

REPORT FROM THE NEA DATA BANK
to the NRDC meeting at BNL, USA
4 - 7 October 2004

General

The NEA Data Bank services celebrate its 40th anniversary in 2004. During all these years, the Data Bank's primary role has been to provide scientists in member countries with reliable nuclear data and computer programs for use in different nuclear applications. The services include also Thermochemical data for radioactive waste management applications. The Data Bank organises seminars and workshops to present information on computer programs or groups of programs that are considered to be of special interest to users. Training courses on widely used computer programs are organised a few times a year to ensure a correct and effective use of these programs.

The Data Bank member countries are: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Japan, Republic of Korea, Mexico, Netherlands, Norway, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, and United Kingdom. Users of the Data Bank services include governmental research institutes, industry and universities.

By arrangement with IAEA, the Data Bank computer program service covers both Data Bank countries and member states of IAEA, except USA and Canada where a separate agreement covers nuclear data and computer program exchanges.

The NEA Data Bank also maintains a close cooperation with the NEA Nuclear Science Section, which provides useful feedback on the performance of computer programs and nuclear data through a number of benchmark studies, especially in the areas of reactor and fuel cycle physics, criticality safety, and radiation shielding.

Organisation

Total number of full time staff in the NEA Data Bank is 19. This is divided into 9 professional staff and 10 support staff. However, only 8 professional and 7 support staff members work directly with the Data Bank services (see Figure 1). The remaining staff is allocated to work in other parts of the NEA.

Thierry Dujardin is Director for **Science and Development** with Claes Nordborg below him as head of the **Nuclear Science** Section, while the post as head of the NEA **Data Bank** is presently vacant. Within the Data Bank, Enrico Sartori is responsible for the **Computer Codes and Benchmarks** together with Juan Galan and Ivo Kodeli (employed by the IAEA). Hans Henriksson and Yolanda Rugama are responsible for the **Nuclear Data Services**. The **in-house computer system** is taken care of by Pierre Nagel. Finally, Federico Mompean is responsible for the **thermochemical data project**. Both Byung-Chan Na and Enrico Sartori work part-time for the Nuclear Science Section, whereas Federico Mompean work full time on data for radioactive waste management applications.

Total annual budget of the Data Bank is about 3.5 million Euros. The Data Bank provides expertise to other parts of the NEA, for example to the Radioactive Waste Management Division and to the Nuclear Science Section. These services are paid by the NEA main budget, leaving an annual budget for the Data Bank scientific services of about 2.7 million Euros.

Nuclear Data Services

The nuclear data services are mainly provided through direct on-line access to the CINDA, EXFOR and EVA databases containing bibliographic, experimental and evaluated nuclear data respectively. Access to all the databases is now open, since the Data Bank abandoned the password restrictions two years ago on the EXFOR and EVA databases. In addition to these on-line services, the Data Bank also answers specific requests from customers. This concerns normally requests for very large datasets, which are too large for direct Internet download. The very large datasets are normally distributed on CD-ROM or DVD. Providing advice to nuclear data users is another important part of the nuclear data services.

EXFOR and CINDA

More than 250 new experiments have been entered by the Data Bank into the EXFOR database since the beginning of 2003. During the same period, close to 3 300 bibliographic references were entered into the CINDA database. Concerning the on-line nuclear data services to member countries, the Data Bank has noted a significant increase in the demand for experimental and evaluated data, since the abolition of password protections of the databases in July 2002. The NEA Data Bank will send out a questionnaire to find out the real need for continuing to produce a printed version of CINDA, considering that the CINDA database is available both on CD-ROM and on-line through the Web.

The new CINDA format, CINDA2001, has been adopted in a local test database. The NEA has developed a program to facilitate the transition of the remaining CINDA entries by using the EXFOR works connected to each CINDA entry. This work is in the final stage, awaiting an agreement on the details of the latest CINDA2001 format and dictionaries. It has been shown that of the about 139 000 blocks that exist in CINDA, over 76 % can be transferred to CINDA2001 quite easily. The majority of the remaining part does not contain any EXFOR related works and it is therefore difficult to add information in the new CINDA2001 format for those cases.

