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INDC INTERNATIONAL NUCLEAR DATA COMMITTEE

Co-ordination of the Nuclear Reaction Data Centers

Report on an IAEA Advisory Group Meeting

IAEA Headquarters, Vienna

11 - 15 May 1998

Edited by

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Abstract: This report summarizes the 1998 co-ordination meeting at the IAEA Headquarters in Vienna of the regional, national and specialized nuclear reaction data centers, convened by the IAEA at two-year intervals. The main topics are

- the international exchange of nuclear reaction data by means of the "EXFOR" system, and the further development of this system,
- the "CINDA" system as an international index and bibliography to neutron reaction data,
- the sharing of the workload for speedy and reliable nuclear data compilation and data center services,
- the exchange and documentation of evaluated data libraries in "ENDF" format,
- the rapid advances of online electronic information technologies,

with the goal of rendering data center services to data users in IAEA Member States by means of computer retrievals, online services and printed materials. The scope of data covers microscopic cross-sections and related parameters of nuclear reactions induced by neutrons, charged-particles and photons.

CONTENTS

The Network of Nuclear Reaction Data Centers

National, regional and specialized nuclear reaction data centers, coordinated by the International Atomic Energy Agency, cooperate in the compilation, exchange and dissemination of nuclear reaction data, in order to meet the requirements of nuclear data users in all countries. A brief summary of the data centers network is given below.

The nuclear reaction data centers:

NNDC	-	US National Nuclear Data Center, Brookhaven, USA
NEA-DB	-	OECD/NEA Nuclear Data Bank, Saclay, France
NDS	-	IAEA Nuclear Data Section
CJD	-	Centr Jadernykh Dannykh (= Nuclear Data Centre), Obninsk, Russia
CAJaD	-	Russian Nuclear Structure and Reaction Data Centre), Moscow, Russia
CDFE	-	Centr Dannykh Fotojadernykh Eksperimentov (= Centre for Photonuclear Experiments Data), Moscow, Russia
CNDC	-	China Nuclear Data Center, Beijing, China
ATOMKI	-	ATOMKI Charged-Particle Nuclear Reaction Data Group, Debrecen, Hungary
RIKEN	-	Nuclear Data Group, RIKEN Institute of Physical and Chemical Research, Wako-Shi, Japan
JCPRG	-	Japan Charged-Particle Nuclear Reaction Data Group, Hokkaido University, Sapporo, Japan
JAERI	-	Nuclear Data Center of the Japan Atomic Energy Research Institute, Tokai-Mura, Japan
CNPD	-	Center of Nuclear Physics Data, Russian Federal Nuclear Center, RFNC-VNIIEF, Sarov, Russia
UKRNDC		Ukrainian Nuclear Data Center, Institute for Nuclear Research, Kyiv, Ukraine
(KACHAPAG)	-	(Karlsruhe Charged Particle Group, Karlsruhe, Germany. Discontinued in 1982, its responsibilities were taken over by CAJaD)

1. Neutron Nuclear Data

1.a Bibliography and Data Index CINDA:
Input prepared by NNDC, NEA-DB, NDS, CJD, JAERI
Handbooks published by IAEA
Online services by NNDC, NEA-DB and NDS

1.b Experimental data exchanged in EXFOR format:
Input prepared by NNDC, NEA-DB, NDS, CJD, CNDC
Online services by NNDC, NEA-DB and NDS

1.c Data Handbooks based on EXFOR
published by NNDC (last issue in 1984)

1.d Evaluated data exchanged in ENDF format:
NNDC, NEA-DB, NDS, CJD, CNDC, JAERI and others. Main data libraries:

BROND-2 (Russia)	IRDF-90, Rev. 92(IAEA)
CENDL-2 (China)	JEF-2 (NEA)
ENDF/B-6 (USA)	JENDL-3 (Japan)

Online services by NNDC, NEA-DB and NDS

1.e Computer retrieval services upon request of customers:
NNDC, NEA-DB, NDS, CJD, CNDC

1.f International data evaluation cooperation coordinated by NEA-DB

2. Charged Particle Nuclear Data (including heavy-ion reaction data)

2.a Bibliography NSR published by NNDC
Online services by NNDC, NEA-DB and NDS

2.b Numerical data exchanged in EXFOR format:
Input prepared by CAJaD, RIKEN, CNDC, ATOMKI (from 1992), NDS, NNDC, JCPRG, NEA-DB
Online services by NNDC, NEA-DB and NDS
Coordination of compilation: CAJaD

2.c Computer retrieval services upon request of customers:
NNDC, NEA-DB, NDS, CAJaD, CNDC

3. Photonuclear Data

3.a Numerical data exchanged in EXFOR format:
Input prepared by CDFE, occasional contributions from NNDC, NDS
Online services by NNDC, NEA-DB, NDS and CDFE

3.b Bibiliography published by CDFE and JAERI

3.c Computer retrieval services upon request of customers:
NNDC, NEA-DB, NDS, CDFE

Past NRDC Meetings

Vienna, 11-15 May 1998	Center Heads + Tech. = 14th NRDC Meeting	INDC(NDS)-383
Vienna, 26-28 May 1997	Technical	INDC(NDS)-374
Brookhaven, 3-7 June 1996	Center Heads + Tech. = 13th NRDC Meeting	INDC(NDS)-360
Vienna, 2-4 May 1995	Technical	INDC(NDS)-343
Paris, 25-27 April 1994	Center Heads + Tech. = 12th NRDC Meeting	INDC(NDS)-308
Vienna, 1-3 Sept 1992	Technical	INDC(NDS)-279
Obninsk, 7-11 Oct 1991	Center Heads + Tech. = 11th NRDC Meeting	INDC(NDS)-262
Vienna, 13-15 Nov 1990	Technical	Memo CP-D/210
Vienna, 2-4 Oct 1989	Center Heads + Tech. = 10th NRDC Meeting	Memo CP-D/200
Vienna, 4-6 Oct 1988	Technical	Memo CP-D/190
Brookhaven, 27-29 Oct 1987	Center Heads + Tech. = 9th NRDC Meeting	INDC(NDS)-204
Vienna, 7-9 Oct 1986	Technical	Memo CP-D/159
Saclay, 9-11 Oct 1985	Center Heads + Tech. = 8th NRDC Meeting	INDC(NDS)-178
Vienna, 19-21 Sept 1984	Technical	Memo CP-D/131
Obninsk+ Moscow, 17-21 Oct 1983	7th NRDC Meeting	INDC(NDS)-154
Vienna, 3-7 May 1982	6th NRDC Meeting	INDC(NDS)-141
Brookhaven, 29.9 - 2.10.1980	5th NRDC Meeting	INDC(NDS)-125
Karlsruhe, 8-13 Oct 1979	4th NRDC Meeting	INDC(NDS)-110
Paris, 19-23 June 1978	3rd NRDC Meeting	NEA-NRDC-3 = INDC(NDS)-99
Kiev, 11-16 April 1977	2nd NRDC Meeting = 3rd CPND + 13th 4-C	INDC(NDS)-90
Vienna, 28-30 April 1976	2nd CPND Meeting	INDC(NDS)-77
Vienna, 26-27 April 1976	12th 4C-Meeting	INDC(NDS)-78
Vienna, 8-12 Sept 1975	CPND Meeting	INDC(NDS)-69+71
Brookhaven, 10-14 March 1975	11th 4C-Meeting	INDC(NDS)-68
Paris, 6-10 May 1974	10th 4C Meeting	INDC(NDS)-58
Vienna, 24-26 April 1974	CPND + PhotoND	INDC(NDS)-59+61
Moscow/Obninsk, 4-8 June 1973	9th 4C Meeting	INDC(NDS)-54
Vienna, 16-20 Oct 1972	8th 4C Meeting	INDC(NDS)-51
Brookhaven, 25-29 Oct 1971	7th 4C Meeting	INDC(NDS)-41
Paris, 5-9 Oct 1970	6th 4C Meeting	INDC(NDS)-28
Moscow, 17-21 Nov 1969	5th 4C Meeting	INDC(NDS)-16

List of Acronyms

ATOMKI	Nuclear Research Institute, Debrecen, Hungary
BNL	Brookhaven National Laboratory, Upton, N.Y., USA
BROND-2	Russian evaluated neutron reaction data library, version 2
CAJaD	Center for Nuclear Structure and Reaction Data, Kurchatov Institute, Moscow, Russia
CDFE	Centr Dannykh Fotojad. Eksp., Moscow State University, Russia
CENDL-2	Chinese evaluated neutron reaction data library, version 2
CENPL	Chinese evaluated nuclear parameter library
CINDA	A specialized bibliography and data index on neutron nuclear data operated jointly by NNDC, NEA-DB, NDS and CJD
CJD	Russian Nuclear Data Center at F.E.I., Obninsk, Russia
CNDC	Chinese Nuclear Data Center, Beijing, China
CNPD	Center of Nuclear Physics Data at RFNC-VNIIEF, Sarov, Russia
CP...	Numbering code for memos exchanged among the NRDC
CPND	Charged-particle nuclear reaction data
CRP	Coordinated Research Programme of the IAEA Nuclear Data Section
CSEWG	US Cross-Section Evaluation Working Group
CSISRS	Cross-Section Information Storage and Retrieval System, the EXFOR-compatible internal system of NNDC
EFF	European evaluated nuclear data file for fusion applications
ENDF-6	International format for evaluated data exchange, version 6
ENDF/B-6	US Evaluated Nuclear Data File, version 6
ENSDF	Evaluated Nuclear Structure Data File
EXFOR	Format for the international exchange of nuclear reaction data
FEI	Fiziko-Energeticheskij Institut, Obninsk, Russia
FENDL	Evaluated nuclear data file for fusion applications, developed by IAEA-NDS
IAEA	International Atomic Energy Agency
IFRC	International Fusion Research Council
INDC	International Nuclear Data Committee
INIS	International Nuclear Information System, a bibliographic system
IRDF	The International Reactor Dosimetry File, maintained by the IAEA-NDS

ITER	International Thermonuclear Experimental Reactor
JAERI	Japan Atomic Energy Research Institute
JCPRG	Japan Charged-Particle Nuclear Reaction Data Group, Sapporo, Japan (previously Study Group for Information Processing)
JEF	The Joint Evaluated File of neutron data, a collaboration of European NEA member countries and Japan
JENDL-3	Japanese Evaluated Nuclear Data Library, version 3
KINR	Kiev Institute of Nuclear Research
LEXFOR	Part of the EXFOR manual containing physics information for compilers
NDS	IAEA Nuclear Data Section, Vienna, Austria
NDS	The journal Nuclear Data Sheets
NEA	Nuclear Energy Agency of the OECD, Paris, France
NEA-DB	NEA Data Bank, Paris, France
NEANDC	NEA Nuclear Data Committee
NND	Neutron Nuclear Data
NNDC	National Nuclear Data Center, Brookhaven National Laboratory, USA
NNDEN	Neutron Nuclear Data Evaluation Newsletter
NRDC	The Nuclear Reaction Data Centers
NRDF	Japanese Nuclear Reaction Data File
NSDD	Nuclear structure and decay data
NSC	Nuclear Science Committee of the NEA
NSR	Nuclear structure references, a bibliographic system
OECD	Organization for Economic Cooperation and Development, Paris, France
PC	Personal Computer
PhND	Photonuclear data
RI	Radievyj Institut, Sankt Peterburg, Russia
RIKEN	Nuclear Data Group, RIKEN Inst. of Phys, and Chem. Res., Wako-Shi, Saitama, Japan
TRANS	Name of transmission tapes for data exchange in the EXFOR system
UKRNDC	Ukrainian Nuclear Data Center at KINR, Kyiv, Ukraine
USDOE	U.S. Department of Energy
VNIIEF	Russian Federal Nuclear Center, Sarov, Russia
WRENDA	World Request List for Nuclear Data
4C...	Numbering code of memos exchanged among the four Neutron Data Centers

Meeting Summary

1. Introduction

The IAEA Advisory Group Meeting on the Coordination of the Nuclear Reaction Data Centers (NRDC) was held in the IAEA Headquarters Vienna on 11-15 May 1998. Twenty-one participants represented 13 Data Centres from China, Hungary, Japan, Russia, Ukraine, USA, NEA and IAEA. Practically all NDS staff took part or contributed to the meeting.

The meeting was one in a series of biennial Data Centres Coordination Meetings with the main task to evaluate the results of the data centres cooperation in maintaining and updating of the common nuclear databases and providing full-scale and user friendly access to these databases, to outline the priorities for future work taking into account the interest of each centre and to consider the technical matters of data compilation, exchange and dissemination.

2. Brief Minutes

The meeting was opened by *D.W. Muir* (IAEA-NDS). *R.M. Iyer*, Director of the Division of Physical and Chemical Sciences welcomed the participants on behalf of the IAEA. In his address, *Mr. Iyer* emphasized that the user service has to be considered as a first priority in the nuclear data centres work. A wide use of new computer technologies will simplify substantially the user's access to the nuclear databases.

C.L. Dunford (NNDC) and *C. Nordborg* (OECD/NEA) were elected as co-chairmen of the meeting. The meeting agenda and schedule were adopted with minor changes. The status reports of the centres were presented by the Centre Heads. New directions in the centres work were discussed.

C.L. Dunford informed participants about the process of reorganizing the activities of the US Nuclear Data Program. The main priority of the programme at present is maintaining and updating the nuclear databases with more attention to the integrity and reliability of the nuclear data. The compilation and evaluation activity will be focused on data obtained or needed for fundamental research (astrophysics, exotic nuclei, high-spin and super-deformed states). User-friendly modern and efficient access to the databases (including archives) is essential.

C. Nordborg (OECD/NEA) informed participants about the continuing efforts of development of databases on PC CD-ROM platform. This will include evaluated data library JEFF-3.0 and experimental data library EXFOR integrated into one package and CINDA. Data for nuclear safety and nuclear waste transmutation programmes have the highest priority for compilation, evaluation and dissemination.

V. Pronyaev (IAEA-NDS) informed participants that the NDS will continue to work on providing the full-scale services to the users having different levels of access to the nuclear databases through computer networks. NDS is going to put more effort in the programming

of the online Web access to the databases and offline access to all the major databases on PC platforms.

A quick review of the general actions from the last Technical Meeting was done. A few new general actions were proposed and included in the list.

Customer services were discussed.

V. McLane (NNDC) informed that NNDC does not have the capability to produce a CD-ROM directly from its computer. NNDC will create a CD-ROM for customer only if there is no alternate transmission method. NNDC will continue to distribute CD-ROMs produced by others. The use of WindowsNT Server for internet access to the databases is being investigated. New BNL-325 online electronic book with plots of evaluated nuclear cross sections in comparison with the experimental data from EXFOR library will be published. Very recently WWW overtook Telnet in the retrieval statistics.

C. Nordborg informed participants that most of the NEA-DB databases are in the Oracle DB with online access through Web with registration of users. Telnet access is available only for nuclear structure databases supplied by NNDC. The problems of consistency of updating of common databases were discussed, and actions to keep this consistency were formulated. The means of communication with users to get feedback from them on online service performance were discussed.

V. Pronyaev presented the NDS point of view on elements and definitions of user's retrieval statistics. Different media and forms of access to the databases are used at present to fulfill the user's request. It was decided to develop common standards on reporting of statistics of retrievals.

The general situation with manpower in the cooperating data centres is stable, with a relatively small decline mainly due to reduction of typing work in a computer era.

A new contractual system which is now under discussion in the NEA-DB will probably bring more stability.

It is expected that more programme development work will be done in the NDS in future.

A few proposals on tighter cooperation in the common programme development work were considered. It will include regular exchange of information between the centres at the stages of planning, designing and writing of the programmes supporting common databases. The centres agreed that the distribution of the work between centres in database programme developing fields is determined mainly by the interests of each center. But tighter cooperation in this field and use of new programming tools may lead to the creation of common, platform independent, computer programmes for maintaining and updating of nuclear databases and providing user's retrievals.

A few new computer programme packages, data files, libraries and databases which have relation to the common database programme development were presented and distributed among participants.

CD-CINDA (CD-ROM database on WindowsNT PC platform programmed in Oracle/SQL*Plus) was demonstrated by *M. Kellet* (NEA-DB). A test version with 20 Mb source data file had shown good performance. Work on decreasing of the access time will be continued.

CD-ROM version of JENDL-3.2 Plots & Data prepared at JAERI was distributed.

EXFOR PC CD-ROM (Hard Disk) database on the WindowsNT platform programmed by J. Vamosi in CodeBase/C was demonstrated by *V. Pronyaev* (IAEA-NDS). The January 1998 version was distributed to meeting participants for test and comments.

The outcome of Technical Sessions which considered mainly technical problems of maintaining and updating the CINDA and EXFOR databases is summarized in the List of Actions and Conclusions of the meeting.

The problems of discrepancies between different evaluated reaction cross section data and use of the cross section shape systematics for threshold reactions were raised by *V. Manokhin* (CJD). The conclusion was to find the most appropriate form to collect and present this information (possibly in a discrepancies file).
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V. McLane (NNDC) informed participants on the development of the Astrophysical Database in the U.S. and NNDC participation in this project.

The general problem of computer network performance for online access to the centres data bases were discussed. *V. Pronyaev* (NDS) presented an analysis of the NDS database server performance, based on real time transfer of files from NDS Web server to different users and a WAN monitoring system based on ping-ing several remote hosts and accumulating statistics. It was shown that after upgrading of the shared line connecting IAEA with a WAN (to 1 Mbit/sec band width) the own user's connection with a WAN limits the transfer rate for many of our users. But the fast growth of traffic through the IAEA gates may lead again to the saturation of the line.

C.L. Dunford informed participants about an approach maintaining and updating of the evaluated nuclear structure data library. ENSDF will continue to be a main source for preparing of specialized libraries on nuclear structure and decay data for most applications. The mechanisms for more frequent updates of some components of the library without revision of all data for a full mass-chain are under discussion at the meetings of the Nuclear Structure and Decay Data Network.

It was agreed that the next Technical Meeting on the Coordination of the Nuclear Reaction Data Centres will be held in Vienna in the May 1999 and the next AGM on the Coordination of the NRDC can be held in June 2000 in Obninsk (Russia), still be coordinated with host laboratory. The national and specialized centres can also be considered as host centres for these meetings in the future.

3. Meeting Conclusions, Actions and Recommendations

3.1 Priorities in the NRDC network coordination

Recognizing that international, national and specialized data centres have their own tasks, priorities and current involvement, and that they use different hardware platforms and computer software, the meeting came to the conclusion that the following priorities in the centres cooperative work can be formulated at present:

1. To continue the maintenance of the existing nuclear databases, their updating through the input of new data, improvement of existing information.

2. To improve customer service through the continuing development of online access to nuclear databases and related information using the increased opportunities of the World Wide Web.

3. To continue the development of databases resident on the user's PC and their updating from one of the Nuclear Reaction Data Centers via computer networks.

4. To improve efficiency in computer programme development by timely exchange of information on plans and progress among the Centers.

3.2 List of Conclusions, Actions and Recommendations

3.2.1 Conclusions

Conclusions on the EXFOR/CINDA dictionary system

Because of the increasing number of measurements involving radioactive targets and beams and reaction products far from stability, the usefulness of nuclide checking using the flags in dictionary 27, needing all-too-frequent dictionary updates, was discussed.

C1 The CINDA flag in dictionary 27 is dropped. The flag for SF1 can be used instead.

C2 Dict.27 flags 13 and 14 are kept until a specific proposal is submitted.(compare Action A21 below)

General conclusions on EXFOR

C3 The proposal of CP-C/239 (on Dates for the Year 2000) is modified. It is provisionally adopted to introduce 4-digit years and 8-digit date fields, with padding by zeros if month and/or day are not known, throughout EXFOR; where only the year is foreseen (EXP-YEAR), 4 digits will be given.

C4 All TRANS tapes transmitted after 1 August 1998 must have all dates in the new format. (See also Actions A51 through A53 below)

C5 The "provisional" tapes 1267, C022, C025 (containing new polarization quantities) are now considered official transmissions.

C6 Retrieving EXFOR by reference date: such a feature has very low priority for NNDC, therefore need will be addressed by NDS. (The "cut-off-date" offered in the NNDC and NDS online services, though sometimes misinterpreted in this way, does not offer this capability.)

