geometry package consists of a combination of simple bodies, used to define the major component outlines, and a collection of special options called hole geometries (based on Woodcock tracking), which provide a lot of the more complicated fine geometric details, as well as offering a short cut to the specification of some of the more commonly occurring arrangements.

The main MONK6 nuclear data library is an 8220 group library based on UKNDL and JEF evaluations. This library together with the continuous energy collision processing package provides a very detailed model of the physics, and has been extensively validated against a wide range of systems. The only real limit on the ultimate accuracy achievable with this option

is the accuracy of the basic nuclear data. For comparison purposes MONK6 can also accept data from a number of established multigroup sources including the SCALE and WIMS systems.

4. ASSOCIATED CODES
SCAN6 produces two-dimensional cross-sectional pictures of MONK6 geometries for display on printer output or colour monitor.

5. QA STANDARDS
The development, maintenance and management of MONK6 is carried out according to the QA standards in the ANSWERS standard documents.

6. MACHINE REQUIREMENTS
MONK6 has been commissioned on a wide range of computer hardware which includes mainframes, workstations and personal computers (PCs), and a version is also available for running on a Meiko concurrent supercomputer. Off-the-shelf versions are currently available for Sun workstations, a range of DEC systems and Unix-based PCs.

7. CONTENTS OF INSTALLATION PACKAGE
The standard package issued to users comprises:

       Executable code module
       Standard nuclear data library (8220 groups)
       Sample problem inputs and outputs for implementation testing
       Hardware-specific installation guide
       User Guide
       Verification report

8. DOCUMENTATION
Documentation to support the use of MONK6 is attached.

9. STATUS
The current version of MONK6 is MONK6B and is available through the ANSWERS Service of the Thermal Reactor Services (TRS) business of AEA Technology at the following address:

The Manager,
ANSWERS Business Centre,
110/B21,
Winfrith Technology Centre,
Dorchester,
Dorset DT2 8DH
United Kingdom

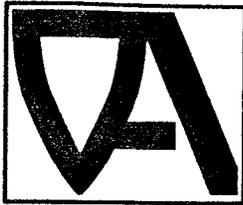Telephone (0305) 202352
Fax (0305) 202746

List of Current MONK6 Documents

Reference number sequence   ANSWERS/MONK6/?

Number	Title	Status	Issue(version)	Date	Comment
1	MONK6 - A Monte Carlo Code for Criticality Calculations (User Guide)	Current	1(3)	Apr 88	Alternative reference AEEW R2195
2	MONK6 - A Monte Carlo Code for Criticality Calculations (Supporting Documentation)	Current	1(3)	Nov 88	Alternative reference AEEW R2248
7	MONK6A Code Maintenance Document	Internal			
8	MONKIN - An Interactive Data Preparation Program for MONK6	Current	1	Oct 88	
10	An Introduction to MONK6B	Current	1	Jul 89	
11	A Guide to the Application of MONK6 to LWR Fuel Transport	Current	1	Apr 90	

Reference number sequence   ANSWERS/MONK(??)?

Number	Title	Status	Issue(version)	Date	Comment
(90)1	MONK6B Code Maintenance Guide	Internal			

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data from a number of established multigroup sources including the SCALE and WIMS systems.

4. ASSOCIATED CODES

SCAN6 produces two-dimensional cross-sectional pictures of MONK6 geometries for display on printer output. VISAGE is a user-friendly package for viewing MONK6 geometries on colour monitors.

5. QA STANDARDS

The development, maintenance and management of MONK6 is carried out according to the QA standards in the ANSWERS standard documents.

6. MACHINE REQUIREMENTS

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