

NEA Data Bank

Progress Report 2009-2010

NRDC meeting, Sapporo, Japan

20 - 23 April 2010

1. General

The OECD NEA Data Bank provides scientist in member countries with reference materials in the field of nuclear energy applications. The services include the compilation, verification, and distribution of nuclear data, chemical thermodynamic data, integral benchmark experiments, as well as computer programs and associated application libraries. The Data Bank also develops and maintains databases and related administration/retrieval tools, including the JANIS display software. The Data Bank works in close co-operation with the Nuclear Science Section, especially in the field of computer codes and associated application libraries benchmarking, integral experiments, nuclear data evaluation co-operation, and knowledge preservation. These activities are in essence international and organized in close collaboration with other main national and international organisations.

2. Organisation

The Data Bank is governed by the Data Bank Executive Group of the Nuclear Science Committee (NSC), one of the seven standing technical committees working under the supervision of the Steering Committee for Nuclear Energy, which is the governing body of the NEA. The members of the NSC hold one meeting a year. The next meeting is scheduled on 9-11 June 2010.

The years 2009-2010 are especially challenging for the NEA Data Bank due to a large number of staff movements. During this period, five out of nine professional staff left the Data Bank (A. Hasegawa, E. Sartori, P. Nagel, H. Henriksson, Y. Rugama) and two of them have been replaced until now. Jim Gulliford joined the NEA in January 2010 at the position previously held by E. Sartori (in the Nuclear Science Section and Computer Program Services) and Emmeric Dupont took up H. Henriksson's duties in September 2009 (Nuclear Data Services). The IAEA liaison for the computer program services (I. Kodeli) also left in 2009 and has been replaced by Luigi Petrizzi in February 2010.

3. Nuclear Data Services

The Data Bank maintains large databases containing bibliographic (CINDA), experimental (EXFOR) and evaluated nuclear data (EVA) and makes them available online to scientists and engineers in member countries. Other important nuclear data related activities of the Data Bank are the coordination of the Joint Evaluated Fission and Fusion (JEFF) file project and the development of the JANIS software, designed to facilitate the visualisation, comparison, and manipulation of nuclear data.

3.1 Experimental data compilation

The Data Bank compilation of measured neutron and charged particle induced reaction data continues with the help of external consultants. The previous backlog pointed out by the EXFOR compilation control system in 2009 has been reduced and should stay under control before the release of the ND2010

proceedings. However, following special efforts to check the content of the database and to collect users' feedback, the number of entries to correct and retransmit is now growing at a significant rate.

Neutron induced data

In 2009, 64 new and 229 updated entries were compiled by the Data Bank for area 2. In the first months of 2010, the corresponding figures are 23 new and 18 revised entries. About half of the 2010 entries have been already submitted, the remaining being under verification at the Data Bank.

Charged particle induced data

In 2009, the Data Bank compiled 95 new entries and updated 41 others for area O. The corresponding figures for the first months of 2010 are 78 new and 22 corrected entries.

3.2 Bibliographic data compilation

Following the NRDC decision to stop the manual CINDA compilation from 2004 forward (cf. WP2003-26 and conclusion C19 of NRDC2003 meeting), voluntary compilation has continued at NEA with the help of a consultant, as well as the continued support of Japanese Nuclear Data Centres (JAEA and JCPRG). The last CINDA batch was sent to NDS in early 2009. The Data Bank has received additional contributions from JAEA (July 2009, January 2010) and JCPRG (April 2010), which still have to be processed and transmitted to NDS.

About future contribution to CINDA, the NEA secretariat has some concern about the prolonged stop of the manual compilation in areas 1, 3 and 4. The decision to stop or continue the CINDA compilation activities at the Data Bank will be taken at the June 2010 meeting of the Data Bank Executive Group of the Nuclear Science Committee.

3.3 The JEFF project

The documentation of the JEFF-3.1.1 radioactive decay data and fission yields sub-libraries was published in September 2009 as JEFF Report 20. This new library significantly improves the prediction of decay heat from fission products, especially for the individual gamma and beta decay heat components.

During the Autumn 2009 JEFF meeting, the release of a moderately revised version, JEFF-3.1.2, for fission applications was discussed, as well as the preparation of a more ambitious beta test file as a first step towards the next major release, JEFF-3.2.

