

Data Bank

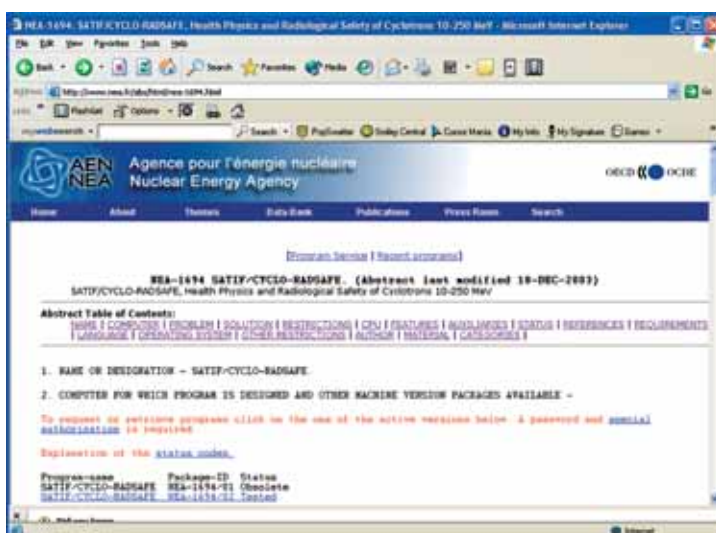
The Data Bank operates as an international centre of reference for its member countries with respect to basic nuclear tools, such as computer codes and nuclear data, used for the analysis and prediction of phenomena in the nuclear field. It provides a direct service to its users by developing, improving and validating these tools and making them available as requested.

Computer program services

Demand for Data Bank computer program services remained high in 2003. More than 1 900 programs were distributed upon request, a figure that is comparable to previous years. The Data Bank also tested and added 82 new programs or new versions of programs to the collection, which contains in total more than 2 000 programs, covering all application areas of nuclear energy. The application areas that attracted most interest in 2003 were radiation physics and shielding, reactor safety analysis and static reactor analysis.

In 2003, the Data Bank issued one edition of the complete collection of nuclear program abstracts on CD-ROM. Four electronic newsletters were sent out via e-mail to liaison officers and subscribers.

A workshop on "Common Tools and Interfaces for Deterministic Radiation Transport, Monte Carlo and Hybrid Codes" was organised in September 2003 at NEA headquarters. It covered recently developed tools for modelling 3-dimensional problems, including automated mesh generation and visualisation of the results, to facilitate interpretation and documentation of these results. Methods for 3-dimensional sensitivity and uncertainty analysis were also covered.



Computer program training courses

The following training courses were organised in 2003:

- KENO/SCALE Training Courses 2003; 23-27 June 2003, Paris, France (14 participants).
- PENELOPE-2003 (electron-photon transport) Training Course/Tutorial; 7-10 July 2003, Paris, France (24 participants).
- MCNP5 Introductory Training Course; 15-19 September 2003, Issy-les-Moulineaux, France (17 participants).
- MCNPX Training Course, Intermediate Level; 6-10 October 2003, Stuttgart, Germany (16 participants).

Preservation of information from integral experiments

The Data Bank is, under the guidance of the NEA Nuclear Science Committee, collecting information from integral experiments to be used, for example, in benchmark testing of computer programs and nuclear data. The areas in which integral information is collected includes reactor physics, nuclear fuel behaviour, radiation shielding and reactor safety.

These integral data sets are highly sought-after among Data Bank customers. More than 2 500 such sets were distributed in 2003, with fuel behaviour data being the most popular category (50%), followed by radiation shielding and safety data (20% each), and reactor physics data (10%). The figure for the reactor physics data is only partially representative as the project started in June 2003 and the data preparation is in progress. New editions of both the fuel behaviour and the radiation shielding databases were issued on CD-ROM in October 2003.

Nuclear data services

The compilation of experimental data for the international EXFOR database continued in 2003 according to plans. The Data Bank contributed 114 neutron-induced and 165 charged-particle-

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■ A new version of JANIS software to display nuclear data was issued.

■ An update on the *Chemical Thermodynamics of Uranium, Neptunium, Plutonium, Americium and Technetium* was published.

induced experiments to the database. The Data Bank recently assumed responsibility for the annual publication of the CINDA database of bibliographic references and the CINDA 2003 volume will be distributed together with the new version of the JANIS data display software.

The above-mentioned EXFOR and CINDA databases, as well as a database containing evaluated nuclear data, are directly accessible to customers through the Data Bank's web pages. In 2003, the Data Bank registered more than 20 000 accesses to these databases, with the EXFOR database being the most popular (55%), followed by the database for evaluated data (40%) and the CINDA bibliographic database (5%).

The first version of the Java-based nuclear data display program JANIS was released in October 2001 and has since been distributed to more than 700 users. Important feedback has been accumulated and a new version of the software has been developed. A number of improvements and extensions have been incorporated: the development of an internal Java-based database for storage of the data and the inclusion of the CINDA bibliographic data are the most significant.



The JEFF project

Following the release of the JEFF-3.0 General Purpose Library of evaluated nuclear data in April 2002, work in 2003 focused on the testing and benchmarking of the data. The first benchmark results show that the JEFF-3.0 library performs better than the former versions. One of the main

validation efforts is aiming at solving the problem of reactivity under-prediction for LWR lattices, an international study carried out in the International Nuclear Data Evaluation Co-operation framework.

Work on the JEFF-3.0 special purpose libraries on radioactive decay and fission yield data has begun, with the goal of releasing already-tested libraries at the end of 2004 or in the beginning of 2005.

International Nuclear Data Evaluation Co-operation

International Nuclear Data Evaluation Co-operation is a worldwide co-operative effort to improve the quality and completeness of evaluated nuclear data available for use in science and technology and to promote the efficient use of available resources through international collaboration. It initiates joint efforts to help solve outstanding and common nuclear data issues. A report on the status of fission neutron spectra of ^{235}U was published in 2003. The report recommends that a new, accurate measurement of the spectrum be undertaken to help solve noted discrepancies.

The Co-operation also maintains a High Priority Request List (HPRL) for nuclear data. The list is being reorganised in order to better highlight the very high priority requests and to improve the documentation and justification of the requests. The group responsible for the list will periodically review it and interact with both requesters and providers of data to maintain the list up-to-date.

The Thermochemical Database (TDB) Project

The Data Bank is working, together with the NEA Radioactive Waste Management Committee, to develop a database of recommended chemical thermodynamic data for the safety assessment of radioactive waste repositories. The details of this programme can be found in the section "Joint Projects and Other Co-operative Projects" (page 26).



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