

Appendix 3: STATUS REPORTS OF THE DATA CENTRES

NATIONAL NUCLEAR DATA CENTER

Status Report to the IAEA Technical Meeting on the Network of Nuclear Reaction Data Centers 27-30 May 2002

General

In February 2002, Charlie Dunford stepped down after 10 plus outstanding years of service as the NNDC Head. Pavel Oblozinsky took over as the NNDC Head, while Charlie continues to serve as the NNDC Deputy Head.

Since the last meeting of the Nuclear Reaction Data Centers in May 2001, one staff member and one support staff member have retired; one staff member and one support staff member will be leaving within the next year. There are currently 10 FTE scientific/professional and three support staff. See Table 1 for list of visitors for this period. Also, attached is a list of NNDC visits to other centers (Table 2).

Computer Facilities

The main work of the NNDC continues to be performed on our Compaq Alpha Server 4100. The TCP/IP network software has been upgraded.

Two new Linux workstations were purchased; one is used to run the Empire nuclear model code, the other will be used as a Web database server. Work has begun on implementing a secure and workable computer environment that includes a web server located outside the firewall communicating with the database server inside the firewall through a secure channel.

The NNDC staff PC's have been upgraded to Windows 2000.

Bibliographies

The NSR compilation activity has continued. About 4,600 references have been entered in the past year.

The CINDA compilation activity continues with respect to those references associated with the experimental data compiled at the Center. In the period from June 2001 to May 2002, 4 CINDA transmissions were sent (Table 4) containing a total of 2091 records.

Experimental Nuclear Reaction Data

The NNDC continues to compile neutron and charged-particle reaction data produced in the U. S. and Canada. In the period from June 2001 through May 2002, 10 final neutron data

transmission tapes and 7 charged-particle transmission tapes were sent containing new and corrected entries; one preliminary transmission has been sent (see Table 3).

The LEXFOR Manual has been updated.

Evaluated Nuclear Reaction Data

NNDC continues to coordinate the work of the Cross Section Evaluation Working Group. ENDF/B-VI, Release 8, was distributed in September-October 2001. Version 6.13 of the ENDF Utility codes will be distributed within the next three months. The ENDF-201 Summary Documentation Appendix A, History of materials issued in ENDF/B-VI, has been updated and is available on the NNDC Web site.

The collaboration with LANL and IAEA Vienna on the development of a modular code for nuclear reaction data evaluations continues. The modular code Empire-II was extended by adding a module based on the exciton model code Degas, motivated by the need to handle direct-semidirect capture in the fast neutron energy region. A further major extension of the code Empire-II was the addition of a new module, the coupled-channels optical model code Ecis-95, with NNDC responsible for validation. These updates are included into recently released Empire-2.17 (April 2002).

The cooperation with the Korean Atomic Energy Research Institute (KAERI) on 19 fission product cross-section evaluations continued in the fast neutron energy range. Preliminary versions of all evaluations were completed, including 6 highly deformed nuclei where coupled-channels optical model is of importance.

Review of cross section evaluations of the 211 available fission products ($31 < Z < 68$) from the five evaluated data files (ENDF/B, JEF, JENDL, BROND and CENDL) has started as an international project under NEA WPEC (new Subgroup 21). The best evaluations will be recommended for inclusion into the future ENDF/B-VII library. So far, 20 nuclides were reviewed.

Nuclear Structure Data

NNDC continues to publish the *Nuclear Data Sheets*. As of April 2002, issues through Volume 95, #3 have been sent to Academic Press.

The experimental nuclear structure and decay data database (XUNDL) now contains more than 857 data sets, compared to 635 one year ago).

Nuclear Data Base Migration

During the last year, the NNDC has purchased and installed the Sybase Adaptive Server Enterprise (ASE) software on a Linux server. Relational versions of NSR, ENSDF, and several reaction databases are being developed and loaded on this platform. For web-based retrieval of the data, we will be using Java Server Pages (JSP) hosted by www2.bnl.gov, a laboratory maintained computer outside of the security firewall.

A second Linux server has been purchased and will be used for web application development, and to host a copy of the databases in "warm stand-by" mode for use in case of hardware failure on the main server.

During the coming year, administrative functions for CSISRS(EXFOR) and NSR will be transferred to the new system. This involves installation of new software and modification of legacy codes, where appropriate, to work with the relational database. Once this is accomplished, the VMS-based version of the database will function as a mirrored copy of the data, updated on a weekly basis. Similar steps will be taken for the other databases over the next two years.