Conclusions on proposed new dictionary codes

C7 It is agreed to keep the code 'SS' both in dict.31 and 34. (Some concern had been expressed that using the same code, SS, in two different contexts but both for polarization quantities, might create confusion among compilers and users. However, since this reflects the abbreviations commonly used in the literature, the above decision was taken.)

C8 JET and MASSP are approved for Dict.21

C9 Data units B*KEV are approved for Dict.25. (These units had been rejected earlier because of equivalence with MB*MEV. Since other cases of equivalent units exist in the dictionary, and generally the units as given by the authors should be used wherever possible, the above decision was taken.)

C10 PAR,COR,G/N is not approved. Instead, PAR,DA/CRL,G/N is introduced (Dictionary 36). (Compare Action A68 below)

C11 D-N14 is approved for Dict.19

C12 MSK/A is agreed for the journal 'Memoirs of the Faculty of Science, Kyoto Univ., Series A'. (Dictionary 5)

Conclusions on CINDA

C13 The participants agree that general theoretical papers are covered in NSR and that coverage in CINDA should be restricted to those theoretical papers associated with producing data files.

C14 The text pages of the CINDA supplement book are reduced by omitting the handbook section (which was increasingly difficult to keep up-to-date) and restricting the annex to the reference and lab tables.

3.2.2 Actions and Recommendations

General Actions

A1	NDS	Investigate whether KAERI is interested in joining the network and, if so, invite them to submit an entry to the Network document.
A2	NDS	Update the Network document to include the Sarov and Ukraine centres and any corrections to the other centres' entries.
A3	NDS	Send (now and in future) CINDA DBMS backups to VNIIEF, and the same for ENDF (DBMS backup and Text libraries).
A4	CJD	Forward all future ENSDF, NSR and NUDAT update tapes (received from NNDC through NDS) to VNIIEF.
A5	Pronyaev	Submit proposal on standards for retrieval statistics.
A6	All	Comment on this proposal within one month after the meeting.
A7	NDS	Distribute final Standard on Reporting Nuclear Data Retrieval Statistics within 2 months after the meeting.
A8	All	Comment on implementation of this Standard at your centre within one month after receiving it.
A9	Dunford	Provide NDS with text for NUDAT document.
A10	NDS	Publish this as IAEA-NDS report.
A11	NDS	Update the CP memo distribution to include the Ukrainian Nuclear Data Center (UKRNDC) and the corrections as received at this meeting.
A12	NDS	Make sure that all NDS documents have the correct full name of CNDC (now: CHINA NUCLEAR DATA CENTER).
A13	NDS	Plan next technical meeting for May 1999 (3 days) in Vienna and propose specific date in a CP memo.
A14	Recomm.	Rotation of meeting sites beyond the four neutron centers is recommended for future meetings.

Actions and Recommendations on Online Services and WWW

A15	Recomm.	All centres maintaining Web pages are recommended to introduce a complaint/suggestion button for users to give feedback on retrieval problems or inconveniences.

A16	Recomm.	Include the Citation Guidelines in Web and Telnet services.
A17	NDS	Put IAEA-NDS-0 (index of IAEA-NDS documents) on the Web with high priority and inform centers by e-mail when completed.

Actions on the EXFOR/CINDA Dictionary System

A18	McLane	Send new dictionaries to NDS including all flags and numerical equivalents.
A19	Schwerer	Check old Actions 7-13 (of 1997 meeting) after receiving the new dictionaries and programs from NNDC.
A20	NDS	Keep the 'particle considered' (SF7) entries in dictionary 36 until all centers can use the dictionary wildcards.*)
A21	McLane	Submit proposal for modification of Dict.27 use flags before the next meeting.
A22	Schwerer	When adding new dictionary codes, take care of flags and numerical equivalents in consultation with V. McLane.

Actions on CINDA

A23	Neutron centers and all interested	Within one month after the meeting, send feedback on the proposal for CINDA 2000 to V. McLane (see memo CP-C/234 of May 1997, also reproduced in the 1997 meeting report).
A24	NNDC	Propose implementation plan and schedule for CINDA 2000.
A25	Lammer	Inform NNDC within one month on any CINDA programs unique to NDS.
A26	NNDC	Provide NEA-DB with translation capability from CINDA to CINDA-2000 format.
A27	NNDC, NEA-DB	Complete the CINDA 2000 programs within a year after this meeting.
A28	Lammer, Pronyaev	Investigate which specific theoretical quantities should be added for CINDA-2000.
A29	Lammer	Send introductory pages of CINDA (if possible in electronic form) to NEA-DB for inclusion in CD-CINDA.

*) **Note**: These wildcards will avoid entering many new quantities in dict. 36 differing only in the 'particle considered' field (REACTION SF7). See conclusion 12 of 1997 Technical Meeting.

A30	NEA-DB	Send test version of CD-CINDA to other centres.
A31	All	Send feedback on the test version of CD-CINDA to NEA-DB within one month after receiving it and inform NEA-DB of the number of final copies needed.
A32	NEA-DB	Distribute final version of CD-CINDA to centres.
A33	Lammer	(old #69 continuing) Distribute the list of "who is covering what for CINDA" to other centers.
A34	Neutron centers	Give feedback on the CINDA coverage list (WP11) to Lammer.
A35	Dunford	Introduce a COPY option for CINDUP.
A36	NEA-DB	(old #85 modified) Send ORACLE design specification developed at NEA for CINDA and EXFOR to NNDC, NDS, CJD and CDFE.
A37	McLane	Submit the necessary changes for the CINDA field in Dictionary 27 to use the old CINDA codes for elements > 100 as long as this is needed.
A38	Kellett, CJD	Specify to NDS the number of copies needed for CINDA-99 by 1 October 1998.
A39	CJD	Send addresses of recipients of CINDA books to NDS (so that part of the books can be mailed directly from Vienna).

General Actions on EXFOR

A40	McLane	Make the EXFOR Basics Manual available online in PostScript.
A41	All	(Old #14 continuing) Send comments and corrections on the "EXFOR Basics" manual to McLane.
A42	McLane	(Old #15 modified) Add example entries (or one brief complete entry) to the "EXFOR Basics" manual.
A43	McLane	Add a one-page dictionary to Basics Manual, listing the most commonly used quantities.
A44	McLane	Complete Exfor Manual update and poste it for the other centres.
A45	McLane	Send EXFOR check program and DANIEL dictionaries to NEA-DB.
A46	NNDC	Send all EXFOR programs and the complete library to CNDC.

A47	NDS	From now on send incremental EXFOR updates (TRANS) to CNDC.
A48	McLane	(Old #24 continuing) Make a benchmark test of TEST-EXF.
A49	McLane	(Old #44 modified) If time becomes available, investigate the possibility of including separate index lines for the ELEM/MASS formalism in the indexing program.
A50	McLane	Correct EXFOR processing codes to properly treat cases where KT is given in place of an average incident particle energy (factor 3/2).
A51	McLane	Send the revised EXFOR retrieval code (introducing 4-digit years) to NDS.
A52	NDS	Retrieve the complete EXFOR library using NNDC's new retrieval code and distribute on CD-ROM so that all centers will have the complete library with 4-digit years. Inform the centers by e-mail which were the latest TRANS files included. The CD-ROM will contain separate files for each area (1,2,3,4,A,B,C, etc.).
A53	All	Send all TRANS tapes to be included on this CD-ROM to NDS before 1 October 1998.
A54	McLane	Distribute the new EXFOR and dictionary programs by 1 August 1998.
A55	All	Correct entries requested in CP-D/297 (or send information on which TRANS correction was transmitted if done already), or explanation in case of disagreement with memo CP-D/297.
A56	McLane	Retrieve all occurrences of He-5 (and other illegal reactions) in EXFOR and request retransmission.

<u>Actions on EXFOR coding rules and dictionary codes</u>

A57	McLane, Varlamov	(Old #19 continuing) Provide LEXFOR entry for energy spectra of particle pairs and PAR,SIG,P/T.
A58	McLane	Update Lexfor page on thick target yields taking into account the conclusion (#29) of the 1997 NRDC meeting (Memos CP-C/224 and CP-C/233 with the modification that "thick target yield per unit time" is coded TTY,,DT instead of TTT).
A59	Lammer	(Old #37 continuing) Check existing codes for fission quantities for possible overlap with the case of memo CP-C/209 and existing EXFOR entries for necessary revisions.

A60	Lammer	(Old #38 modified) Reply to intems 1 and 2 of memo 4C-4/57 (codes PR,NU,FF and PRE,FY/DE for dictionary 36) and propose solutions for the remaining questions on entry 40420 in a CP memo.
A61	CJD, Lammer	(Old #39 modified) Agree on modifications for entry 40420 and retransmit
A62	Lammer	(Old #49 continuing) Revise the LEXFOR entry on fission-product yields and submit a proposal on the coding of mass yields as a CP memo with information on corresponding measurements.
A63	CAJaD	Submit proposal on redundant coding in EXFOR for discussion at the 1999 meeting.
A64	McLane	Provide expansion for lab codes 1USATTU, 1USACBF.
A65	McLane	Clarify questions on dictionary 27 changes raised in memo CP-D/291
A66	McLane	Submit LEXFOR entry on use of RCL and RSD in SF7.
A67	Chukreev	Provide examples supporting the proposal in memo CP-A/79 (item 1) (see also related memo CP-A/89) for decision at the next meeting.
A68	NEA-DB	Retransmit subentry 20220.007 using the new REACTION introduced at this meeting (PAR,DA/CRL,G/N) and check whether correction of DATA headings is necessary.
A69	McLane	Provide more information on the proposal containing 'PN' (prompt neutrons) in REACTION SF7 (memo CP-C/235).
A70	NEA-DB	Check the incorrect report code mentioned in 4C-3/389 and retransmit entry 22357.
A71	McLane	Propose clarification of the definiton of gamma-ray abundance in LEXFOR.
A72	Maev	Submit proposal (including Lexfor entry) for self-indication ratios.
A73	McLane	Check code AXX for REACTION SF8 (submit dictionary addition or retransmit entry C0138).
A74	McLane	Change LEXFOR to allow both units PC/FIS and NO-DIM for total delayed nu-bar.

Actions on Neutron Data

A75	CJD	Complete conversion of EXFOR 8000 series by end of 1998.
A76	NEA-DB	Look into status of EXFOR 6000 series.

Actions on CPND

A77	NDS	(Old #59 modified) On the comparison of the Landolt-Bornstein CPND compilation with EXFOR: include this topic on the agenda of the 1999 NRDC meeting (comparison to be done once the CPND bibliographic data are included in CINDA-2000)
A78	CAJaD	Investigate whether the Landolt-Bornstein CPND compilation can be made available to the CPND centers in computerized form.
A79	CAJaD	(old #61 modified) Complete correction of EXFOR area B file by the time of the 1999 NRDC meeting.
A80	NDS	(old #62 continuing) Distribute the corrected area B file after the corrections by CAJaD are completed.
A81	CPND centers	Go through Chukreev's list of duplications (WP 12) and agree with the respective other centres on which entry to delete.

Actions on Photonuclear Data

A82	Varlamov	(replacing old #52) Check main reference and EXFOR coding of the entry originally transmitted as 22242 (containing photonuclear data and possibly a new polarization quantity).
A83	Varlamov	The photonuclear bibliography and other CDFE files are now available from the CDFE web site; CDFE to investigate including search options in the bibliography.

Actions on Evaluated Data Libraries

A84	Manokhin	Send Russian Dosimetry File (RRDF-96) to NDS.
A85	All centers concerned	(Old #75 continuing) Compile and maintain a list of known errors in the evaluated libraries for which they are responsible and make this list available to the users of the online service.
A86	All centers concerned	(Old #76 modified) Document the parameters being used for producing pointwise cross sections including the code name, version number and input deck.
A87	Recomm. All	(Old #77 continuing) All centers responsible for evaluated data libraries should try to make the documentation available online.

IAEA Advisory Group Meeting
on the Coordination of the Nuclear Reaction Data Centres
11-15 May 1998
IAEA Headquarters, Vienna, Austria

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IAEA Advisory Group Meeting
on the Coordination of the Nuclear Reaction Data Centres
11-15 May 1998

IAEA Headquarters, Vienna, Austria

AGENDA

P Plenary session, chaired by Meeting Chairman
H Center Heads session, chaired by Centre Heads session Chairman
T Technical session, chaired by Technical session Chairman

Meeting Room A07-42, unless shown otherwise

Monday, May 11, 9:30 - 18:00

P.1. Opening, electon of chairman
P.2. Adoption of the Agenda
P.3. Brief status reports of the centres (reports requested in writing)
P.4. Centre programmes, priorities and involvements
P.5. Quick review of the General Actions of the last Technical NRDC Meeting (INDC(NDS)-374) and the last Advisory Group Meeting (INDC(NDS)-360)

18:00-20:00 NDS Welcome Reception, *Room A23-40* (NDS Library)

Tuesday, May 12: 8:30 - 12:30

P.6. Customer services
- conventional services
- offline (local PC platform) database services
- electronic services
  - interactive online systems
  - FTP
  - WWW

P.7. Retrieval statistics

14:00 - 16:00 (Parallel Session)

H.1. General situation, manpower
H.2. Customers and role of the centres, future developments, new tasks and more tight centers' cooperation
H.3. Other general problems

Tuesday, May 12: 14:00 - 16:00 (Parallel Session in *Meeting Room A23-40*)

T.1. EXFOR/CINDA dictionary system
- T.1.1. Review of Actions [WP1]
- T.1.2. Review of current dictionary distribution method
- T.1.3. Dates for years > 2000 in DANIEL dictionary system [WP2] (CP-C/239 of 29 Dec.1997)
- T.1.4. Proposed changes for dictionary 27 [WP2]
  - Drop CINDA code? (e-mail by V. McLane, 26 Feb.1998)
  - Drop columns 13, 14? (CP-A/87, item 3)
- T.1.5. Update procedure for "internal" dictionaries [WP2] (existing only in DANIEL and ARCHIVE systems but not in EXFOR dictionaries), e-mails: OS to VML, 28 Jan.1998; VML to OS, 10 Mar 1998; OS to VML, 20 March 1998.

16:00-18:00 *(Meeting Room A23-40)*

T.2. Common database program development
T.2.1. Centres contribution
T.2.2. Computer demonstration session

Wednesday, May 13: 8:30 - 18:00

T.3. General EXFOR matters
T.3.1. Review of Actions [WP1]
T.3.2. Dates for years > 2000 in EXFOR [WP2]
(CP-C/239 of 29 Dec 1997)
T.3.3. TRANS tapes exchanged
- Review of distribution pattern of TRANS tapes [WP3, WP9 item 5]
- List of TRANS exchanged since last meeting [WP4]
- Pending transmissions (CP-D/297) [WP5]
- "Provisional" TRANS 1267, C022, C025

T.3.4. Pending EXFOR items for NRDC approval [WP6]
(dictionary codes, coding rules)
T.3.5. EXFOR programs
- Questions on XTRACT, CHEX [WP9, item 2, 3]
- New versions of NNDC programs (CHEX et al.)
- Retrieving by date ("cut-off-date"): using Ref-index?

T.4. Neutron data
T.4.1. Deletion of 8000 series entries (4C-4/78 and others) [WP7]
T.5. CINDA
T.5.1. Review of Actions
T.5.2. CINDA 2000
T.5.3. Questions on CINDUP [WP9 item 1, 4]

Thursday, May 14: 8:30 - 12:30

T.6. CPND compilation
T.6.1. Review of Actions [WP1]
T.6.2. Duplication of CPND entries
(various e-mails by Chukreev; CP-A/87, item 1 + Appendix) [WP8]
T.7. Photonuclear data
T.7.1. Review of Actions [WP1]
T.7.2. Photonuclear bibliography
T.8. Computer matters
T.8.1. Review of Actions [WP1]
(including those on "Citation Guidelines")
T.9. Evaluated reaction cross section libraries
T.9.1. Review of Actions [WP1]

14:00 - 18:00

P.8. Network performance
P.9. Evaluated nuclear structure data libraries
P.10. Next NRDC meetings
- Technical Meeting 1999 in Vienna
- AGM 2000 in Obninsk (?)

Friday, May 15: 8:30 - 17:00

P.11. Summary and conclusion of the Centre Heads sessions
P.12. Summary and conclusion of the Technical sessions
P.13. Summary and conclusion of the Plenary sessions
P.14. Other business
P.15. Closing of the Meeting

NATIONAL NUCLEAR DATA CENTER

Status Report
to the
Advisory Group Meeting
on the Co-ordination
of the Nuclear Reaction Data Centers

11-15 May 1998

General

Since the last meeting of the Nuclear Reaction Data Centers in June 1996, we have hired a full-time scientific staff member to assume responsibility for the NSR system; there are currently 9 FTE scientific/professional and 4 support staff. See Table I for list of visitors for this period.

The Citation Guidelines report [1] was issued in July 1996.

Computer Facilities

In the past two years the NNDC has upgraded some of its X-Window terminals and has acquired two new PC's which are functioning as a Windows NT servers. The Alpha system has recently been upgraded to Open VMS 6.2, and one new 9-gbyte disk drive and two 4-gbyte drive have been installed.

Bibliographies

The NSR activity has continued.

The CINDA compilation activity continues with respect to those references associated with the experimental data compiled at the Center. In the period from June 1996 through May 1998, 7 CINDA transmissions were sent (BNL146-152).

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 1996 through May 1998, 10 neutron data transmission tapes (TRANS 1261-1270) and 10 charged-particle transmission tapes (C016-C025) were sent containing new and corrected entries.

EXFOR Basics [2] was issued in July 1996.

A major rewrite of the EXFOR checking code CHEX has been completed and is being tested. All

EXFOR Processing codes have been updated to take care of the year 2000 problem and will be distributed after an agreement is made on the new formats.

A starter library of relativistic heavy-ion data consisting of 7 data entries has been compiled and is available on line.

Evaluated Nuclear Reaction Data

NNDC continues to coordinate the work of the Cross Section Evaluation Working Group.

ENDF/B-VI, Release 4, was distributed in January, 1997, and includes updates to the neutron sublibraries and ENDF/HE library. Version 6.11 of the ENDF Utility codes was distributed in February, 1998.

The revised ENDF-102 Formats and Procedures Manual [3] and ENDF-201 ENDF-B-VI Summary Documentation [4] have been made available online in PostScript or PDF format.

Said Mughabghab is now resident at the NNDC and is working on the evaluation of fission product nuclei and average resonance parameters.

Nuclear Structure Data

NNDC continues to publish the ***Nuclear Data Sheets***. As of April, 1998, issues through Volume 84, #1 have been sent to Academic Press.

Customer Services

ENDSF, NuDaT, NSR, CINDA, and ENDF retrievals are now available from the NNDC Web site. Retrievals from NSR and CINDA have been linked to the American Physical Society online journals, allowing users access to the journal abstracts.

The use of the Online Service continues to increase, although at a slower rate, primarily due to the available of most databases on the Web. There are now about 1500 customer accounts with about 1900 users. There are now about 12,000 retrievals per month from the combined Online Service and Web site. A chart of Online Data Service retrievals is attached.

There was an exchange of personnel between the NNDC and NDS to establish a collaboration on online services; see Tables I and II for details.

A page linking to the Table of Contents of journals scanned by the NNDC, has been made available on our Web site.

References

[1] V. McLane, Citation Guidelines for Nuclear Data Retrieved from Databases Resident at the Nuclear Data Centers Network, Brookhaven National Laboratory report **BNL-NCS-63381** (July 1996)

[2] EXFOR Basics: a Short Guide to the Nuclear Reaction Data Exchange Format, Brookhaven National Laboratory report **BNL-NCS-63380** (July 1996)

[3] V. McLane, C.L. Dunford, P.F. Rose, editors, *ENDF-102 Data Formats and Procedures for the Evaluated Nuclear Data File ENDF-6*, Brookhaven National Laboratory Informal Report **BNL-NCS-44945 Rev. 1/97** (February 1997).