3.4 The JANIS software

Updates to the latest version of JANIS have been made accessible through Java Web Start technology in December 2009 (JANIS-3.1). Work is under way to release a new version (JANIS-3.2) within a couple of months. This version will be also available on DVD, together with the main JANIS database. New features include:

- Automated comparison of experimental and evaluated data.
- More efficient file storage on the JANIS DVD: better compression, faster access and quicker copy to hard drive.
- Extended ENDF coverage: covariances (MF33).
- New NJOY formats supported: COVFILS (ERRORR) and BOXER (COVR) for correlation matrices.
- Isobaric and isotopic fission yields.

- Recent data libraries: JEFF-3.1.1, CENDL-3.1, EAF-2007, TENDL-2009, and new JENDL special purpose files (data for actinoids, high energies, alpha-induced and photonuclear reactions).
- Consistent NJOY processing of included evaluated libraries with additional derived data: thermal scattering on bound nuclei, gas production, KERMA, damage.

The JANIS Trans checker tool (www.nea.fr/janis/trans-checker/) periodically checks if new preliminary EXFOR TRANS files are uploaded to the NDS folder and provides compilers with an on-line log file containing error(s) and warning(s) to allow correction of format errors at an early stage. In addition, the Data Bank systematically sends comments on preliminary TRANS files.

The JANIS Trans checker tool has been released as a standalone version and is now part of the EXFOR-Editor developed at VNIIEF, Sarov (Russian Federation).

3.5 Web services to nuclear data users

The nuclear data services are provided through direct on-line access to CINDA, EXFOR, and EVA databases containing bibliographic, experimental, and evaluated nuclear data respectively. The EVA database contains over 40 evaluated data libraries and now includes the new JEFF-3.1.1 files. The statistics for these services are given in the following table.

	Number of Visits		
	2009	2008	2007
Computer Programs	210872	270826	249813
Abstracts	145010	202077	190604
Web Pages	64667	67648	58281
Program Retrievals	1195	1101	928
Nuclear Science	122055	112604	119993
Nuclear Data	49331	48653	53819
Janis (web+soft)	53803	48815	25268
Searches	15027	14786	22216
Eva Search	10190	9085	16755
EXFOR Search	2837	3550	3586
CINDA Search	2000	2151	1875
TDB	12011	15927	14087
Other Databases	4498	4962	4465
HPRL	1268	1750	1942
SFCOMPO	2136	2102	1739
RTFDB	1094	991	378

4. International nuclear data evaluation co-operation

The Data Bank co-operates closely with the NEA Nuclear Science Committee Working Party on international nuclear data Evaluation Co-operation (WPEC) and especially with two of the WPEC subgroups, namely subgroup 30 on “Improvement of Accessibility and Quality of the EXFOR Database” and subgroup C on the High Priority Request List (HPRL) for nuclear data.

A one year extension of subgroup 30 was approved at the June 2009 WPEC meeting. The final report is expected by mid-2010. The WPEC effort on establishing a High Priority Request List (HPRL) for nuclear data is a longer-term activity, where the Data Bank is assisting in maintaining the list’s website (www.nea.fr/dbdata/hprl/) currently containing 10 general and 25 high priority requests.

5. Other database projects maintained by the Data Bank

The Data Bank provides expertise and support to other NEA divisions, mainly assistance in setting up databases, developing retrieval tools and web interfaces. The NEA work areas concerned are nuclear science, radioactive waste management, radiological protection and nuclear safety. Examples of databases and tools developed in these areas are:

- Nuclear Science
 - **SFCOMPO**: Database of Spent Fuel Composition
 - **RTFDB**: Database of Research and Test Facilities
 - **DICE**: Database for the International Handbook of Evaluated Criticality Safety Benchmark Experiments
- Radioactive Waste Management:
 - **TDB**: Thermochemical Database Project
- Radiological protection:
 - **ISOE**: Information System on Occupational Exposure
- Nuclear Safety:
 - **OPDE**: OECD/NEA Piping Failure Data Exchange Project
 - **FIRE**: OECD/NEA Fire Incidents Records Exchange Project
 - **SCAP-SCC**: OECD/NEA Stress Corrosion Cracking and Cable Ageing Project
 - **CONEX**: Construction Experience Database