Customer Services

The number of online retrievals continues to increase, primarily due to the availability of most databases on the Web. There are now about 950 customer accounts for the Online Service with more than 1,100 users. There are about 23,000 retrievals per month from the combined Online Service, Web site, and anonymous ftp (87% of retrievals are from Web). A chart of statistics for the combined online retrievals is attached.

CINDA, CSISRS, and NSR links to the APS Link Manager were extended back to include all of Physical Review from Series II on and all of Physical Review Letters and Reviews of Modern Physics. NSR now contains links to somewhat over 40,000 journal abstracts from 15 journals.

The printed version (January 2000) of Nuclear Wallet Cards was adopted by the DOE Security Office, Nuclear Materials Management and Safeguards System, as its official decay data standard.

A general update of all information pages that are under NNDC control (NNDC, CSEWG, and USNDP) was done. An International Nuclear Structure and Decay Data Network page was added. The NRDC Web page was updated and distributed to other centers for comment. The following have been added to the NNDC Web site:

1. Table of Magnetic Dipole Rotational Band (Balraj Singh);
2. History of the Origin of the Chemical Elements and Their Discoverers (Norm Holden);
3. WPEC SG21 Assessment of Neutron Cross-Section Evaluations for the Bulk of Fission Products, including graphical inter-comparison for all 211 nuclides;
4. Nuclear Reaction Model Codes containing ABAREX (R.D. Lawson and A.B. Smith, ANL), EMPIRE-II (M. Herman, IAEA, R. Capote, Univ. Sevilla, P. Oblozinsky, BNL, and A. Trkov, IAEA), and PRECO-2000 (C.K. Walker, TUNL);
5. Improved tabular representation of data from ENSDF, MIRD, and XUNDL;
6. Utility code QCALC, which calculates decay and reaction Q-values and reaction threshold energies;
7. CSISRS page upgrade to use the program ZVView (Viktor Zerkin, IAEA Nuclear Data Section) as a helper application.

Table 1.
Visitors to NNDC from June 2001 to May 2002

Visitor	Host	Duration	Topic
Viktor Zerkin, NDS	D. Winchell V. McLane	2 weeks	Nuclear reaction relational databases
Yong-Deok Lee, KAERI	P. Oblozinsky	1 month	Fission product nuclei evaluation
He Dong Choi, Seoul National Univ., Korea	S. Mughabghab	1 year	1-year sabbatical: capture gamma ray evaluation.
Viktor Zerkin, NDS	V. McLane	2 weeks	Nuclear Reaction Database, ZVView

Table 2.
Visits by NNDC Personnel to Other Centers

Staff Member	Host	Duration	Topic
Jagdish Tuli	IAEA/NDS	1 week	Evaluators' training workshop planning
Victoria McLane	IAEA/NDS	1 week	Nuclear reaction database design