[4] V. McLane and Members of CSEWG, *ENDF-201: ENDF/B-VI Summary Documentation, Supplement 1 and ENDF/HE Summary Documentation*, **BNL-NCS-17541**, 4th Edition, Supplement 1 (December 1996)

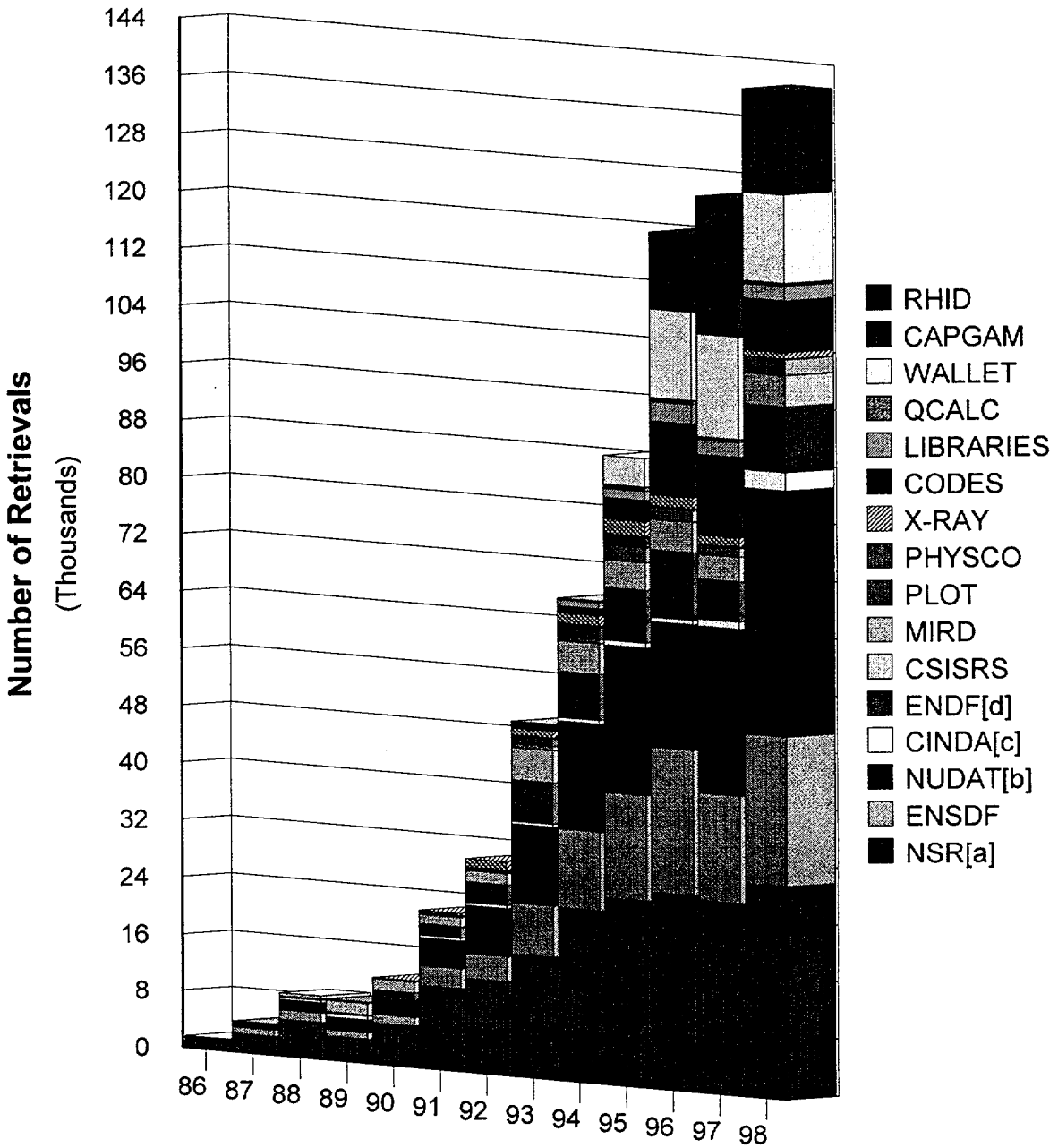
Table I.
Visitors to NNDC from June 1996 to May 1998

Visitor	Host	Duration	Topic
Otto Schwerer,NDS	T. Burrows	3 weeks	Web services
Svetlana Dunayeva, VNIIEF, Sarov	V. McLane	6 weeks	Charged-particle reaction data compilation
Yu Hongwei, CNDC	V. McLane	6 months	Nuclear reaction data compilation and evaluation data systems
Ramon Arcilla, NDS	Y. Sanborn	2 weeks	Computer operations
Stanislav Maev, CJD	V. McLane	6 weeks	Nuclear reaction data compilation
Svetlana Babykina, CaJaD	V. McLane	6 weeks	Charged-particle reaction data compilation
G. Molnar, II, Budapest	S. Mughabghab	3 days	Thermal neutron capture data

Table II.
Visits by NNDC Personnel to Other Centers

Staff Member	Host	Duration	Topic
T.W. Burrows	IAEA/NDS	6 weeks	Online services
Y. Sanborn	IAEA/NDS	2 weeks	Computer operations
T.W. Burrows	IAEA/NDS	2 weeks	Online services
S.F. Mughabghab	KAERI	5 days	Evaluation procedures
V. McLane	Slavutych	2 days	Reaction data compilation

*NNDC On-Line Data Service, World Wide Web (W^3), and FTP Retrievals 1986-1998**



* Extrapolated as of March 31, 1998.
[a] Added to Web August 25, 1997.
[b] Added to Web March 12, 1997.
[c] Added to Web September 25, 1997.
[d] Added to Web February 27, 1998.

NEA DATA BANK

PROGRESS REPORT FOR 1997

NRDC Meeting at IAEA NDS, Vienna

11 - 15 May 1998

1. INTRODUCTION

In 1997 a re-organisation has taken place allowing the appointment of a second full-time staff member for nuclear data services. Due to Luigi Pellegrino retiring, Pierre Nagel has moved into full-time computer support along with the newly appointed Christian Penon. The post formally filled by Pierre Nagel was then re-allocated to nuclear data and was filled by an external candidate, Mark Kellett, to work alongside Marek Konieczny. The overall distribution of personnel within the Data Bank is illustrated in the organigram shown at the end of this document.

2. NUCLEAR DATA SERVICES

Experimental (EXFOR) and Bibliographic (CINDA) data compilation

The continuing objective of the Data Bank with regard to the compilation of CINDA and EXFOR entries is to remain as up-to-date as possible. This means that all known and relevant publications should have been compiled, entered in the data bases and sent to the other data centres within six months of their publication. The on-going compilation effort resulted in a total of 510 new CINDA entries, compared to the 400 originally envisaged for the period.

In parallel with the continuing effort on the CINDA data base in 1997, the Data Bank also carried on the work solving the problems with older deficient EXFOR entries which needed correcting, based on both user identification and information from the other three data centres. To this end a total of 39 corrected entries were processed. In conjunction with this corrective procedure a number of new entries were processed and a total of 54 new EXFOR entries were completed during 1997 (TRANS.2139-TRANS.2145). This was significantly more than the expected number of 35. The compilation of these has been accomplished by the use of an external consultant, Dr Stanislav Maev, CJD Obninsk.

The on-going correction of older EXFOR entries will continue in 1998 as necessary, in parallel with the compilation of new entries identified. A single large source for new entries being the International Nuclear Data Conference, held in May 1997 in Trieste, which will lead to an increased volume of data needing compilation in both CINDA and EXFOR in 1998, compared to the usual figures of 400 CINDA and 35 EXFOR entries.

As mentioned at the NRDC meeting of 1997 it has been possible to allocate a second position at the data bank for a staff member working mainly on nuclear data services. However due to unforeseen personal circumstances the new staff member was unable to take up duty until mid-March of 1998, rather than in the Autumn of 1997 as originally envisaged. This meant that much of the envisaged work-load re-allocation was not possible and hence lead to increased time requirements for the existing staff member on topics not originally planned for. Although some time was lost in other areas, the CINDA and EXFOR databases were given priority and hence they remained as up-to-date as possible. This was mainly achieved through the use of external consultants for the initial compilation stages of entry preparation, but significant data bank staff time was still required before the final loading of these new entries into the two data bases.

The new staff member is now involved in the various aspects of data compilation, data base update procedures and documentation of a Quality Management System (QMS), but all of this is drawing resources from other areas as existing staff members give up their time for training and personnel development. The main staff member for nuclear data activities also reaches the end of his contract during 1998 and will be leaving at the end of July. The relatively short overlap between the new and current staff means that although more manpower is allocated to nuclear data services, in reality the need for the transfer of knowledge between the staff members could mean no significant increase in output will be immediately apparent. The position vacated by the out-going staff member will hopefully be filled later in the year.

Intermediate Energy Nuclear Data (IEND)

The need for compiled experimental charged particle data at intermediate energies is significantly increasing, following intensified studies of different hybrid reactor concepts. The experimental data are needed mainly to validate the intermediate energy nuclear model codes that are being developed in many member countries. In 1997, the Data Bank compiled 134 new data sets from charged particle induced experiments into the EXFOR database, compared to an expected 100. These were carried out by Feliks Chukreev of the Kurchatov Institute in Moscow. It is planned to continue this activity at about the same level in the coming years, taking into account the needs of the user community.

The JEFF Project

The planned benchmark testing of the JEF-2.2 evaluated nuclear data library has been completed in member countries and the result of this testing will be compiled in a series of reports, which will be an essential part of the summary documentation of the data library. This activity has been somewhat delayed but it is now envisaged to publish this summary documentation in late 1998 or early 1999.

The selection of isotopes to be included in the JEFF-3.0 general purpose library has been agreed and the Data Bank is presently compiling a starter library using the Quality Assurance system developed specifically for the task. This compilation work has, due to the late arrival of the new Data Bank staff member for nuclear data, been somewhat delayed, but it is envisaged that the first phase will be completed before the next JEFF meeting in September 1998.

In 1997, two new working groups were set up within the JEFF project. One working group will review the fission product data selected for JEFF-3.0, taking into account the findings of two subgroups of the NEA International Evaluation Co-operation devoted to inelastic scattering cross sections and to the testing of lumped one-group cross sections of fission products. The second working group is devoted to the selection of evaluated data in the intermediate energy range for inclusion in the JEFF-3.0 library.

The Data Bank will also continue the compilation of the JEFF-3.0, focusing on special purpose data libraries, such as the radioactive decay data and fission yield libraries.

Quality Assurance Procedures

The Quality Assurance procedures defined for the compilation of the new JEFF general purpose library are in place and have been successfully applied during the assembly phase of JEFF-3.0. Refinements and extensions to the system, to cover for example the JEFF radioactive decay data file, will be implemented at a later date in light of any lessons learned from initial usage of the system. A rolling programme of critical QA review has been initiated, aimed at introducing "best-practice" to all aspects of nuclear data related activities, with the ultimate goal of improving performance, operational transparency and customer satisfaction. A separate document giving more details on the Quality Assurance procedures will be presented at the committee meeting.

Services to Nuclear Data Users and Publications

The number of requests for large data files, received directly at the Data Bank, decreased in 1997. Seventy (70) requests were received and answered manually compared to an expected number of about 100-150. The main reason for this decrease is probably that there was no release of any completely new evaluated data libraries in 1997. As well this the low figures above shows that customers in

member countries are making increased use of the newly redesigned Data Bank Web pages for retrieving nuclear data. The spectacular increase in the number of direct on-line accesses to the databases supports this last statement. More than 20 000 on-line accesses were registered in 1997 compared to an expected 5 000. This high level of on-line access is expected to continue and may even increase as the Data Bank improves its Internet line capacity.

Similarly the number of requests for documents is expected to decrease, since the Data Bank has recently scanned a large number of documents and made them available via the NEA Web site to accredited users. For example, more than 700 documents in the JEF/DOC series were made available directly on-line in 1997 to members of the JEFF working groups. In 1998, it is planned to scan and make available also the documents in the EFF/DOC (European Fusion File) series.

Following an agreement with the international nuclear data centres network, the Data Bank developed in 1997 a pilot version of the CINDA database for PC and Macintosh computers to be distributed on CD-ROM. The first version is being tested with a view to improve the performance as far as possible, and we are currently awaiting the delivery of the new release of ORACLE Lite, which should lead to further performance gains. This is expected in the very near future and it is envisaged that it will make significant gains in data base access and retrieval times. The product is likely to be available to customers in autumn 1998.

JEF-PC Program

A new improved version of the JEF-PC program, for displaying nuclear data from the JEF-2.2 library, was issued at the end of 1997. It has been extended to display also experimental data and is delivered with four CD-ROMS containing cross section data from all major evaluated data libraries, as well as all neutron induced cross section data from the EXFOR database. The program has become very popular and the OECD has already sold 133 new and 100 upgrade versions during the first three months of 1998.

The extensive use of the program has led to a number of proposals to the Data Bank for additional features to be included in the code. Many of these proposals concern useful extensions to the code, such as possibilities for plotting angular and energy distributions, and for a more flexible input routine to read formats other than the ENDF format. The Data Bank will continue to develop the JEF-PC code with a goal of publishing a new version in 1999.

3. COMPUTER PROGRAM SERVICES

Program Acquisition/Revision of Existing Information

In all, 90 new items were acquired during 1997. More than this were expected, but the release of some computer codes has been considerably delayed compared to the initial plan. About a third of the acquisitions concerned shielding integral experiments (14), fuel performance experiments (14) and cross section libraries for application codes (8). Revisions, and new codes related to radiation shielding, represent about a fifth of the codes acquired. Other larger categories of code acquisitions concerned safety aspects and environmental impact of nuclear activities. Countries or organisations not members of the OECD contributed eight of these packages.

A new release of the International Criticality Safety Benchmark Handbook was issued in September 1997 on CD-ROM. A second new release is scheduled for the end of 1998.

Testing, Validation and Master-filing of Computer Programs

Programs tested in 1997 reached 93 along with associated data also being master filed. Also in this case a number of compilations and reviews of integral experiments have been completed and added to the database (16). Ten of these packages concern new application specific data libraries in established formats to be used with several radiation transport codes. The tested codes were mainly in the areas of nuclear safety and accident analysis, radiation transport and shielding and data processing.

During the first four months of 1998 18 new computer codes were master-filed. At the time of writing of this report, 24 computer programs are undergoing testing and should be completed before July 1998.

Distribution of Programs

Dispatch of computer programs was again higher in 1997 than the previous year. In fact a new historical high was reached (2212, plus 73 additional reports). This increase is mainly due to increasing interest in the integral experiments databases, IFPE (Fuel Performance) and SINBAD (reactor and accelerator shielding, fusion blankets etc.). As agreed RIST is the only recipient of codes for Japan. This centre has further distributed 147 copies of programs obtained from the Data Bank during 1997.

Of the dispatches made, 222 packages and five additional reports were sent to the non-OECD area, which represents ten percent. This is about half the amount of the previous year. However the current requests from the non-OECD area have returned to the level of 1996 because of the bi-annual workshop organised for developing countries by the IAEA at the International Centre for Theoretical Physics (ICTP) in Trieste, Italy. During this course, participants are gaining hands-on experience with specifically released computer codes distributed by the Data Bank. In fact, during the last course held in March, the 50 participants requested about 300 computer program packages. Among all the distributed computer programs in 1997, 158 originated in the non-OECD area.

The trend concerning the distribution method requested by users confirms that CD-ROMs are the preferred medium as it represents a certified, un-modifiable copy of the master. In fact slightly over half of the dispatches were made on this medium compared to one fifth in 1996. Diskettes were used in one third of the dispatches as compared to two thirds in 1996. The dispatches made in 1998 confirm this trend, with an increase however for programs distributed via Internet.

Computer Program Service Data Base Management and Publications

The publication of Nuclear Program Abstracts was discontinued in 1996 following an inquiry with the users. It has been replaced in 1997 with a fully revised release of a Nuclear Program Abstracts database on CD-ROM with a search program containing many useful options for identifying the codes having specified characteristics. This version is operational in full screen mode on a PC operating under Windows-3.1, Windows-95 and Windows-NT. The feedback received was very positive, but has suggested that the next version should be further adapted to novel methods. A new release will be completed in 1998 based on ACCESS software. In addition, computer program abstracts are updated monthly on the Internet.

Training courses

Six training courses were held to improve the use that is made of the codes the Data Bank distributes:

- two advanced MCNP courses were held at Imperial College in London,
- one introductory MCNP course was held at the University of Stuttgart,
- one course on the latest public domain version of WIMSD5 was held last June at AEAT Winfrith,
- one course on both deterministic and stochastic transport methods for pressure vessel dosimetry calculations was held at the University of Stuttgart,
- one training course dedicated to Criticality, Source Term and Shielding of VVER spent fuel was held at NRI-Rez near Prague and was financially supported by NRC, NEA and IAEA.

These courses have contributed to an improved utilisation of widely used computer codes and have improved communication between authors and users.

For 1998 the following courses have been scheduled:

- one advanced MCNP course with introductory refresher was held in March at the University of Stuttgart,
- one specifically concentrating on dosimetry applications with MCNP will be held at Imperial College in London towards the end of September,

- one course on both deterministic and stochastic transport methods for pressure vessel dosimetry calculations will be held at SCK-CEN Mol.

Several centres from East European countries have expressed the needs for one training course dedicated to Criticality, Source Term and Shielding of VVER spent fuel to be repeated as not all applicants could be accepted in 1997. An inquiry will be made as to the overall interest in such a course and then it will be decided whether one is to be held.

4. COMPUTER INFRASTRUCTURE

Introduction

The Data Bank has in the last few years undergone a triple migration effort consisting of:

- Conversion of the basic database management system from the proprietary Digital DBMS to a standard relational database model from ORACLE,
- Migration from VMS to Unix for all in-house applications,
- Replacement of the telnet user access for the online services by Web Interfaces.

The migration period was essentially completed by the end of 1997 with a few applications remaining to be finalised in the first half of 1998. The post-migration period is now characterised by the consolidation of the working procedures relating to the use of the ORACLE databases and Unix platforms.

External network usage has risen sharply in 1997 (from 4.5 Gigabytes of data transferred in 1996 to 11.3 Gigabytes). The internal network has been upgraded in early 1998 and the external network will be upgraded in mid 1998.

Achievements in 1997

Rationalisation of VMS

All Unix machines are now in full operation, with the remaining two VMS workstations used to maintain a capability to deal with VMS specific issues (such as VMS back up formats, some program compilations and the auxiliary Internet server carrying the VMS based BNL nuclear structure databases.) The central VAX-6000 VMS system was removed during 1997 and the VAX-4000 VMS machine is due to be disconnected in 1998, once the master files for the computer program service are fully operational under Unix.

Databases

All Data Bank databases have now been converted and are operating under ORACLE:

EXFOR	has been operational since 1996,
EVA	has been operational since 1996,
CINDA	the current Web based service and VMS based internal database are being replaced by the Oracle/Web/Unix configuration in 1998. A pilot version of the complete CINDA contents has been developed on CD-ROM and will continue to be developed throughtout 1998,
TDB	the retrieval services have been operational through the Web since early 1997. The update and checking applications will begin to be used in May 1998,
DBAIS	the parallel maintenance of the VMS/DBMS and the Oracle/Unix databases is being discontinued in July 1998. The associated master files on VMS will be transferred definitively to Unix by the end of May 1998 and this should entail a rationalisation of the Internet dispatching procedures,
ADD	the central address database (ADD++) was brought online on the Intranet server in August 1997. This database incorporates the information needed for accessing the password protected online services and is used widely by the Agency.

Online Services

The number of accesses to the online services, through Ftp and Telnet, have been reduced to a minimum, except for the Nuclear Structure databases which are VMS/DBMS based and managed by the National Nuclear Data Centre (NNDC) at BNL in the USA. The Data Bank will have to maintain the Telnet service for the foreseeable future, as we are not aware of any plans by NNDC to migrate to a more contemporary database system. All other accesses are now through the Web and this is reflected in the large increase in 1997 in page accesses (182,000) and data downloaded (11.3 GB), compared to 1996 (85,000 pages and 4 GB respectively).

In 1997 the Data Services Web pages have been redesigned into a coherent structure. The Computer Program Service, TDB and Nuclear Science pages will be redesigned in 1998 to conform to the general NEA Web guidelines.

Current and recent work in 1998

Peripheral hardware

The following improvements to the in-house hardware system are being implemented:

- Procedures for backing up the data on each Unix server has been improved with the installation of a DLT cassette backup system.
- The External Firewall has been upgraded to a commercial version of AltaVista Firewall in February 1998. The new version offers better configuration control.
- The Internal gatekeeper is being replaced in April/May 1998 by an equivalent hardware router module in conjunction with the upgrading of the internal network bandwidth.
- In order to provide increased robustness in the event of disk failures, RAID disks and controllers are being installed in the main Unix servers.

