

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 collection contains more than 2 000 computer programs covering a wide range of nuclear energy and technology applications. Seventy-five new or new versions of programs were added to the collection in 2001. Special efforts have been devoted to developing tools that facilitate the geometrical modelling of complex systems.

Demand for Data Bank computer program services remained very high in 2001. More than 2 200 programs were dispatched on request. About 150 of these programs were sent to non-OECD countries according to a special co-operative agreement with the IAEA.

The most requested programs in 2001 were in the field of radiation transport and shielding, in particular the two Monte Carlo codes MCNP and PENELOPE. About 50 per cent of the requests for computer programs originated from national laboratories, 25 per cent from universities and the remaining 25 per cent from industry and consulting firms.

The project to transfer all the computer program manuals and documentation to electronic form by scanning the printed material continued in 2001. About 85 per cent of the material had been transferred at the end of the year, allowing the Data Bank to distribute almost all computer program packages on CD-ROM or via the Internet.

Detailed information about material available from the computer program services can be accessed via the NEA website at www.nea.fr/html/dbprog/. This section is updated weekly. Additional information is provided in a bimonthly, electronic newsletter and in a regularly distributed CD-ROM containing a catalogue of computer-searchable abstracts.

Data from integral experiments

The Data Bank and the NEA Nuclear Science section work closely together on the preservation of data from integral experiments to increase their uses and benefits and to favour innovation, especially in the development of future nuclear energy systems. The Nuclear Science committee is responsible for overall guidance of the project, whereas the Data Bank provides the infrastructure for safeguarding information in databases and supplying services to Member countries.

The following databases were updated with new material in 2001:

- radiation shielding (SINBAD);
- reactor fuel performance (IFPE);
- criticality safety benchmark experiments (ICSBEP);
- code validation matrix of thermal-hydraulic codes for LWR LOCA and transients (CCVM);
- reactor physics experiments (IRPhE) – pilot project.

The demand for integral nuclear data services was in line with average distribution figures over the last three years. More than 1 800 data sets were distributed, of which about 290 went to non-OECD countries according to the co-operative agreement with the IAEA.

Nuclear data services

The Data Bank maintains large databases containing bibliographic, experimental and evaluated nuclear data and makes these databases available to scientists in Member countries through the Internet. The databases are maintained in close co-operation with other nuclear data centres and cover all types of data needed in nuclear energy applications.

A CD-ROM version of the Computer Index of Neutron Data (CINDA) bibliographic database was produced by the Data Bank in 2001 and was distributed along with the book published by the IAEA. The CD-ROM was well-received and it is hoped that, as more users become accustomed to this format, the number of printed paper copies can be reduced.

The Exchange Format (EXFOR) database containing experimental nuclear reaction data was updated by the Data Bank in 2001 with data from approximately 150 new neutron and charged-particle experiments.

JANIS (Java-based Nuclear Information Software), the new platform-independent nuclear data display software developed by the Data Bank, was officially released in October 2001. The program is designed to facilitate the visualisation and handling of nuclear data. Its objective is to allow the user to access numerical values and graphical representations without prior knowledge of the storage format. More than 400 copies have so far been distributed upon request.

The Data Bank registered over 24 000 on-line accesses to the databases containing nuclear data. This was a 20 per cent increase compared with the previous year. The repartition between the databases was similar to former years, with about 40 per cent of requests for experimental data and 30 per cent each for bibliographic and evaluated nuclear data.

Screen capture of the JANIS program and CD-ROMs produced by the Data Bank.



- The computer program service dispatched more than 2 200 computer programs and close to 1 850 data sets from integral experiments to scientists and engineers in Member countries.
- The nuclear data services registered more than 24 000 accesses to the databases containing bibliographic, experimental and evaluated nuclear data.
- The first official version of a new platform-independent display program for nuclear data (JANIS) was released.
- A book on recommended chemical thermodynamic data for neptunium and plutonium was published.

- co-ordination of the data review teams;
- editorial support for the review teams;
- validation of software for the TDB database;
- maintenance and updating of the TDB bibliographical database.

Progress made in 2001 is described under the heading "Joint and Other Co-operative Projects".

Evaluated nuclear data for fission and fusion applications

The co-ordination of the Joint Evaluated Fission and Fusion (JEFF) file project, which seeks to establish a reference data set for a vast range of nuclear energy applications, continued in 2001. An improved version of the general-purpose data library was compiled at the Data Bank for testing by participating laboratories in Member countries. The preliminary test results are very encouraging and it is foreseen that the data will be released to the public in the first half of 2002.

Enhanced versions of the JEFF radioactive decay and fission yield data libraries were also compiled in 2001. The data will be tested, in particular for reactor core decay heat calculations and the storage of spent fuel.

The JEFF project established a new working group on nuclear data measurement activities in May 2001. The aim of this group will be to help analyse the expressed needs for nuclear data measurements and to co-ordinate the subsequent experimental work.

Chemical thermodynamic data

The NEA Data Bank acts as project co-ordinator for the NEA Thermochemical Database (TDB) Project. The work performed at the Data Bank comprises:

Training courses

The Data Bank regularly organises training courses with the aim of contributing to an effective utilisation of widely used computer codes and improved communication between the users and the authors of the codes. The following courses were arranged in 2001:

- MCNP (Monte Carlo) training course held in April at Imperial College, London, UK.
- SAMMY (nuclear resonance analysis) training course held in April at the NEA, Paris, France.
- NJOY (nuclear data processing) workshop and users' group meeting held in May in Aix-en-Provence, France.
- PENELOPE (electron-photon transport) workshop and tutorial held in November at the NEA, Paris, France.
- TRIPOLI-3.5 (Monte Carlo) training course (in French), held in October at the NEA, Paris, France.
- MCNP (Monte Carlo) introductory training course held in September in Stuttgart, Germany.

More than 100 trainees participated in these training courses.



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