

Data Bank

Mission

To be the international centre of reference for its Member countries with respect to basic nuclear tools, such as validated computer codes and nuclear data, and to provide a direct service to its users by developing, improving and validating these tools and making them available as requested.

Highlights

- Demand for the Data Bank's computer program services was at a record high in 2000. Close to 2 300 programs were dispatched.
- A new Java-based display program for nuclear data (JANIS) was developed and is undergoing testing.
- The radioactive decay data file of the Joint Evaluated Fission and Fusion (JEFF) data library was compiled.
- The book on recommended chemical thermodynamic data of neptunium and plutonium was finalised for publication.

Computer program services

The Data Bank makes tested computer program packages available to scientists in Member countries. The collection contains about 2 000 programs, covering all application areas related to nuclear energy. The Data Bank also provides programs to non-OECD countries through a co-operative agreement with the IAEA and has a special agreement with the US Department of Energy on the exchange of computer codes.

A special effort to review all computer program packages for possible Y2K problems was successful, with no difficulties reported at the beginning of the year. The Data Bank acquired 85 new or revised versions of computer codes during the year, of which 28 came from non-OECD countries.

A record-high 2 262 computer program packages were dispatched to requesters in 2000. About 50% of these requests came from national laboratories, whereas the remaining 50% were equally divided between universities and industry. The most requested programs were

in the areas of radiation shielding and nuclear safety. Two editions of the computer program abstracts database were published and distributed on CD to nominated establishments and customers.

A major effort has been devoted to transforming paper-based computer program documentation into electronic form. In all, 420 computer program packages were restructured and these can now be fully distributed in electronic form, either on CD or via network. Other program packages are normally sent out on CD together with a paper copy of the documentation.

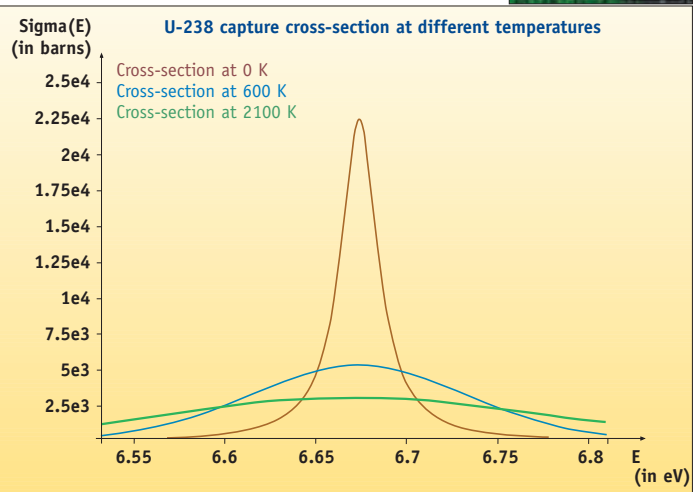
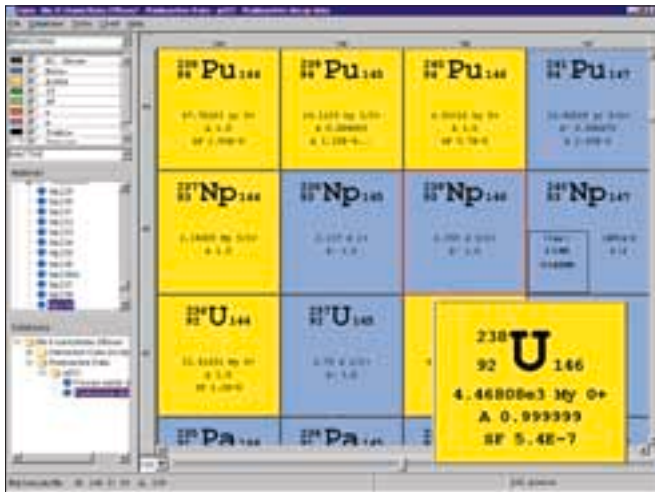
As part of the computer program services, the Data Bank organises training courses on the use of the programs. Three training courses were held in 2000, all concerned with Monte Carlo computer codes. They were either of introductory or advanced type and addressed modelling capabilities for shielding, criticality and core calculations, as well as visualisation of the geometry and results. The participants in the courses were mostly younger scientists. The list of courses was as follows:

- Advanced MCNP-4C training course, held in April in the United Kingdom;
- Training Course on Nuclear Criticality Safety Using KENO-VI – Handling, Transportation and Storage of Spent Fuel (included KENO-3D), held in May in France;
- Introductory MCNP-4C training course, held in July in Germany.