Networks

The internal network was until now running with a bandwidth of 10 Megabits/s and without any segmentation so that each network connection from a machine to the telecom hub was carrying all network traffic. The network is being upgraded to a fully switched 10 Megabits/s and trunk lines are being upgraded to 100 Megabits/s. This change will avoid the internal network saturation currently experienced, especially when large amounts of data are transferred.

The external network (Internet) has continued to be saturated despite the continual upgrading of the international bandwidth of our Internet service provider (Renater). The increase from 64 kbits/s to 256 kbits/s, to be performed in 1998, is expected to alleviate the congestion between NEA and the Paris Interconnecting node (GIX). The attempt to introduce a second Internet service provider (IBM-Axone) is at a stand still because of legal disagreements on the contract between the OECD and IBM.

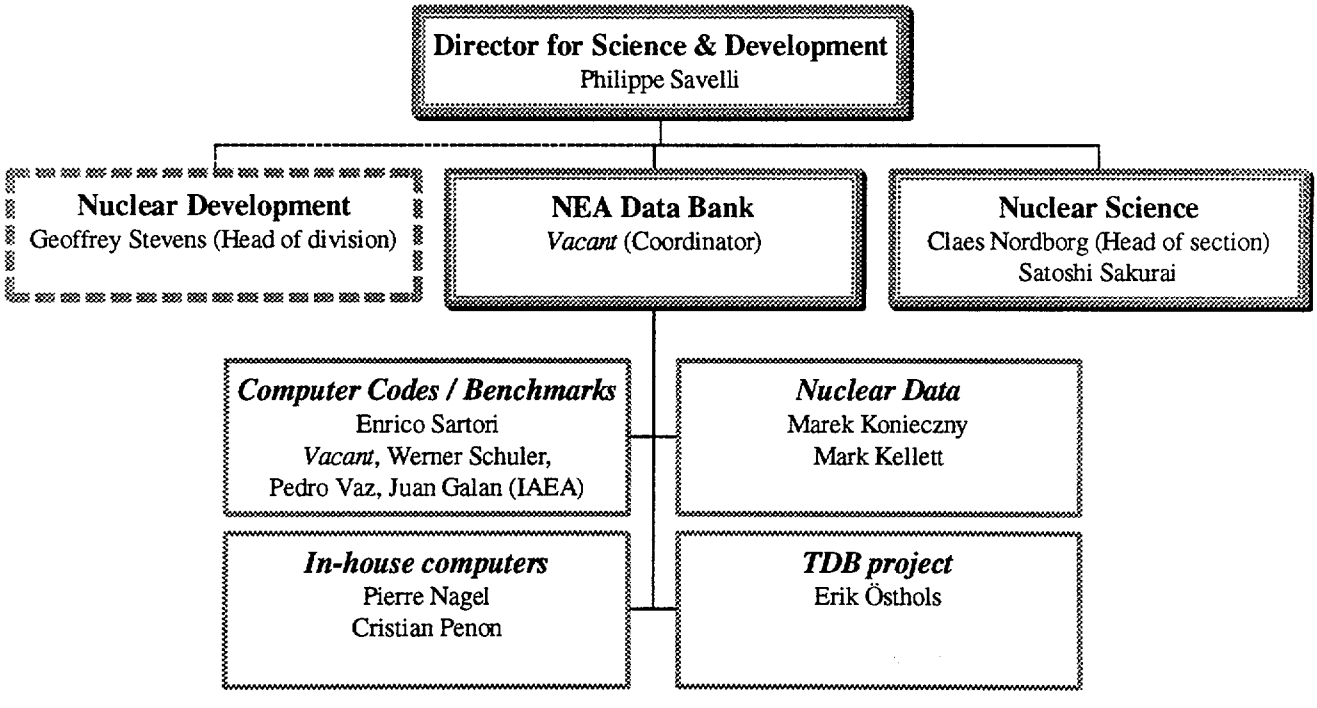
Computer system documentation

At the beginning of 1998 the process of finalising the documentation on the use and maintenance of the new computer systems was begun. It is expected to be completed at the end of 1998. It is planned to integrate the completed documentation into a Quality Management System in order to manage properly any further configuration changes.

MANPOWER ALLOCATION IN THE DATA BANK (man-months/year)

Project area	*1997*	*1998*	*1999*
Co-ordination, planning and central services	22	22	19
Nuclear data co-ordination and services	28	28	28
Software validation and services	33	34	34
Calculation methods for fission reactors			
BWR stability, Main steam line break, etc.	4	5	To be decided
Reactor dosimetry and Pin power distribution.	5	4	-
Radiation shielding	3	3	To be decided
Expertise to other parts of NEA			
To Nuclear Science	10	10	To be decided
To other NEA divisions	20	19	To be decided
TOTAL DATA BANK MANPOWER	125	125	113

DATA BANK ORGANISATION CHART
May 1998



Progress Report of the IAEA Nuclear Data Section

I. Nuclear Data Section Staff and Budget

The authorized staff level on 11 May 1998 includes 18 permanent positions. One temporary-assistance professional was appointed in November 1997 for a 12-month assignment emphasizing WWW and FTP software development.

The present NDS organizational chart includes:

- *Nuclear Data Centre Unit* (2 Nuclear Physicists, 2 Assistant Nuclear Physicists, 1 Programmer Analyst, 1 Production Programmer, and 1 Secretary)
- *Nuclear Data Development Unit* (2 Nuclear Physicists, 1 Nuclear Data Information Physicist, and 1 Secretary)
- *Computer Operations Unit and Section Management* (Section Head, Section Secretary, 2 System Analysts and 1 Applications Programmer)
- *Atomic and Molecular Unit* (1 Atomic Physicist, 1 Atomic Physicist/Programmer, and 1 Document Clerk)

The 1999-2000 budget is not yet final. The projected NDS budget figures for this two year cycle allow to keep the staff at present level. At the same time, 35% reduction of NDS printing expenses between 1998 and 2000 can be compensated by more wide use of electronic publications especially for working materials containing intermediate results. The inter-department policy on research contract agreements is substantially changed with much lower priority now to the individual (outside of the CRPs) contracts.

Changes in the NDS staff in the past year include the following:

- The post of Nuclear Data Information Physicist (P-3 post vacated after departure of Anatoly Pashchenko) was filled by Raquel Paviotti Corcuera.
- The temporary position of System Analyst (P-3, open for 1 year) was filled by Scott Miller in November 1997.
- The post of Nuclear Data Physicist (P-4, vacated after Hans Lemmel's retirement) was filled by Vladimir Pronyaev in November 1997.

The following changes in the NDS staff expected in the 1998:

- The post of System Manager (P-2 post - Data Service Specialist is closed after expiration of contract with Ramon Arcilla; new P-3 post, Data Centre System Manager, will be filled in May 1998.

- The post of Nuclear Physicist (P-2, will be vacated after the end of Harry Wienke's contract in October 1998) is advertised with the new title of Nuclear Physicist/Programmer beginning in May 1998.

II. Data Centre Operation

A. Data Compilation

35 new EXFOR entries have been compiled from May 1997 to April 1998. 20 entries are from Area 3 and 15 entries from Area D (Hungarian charged particle data) with a total number of 181 data sets (96 for area 3 and 85 for area D). 11 new entries represent the re-compilation of Area 7 entries. 3 new TRANS tapes have been distributed to other centres.

The Handbook CINDA97 was published as cumulative issue (1988-1997).

Nuclear Data Newsletter No. 23 and 24 with information on new NDS publications, database, libraries and file updates and nuclear data related topics were issued. Report IAEA-NDS-7 Rev. 97/12 with updated information on all available nuclear data is published.

FENDL-2 Library and the Starter File of RIPL Library were released.

B. Data Services

Because the users of our area are from countries which use widely varying information technologies, many methods are used to fulfill their requests. The summary of the NDS retrieval statistics for the last 4 years is given in Table 1 and the country profile for 1997 is shown in Fig. 1 (please note the log scale on retrieval numbers scale). The definitions of statistical accounting terms are given below.

1. Services by ordinary mail

The number of retrievals per year (only on user's requests, no standard document distribution) is rather stable and based mainly on hard copies of documents. The retrievals of computer based data are declining due to expansion of online service. One retrieval contains one homogeneous piece of information. It can be one report, or set of different data retrieved from one library, or database on diskette or CD-ROM, or computer code or codes when they are distributed as a package.

2. Offline CD-ROM database service

We have now practically all our databases on CD-ROMs for PC. They can be distributed to users with poor access to the global computer network on requests. In case of establishment of PC platformed local nuclear data center for general purpose or special applications, the obligations to update periodically the delivered databases should be taken by the parent center.

3. File transfer with FTP

NDS at present has no software which logs in detail each FTP session. But the total number of FTP sessions can be accounted on. One FTP session corresponds one *.log record. Including transfers of files created in NDIS sessions we now have about 200 FTP sessions per month.

4. Online Telnet NDIS service

The number of retrievals shows a steady growth by year (see Table 1). Some decline in NDIS retrievals during the first quarter of 1998 may be explained by the opening of direct Web access to some major nuclear databases (EXFOR and CINDA) not counting in the NDIS statistics. One retrieval is considered at least as one user created output. One Telnet NDIS session may contain a few retrievals.

5. Online WWW service

At present, NDS has no software which can prepare detailed statistical reports of Web retrievals by users or topics although this is under active development in the Section. The installed Web server software produces detailed records in Web log file on each user's action. But existing statistics preparing programs allow to evaluate only approximate number of Web sessions by month and country. The accuracy of this statistics is limited by absence of complete table of correspondence between IP/host addresses and countries, by difficulties in determination what is one user session and (in some cases) how to distinguish between simple superficial browsing and serious user interest.

A single user's Web session is determined at the NDS at present as one continuous (not interrupted by other user) set of Web log records belonging to this particular user. In cases where few users are (simultaneously) the guests at the server, this simple approach will artificially exaggerate the number of sessions. The introducing of maximum time interval between two sequential log records of the same user inside which they are still considered as belonging to the same Web session (as it is done at NNDC) will lead to more realistic statistics of the Web sessions.

The number of Web sessions with definition given above for resolved IP addresses but without account of in-house users is shown by year in Table 1 and by country for 1997 in Fig. 1.

Table 1. NDS Nuclear Data Retrieval Statistics by Year

Numbers in brackets are the number of requests. One request may contain a few retrievals. Number of Web sessions on NDS server is given only for resolved IP addresses of external users.

	Year				
Type of Medium	**1994**	**1995**	**1996**	**1997**	**1998 (1st Quarter)**
Telnet NDIS	2788	4462	5688	7372	786
Ordinary Mail	1975 (831)	1556 (706)	786 (412)	1846 (758)	654 (238)
Including:					
Documents	1567 (524)	1155 (452)	554 (242)	1547 (561)	573 (197)
Experimental Data	23 (17)	16 (8)	14 (12)	9 (6)	-
Evaluated Data	293 (226)	357 (228)	205 (147)	260 (170)	71 (30)
Computer Codes	92 (64)	205 (147)	13 (11)	26 (18)	10 (11)
No. of Web Sessions	-	-	1900	36266	15852

III. Computer Operations

In 1997, the Section's local area network (LAN) underwent hardware and software upgrades to meet the growing computing requirements of its online services users and staff members:

The AlphaServer's disk storage subsystem was upgraded. Its disk storage capacity was augmented with a new 4.3- Gigabyte Ultra SCSI hard disk drive. Users' files were then moved to the new disk drive which subsequently doubled the overall disk access speed to user files and application programs, e.g. the Nuclear Data Information System (NDIS). The old users' disk is being used to store nuclear data files migrated from the IBM mainframe.

The Ethernet LAN was upgraded from a 10-Megabit/sec, shared LAN to a 100-Megabit/sec, switched LAN by installing a new 10/100-Megabit/sec Fast Ethernet switch from Bay Networks, Inc. The switch is now providing full (dedicated) 10-Megabit/sec network bandwidth to each major workstation and terminal server. This resulted to a significant overall improvement in network response time especially for graphics-intensive applications.

Six PCs, powered by Intel's Pentium class of microprocessors, were installed inside the Agency's FireWall. These PCs provide access to (among other things) to the Agency's intranet services. These services are not accessible from the Section's Ethernet LAN which is located outside the FireWall. An example of a very important intranet service is the Agency's Research Contracts System which assists physicists in administering and monitoring Coordinated Research Programmes in nuclear data measurements, compilation and evaluation.

A Windows NT-based server was connected to the LAN. The machine is a 200-MHz Pentium Pro PC with industry-leading Web development software installed on it. It will be used as an experimental server to evaluate the technical and economic feasibility of using Windows NT to host the Section's Web-based application development and services.

Figure 2 shows the servers, clients and other network components comprising the Section's Fast Ethernet LAN.

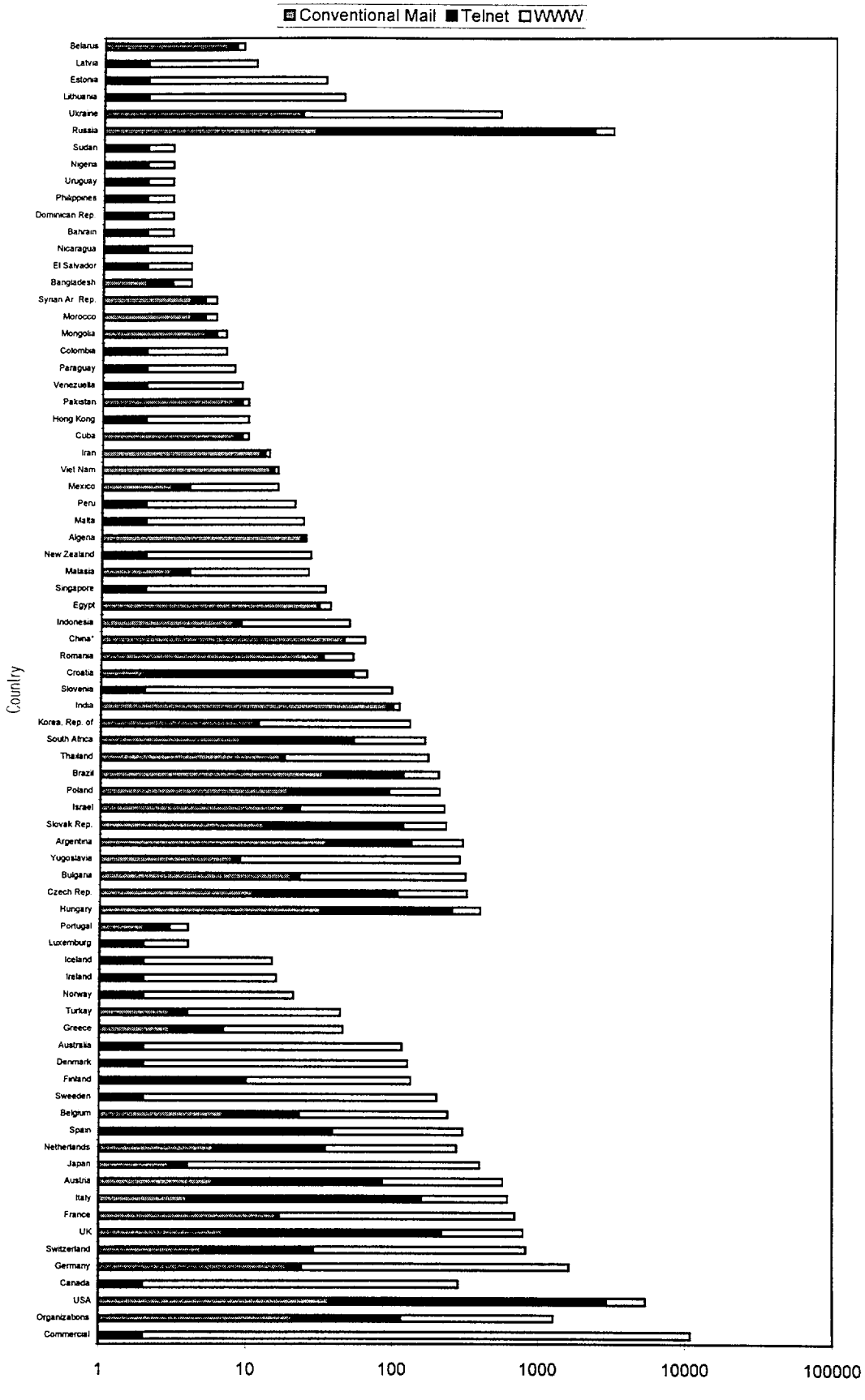


Fig.1 IAEA Nuclear Data Service (1997)

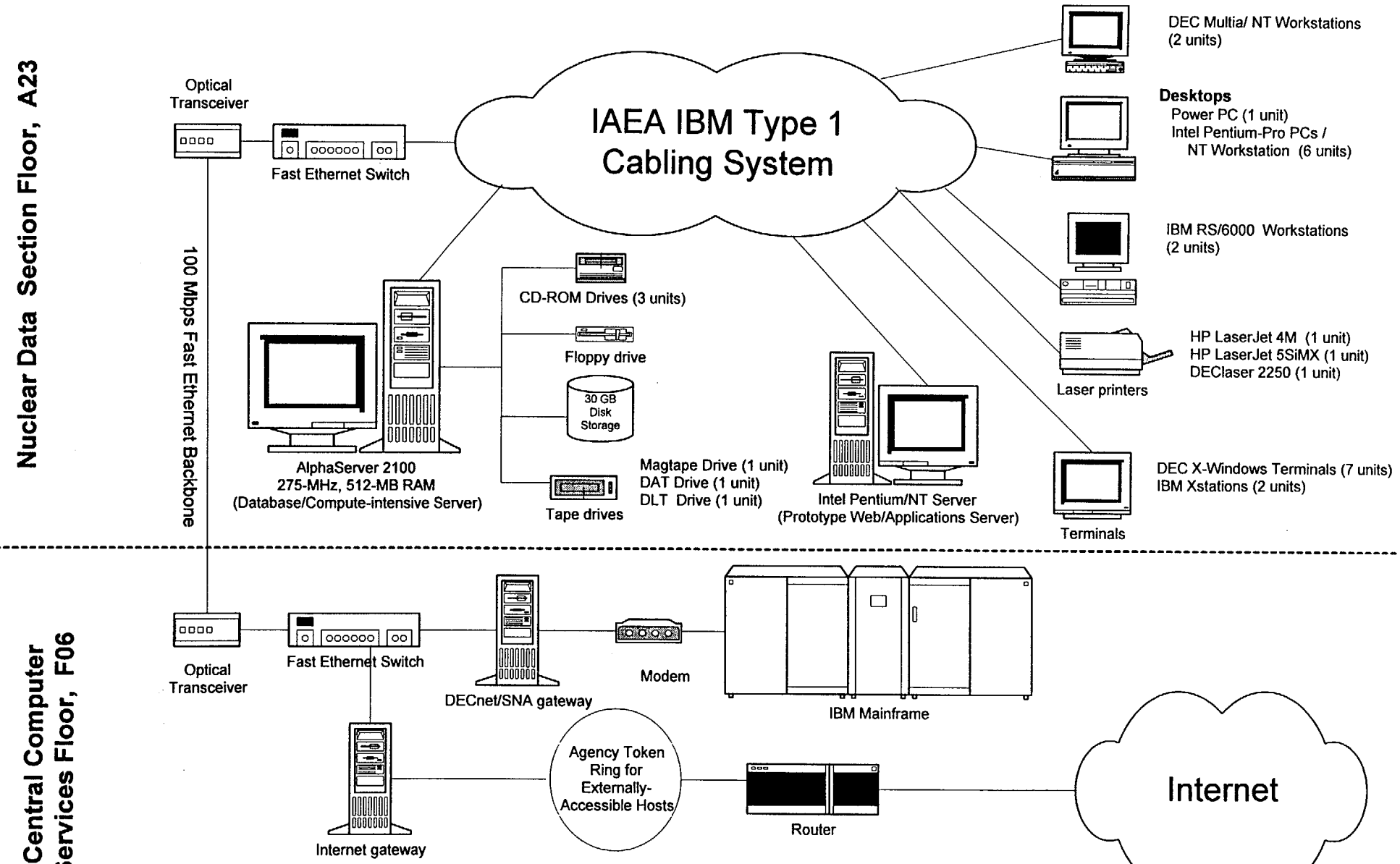


Fig. 2: The IAEA/NDS Fast Ethernet LAN Configuration

PROGRESS REPORT
to NRDC Meeting (11-15 May 1998, Vienna)

A.I.Blokhin, V.N.Manokhin, S.A.Maev

Russian Nuclear Data Center (CJD, IPPE, Obninsk)

1. Introduction.

The CJD was created 35 years ago in october 1963. This year we are going to celebrate the date. On this occasion we prepared two papers with the description of history and the results of longterm nuclear data activity in the USSR and in Russia. One of these papers will be publish in Yadernye Konstanty and another in Atomnaya Energia. In the same year Nuclear Data Commission was also created. The activity of Russian Nuclear Data Commission and Russian nuclear data centers is a part of international nuclear data activity, which is an excelent example of very well organized and effective cooperation in international, regional and national scales.