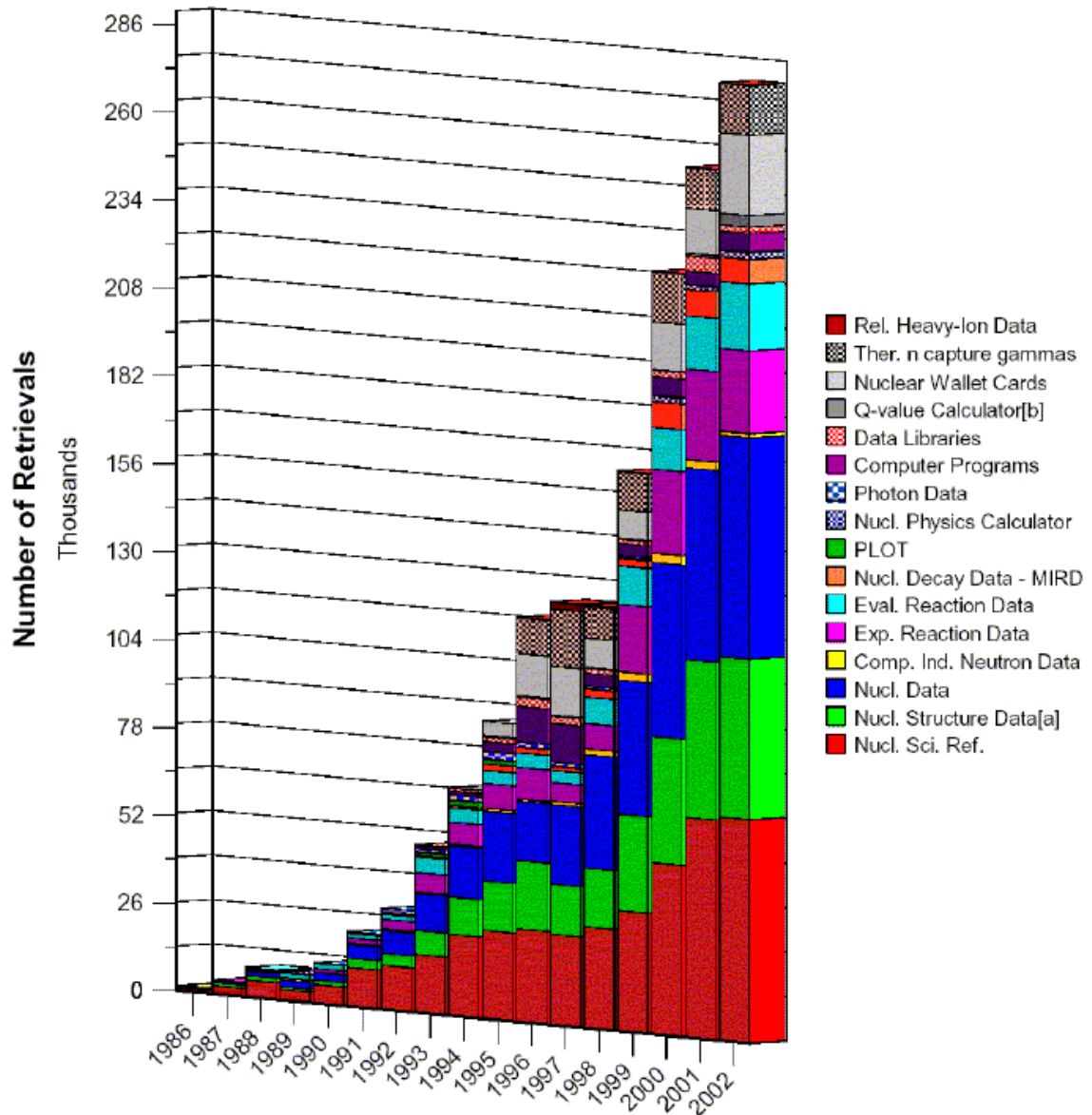
Table 3. NNDC Transmissions (June 2001 - May 2002)

Tape	Prelim sent	Final sent	# Data points	# Entries	# Subents	# New Subents
Area 1 (neutron)						
1295	20010711	20010815	50622	16	49	21
1296	20010726	20011023	78827	8	41	18
1297	20010913	20011023	76206	13	76	46
1298	20010913	20011024	119691	5	21	12
1299	20011024	20011127	112996	6	28	20
1300	20011130	20011227	37264	12	40	25
1301	20011204	20011227	52075	22	132	4
1302	20011204	20011227	66173	9	98	0
1303	20020102	20020213	52364	23	167	0
1304	20020213	20020402	47153	18	24	47
1305	20020409	20020515	2991	13	59	27
Area 1 Total			696362	145	735	220
Area C (charged particle)						
C050	20010518	20010628	10434	18	66	42
C051	20010628	20010815	50622	22	76	46
C052	20010726	20011024	40910	19	95	66
C053	20011025	20011127	13548	20	159	131
C054	20011218	20020214	5791	23	77	48
C055	20020214	20020402	7474	45	189	11
Area C Total			128779	147	662	344
Area T (charged particle - original compiled at other centers)						
T009	20010829	20020102	7681	21	118	95
T010	20020215	20020402	10512	16	78	59
Area T Total			18193	37	196	154
NNDC Total			843334	329	1593	718

Table 4. NNDC CINDA transmissions (June 2001 - May 2002)

	Transmission		Lines in database	Blocks in database
	Date	# lines		
NNDC				
167	20010726	541		
168	20011211	184		
169	20020205	1322		
170	20020401	44		
171	20020506	111		
NNDC Total		2202	131592	265189

*NNDC On-Line Data Service, Web, & FTP Retrievals 1986-2002**



* Extrapolated as of April 30, 2002.

^a Includes proton emitters (added to Web February 21, 2002).

^b Added to Web September 11, 2001.