JANIS - 2

The first version of the nuclear data-plotting JANIS (Java Nuclear Information System) software was released in October 2001. A presentation of the software was made at the International Nuclear Data conference (ND-2001) at Tsukuba, Japan. This first version has proven to be very useful to a variety of users.

A new version of the JANIS (JANIS-2.0) software, developed at the Data Bank, was released in January 2004. This extended and improved version now includes bibliographical data (CINDA), experimental data (EXFOR) and evaluated data (EVA). The software has become very popular in the nuclear community and the stock of 1000 copies was distributed during the first two months after release. A new version (JANIS-2.1) was released in August 2004 and has been distributed among all registered JANIS users world-wide.

The latest updates to JANIS include additional data, such as activation data, remote connection with Servlet technology and improved computational possibilities (user-friendly equation string interface and an extension to allow combination of various types of data like cross sections and energy-angle distributions. JANIS 2.1 is distributed only on DVD to permit inclusion of the main databases on one single medium for local access. The software can also be downloaded directly from the NEA web server. See www.nea.fr/janis/ for further information.

The Joint Evaluated Fission and Fusion (JEFF) Project and JEFF-3.1

The JEFF-3.0 General Purpose Library, intended for use in Fission and Fusion neutronic applications, was released in April 2002. This library contains recommended nuclear data for use in neutron transport calculations. Evaluated nuclear data are given for 340 isotopes or elements and for five molecular/lattice structures in the case of thermal scattering data.

The development of the JEFF project is progressing in line with the revised mandate adopted by the Executive Group in June 2003. Studies performed at several participating institutes are providing feedback on the JEFF-3.0 library. Extensive processing and validation studies have been undertaken and have highlighted files that are in need of revisions. In parallel, evaluation work is progressing with the aim of providing new or revised evaluations for inclusion in the JEFF-3.1 library. It is planned to issue the JEFF-3.1 library in 2005.

Work on the JEFF-3.1 special purpose libraries on radioactive decay and fission yield data is well under way, with the goal of releasing already tested libraries in 2005, in conjunction with the release of the general purpose library.

Data from Integral Experiments

The Data Bank and the NEA Nuclear Science division work closely together on the preservation of data from integral experiments to assist users in having well documented data available for benchmark testing, especially in the context of the development of future nuclear energy systems. The Nuclear Science Committee (NSC) is responsible for the overall guidance of the project, whereas the Data Bank provides the infrastructure for the safeguarding of information in databases and for services to member countries.

The following databases were all updated with new material in 2004:

- 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)

The demand for integral nuclear data is high. More than 1 800 data sets were distributed in 2003, of which about 290 went to non-OECD countries, according to the cooperative agreement with the IAEA

Computer Program Services

The computer program services have during its 40 years of existence distributed in total about 67 000 programs upon request. In 2003, the Data Bank acquired 70 new or revised versions of computer codes. During the same period, the NEA distributed more than 1 900 programs, to users in member countries. The Data Bank had also issued five electronic newsletters and one new edition of the program abstracts on CD-ROM. Five training courses and two workshops, covering the most sought after computer codes, were organized in 2003.

Acquisition of new or revised versions of computer codes has been rather low in 2003, partly because of the interruption in the exchange of codes with the US during the negotiation of the renewal of the cooperation agreement between the US DOE and the NEA Data Bank. It is hoped that the new agreement will soon be in place.

The Thermochemical Data Base (TDB)

The Thermochemical Data Base (TDB) project is a co-operative effort between the NEA Data Bank and the NEA Radioactive Waste Management Committee to produce internationally recommended chemical thermodynamic data needed for the safety assessment of radioactive waste disposal systems.

An update to earlier reviews of thermochemical data for U, Np, Pu, Am, and Tc had been published in 2003. Reviews of data for Zirconium, Selenium, Nickel and selected organic compounds are underway and are expected to be published in late 2004 and 2005. A new phase of the project was started in 2003 covering evaluation of inorganic complexes and compounds of Thorium, Iron, Tin and Molybdenum.

In-house computer configuration

The overall security of the Data Bank's in-house computer system has been improved in relation to the Internet, by using separate firewall switches for the web and mail servers. Special filters have also been installed to identify spam email. An outline of the present configuration can be found in Figure 2.