During many years a lot of speciaslists in nuclear data measurements, in nuclear theory and data evaluation from many laboratories in many countries participated in this activity. We should like to note the leading role of International Nuclear Committy and Nuclear Data Section in the organization and coordination of international cooperation and nuclear data exchange. Next year 35 years since creation of NDS and NEA DB. Very soon NNDC will meet 50 years since the beginning of nuclear data activity in USA. Joe Schmidt and Hans Lemmel during about 25 years contributed greatly to the problem of international excange of nuclear data and we propose to ask them to write history of great nuclear data activity.

2. CINDA and EXFOR activity.

Compilation of bibliografic and numerical experimental data from Russian publications into CINDA and EXFOR was done on steady level. There are no great decrease in the number of theoretical and experimental works devoted to neutron data. However, one can note that the interest increased to the data outside traditional reactor requirements.

During 1997 CJD compiled 47 new works and corrected 37 works into EXFOR, and prepared 3011 Cinda entries in excange format and 567 in reader format. 68 works on neutron data from 12 institutes of 4 area were presented to Trieste Conference. 22 works from this number must be compiled to EXFOR.

In 1996-1997 years CJD took part in compilation of the works from NEA DB area. It was very useful experience in providing the completness of EXFOR in spite of temporary difficulties, which could occur in any center from the network.

Dr. Maev worked about two months in NNDC. It was very useful for him to gain experience in nuclear data menagement. About several hundreds Russian works were corrected during this visit.

3. Data evaluation activity.

3.1.Recent years CJD participated actively in the analysis and comparison of available experimental data, especially threshould reaction cross sections. It was concluded that all existing libraries contain many excitation functions which unreliable, do not correspond to physics of process or wrong. This situation is not crucial for the libraries of general purpose, oriented mainly to reactor requirements. However, it is serious shortage for specialized libraries.

The recent activation libraries as ADL-3 and EAF-97 contain also many reaction excitation functions for which the shape and absolute values in the maximum are not realistic.

Of course during longterm activity (about 40 years) many data problems were already solved and some applications were provided with accurate nuclear data. It is so concerning existing types of reactors. The most important reactor demands were met. However, it is not so, for example, for reactors based on thorium fuel cycle.

We analized the status of data for thorium fuel cycle /1/. There is a lot of considerable discrepancies in available data libraries. For most isotopes there are no experimental and reliable calculated data. Of course at the present time this is not urgent problem but for some or other reason the specialists in measurements and evaluation are leaving the activity. We are not shure that in the future it will be possible to improve the needed evaluated data.

The problem of cross sections for actinide isotopes is also far from solution in the fast neutron energy range. It is known that the experimental data are absent for the inelastic scattering and (n,2n) reaction cross sections for the most fissile isotopes.

In some cases the libraries which calculated using theoretical models and contain a great amount reactions are not checked properly. The testing of the large libraries on the basis of integral experiments does not permit to reveal separately the unrealible curves, because too many curves are used similtaneously in the testing.

3.2. According to ISTC project 304 we took active part in the analisys and evaluation of data for ^{237}Np, ^{241}Am, ^{243}Am, ^{244}Cm, ^{243}Cm and ^{244}Cm /2,3/ and prepared new full files for these isotopes. Our evaluations differ considerably in some energy ranges from those made Minsk`s group and the evaluated files from other libraries. The evaluation of actinide isotopes stimulated search for systematics of the fission and (n,2n) reaction cross sections for fissile isotopes. Some almost evident systematical trends are summed in IPPE preprint (in press).

Having in mind the recommendation of previous Technical NRDC Meeting the CJD analyzed about 150 threshold reaction excitation functions for rare earth isotopes and important structural materials Ti, Cr, V, Fe, Ni, Zr, Nb, Mo. The data analysis for rare earth isotopes was published as report INDC(CCP)-411 /4/. The consistent evaluation of the (n,p) and (n,α) reaction cross section for Y, Zr, Nb, Mo isotopes was published in Yadernye Konstanty /5/. The analysis of discrepancies in the evaluated data from different libraries for structural materials are presented to this Meeting /6/. In all cases our recommendations are given using the systematics of the reaction excitation functions /7-9/. The results of this analysis showed considerable discrepancies in the evaluated data based on theoretical calculations when there are no enough experimental data. From our experiance the

systematics of excitation functions can serve as suitable criteria for selection of more reliable data.

3.3. It should be noted that international and regional programmes of Nuclear Data Section and NEA Data Bank stimulated greatly the evaluation activity. The work of the international group of experts organized for selection of the data for FENDL library was very seful. This work was started firstly for FENDL project but permits to meet requirements in nuclear data for activation and radiation damage of structural materials irrespective of its applications.

We think that NDS projects and workshops on the evaluation and selection of nuclear data are needed to continue. It is necessary to find possibility to improve at least the international libraries. At the present time there are the specialists who has experience in the creation, analysis, comparison and selection of data and can solve the problem of improvement of existing data libraries. The technical and financial mechanism must be developed for that. Nowdays funds for nuclear research are becoming more limited almost everywhere. Only through international cooperation it is possible to improve existing and create new evaluted data libraries.

We propose to prepare special document in order to pay attention of INDC that some available evaluated data from all existing international and national libraries are needed in serious corrections with the aim of improving their reliability.

There is need to prepare document with uptodated requirements in nuclear data on the basis of documents issued several years ago and reports presented to Trieste Conference.

3.4. At the present time the CJD and specialists from Laboratory of Theoretical Physics (IPPE) in cooperation with specialists from Sarovo are engaged in ISTC project 731, the objective of which is measurement, analysis, calculation and evaluation of the production cross section and spectra of gamma-rays for set of structural and technological materials such as C, Al, isotopes of Cr, Fe, Ni, Nb, Zr, Pb, Bi.

The work on new version of BROND-3 library is in progress. We think to replace some files by new ones for the following isotopes: Cr-52, Fe-56, Np-237, Am-241, Am-243, Cm-242, Cm-243, Cm-244. The corrected files for D, Sn, N-15, Nb, Zr-90-96 were included as well.

The experimental and evaluation work is under way to prepare fission product yield sublibrary for BROND-3. The work is based on the evaluations of two groups from Moscow Institute of Physics and Engineering. One of this groups created ASIYAD library and another (A.Koldobsky`s group) evaluated independently the yields for 10 isotopes using other approuch.

The atlas of these data was prepared and we suggest it for publication as INDC report.

The new version of photonuclear data library BOFOD-98 is in process of formation. The atlas of plots will be prepared.

The library of the threshold reaction excitation functions evaluated on the basis of systematics is formed. About 500 reactions in ENDF-6 format are included. We continue this work with the aim of including evaluated data for natural elements and for neutron inelastic scattering excitation functions.

We declared about formation of new version of the Russian Reactor Dosimetry File (RRDF-96), which contains 34 reactions. At the present time the description of each reaction is made. We plan to publish it in Yadernye Konstanty.

4. Computer matters.

A great attention was concentrated during last several years on means of communications among centers and users. Now we have no principal problem to transmit data to any center abroad and institutes in Russia. However, the IPPE has some technical problems with a connection between Obninsk and Moscow. That is why we have a slow speed of data transmission.

In our local network on the basis of ALPHA computer we have 20 personal computers connected with INTERNET.

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CAJAD activity on charged particle nuclear data.

F.E. Chukreev

After our last meeting at Brookhaven we continued our activity on some directions.

1. **Team-work** with NEA-DB regarding to data compilations of medium energy protons (< 1 GeV) interactions with more interesting nuclei were continued.

During to 1996-97 years 200 ENTRIES were prepared. The compilations included numerous differential data for elastic and inelastic scattering, radioactive and stable isotopes production. This work is oriented for medical, radiation damages, space and nuclear wastes transformation applications.

Additionally in 1996 year we helped to include in EXFOR very much results of international group, where Prof. R. Michel is leader. Some important details of this investigation were defined more exactly. This job has been made in Hannover side by side with investigators. I see similar method to compile experimental data is the best way.

2. **KACHAPAG library** correction has been continued too. This correction is not finished yet, but half of this library is corrected, approximately. Some delay is connected with our checking of experimental data. After KACHAPAG finished its activity existed essential changes for decay data: some isomer and ground states were transposed, branching data for detected radiations were changed too.

We believe that users must be notified about this changes.

We did not change the DATA and COMMON sections, because similar changes will be doubtful.

3. **A036-A043 TRANSes** were transmitted. The TRANSes contain new and changed compilations.

4. **To expose the duplications** among CPND entries new code was prepared. The index of observed duplications is enclosed. The discussion on this index will be useful as I hope.

5. **Some interesting events** for transmitted changed entries were obtained. Original entry did not contain any errors. Partially changed entry did not contain any errors too. But, if

changed subentries will be combined with unalterable subentries, then some errors could be found in this combined entry.

Obviously, using system to transmit the alterations has need to be corrected.

According to our opinion the transmission of total entry only can protect from similar errors.

6. **Data requests.**

Russian requests number is decreasing during to last years. The reasons of this phenomenon is known. Today requests regarding to medical applications of radioactive isotopes and nuclear wastes transmutation, as rule.

Although requests number is not very much, the reply for each request is very large.

Besides the requests from Russian scientists, we had the requests from the scientists of former USSR and developed countries too.

7. **Hardware and Software**.

Our main tool is IBM- compatible personal computers. We have two PC-286, one PC-486 and two Pentium now. Optical cable network of Kurchatov's Institute reached our building and therefore we have possibility to use INTERNET and FTP. Sorry, but nobody has free access to our files now, but I am sure, that it is temporary problem.

The code to search entries duplication was mentioned in #4.

New, more suitable, code to read numerical data from published figures was prepared. This code use a scanner and usual "mouse". Output of this code is COMMON and DATA sections in EXFOR formats.

Tabular information is preferable of course, but our experience shows that the presence in EXFOR the data which were read from published figures stimulates receiving data tables from authors.

Besides, tabular data are not accessible very often, when old data are needed. For example, today to measure cross sections of spallation or fission reactions gamma spectroscopy method is more often using method. On previous stage of experimental technic these data were measured by radiochemical methods. These old radiochemical results are not accessible in tabular form now, but these data are needed addition to gamma spectroscopy. Both methods are suitable for different groups of reaction products.

8. **Financial support.**

We have a little support from Ministry of Science and Technology, but this support is not enough.

9. **Staff**

CAJAD's staff is decreasing continuously. Reason of this decreasing is insufficient financial support. CAJAD has 5 collaborators: 3 - physicists, 1 - programmer engineer and 1- technical support.

But improving technic and software help to do increasing volume of CPND compilations.

10. **Evaluations.**

The works for monitor cross sections evaluations are stopped temporary. We believe that existing experimental data are not enough to essential moving ahead. But we are ready to participate in international cooperation if our experience is useful.

The MSU INP CDFE Nuclear Data Files and Bases.

I.N.Boboshin, A.V.Varlamov, V.V.Varlamov, M.E.Stepanov

Progress Report to the
IAEA Advisory Group Meeting on the
Coordination of the Nuclear Reaction Data Centers
11 - 15 May 1998 (Vienna, Austria)

The following report contains the brief review of the works carried out by the CDFE in **1996 - 1998** and the main results obtained in contunuation of activities reported on the previous 1996 IAEA Advisory Group Meeting on the Coordination of the Nuclear Reaction Data Centers /1/.

1. The CDFE Photonuclear Data Index **"PHOTONUCLEAR DATA 1976 - 1995"** has been published /2/. It combines both corrected and added information from two previously published CDFE Photonuclear Data Indexes for the time periods 1976 - 1985 /3/ and 1986 - 1990 /4/ and the new information for 1991 - 1995.

In addition to the traditional Data table, Bibliography table, Author Index, and the Table of the main photonuclear reaction threshold values the new issue /2/ contains the Table **"PARAMETERS OF GIANT DIPOLE RESONANCE"**:

NUCL	A	REACT	E-MAX	SIG	FWHM	E- INT	SIG- INT	SIG - INT-1	REFERENCE	AUTHOR
			MEV	MB	MEV	MEV	MEV*MB	MB		

which includes such main resonance parameters as cross section maximum positions (**E-MAX**), cross section maximum values (**SIG**), full widths at half maximum (**FWHM**), integrated (up to energy **E-INT**) cross section (**SIG-INT**) and first moment of integrated cross section values (**SIG-INT-1**) for the number of photonuclear reactions (**REACT**) and nuclei (**NUCL** and **A**).

The parameters deduced from various photonuclear cross sections, such as photoabsorption, neutron yield, total neutron production, single, double and triple neutron production, charged particle emission and fission are included. The data for almost all more than 400 various photoneutron cross section entries from /5/ are presented.

On the whole the table contains information on giant dipole resonance (GDR) parameters for:

Z	ISOTOPES AND NATURAL COMPOSITIONS	ENTRIES
1 - 95	215	1050

2. The relevant part of the Table **"PARAMETERS OF GIANT DIPOLE RESONANCE"** /2/ for the GDR parameters deduced from the most interesting photoabsorption **(G,ABS)** cross sections and neutron production **(G,SN)** = (G,N) + (G,NP) + (G,2N) + (G,3N) + ... +(G,F) cross sections was included into the IAEA NDS **REFERENCE INPUT PARAMETER LIBRARY (RIPL)**. In the cases when **(G,ABS)** and **(G,SN)** data are not available, GDR parameters deduced from neutron yield **(G,XN)** = (G,N) + (G,NP) + 2(G,2N) + 3(G,3N) + ... + nu(G,F) cross sections are presented. In the cases when none of the above data are available, GDR parameters deduced from neutron yield **(G,N)**, and from **(G,2N)**, and **(G,F)** cross sections for most heavy nuclei are presented.

Altogether, this part contains 366 entries for 6 reaction types:

Reaction	**(G,ABS)**	**(G,SN)**	**(G,XN)**	**(G,N)**	**(G,2N)**	**(G,F)**
No of entries	**56**	**259**	**18**	**5**	**2**	**26**

3. The data for the new index **"PHOTONUCLEAR DATA - 1996"** /6/ have been compiled. At present this issue is in preparation for publication.

4. The **CDFE EXFOR TRANS M019** (ENTRYs M0369, M0371 - M0385) produced before the previous 1996 IAEA Advisory Group Meeting (Brookhaven, USA) has been checked, corrected and included into the IAEA NDS international fund:

TRANS	ENTRYs	DATA TABLES
M019	16	73

5. The **new CDFE EXFOR TRANSes M020** (ENTRYs M0370, M0386-0390, M0501 - M0515), **M021** (contains retransmitted ENTRYs from the TRANS M020), and **M022** (ENTRYs M0516 - M0530) have been produced and transmitted to the IAEA NDS:

TRANSes	**ENTRYs**	**DATA TABLES**
M020	21	109
M021	3	12
M022	17	144

6. The new **EPNDL2** Evaluated Photonuclear Data Library for the Nuclear Physics and Technology has been prepared in the **ENDF** format in accordance with the Program of Work of the IAEA Research Contract N 8839/RB in the cooperation with the CJD (Dr. ***A.I.Blokhin***).

The **complete version EPNDL** has been developed by merging of the data from **EPNDL2** and previously prepared **EPNDL1** and transmitted to the IAEA NDS:

LIBRARY	MATERIALS	REACTIONS
EPNDL2	7	21
EPNDL	20	40

7. The **MSU INP CDFE WEB SITE** was developed in accordance with actions and recommendations of the IAEA Advisory Group Meeting /1/ and the IAEA NDS Workshop on WWW activities (30 September – 2 October 1996, Vienna, Austria):

http://DEPNI.NPI.MSU.SU/CDFE/

where **DEPNI** means MSU INP **D**epartment of **E**lectromagnetic **P**rocesses and Atomic **N**uclei **I**nteractions.

The following data:

"PHOTONUCLEAR REACTION CROSS SECTIONS"
(selected **EXFOR SUBENT data** in the forms of graphs and tables (downloadable sources) are available)

"PARAMETERS OF GIANT DIPOLE RESONANCE"

"PHOTONUCLEAR REACTION THRESHOLDS"

"ABUNDANCES OF ISOTOPES"

"PHOTONUCLEAR DATA INDEX
(the single complete photonuclear data bibliography - the combination of /2, 6, 7/ Photonuclear Data Indexes – f or 1955 - 1966 (2 compressed files with the data in the forms /2/ of **DATA TABLE** and **BIBLIOGRAPHY** are available as downloadable sources)

based on the corresponding Photonuclear Data Indexes /2, 6, 7/ tables and international EXFOR data fund have been put up on the **MSU INP CDFE Web site.**

The nuclear spectroscopy data base **"NESSY: THE NEW ENSDF SEARCH SYSTEM"** /8/ is at present in preparation for putting on the CDFE Web site.

8. In accordance with the Program of Work of the IAEA Coordinated Research Program "Compilation and Evaluation of Photonuclear Data for Applications" the CDFE contributions to the **IAEA HANDBOOK ON PHOTONUCLEAR DATA** specified in /9/ have been prepared and transmitted to the IAEA NDS.

9. The new computer equipment for **E-MAIL & TELNET & FTP** has been installed in the CDFE.

In addition to the active till now old e-mail address

Varlamov@CDFE.NPI.MSU.SU

one can use the **new CDFE e-mail address**

Varlamov@DEPNI.NPI.MSU.SU

The new **FTP** way to the **CDFE open area** is now the following:

ftp DEPNI.NPI.MSU.SU
login: open
password: guest_1

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5. ***S.S.Dietrich, B.L.Berman.*** Atlas of Photoneutron Cross Sections Obtained with Monoenergetic Photons. Atomic Data and Nuclear Data Tables, 38 (1988) 199.

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8. ***I.N.Boboshin, V.V.Varlamov.*** Nucl.Instr. & Meth. in Phys. Research, A369 (1996) 113.

9. Ed. by ***P.Oblozinsky.*** Summary Report of the 1-st Research Co-ordination Meeting on Compilation and Evaluation of Photonuclear Data for Applications (3 - 6 December 1996, Obninsk, Russia), INDC(NDS)-364, IAEA NDS, 1997.

The Status of Nuclear Data Activities in CNDC

Chinese Nuclear Data Center (CIAE)

Liu Tong

Abstract

A new Alpha Server was installed in CNDC in 1997. The local computer network was established. The computer processing system for theoretical calculation has been developed. The technical route for CENDL-3 is introduced.

Introduction

At the beginning of nuclear data evaluation, a lot of people hoped that nuclear data evaluation would be performed by the secretary in the near future. Many years have passed. It is still remaining a dream. But, for the theoretical calculation, most of the manual work can be replaced by computer automatically or half automatically. A computer processing system for theoretical calculation has been developed in CNDC and used for the evaluation of CENDL-3.

1. The Computer Network and File System in CNDC

A good computer environment will be very helpful for a scientist to work alone or work together with other people. It can greatly raise the effectiveness of working.

1). The Alpha Server 4000

An Alpha Server 4000 has been installed in CNDC in 1997. It consists of two 5/300 CPU, 512M Memory and 12 GB hard disk and 21 inches color monitor. The FORTRAN languages are FORTRAN-77 and FORTRAN-90. Some other software are installed such as netscape and pathworks.

2). The Computer Network

The main diagram of the computer network in CNDC is shown in Fig 1. At present, CNDC have about 20 PCs, most of them are the IBM-586, the main frequency is between 120 to 200 MHZ. Some of the operating system using on the PC are windows 95, the others are windows 3.11 for working group. The Alpha server has two net cards, one is connected with the network of CIAE, another is connected with the local network.