Integral nuclear data

Under the guidance of the Nuclear Science Committee, the Data Bank collects, stores and distributes integral nuclear data sets. These data sets contain complete information from experiments performed mainly at research or power reactors, and are primarily used for computer code and basic data validation purposes. The application areas covered are nuclear fuel behaviour, criticality safety and radiation shielding. The Data Bank also provides a service and distributes the integral data sets on request. 1 252 data sets were dispatched on CD from the following databases:

- International Criticality Safety Benchmark Experiments (ICSBEP);
- International Fuel Performance Experiments (IFPE);



- Radiation Shielding Experiments (SINBAD);
- Code Validation Matrix of Thermal-Hydraulic Codes (CCVM).

A project on general preservation of integral nuclear data was undertaken in 2000. The first application area to be considered was reactor physics experiments. A pilot project was started to explore the availability of data, to agree on a suitable storage format and to determine the resources needed to accomplish the project.

Nuclear data services

The Data Bank continued to compile and make available basic nuclear data within an international framework, comprised of five major data centres. The data centres are located in the USA (Brookhaven), France (NEA), Austria (IAEA) and Russia (Obninsk and Moscow). Both bibliographic and experimental nuclear data are compiled and exchanged between the centres. The databases containing nuclear data are directly available for registered users on the Data Bank's web page.

The bibliographic database, CINDA (Computer Index for Neutron Data), contains more than 260 000 references. The database is published annually, either as an annual or a cumulative update. The Data Bank has developed a CD version of the complete database, which is incorporated in the published book. The EXFOR (Exchange Format) database containing experimentally measured nuclear reaction data continues to be updated. The Data Bank added new data from 46 neutron-induced and 100 charged-particle-induced experiments during 2000.

Demand for nuclear data services remained high. During 2000, the Data Bank recorded over 20 000 retrievals from the on-line accessible databases containing nuclear data. Close to 2 000 scientists have registered and obtained passwords for access to these databases. Demand was distributed as follows: 30% of accesses concerned the bibliographic data in CINDA, 30% the evaluated nuclear data and 40% the experimental data in EXFOR.

The NEA organises international collaboration between the major nuclear reaction data evaluation projects in the world. The first meeting of the newly reorganised working party (WPEC) was held in Japan

in June 2000. The working party supports continued co-operation on the evaluated data formats and a high priority request list for nuclear data, in addition to a number of short-term expert groups on, for example, nuclear data standards. A report on *Processing and Validation of Intermediate Energy Evaluated Data Files* was published in 2000.

A new, completely rewritten data visualisation tool was developed and is undergoing thorough testing. The program is called JANIS (Java-based Nuclear Information System). Details are available on the Data Bank's web pages.

JEFF project

The complete documentation of the second version of the Joint Evaluated Fission and Fusion (JEFF) data file (JEF-2.2) was published. This was followed by the development of the new, third version (JEFF-3) of the data library. The correction of all format and physics problems discovered in the quality assurance checking of the new general-purpose file was finalised. The processing and benchmark testing of the most important isotopes in the JEFF-3 library began and the first results were presented at the biannual meeting in December 2000. The first version of the JEFF-3 radioactive decay data file was compiled and the checking of the data, using a newly developed checking code, was undertaken. A report on the evaluation and analysis of nuclear resonance data was also published in 2000.

A new Monte Carlo library based on the former version of the data library was developed for the MCNP-4B program. It contains more than 100 of the most important isotopes from the JEF-2.2 general-purpose library and can be obtained through the Data Bank computer program services.

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