Figure 1

Organisation chart of the professional posts in the
NEA Data Bank and Nuclear Science divisions

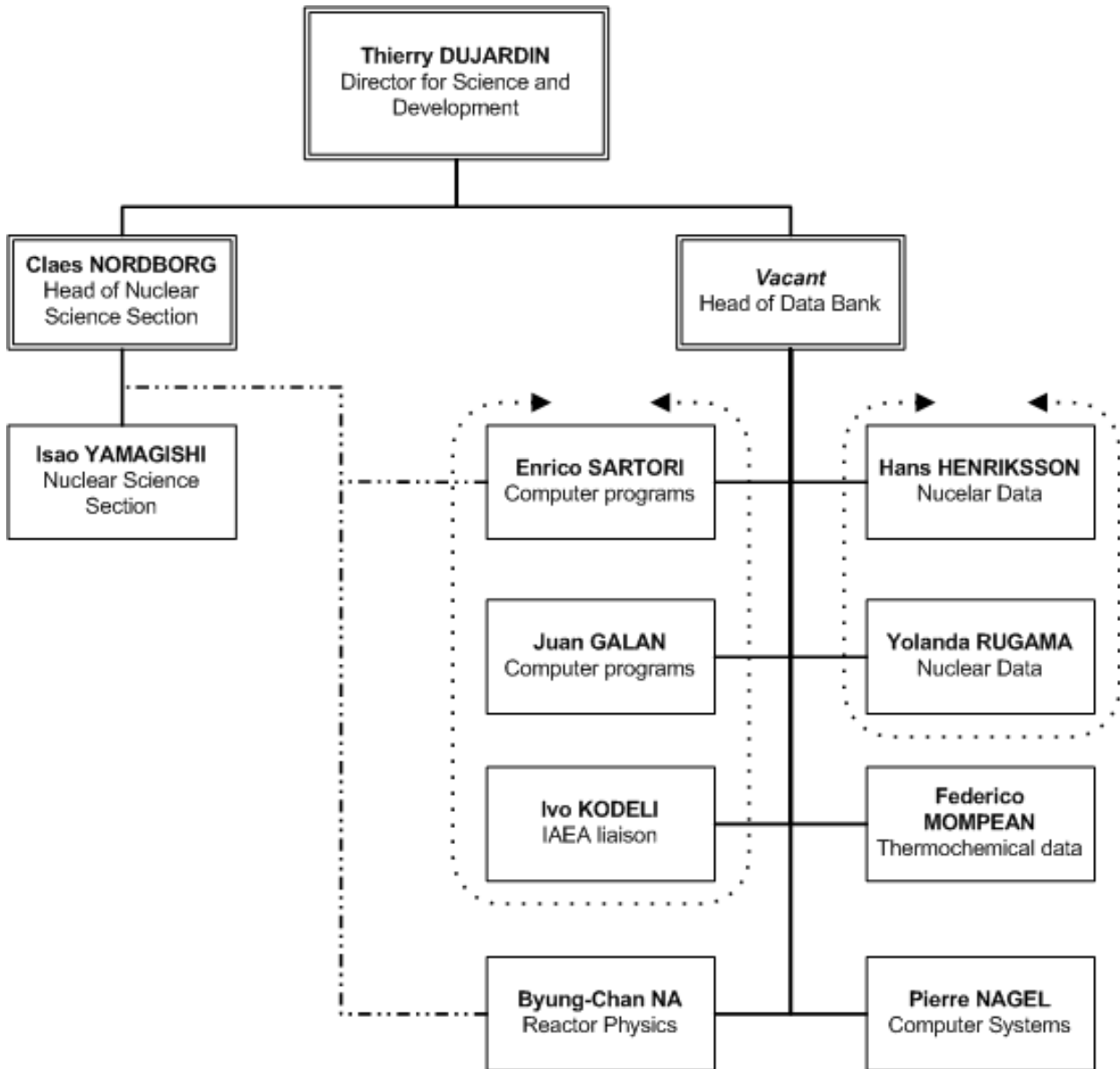


Figure 2

NEA Data Bank computer system configuration