Micro-VAX-II and SUN working station are connected with a switch. Two HUBs (HP) are used to connect the PCs.

3). The Main Functions of CNDC Network

The CNDC network has the following functions:

1) Sharing the facilities of network, including printers and CD-ROMs as well as floppy disk and hard disk. 2) Sharing the disk space between the SUN working station and Alpha server, in this case, the one who is familiar with the UNIX operating system can use the vi editor to edit a file and save it on the VMS disk easily. On the other hand, VMS users can also do this by using EDIT/EDT. 3) The hard disk of Alpha server can be used as the visual disk of PC. If a file is changed from PC, the data can also be changed on the alpha computer. If user is familiar with the utilities of PC, for example, Graph Tools, the user's data don't need to be transferred from alpha computer to PC. 4) By installing the Excursion software, the PC can be used as a graph terminal, such as vt240, vt340, or vt125 ... .

2. Chinese Evaluated Nuclear Data Library, Version -3 (CENDL-3)

CENDL-3 will be completed by the end of 2000. This library will contain about 200 Nuclides: fission nuclides 15 (^{233,234,235,236,237,238,239}U, ^{238,239,240,241,242}Pu, ^{242}Am, (^{241}Am)); structure materials 18 (Fe,Ni, Cu, Hf, Zr Isotopies); light nuclides 5 (^{6,7} Li, ^{9}Be, ^{12}C, ^{14}N;) fission products 91 (Z=36-71).

3. The Technical Route of CENDL-3

Theoretical calculation plays an important role in the neutron data evaluation. As we know, in order to do a consistent calculation for neutron induced data, the evaluator must compare the calculated cross section, angular distributions, energy spectra, as well as the double differential cross sections with the experimental and other evaluated data. To perform the comparison, a lot of graphs must be plotted. Some of them have to be plotted many times. A computer processing system for theoretical calculation has been developed for calculating the neutron nuclear data automatically or half automatically. The general diagram of this system is shown in Fig 2.

The main functions of this system are: 1). Filling the input data for the code automatically. 2). Plotting the results compared with the experimental and evaluated data. This code system includes a lot of codes and the EXFOR retrieving system as well as the CENPL[1] (Chinese Evaluated Nuclear Parameter Library) library. Therefore, it is impossible to use

one code to carry out these functions. The VMS commands are used to connect all the codes together.

In order to do a consistent calculation, the following three steps are usually needed: 1) Searching for the optimal neutron optical potential parameters. 2) Calculating the direct process cross section and angular distribution. 3) Doing the consistent calculation by using the UNF code series. According to the three steps, this code system is divided into three parts.

1) The theoretical calculation system searching for the optimal optical model parameters[2].

Although a lot of computer codes can be used to search for the optimal neutron optical potential parameters automatically, the input format is very complex, especially for input of the experimental data. This affair will cost the evaluator a lot of time to input the experimental data in the format which fit the code. APOM94 - a new version of code APOM[3] and GENOA[4] are included in this system. First, the total cross section and non-elastic cross section and the angular distribution for elastic scattering are retrieved from the EXFOR data library automatically. Second, the data format and the coordinate system are changed to fit with the theoretical calculation codes. The other parameters are retrieved from the CENPL library. Systematic optical model parameters[5] are used as the initial value.

2) The calculation for the direct process

DWUCK[6] or ECIS95[7] code is used to calculate the direct process cross section and angular distribution. The working course of this part is almost the same as the others.

3) A consistent theoretical calculation by using UNF code series.

The UNF code series are used to do the consistent calculation. UNF code series has seven codes now, in which UNF[8] for structure material; FUNF for fission Nuclides; SUNF[9] for fission product nuclides; CUNF for charged particle incident on the structural material; GUNF for photonuclear reactions; NUNF for the natural material and LUNF for light nuclides. The theoretical calculation for CENDL-3 is based on this UNF code series. The optimal optical model parameters which are obtained by the first part are used. All of the other parameters such as binding energies; level density parameters; giant resonance parameters and the parameters for discrete levels et al., are obtained from the CENPL library automatically.

UNFTOOLS[10] is an auxiliary plotting code of UNF code series. The following quantities can be plotted :1) The cross section of each reaction channel. 2) The γ production cross section between two levels. 3) The particle production cross section. 4) The double differential cross section

at a given angle. 5) The differential cross section at a given secondary energy. 6) The total particle production spectrum (integrated over angles).

To summary, this is a developing theoretical calculation system. A lot of theoretical calculation codes as well as the new functions will be supplemented in the future. By using this system, the time of performing a consistent theoretical calculation will be decreased a lot.

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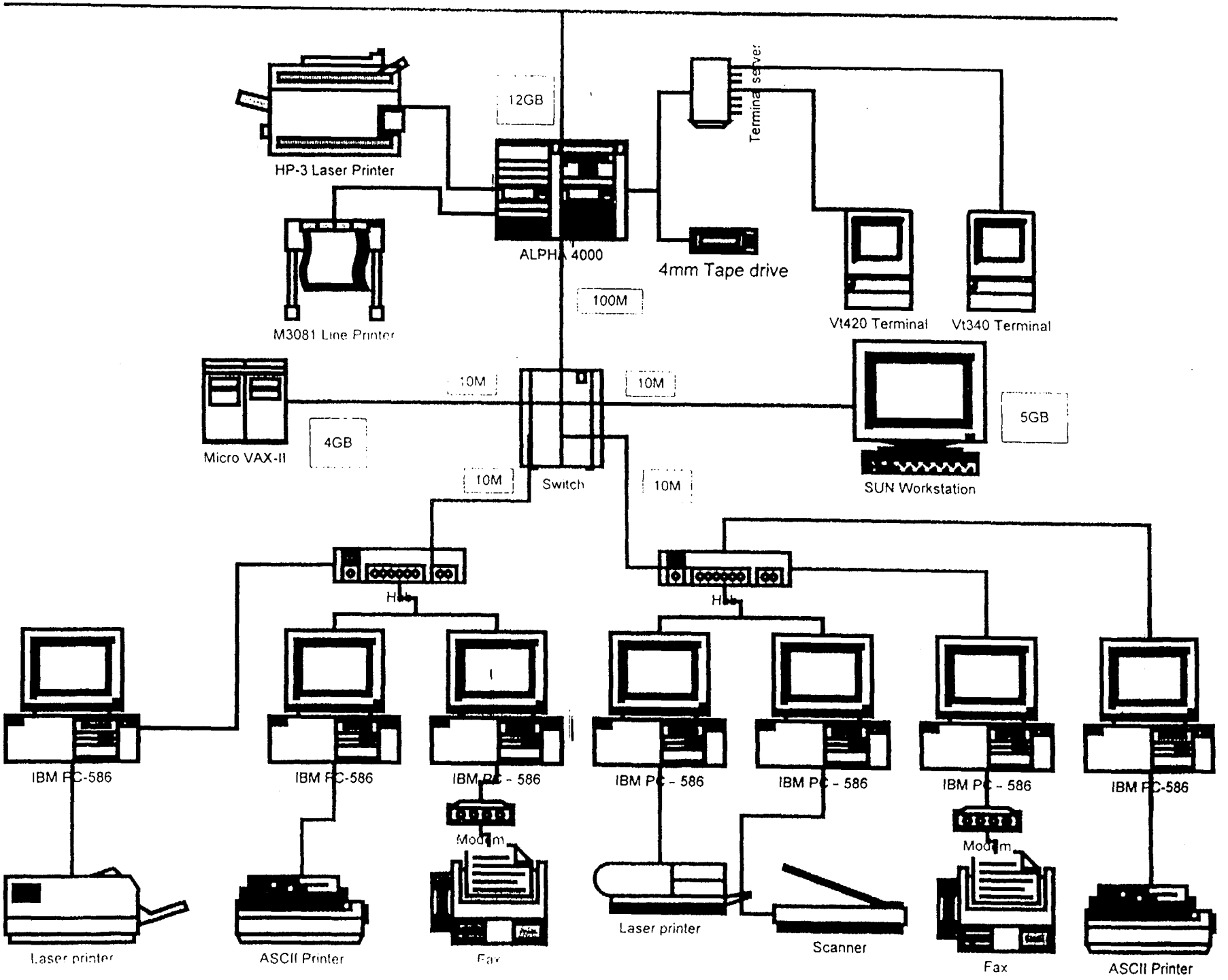
Fig.1 The Computer Network and File System in CNDC



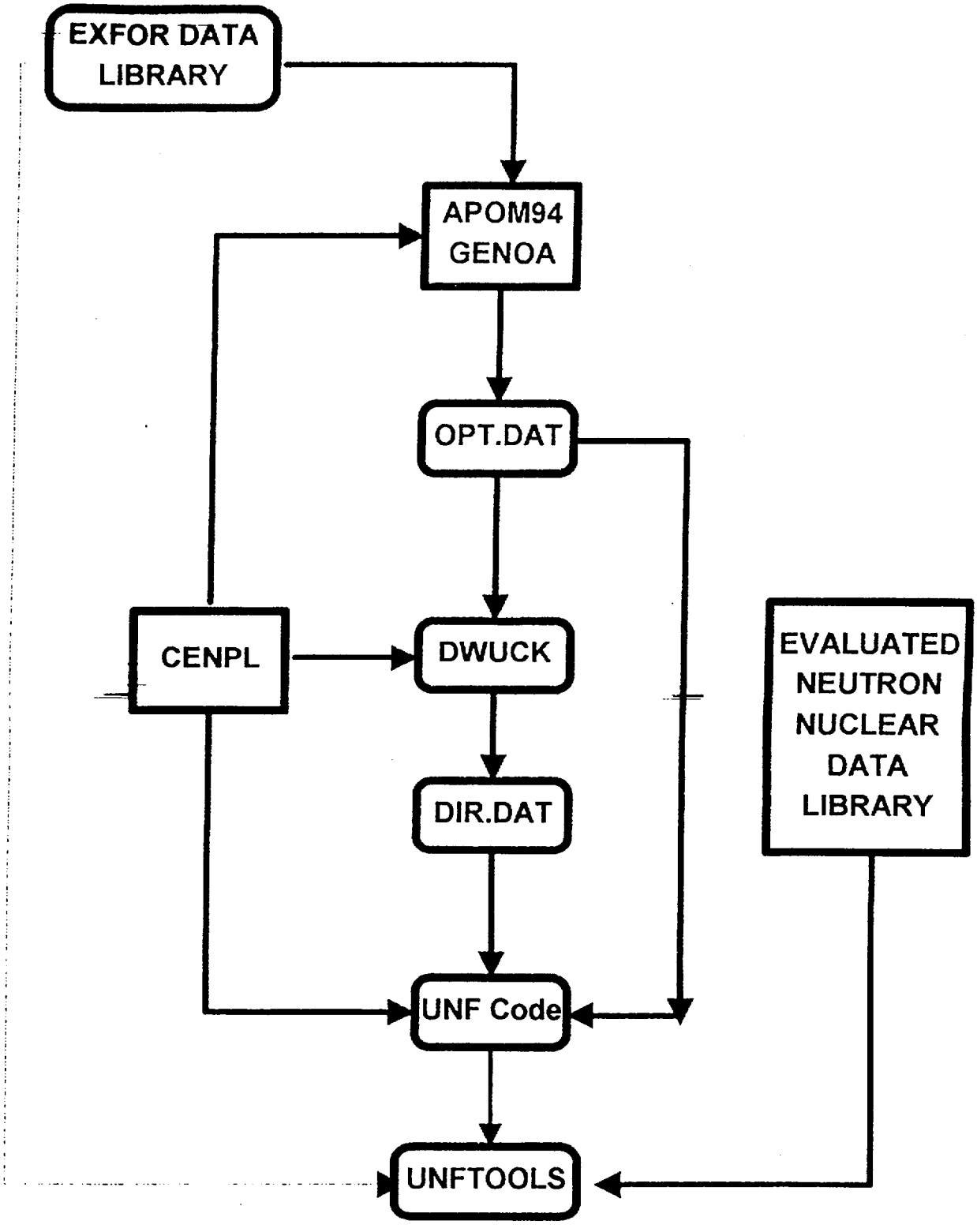


Fig.2 **The Theory Calculation System**

NRDC AGM:11-May-1998

Present Status of JENDL Project

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1. JENDL-3 revision 3 (JENDL-3.3: General Purpose File)

The second revised version of JENDL-3 (JENDL-3.2) was released in June 1994. It contains the data for 340 nuclides in the energy range from 10^{-5} eV to 20 MeV. The ENDF-6 format was adopted for JENDL-3.2. The pointwise files were also constructed at 0 K and 300 K by using RESENDD, RECENT, LINEAR and SIGMA1.

Though JENDL-3.2 gives much better evaluated data than JENDL-3.1, JENDL-3.2 has no covariance matrices. We recognize importance of the covariance matrices. A new working group has been organized in Japanese Nuclear Data Committee (JNDC) for the study of evaluation method of the covariance matrices. Answering the requests from FBR reactor projects, several materials have being compiled by this group.

The benchmark tests have shown that JENDL-3.2 gave much better prediction of various reactor characteristics than JENDL-3.1, though some problems have been pointed out. Up to now a lot of experiences has been piled up. To reflect these feedback information to JENDL-3.3,a new task force was organized to summarize the problems of JENDL-3.2 at April 1996. A report indicating the direction of revision for JENDL-3.2 was submitted to JNDC by the group after one year survey. It was approved by the steering committee of JNDC at March 1997.

The data improvement of JENDL-3.2 has been started at April 1997 for three years project.(See the schedule in Fig.1.) JENDL3.3 will be published as a consolidated new versions of JENDL by JAERI NDC (Nuclear Data center) with the cooperation of JNDC (Japanese Nuclear Data Committee). It's main features are followings: 1) Covariance data supplemented for major elements such as major actinides, structural materials and main coolants for the applications of

FBR, LWR and Fusion reactors, to enable the estimation of quantitative contribution of nuclear data uncertainty to design accuracy or safety margin. No covariance data were supplied up to the JENDL-3.2. 2) New material evaluations such as Er for burnable poisons in LWR high burn-up applications. 3) Adoption of isotope evaluation policy rather than natural element evaluation policy. Up to 3.2 for natural elements JENDL was prepared by natural element evaluation policy, i.e., for the transport calculations in nuclear reactors, natural elements data are recommended to use and for the dosimetry or activation applications isotope evaluations are recommended to use. Among others, addition of gamma-ray production data for the materials needed in Fusion application, . The data will be released after the review process for the reevaluated nuclide is adequately made.

Publications in this period of this category are as follows,

- Chart of Nuclides 1996 (booklet JAERI、February 1997)
- CD-ROM Storing JENDL-3.2 Plots and Data, T. Fukahori, O. Iwamoto, T. Nakagawa, K. Shibata, T. Narita, J. Katakura and A. Hasegawa ,JAERI-Data/Code 97-044 (October 1997)
- Descriptive Data of JENDL-3.2 (Part-I: Z=1-50, Paert-II: Z=51-100), (Eds.) K. Shibata and T. Narita JAERI-Data/Code 98-006 (February 1998)
- Curves and Tables of Neutron Cross Sections in JENDL-3.2 Part I (Z=1-50), Part II (Z=51-100), (Eds.) K. Shibata, T. Nakagawa, H. Sugano and H. Kawasaki, JAERI-Data/Code 97-003 (February 1997),

2. JENDL Special Purpose Files

The following special purpose files other than JENDL-3.3 general purpose file are being developed in Japan. Their status is given below.

JENDL Fusion File

JENDL Fusion File(JFF) was released at March 1996 to provide precise double-differential neutron and charged particle emission data by using MF6 representation of the ENDF-6 format. The evaluation was made for the data of H, D, Li, Be, C, N, O, ^{19}F, ^{27}Al, Si, Ca, Ti, Cr, ^{55}Mn, Fe, ^{59}Co, Ni, Cu, ^{75}As, Zr, ^{93}Nb, Mo, Sn, Sb, W, Pb and ^{209}Bi. For H, D, Li, N and O, the data of JENDL-3.2 are directly adopted. The revision works for some nuclides except light mass nuclei have been performed by the SINCROS-II code system which consists of GNASH, DWUCK, CASTHY and several auxiliary programs. Those results are examined by comparing with DDX measured at Tohoku and Osaka Universities. For the data of light mass nuclei, individual evaluation has been done. A lot of nuclides are adopted as FENDL-2 from this file (see Table-1). Complete version of JFF96 will be released in the FY98.

JENDL Actinide File

This file will provide the data of about 90 nuclei in the actinide region from 10^{-5} eV to 20 MeV. Data for about 60 nuclei will be taken from JENDL-3.2 with some modification. We need new evaluation work for about 30 nuclei, among which the evaluation have been completed for ^{235}Np, ^{237}Pu, ^{244}Pu and ^{246}Pu. Since 1994, International Science and Technology Center (ISTC) project for Measurements and Evaluation of miner actinide nuclei has been started at Institute of Physics and Power Engineering (IPPE, Obninsk Russia, #304.), V.I. Khlopin Radium Institute (KRI, StPetersburg Russia, #183.) and Radiation Physics and Chemistry Problem Institute (RPCPI, Minsk Belarus, #b-03). Recently the forth project started to measure fission cross-sections of minor actinides in medium energy range, i.e.,1 to 200 MeV by .Petersburg Nuclear Physics Institute (PNPI St.Petersburg, #609.) The results obtained by these projects are destined to be reflected in JENDL Actinide File. The file release will be envisaged in FY99. (See Appendix A)

JENDL Dosimetry File

The working group on dosimetry in JNDC which is working for JENDL Dosimetry File is now engaging update of the file. The cross section data for more than 20 reactions will be revised and their covariance matrices will be replaced with new ones. Integral tests will be carried out after the data reviewed.

JENDL Activation Cross Section File

Evaluation and compilation work for JENDL Activation Cross Section File has been completed. Its first version stores the data for 233 nuclei and 1246 reactions. The working group for this file has reviewed the data in the file. The first version of the file, JENDL Activation Cross Section File 96, was released in March 1996 .

JENDL High Energy Files

The evaluation of data for high energy neutrons and protons has been initiated in JNDC. They will make data files for neutrons and protons up to 50 MeV and about 3 GeV.

The former files will be used for the IFMIF project which JAERI participates. The evaluation of neutron data up to 50 MeV has been made for almost all necessary nuclides. The evaluations results for neutron are being reviewed. After review, the data will be combined with JENDL Fusion File or JENDL-3.2 below 20 MeV. The file release will be envisaged in FY98.

The latter files will be used for design of accelerators, transmutation systems of high-level waste, medical applications and so on. The evaluations of Al, Si, Cr, Ni, Cu, Pb and Bi isotopes were made for neutron and proton induced reactions up to 1 GeV. The neutron nuclear data for hydrogen are also finished. These data will be reviewed. The file release will be envisaged starting at FY99.

JENDL PKA/KERMA File

This file stores the spectra of primary knock-on atoms (PKA) and KERMA factors. The data to be stored are created from the data files(JENDL High Energy File) up to 50 MeV made for the IFMIF project. A couple of processing codes to create the file from evaluated nuclear data file, by using the effective single particle emission approximation, have been developed and tested.

The test compilation has been performed from JENDL Fusion File for the 69 isotope data except light mass nuclei below 20 MeV. The file release will be envisaged in FY98.

JENDL Photonuclear Data File

The evaluation has been finished for 46 isotopes; ^{2}D, ^{12}C, ^{14}N, ^{16}O, ^{23}Na, ^{24,25,26}Mg, ^{27}Al, ^{28,29,30}Si, ^{40,48}Ca, ^{46}Ti, ^{51}V, ^{52}Cr, ^{55}Mn, ^{54,56}Fe, ^{59}Co, ^{58,60}Ni, ^{63,65}Cu, ^{90}Zr, ^{93}Nb, ^{92,94,96,98,100}Mo, ^{133}Cs, ^{160}Gd, ^{182,183,184,186}W, ^{197}Au, ^{206,207,208}Pb, ^{209}Bi and ^{235,238}U in the gamma-ray energy range up to 140 MeV. Their compilation in the ENDF-6 format and the critical review are in progress. The file will be released in FY98.

