Data Bank

The Data Bank serves as a centre of reference for computer programs, basic nuclear data and chemical thermodynamic data by providing scientists with a reliable, up-to-date and rapid computer program and nuclear data service. It continues the effort to preserve data from integral experiments and to develop user-friendly tools for handling nuclear data.

Computer program services

The Data Bank has a collection of about 2 500 computer programs covering all nuclear energy application areas. During 2002, a total of 85 new or revised versions of computer codes were acquired. The main topics covered by this acquisition were reactor physics and radiation transport codes (25%) and application data libraries (20%). Of particular interest were three-dimensional radiation transport codes.

Close to 3 000 computer programs and associated data libraries were distributed upon request during the year. This was a record high distribution compared with previous years (roughly 2 200 programs in 2001 and 2 300 programs in 2000). The three most requested program categories coincide with the three most popular acquisition topics mentioned above.

The scanning of the computer program manuals and associated documentation has now been completed, allowing fully automatic package dispatching on CD-ROM. A complete collection of program abstracts on CD-ROM was prepared for publication in December. In addition, five electronic newsletters, providing information on newly arrived material as well as planned program-training courses, were sent out during the year to liaison officers and subscribers.

Computer program training courses

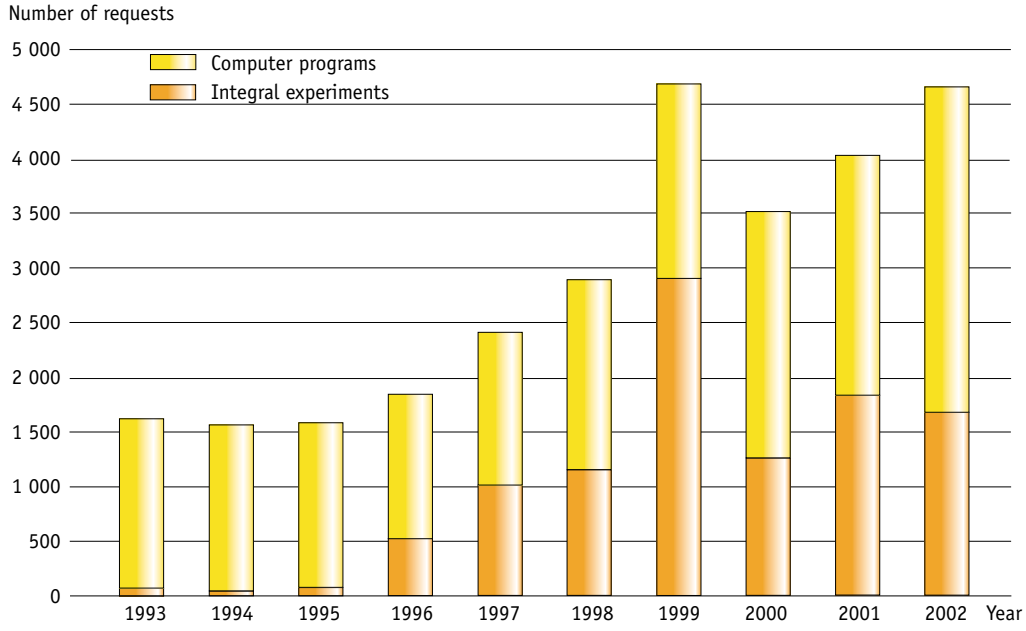
The following training courses were organised in 2002:

- MCNP – Advanced Course including MCNP5 Features, held on 18-22 March at the Imperial College, London, UK.
- Workshop on Computing Radiation Dosimetry (CRD-2002) with an embedded training course on MCNPX (Monte Carlo Code System for Multiparticle and High Energy Applications), held on 22-28 June at the *Instituto Tecnologico e Nuclear* (ITN), Sacavém, Lisbon, Portugal.
- MCNP – Introductory Course including MCNP5 Features, held on 9-13 September at the University of Stuttgart, Germany.
- MCNPX – Monte Carlo Code System for Multiparticle and High Energy Applications, held on 18-22 November at SCK•CEN, Mol, Belgium.