JENDL PROJECT

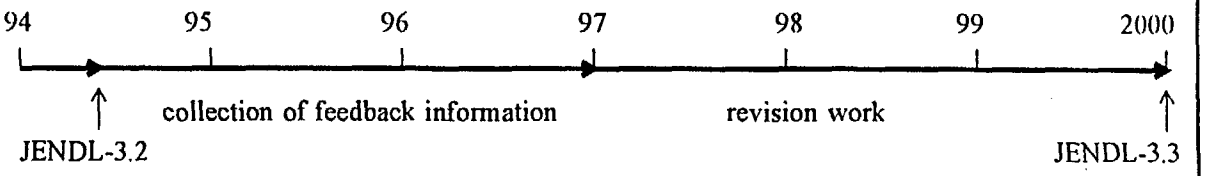
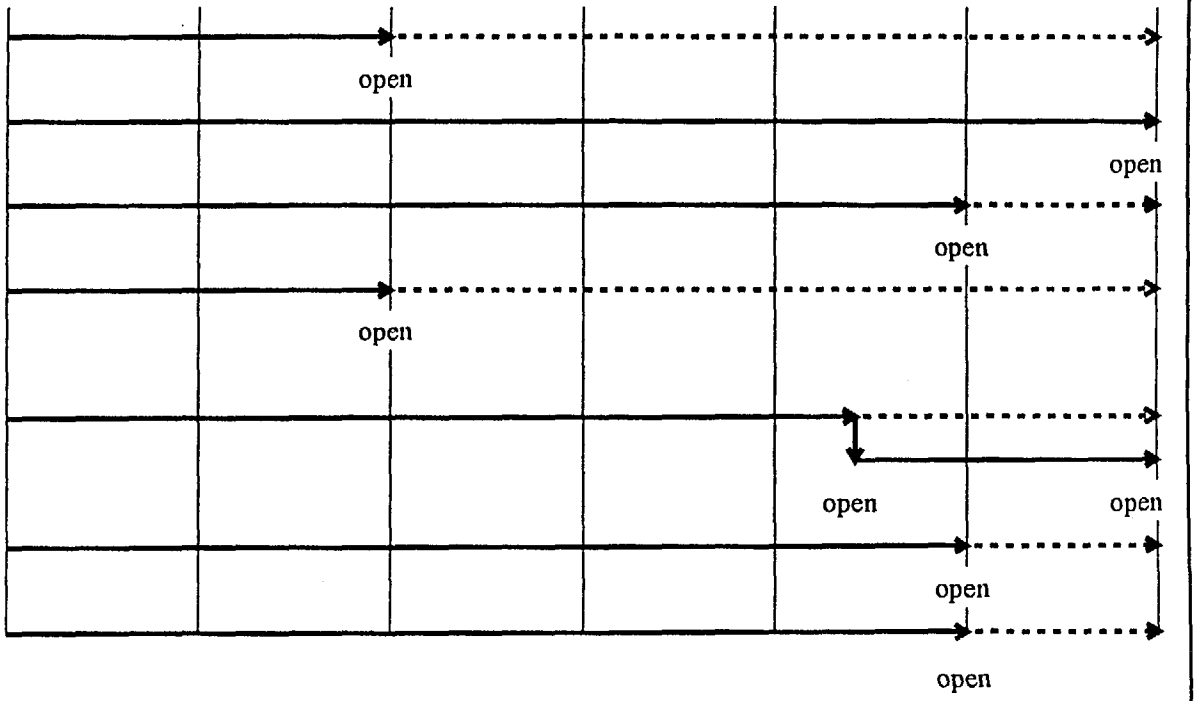
General Purpose File	1) JENDL-3	
Special Purpose File	2) Fusion File 3) Actinide File 4) Dosimetry File 5) Activation C.S File 6) High Energy File a. up to 50 MeV b. up to 2 GeV 7) PKA/KERMA File 8) Photonuclear Data File	

Table 1 Selected evaluated nuclear data libraries for FENDL/E-1.0 and -2.0.

Nuclide	FENDL/E-1.0	FENDL/E-2.0	Nuclide	FENDL/E-1.0	FENDL/E-2.0
1-H -1	ENDF-VI	ENDF-VI	25-Mn-55	ENDF-VI	ENDF-VI
1-H -2	ENDF-VI	JENDL-FF+BROND-2	26-Fe-54	ENDF-VI.1	ENDF-VI.1
1-H -3	ENDF-VI	ENDF-VI	26-Fe-56	ENDF-VI.1	EFF-3/ENDF-VI.1
2-He-3	ENDF-VI.1	ENDF-VI.1	26-Fe-57	ENDF-VI.1	ENDF-VI.1
2-He-4	ENDF-VI	ENDF-VI	26-Fe-58	ENDF-VI.1	ENDF-VI.1
3-Li-6	ENDF-VI.1	ENDF-VI.1	27-Co-59	ENDF-VI.2	ENDF-VI.2
3-Li-7	ENDF-VI	ENDF-VI	28-Ni-58	ENDF-VI.1	ENDF-VI.1
4-Be-9	ENDF-VI	JENDL-FF	28-Ni-60	ENDF-VI.1	ENDF-VI.1
5-B -10	ENDF-VI.1	ENDF-VI.1	28-Ni-61	ENDF-VI.1	ENDF-VI.1
5-B -11	ENDF-VI.1	ENDF-VI.1	28-Ni-62	ENDF-VI.1	ENDF-VI.1
6-C -12	ENDF-VI.1	JENDL-FF+ENDF-VI.1	28-Ni-64	ENDF-VI.1	ENDF-VI.1
7-N -14	BROND-2	JENDL-FF+BROND-2	29-Cu-63	ENDF-VI.2	ENDF-VI.2
7-N -15	BROND-2	BROND-2	29-Cu-65	ENDF-VI.2	ENDF-VI.2
8-O -16	ENDF-VI	JENDL-FF	31-Ga-nat	-----	JENDL-3.2
9-F -19	ENDF-VI	ENDF-VI	40-Zr-nat	BROND-2	JENDL-FF
11-Na-23	JENDL-3.1	JENDL-3.1	41-Nb-93	BROND-2	JENDL-FF
12-Mg-nat	JENDL-3.1	JENDL-3.1	42-Mo-nat	JENDL-3.1	JENDL-FF
13-Al-27	JENDL-3.1	EFF-3/JENDL-FF	50-Sn-nat	BROND-2	BROND-2
14-Si-nat	BROND-2	ENDF-VI/JENDL-FF	56-Ba-138	ENDF-VI	ENDF-VI
15-P -31	ENDF-VI	ENDF-VI	73-Ta-181	JENDL-3.1	JENDL-3.1
16-S -nat	ENDF-VI	ENDF-VI	74-W -182	ENDF-VI	JENDL-FF
17-Cl-nat	ENDF-VI	ENDF-VI	74-W -183	ENDF-VI	JENDL-FF
19-K -nat	ENDF-VI	ENDF-VI	74-W -184	ENDF-VI	JENDL-FF
20-Ca-nat	JENDL-3.1	JENDL-3.1	74-W -186	ENDF-VI	JENDL-FF
22-Ti-nat	JENDL-3.1	JENDL-3.1	82-Pb-204	ENDF-VI.1	ENDF-VI.1
23-V -51	ENDF-VI	JENDL-FF	82-Pb-206	ENDF-VI	ENDF-VI
24-Cr-50	ENDF-VI	ENDF-VI	82-Pb-207	ENDF-VI.1	ENDF-VI.1
24-Cr-52	ENDF-VI	ENDF-VI	82-Pb-208	ENDF-VI	ENDF-VI
24-Cr-53	ENDF-VI	ENDF-VI	83-Bi-209	JENDL-3.1	JENDL-3.1
24-Cr-54	ENDF-VI	ENDF-VI			

+: Data in both evaluations are merged.

/: One of them is selected after benchmark testing.

Appendix-A 11 May 1998

ISTC Project summary

Objective:

- Improvement of minor actinide data for transmutation projects using actinide burner reactors or accelerator driven spallation neutron sources.
- The data needed are for $^{237, 238}Np$, $^{238, 242}Pu$, $^{241, 242g, 242m, 243}Am$ and $^{242, 243, 244, 245, 246}Cm$.
- The corresponding data for most important cross sections should be obtained on the basis of ISTC.

ISTC projects:

- "Measurements of the fission neutron spectra for minor actinides"
  V.I.Khlopin Radium Institute (KRI St.Petersburg Russia, # 183-p)
  1995-1997

  - high precision measurements of the fission neutron spectra for spontaneous fission of Cm-244, -246, Pu-240 -242, and that for thermal induced fission of Cm-243, -245

- "Measurements and analysis of basic nuclear data for minor actinides"
  Institute of Physics and Power Engineering (IPPE Obninsk, #304-p)
  1995-1996

  - precise measurements of the fission cross sections of Cm-243, -244, -245, -246, -247, -248m, Am-242m, Pu-238.
  - measurements of fission product yields for Np-237
  - measurements of inelastic scattering and prompt fission neutron spectra for Np-237
  - measurements of delayed neutron yields and it's 6-group constants for Np-237 fast neutron fission
  - critical comparison between evaluated data for BROND-2, JENDL-3 and ENDF/B-VI and deduction of recommended values

- "Evaluation of actinide nuclear data"
  Radiation Physics and Chemistry Problems Institute

(RPCPIMinsk Belarus, # b-03)
1995-1997

- complete new evaluations of neutron cross sections for Cm-243, -245 -246, Am-241, 242, 242m, 243, Np-238, Pu-238, -242.

- "Neutron induced fission cross-sections of some actinides heavy nuclei in energy region 1-200 MeV
  Petersburg Nuclear Physics Institute (PNPI St.Petersburg, #609)
  1996-1998

  - measurements of neutron fission cross-section of U-233, U-238, Np-237, Th-232, Pu-239, Pb and Bi in the energy range up to 200 MeV.
    Relative measurements to U-235 fission with accuracy 3-10%.
  - evaluation of above listed cross section for neutron and proton induced fissions in the energy range 20-200 MeV.

RIKEN Nuclear Data Group

IAEA Advisory Group Meeting
On the Coordination of the Nuclear Reaction Data Centers
Vienna, 11-15 May 1998

Y. Tendow

EXFOR

RIKEN Nuclear Data Group has been collecting and compiling the nuclear reaction cross section data for medical radioisotope production, especially making efforts to pick up important data left off the EXFOR master file. After the last TRANS R012, we have not transmitted a new TRANS this year. We have compiled entries R0001 through R0053 up to this time. Entries R0054 through R0060 are partially finished at present and expected to be completed before long.

ENSDF, NSR

We also continue the mass chain evaluation as a member of the Japanese ENSDF working group that shares masses 118 through 129.

After the A = 129 mass chain evaluation completed, A = 120 evaluation is now under the author review. In consequence of recent advances in in-beam technique, lots of novel data on high-spin states and band structures have been produced throughout this mass region. We are planning to make partial updates for some masses including A = 129 to incorporate these new data appeared afterwards.

NSR compilation of secondary sources published in Japan in 1997 has been carried out. A total of 125 works from 7 Annual Reports has been sent to the NNDC to be incorporated into the Recent References File.

RIKEN Accelerator Progress Report 1996	33 (reports)
JAERI-TV Annual Report 1996	22
JAERI-TIARA Annual Report 1996	5
RCNP Annual Report (Osaka Univ.) 1996	22
OULNS Annual Report (Osaka Univ.) 1996	22
UTTAC Annual Report (Univ. Tsukuba) 1996	15
CYRIC Annual Report (Tohoku Univ.) 1996	6

Publication of some regular Annual Reports was much delayed last year. Compilation works for the rest of 1997 publications, along with those published in 1998 are now in progress.

Staff

Present group members are the same as the previous year, that is: 4 "professionals" and 1 "general service".

4	"professionals",	Y. Tendow,	EXFOR, ENSDF, NSR,
		K. Kitao,	ENSDF,
		A. Yoshida,	NSR,
		A. Hashizume,	ENSDF, EXFOR.
1	"general service",	Y. Kidachi,	secretary, data preparation.

Japan Charged-Particle Nuclear Reaction Data Group (JCPRG)

Progress Report to
the IAEA Advisory Group Meeting
May 11-15, 1998

The Executive Committee of JCPRG

General

In 1997, we have carried out the following businesses:

(1) Compiling all the CPND(Charged Particle Nuclear Reaction Data) produced in Japan with the NRDF(Nuclear Reaction Data File) format,

(2) Translating the NRDF data into the EXFOR data,

(3) Making a combined index database for the CPND in both of NRDF and EXFOR for the convenience of the customers in Japan,

(4) Distributing the CPND and promoting utilization in Japan.

In 1997 much of our effort was concentrated on the second subject mentioned above. The details of the work will be reported later. This year (1998), we plan to make a new practicable database based on the IntelligentPad system. A preliminary system for the NRDF data has been already made by Chiba. As the next step, we make the system more practicable and extend the system to be able to manage EXFOR files as well.

NRDF Data Compiling Activity

In 1997 we newly compiled 35 entries (595 tables, 1.6 MB) based on the data obtained with the accelerators in Japan. We list the institutes which provided us with their data:

- Tohoku Univ.(CYRIC) — 1 entry
- Tsukuba Univ.(UTTAC) — 3 entry
- Institute or Nuclear Study, Tokyo Univ. (INS) — 9 entries
- Tandem Accelerator Lab., Kyushu Univ. — 1 entries
- Research Center for Nuclear Physics, Osaka Univ. (RCNP) — 12 entries
- JAERI Tandem, LINAC & V.D.G. — 4 entries

- RIKEN Accelerator — 12 entries
- KEK Accelerator — 2 entries

By March of 1998 the amount of the compiled data has reached 24,914 tables of about 70.93 MB. Our aim is to store all data produced with Japanese accelerators in the NRDF database. Ever year the NRDF data are compiled approximately by 1,000 tables and 3 MB.

EXFOR Translation from NRDF

The conversion to the EXFOR has been done of the NRDF data compiled from CPND which were produced in Japan up to 1993. We checked at this moment some problems we had encountered to continue increasing translatable NRDF data and we have discussed a possible way of improving the NRDF compilation. In the near future the translation system on the mainframe computer is to be moved to the workstation. By that time several improvements on the translation system, including version-up of the NRDF dictionary should be done. At present we have obtained 31 EXFOR files translated from the NRDF data from 1994 to 1996.

The nine EXFOR entries which were translated from the NRDF files were found to have the duplicated files. We made unified files and translated into EXFOR files of revised NRDF ones.

Customer Services

Retrieval services of NRDF and EXFOR data are available by using computers in the Hokkaido University Computing Center. In addition to these services, the WWW homepage (http://nucl.sci.hokudai.ac.jp/ ñrdf/index.html) has been opened to public. In order to extend the NRDF data service, we have started to make a developed retrieval system based on the IntelligentPad.

ANNEX: Organization and members of JCPRG

Advisory committee:

Yasuhisa ABE (Research Institute for Fundamental Physics, Kyoto Univ.)

Yoshinori AKAISHI (Institute for Nuclear Study, Tokyo Univ.)

Yasuo AOKI (Tsukuba Univ.)

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(2) Data input:

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NRDF System Maintenance:

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Working Staff of Transformation from NRDF to EXFOR:

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Toshiyuki KATAYAMA(Hokusei-Gakuen Univ.)

Working Staff of Making a Data-base based on IntelligentPad:

Sigeyoshi AOTYAMA(Hiokkaido Univ.)
Yoshihide OHBAYASHI(Hokkaido Univ.)

CHARGED PARTICLE NUCLEAR DATA GROUP, DEBRECEN

Progress Report

Co-ordination of the Nuclear Reaction Data Centres
11 - 15 May 1998, Vienna

(Ferenc Tárkányi)

General

The Debrecen Nuclear Data Group is working within the Cyclotron Department of the Institute of Nuclear Research of the Hungarian Academy of Sciences (ATOMKI).

We have continued the compilation and the critical comparison of several selected reactions used for production of medically important radioisotopes, for monitoring charged particle beams and for thin layer activation measurements. New experimental cross section determination were made as part of a systematic investigation of the above mentioned type of reactions.

Staff and Nuclear Data Program

The staff consist of five "professional" members working on compilations in part-time only. They are involved simultaneously in measurements of new charged particle and neutron induced cross section data and in different applications of cyclotrons (medical and other isotope production, nuclear analitics, application of thin layer activation technique for wear measurement, radiation damage test, etc.). The direct experience gathered on the field of different applications helps in selection of measurements for acquiring new data and in selection of importance of different data. The method which we would like to follow is a complex investigation of each problem (very detailed compilations, critical selections of experimental works, new measurements, development of recommended data base, development of new methodologies to use nuclear the results of compilation and evaluation to be published in international referred journals.

We consider new data measurements to be very important from different reasons:

- to have more reliable experimental data for practical applications
- to complete the gaps or at least reach an acceptable level of disagreements among literature data under compilation in the frame of international nuclear data programmes.

The experimental part of the programme is carried out in broad and effective collaborations with cyclotron laboratories in Belgium (VUB Brussels), in Germany (INC FZ Julich) and in Finland (Turku PET Centre). Institutes from Hungary (Kossuth Univ. Debrecen) and from Russia (IPPE Obninsk) contributing also in theoretical calculations of he measured data. The Debrecen Group is deeply involved in the CRP project of the IAEA "Development of Reference Charged Particle Data Base for Medical Isotope Production" (see later), which gave them significant amount of work. Because of the CRP and some other engagements (dissertations, work abroad, structural changes of the department) the EXFOR compilation work slowed down a little in 1997.

Computer Facilities

For data handling and storage we use Personal Computers (PC) and their environments (large hard disks, EXABYTE tape unit, scanner for graphical data input). Since the last meeting we have installed several new PC which is used to handle EXFOR data.

For data input and editing the DOS Editor is used, for checking the new entries the Chukreev's checking codes are applied. In the lack of proper retrieve software for PC we use the Microsoft Winword to search on index files or on EXFOR data files. The PCs can communicate with each other trough local network and can have access to other centres trough international network.

We have checked the on-line service of the IAEA as well as the file transfer protocol (FTP) again by downloading data from the server of the Agency, but we found it almost useless during working ours because of the very low speed of the connecting line. To transfer transfer large files (> 1 Mb) by FTP is very difficult because of the frequent break down of the connection. Recent developments which makes available the EXFOR data base at the agency improved the on-line service, but still there are many occasions when users encounter problems using the on-line system.

Compilation, evaluation and measurements of selected reactions

In accordance with the agreement of the EXFOR compilators of charged particle data the new experimental data published from the Jülich and the Debrecen Institutes are entered into the EXFOR library by the Debrecen Group. The new experimental works result in about 20-30 publications in each year.

Beside the compilation of CPND in EXFOR format the Debrecen Group is participating in a Co-ordinated Research Program on "Development of Reference Charged Particle Cross Section Data Base for Medical Radioisotope Production" co-ordinated by IAEA. The CRP focuses on beam monitor reactions and production reactions for most important gamma- and positron emitter isotopes induced by light charged particles with an incident energy up to 100 MeV. The CRP programme contains compilation and evaluation of the existing experimental data and also new measurements on cross sections of charged particle induced nuclear reactions. The reactions included in the scope of the CRP are given in tables 1 and 2. The results of compilation and evaluation of cross sections for production of ^{67}Ga and ^{111}In and p, d, alpha and ^{3}He induced monitor reactions on Cu, Ti, Ni and Fe are already published or accepted for publication in a referred journals.

The last column of the tables indicates the new experiments required to perform on different reactions and quantities. The references of the works published in the period 96-98 is collected at the end of the report. The shaded area in the tables indicates the area in which the Debrecen group is engaged.

In this project the Debrecen group is responsible also to include in EXFOR all the old published data which they encounter during the CRP work and are not included yet in the EXFOR library. The compilation of the collected experimental works in the EXFOR is already started, but the work is huge therefore, we suggest to redistribute the work among the CPND Centres, if they ready to do it.