Preservation of information from integral experiments

In close co-operation with other parts of the NEA, the Data Bank has established a number of databases containing information from integral experiments. These data are especially important for the validation

Evolution of requests for computer programs and integral experiments data



and benchmarking of computation methods and programs used in member countries to model different nuclear systems. The databases maintained and updated by the Data Bank are:

- SINBAD (Integral Shielding Experiments),
- IFPE (International Fuel Performance Experiments),
- ICSBEP (International Criticality Safety Benchmark Evaluation Project),
- CCVM (CSNI Code Validation Matrix for LWR LOCA and transients),
- IRPhE (International Reactor Physics Benchmark Experiments).

New editions of the SINBAD, IFPE and ICSBEP databases were issued in 2002. Concerning IRPhE, a demonstration CD-ROM with results of a pilot project was issued, containing in total several hundred reactor configurations.

About 500 CD-ROMs of the complete ICSBEP database, containing close to 2 800 experiments, were distributed in 2002. The most popular of the other databases was the IFPE with more than 800 experiments distributed, followed by the three databases with an annual distribution of about 300 experiments.

Nuclear data services

The Data Bank participates in a worldwide network of nuclear data centres that compiles and makes available nuclear reaction data to scientists and engineers. The Data Bank services its member countries with bibliographic, experimental and evaluated scientific nuclear data. Most of the data are accessible directly online, but the Data Bank also provides guidance to users on the availability and choice of data.

More than 15 000 accesses to the nuclear data services' databases were registered in 2002. A major part (60%) of the requests were for experimental data (EXFOR); the databases of bibliographic (CINDA) and evaluated nuclear data (EVA) followed with 20% each.

The bibliographic references to neutron data publications (CINDA) are also issued in paper form, with an accompanying CD-ROM containing all data on an easily searchable database. The latest version was issued in November.

The JEFF project

Further improvements were made to the Joint Evaluated Fission and Fusion (JEFF) file and culminated in the release of the JEFF-3.0 general-purpose library in April. Evaluated nuclear data are given for 340 isotopes or elements and for five molecular/lattice structures in the case of thermal scattering data. This library is intended for use in fission and fusion neutronic applications, and is used in many member countries as the standard data library for most nuclear energy applications. The documentation of the general-purpose library will be issued in early 2003.

Work on the JEFF project will continue in 2003 with the processing and validation of the general-purpose library, and with the goal of releasing the JEFF-3.0 activation, radioactive decay data and fission yields libraries in 2003.

Highlights

- Demand for the Data Bank's computer program and nuclear data services was record high in 2002. More than 4 600 computer programs and integral data sets were distributed upon request and the nuclear data services recorded more than 17 000 accesses to the online databases.
- A new version of the Joint Evaluated Fission and Fusion (JEFF-3) nuclear data file was released in April.
- A pilot project to compile and format information from reactor physics integral experiments was completed.
- It was agreed to start a new phase of the Thermochemical Database (TDB) project.

International nuclear data evaluation co-operation

The NEA is coordinating international collaboration among the major nuclear data evaluation projects in the world. In 2002, the working party that manages this co-operation published a report on delayed neutron data. The report contains recommended delayed neutron data for the major actinides, ^{235}U, ^{238}U and ^{239}Pu, as well as for the time dependence of delayed neutron emission and for the associated energy spectra for fission in 20 isotopes. The report is accompanied by a CD-ROM, which contains a number of documents providing details about the origin of the recommended data.

The High Priority Request List for nuclear data has been made generally available on the NEA website to facilitate feedback on the requests listed. An expert group is presently discussing ways to reorganise the list in order to clearly indicate the very high priority requests, as well as the origin and reason for the requests.

The Thermochemical Database (TDB) Project

The Data Bank is working with the NEA Radioactive Waste Management Committee to develop a database of recommended chemical thermodynamic data for the safety assessment of nuclear waste repositories. The present phase of the project is coming to an end and the TDB Management Board decided in November 2002 to launch a new four-year phase of the project. The details of this programme can be found in the section "Joint Projects and Other Co-operative Projects".

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