Table 1. Monitor reactions evaluated in the CRP

Particle	Reaction	Product half life	Phase	Additional experiment
p	$^{27}Al(p,3p3n)^{22}Na$	2.6 y	I	
	$^{nat}Ti(p,x)^{48}V$	16.0 d	I	σ
	$^{nat}Ni(p,x)^{57}Ni$	1.5 d	I	**σ, n eff.**
	$^{nat}Cu(p,x)^{56}Co$	77.7 d	I	
	$^{nat}Cu(p,x)^{62}Zn$	9.3 h	I	
	$^{nat}Cu(p,x)^{63}Zn$	38.1 min	I	
	$^{nat}Cu(p,x)^{65}Zn$	244.1 d	I	
d	**$^{nat}Al(d,x)^{22}Na$**	2.6 y	II	
	$^{nat}Ti(d,x)^{48}V$	16.0 d	II	σ
	$^{nat}Fe(d,x)^{56}Co$	77.7 d	II	σ
	$^{nat}Ni(d,x)^{61}Cu$	3.4 h	II	σ
^{3}He	**$^{nat}Al(^{3}He,x)^{22}Na$**	2.6 y	II	
	$^{nat}Ti(^{3}He,x)^{48}V$	16.0 d	II	σ
	$^{nat}Cu(^{3}He,x)^{66}Ga$	9.5 h	II	σ
	$^{nat}Cu(^{3}He,x)^{67}Ga$	3.3 d	II	σ
	$^{nat}Cu(^{3}He,x)^{65}Zn$	244.1 d	II	σ
α	**$^{nat}Al(\alpha,x)^{24}Na$**	14.7 h	II	
	$^{nat}Ti(\alpha,x)^{51}Cr$	27.7 d	II	σ
	$^{nat}Cu(\alpha,x)^{66}Ga$	9.5 h	II	σ
	$^{nat}Cu(\alpha,x)^{67}Ga$	3.3 d	II	σ
	$^{nat}Cu(\alpha,x)^{65}Zn$	244.1 d	II	σ

Table 2. Reactions for medical radioisotope production. Single photon and positron emitters

Nuclei	Half life	Nuclear reaction	Phase	Additional measurement
^{67}Ga	3.3 d	**$^{67}Zn(p,n)^{67}Ga$**	II	**yield**
		$^{68}Zn(p,2n)^{67}Ga$	II	**σ, yield**
$^{81}Rb(^{81}Kr)$	4.6 h(13s)	$^{82}Kr(p,2n)^{81}Rb$	II	
		$^{nat}Kr(p,2n)^{81}Rb$	II	
^{111}In	2.8 d	**$^{111}Cd(p,n)^{111}In$**	I	**yield**
		$^{112}Cd(p,2n)^{111}In$	I	σ
		$^{nat}Cd(p,xn)^{111}In$	I	
^{123}I	13.2 h	**$^{123}Te(p,n)^{123}I$**	I	**yield**
		$^{124}Te(p,2n)^{123}I$	I	yield
		$^{127}I(p,5n)^{123}I$	I	yield
^{201}Tl	3.0 d	$^{203}Tl(p,3n)^{201}Tl$	I	
		$^{nat}Tl(p,xn)^{201}Tl$	I	
^{211}At	7.2 h	$^{209}Bi(\alpha,2n)^{211}At$	II	
^{11}C	20 min	**$^{14}N(p,\alpha)^{11}C$**	II	
^{13}N	10 min	**$^{16}O(p,\alpha)^{13}N$**	II	
^{15}O	2 min	**$^{14}N(d,n)^{15}O$**	II	σ
^{18}F	110 min	**$^{18}O(p,n)^{18}F$**	II	σ
		$^{20}Ne(d,\alpha)^{18}F$	II	σ
$^{62}Zn(^{62}Cu)$	9.3 h(9.7 min)	$^{63}Cu(p,2n)^{62}Zn$	II	
$^{68}Ge(^{68}Ga)$	288 d	$^{69}Ga(p,2n)^{68}Ge$	II	
$^{68}Ge(^{68}Ga$	288d	$^{nat}Ga(p,x)^{68}Ge$	II	
$^{82}Sr(^{82m}Rb)$	25.5 d	$^{85}Rb(p,4n)^{82}Sr$	II	
		$^{nat}Rb((p,x)^{82}Sr$	II	yield

The work already performed within this CRP and our other compilation programes gave several important conclusions concerning the status of the integral cross section data of the low and middle energy charged particle induced reactions.
The problem oriented compilations are very important both for further development of the data bases, to initiate new measurements and for the users by obtaining the required critically selected data very quickly.

Recent Progress in EXFOR compilation

In the second half 1996 we have compiled 18 new CPND entries (155 sub-entries) in EXFOR format. The entries were checked and corrected by the NDS. In 1997 15 new entries were compiled and transferred to NDS for checking and other 10 new entries were compiled but still not sent

Services

The group supplied charged particle reaction data for Hungarian users.
Several request arrived from abroad concerning mainly recommended data, not yet available in other data bases.

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M. Sonck, S. Takács, F. Szelecsényi, A. Hermanne and F. Tárkányi:
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Center of Nuclear-Physics Data (CNPD) RFNC-VNIIEF. Status report to the IAEA Advisory Group Meeting, May 11-15, 1998.

S.A.Dunaeva

Russian Federal Nuclear Center - VNIIEF.
Russia, 607190,Sarov, Nizhnij Novgorod region, pr. Mira 37

Last year according to proposal of the Nuclear Data Center Meeting a center for support and development of the experimental and estimated data libraries was set up in RFNC-VNIIEF.

We are continuing data correction and translation to the EXFOR format of our experimental data. In 1996 we transmitted 176 entries with file identification character (FIC) 'A', in 1997 - 284 entries with FIC 'A' and 167 entries with FIC 'F', in 1998 - 128 entries with FIC 'F'. We checked our library on the duplication with EXFOR library and found 502 entries, which were the same.

The experimental data compilation and checking have been performed in the VMS operating system with the help of NNDC software.

Evaluated data were obtained from charged particles interaction with nuclei of carbon, nitrogen and oxygen. We are continuing the creation of the software to support evaluated data base. It will permit potential user not only to scan base containing but to perform works oriented on reevaluation the old value of cross section with consideration of new received experimental information. We are planning to transmit this software and the evaluated data in the end of 1998 to the IAEA.

Table 1

List of evaluated data files for charged particle interaction with $^{1,2,3}H$ and $^{3,4}He$.

Reaction	Energy, MeV	Reaction	Energy, MeV
$^{2}H(p,g)^{3}He$	.024÷22.6	$^{2}H(p,p+n)^{1}H$	3.4÷40.0
$^{2}H(d,g)^{4}He$	.03÷18.9	$^{2}H(d,n)^{3}He$	.005÷20.0
$^{2}H(d,p)^{3}H$	.005÷14.0	$^{3}H(p,g)^{4}He$	.1÷17.8
$^{3}H(p,n)^{3}He$	1.2÷20.0	$^{3}H(d,g)^{5}He$	.04÷5.0
$^{3}H(d,n)^{4}He$	.005÷19.0	$^{3}H(\iota,2n)^{4}He$	.01÷4.0
$^{3}He(d,g)^{5}Li$	.05÷16.8	$^{3}He(d,p)^{4}He$	.01÷20.0
$^{3}He(\tau,2p)^{4}He$	.04÷24.0	$^{4}He(d,g)^{6}Li$	.001÷13.5
$^{4}He(t,g)^{7}Li$	.25÷6.0	$^{4}He(\tau,g)^{7}Be$	.25÷6.0

Table 2.

List of evaluated data files for charged particle interaction with ^{10}B, ^{11}B

Reaction	E, MeV	Reaction	E, MeV
$^{10}B(p,g)^{11}C$	.1÷12.7	$^{10}B(p,\alpha)^{7}Be$	0.06÷9.5
$^{10}B(d,n)^{11}C$	.4÷16.	$^{10}B(d,p)^{11}B$	0.14÷13.4
$^{10}B(d,\alpha)^{11}B$	.45÷11.8	$^{10}B(\alpha,p)^{13}C$	1.3÷25.9
$^{11}B(p,g)^{12}C$	.16÷37.1	$^{11}B(p,n)^{11}C$	2.7÷27.19
$^{11}B(p,\alpha0)^{8}Be$	0.06÷20.9	$^{11}B(p,\alpha1)^{8}Be$	.09÷20.6
$^{11}B(d,g)^{13}C$	1.0÷12.1	$^{11}B(d,n)^{12}C$	.44÷11.7
$^{11}B(\alpha,g)^{15}N$	6.8÷9.5	$^{11}B(\alpha,p)^{14}C$	.6÷16.1

Table 3

List of evaluated data files for charged particle interaction with $^{6,7}Li$

Reaction	E, MeV	Reaction	E, MeV
$^{6}Li(p,g)^{7}Be$	.16÷1.17	$^{6}Li(p,x)n$	5.7÷13.4
$^{6}Li(p,\alpha)^{3}He$	.01÷18.5	$^{6}Li(d,n)^{7}Be$	.016÷17.0
$^{6}Li(d,p)^{7}Li$	.027÷12.0	$^{6}Li(d,t)^{5}Li$	.11÷3.9
$^{6}Li(d,\alpha)^{4}He$	.03÷14.8	$^{6}Li(t,2n)^{7}Be$	4.8÷12.0
$^{6}Li(t,d)^{7}Li$	.09÷10.0	$^{6}Li(t,p)^{8}Li$	.1÷20.0
$^{6}Li(\tau,x)n$	3÷21.7	$^{6}Li(\tau,p)^{8}Be$	.5÷10.0
$^{6}Li(\tau,p)^{8}Be$	0.5÷10.0	$^{6}Li(\tau,d)^{7}Be$	.4÷6.9
$^{7}Li(p,g)^{8}Be$	.09÷18.0	$^{7}Li(p,n)^{7}Be$	1.9÷20.0
$^{7}Li(p,\alpha)^{4}He$	.02÷11.9	$^{7}Li(p,x)^{3}H$	2.0÷12.5
$^{7}Li(d,2n)^{7}Be$	5.4÷12.	$^{7}Li(d,x)n$	.13÷11.
$^{7}Li(d,p)^{8}Li$	.4÷7.1	$^{7}Li(d,t)^{6}Li$	1.4÷12.
$^{7}Li(t,p)^{9}Li$	.5÷14.9	$^{7}Li(t,d)^{8}Li$	6.1÷10.2
$^{7}Li(t,\alpha)^{6}He$	.06÷22.0	$^{7}Li(t,x)n$	.013÷12.1
$^{7}Li(\tau,t)^{7}Be$	1.7÷7.93	$^{7}Li(\tau,\alpha)^{6}Li$	.8÷9.0

Table 4.

List of evaluated data files for charged particle interaction with ^{9}Be

Reaction	E, MeV	Reaction	E, MeV
$^{9}Be(p,g)^{10}B$	.1÷1.19	$^{9}Be(p,x)n$	2.05÷14.2
$^{9}Be(p,\alpha 0)^{6}Li$	.03÷11.6	$^{9}Be(p,\alpha 1)^{6}Li$	4.9÷11.6
$^{9}Be(d,p0)^{10}Be$	.045÷11.8	$^{9}Be(d,p1)^{10}Be$	.045÷11.8
$^{9}Be(d,x)^{3}H$	1.4÷18.4	$^{9}Be(d,t0)^{8}Be$	0.3÷15.0
$^{9}Be(d,\alpha 0)^{7}Li$	.09÷14.1	$^{9}Be(d,\alpha 1)^{7}Li$	.09÷14.1
$^{9}Be(t,n)^{11}C$	.6÷2.	$^{9}Be(\tau,n)^{11}C$	.6÷40.1
$^{9}Be(\tau,p0)^{11}B$	1.8÷14.0	$^{9}Be(\tau,p1)^{11}B$	1.8÷14.0
$^{9}Be(\alpha,n0)^{7}Li$	1.4÷30.	$^{9}Be(\alpha,n1)^{7}Li$	1.6÷30.
$^{9}Be(\alpha,n2)^{7}Li$	3.8÷30.	$^{9}Be(\alpha,n3)^{7}Li$	6.2÷30.

The software for data evaluation is designed at the RFNC-VNIIEF for the Window NT system on the personal computer.

The whole work was fulfilled according to financial support of the #145 ISTC project and participation of Roger White, collaborator from Livermore National Laboratory and with great support of Vicki McLane from NNDC.

I appreciate everybody, who gave us corrections and I believe that we shall collaborate fruitfully in the works we have planned.

The list of articles and papers:

1. V.I.Serov, Y.V.Strelnikov, S.N.Abramovich, L.A.Morkin, G.N.Sleptsov *Neutron and α-particle formation cross-section measurement at interaction of tritons with ^{7}LI nuclei.* Preprint 60-97. Russian Federal Nuclear Center. Sarov, 1997.
2. G.B. Yan'kov, O.V. Bochkarev, V.A. Vukolov, E.A. Koltypin, E.A. Kuz'min, Yu.D. Molchanov, L.V. Chulkov Kurchatov Institute, Moskow, S.N. Abramovich, L.I. Shizhenskaya RFNC-VNIIEF, *Neutron channels of $^{6}Li+^{3}H$ and $^{7}Li+^{3}H$ reactions.* Sarov Preprint 59-97. Russian Federal Nuclear Center. Sarov, 1997.

STATUS OF THE NUCLEAR DATA ACTIVITY IN UKRAINE

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STCU Project 355 (1997 - 1999)

Project manager: Kaltchenko Alexander I.

NUCLEAR DATA ANALYSES IMPORTANT FOR NUCLEAR INDUSTRIES IN UKRAINE

1. **Organization of Nuclear Data Bank , Chornobyl Center, Slavutych, on the base of computer complexes DEC ALPHA 2100 and DEC ALPHA 1000 in cooperation with the specialists of DEC Ukraine, PNNL and BNL.**

2. **Providing and development of methods and codes PREPRO and GRUCON for nuclear constant calculations using the evaluated nuclear data libraries in ENDF/B format.**

3. **Study and implementation of computer codes operating in UNIX system (NJOY, TRANSX, SCAMPI) with the help of specialists from RSICC, USA, and NDC specialists, Obninsk, Russia.**

4. **Development and implementation of the first turn of the specific multigroup library for analysis of the radiation burden onto pressure vessels of the operating NPPs (Khmel'nytsk and South-Ukraine) together with specialists from Ukraine State Committee on Nuclear Power**

As a result of this Project realisation we may consider:

1. In cooperation with the PNNL, BNL, ORNL, Chonobyl Center and INR specialists, the Nuclear Data Bank will be established in Slavutich on the base of computer complexes DEC ALPHA 2100 and DEC ALPHA 1000.
This Bank will be equipped with the modern information and other software bases and will be ensured by scientific and methodological support by INR specialists.
(ADLIST, CINDA, CSISRS, ENDD, NSR, ENSDF, NUDAT, MASSES, X-RAY).

2. The methods and practice for calculations of nuclear constants such as neutron cross sections, angular distributions etc. will be developed using the last versions of nuclear data libraries ENDF/B-IV, V, VI, JENDL-3, JEF-2, CENDL, BROND-2 et al.

3. INR specialists will provide and develop the methods of producing the multigroup constants using the code complexes NJOY, TRANSX-2.15, SCAMPI et al after the training and under the support of the RSICC, ORNL specialists.

4. The specified multigroup library for reactor dosimetry will be developed and provided for neutron fluence determination in VVER-1000 reactor vessels to evaluate the resources of their work.

5. Calculation methods and codes will be developed and provided for realistic neutron fluence determination using the results obtained with the multiple- folg technique (codes MIEKEB, MSANDB, MSITER et al).

6. Codes for factor *dpa* determination and H and He production will be worked out and provided using the radiation damage library DAMSIG-84.

7. As the final result, there will be created the scientific, information and technological division capable to ensure the nuclear technologies in Ukraine with the necessary nulear data support (multigroup constants, cross sections averaged over neutron spectra etc), methods and codes for calculations and predictions in the area of NPP and other technologies with radiation sources in the fields: nuclear research, nuclear power engineering, medicine, geology, agriculture, space research programmes, etc.

The use of the computer complexes based on DEC ALPHA, Chornobyl Center, Slavutych is planned to be used by participants of the Project to support the activity of the Chornobyl Center in Slavutych and to use the resources of Nuclear Data Bank and other software and hardware abilities of Chornobyl Center for the development of scientific support for Nuclear Power needs.

The use of the computer IBM RS/6000 P43 Model 140 is planned at the second year of the Project as an addition to the Nuclear Data Analysis Facility(based on DEC ALPHA) in Slavutich. This computer has to fulfill some analytical calculations with codes operating in UNIX System and may be used for training and teaching tasks to support the Chornobyl Center Nuclear Data Bank activity.

Here is the list of codes for Chornobyl Center ordered by PNNL in RSICC, Oak Ridge, some of them, working in UNIX, may be effectively used on RS/6000:

NJOY 94.35, TRANSX-2.15, SCAMPI, BUGLE-96(in UNIX),

and other codes working in various systems:

- MCNP-4, TORT-DORT/PC, ANISN-ORNL/(PC), SAND II(PC), STAY'SL, LEPRICON.

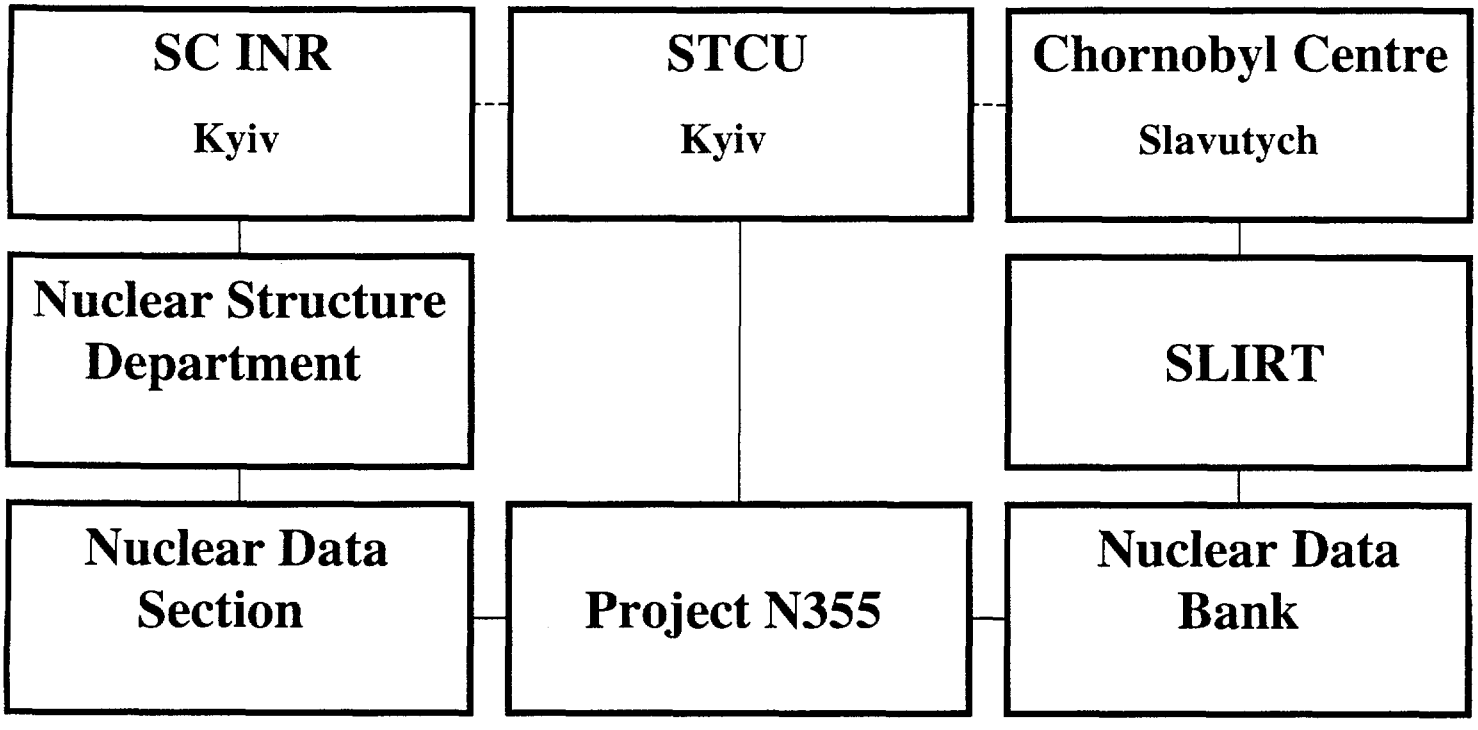
This activity will join scientists and specialists with the large experience in nuclear data measurements and analysis, will provide the future for scientific youth, will make it possible to maintain the advanced scientific level for nuclear technologies in Ukraine.

This activity will continue after the end of this Project.

Ukrainian organizations interested in this activity:

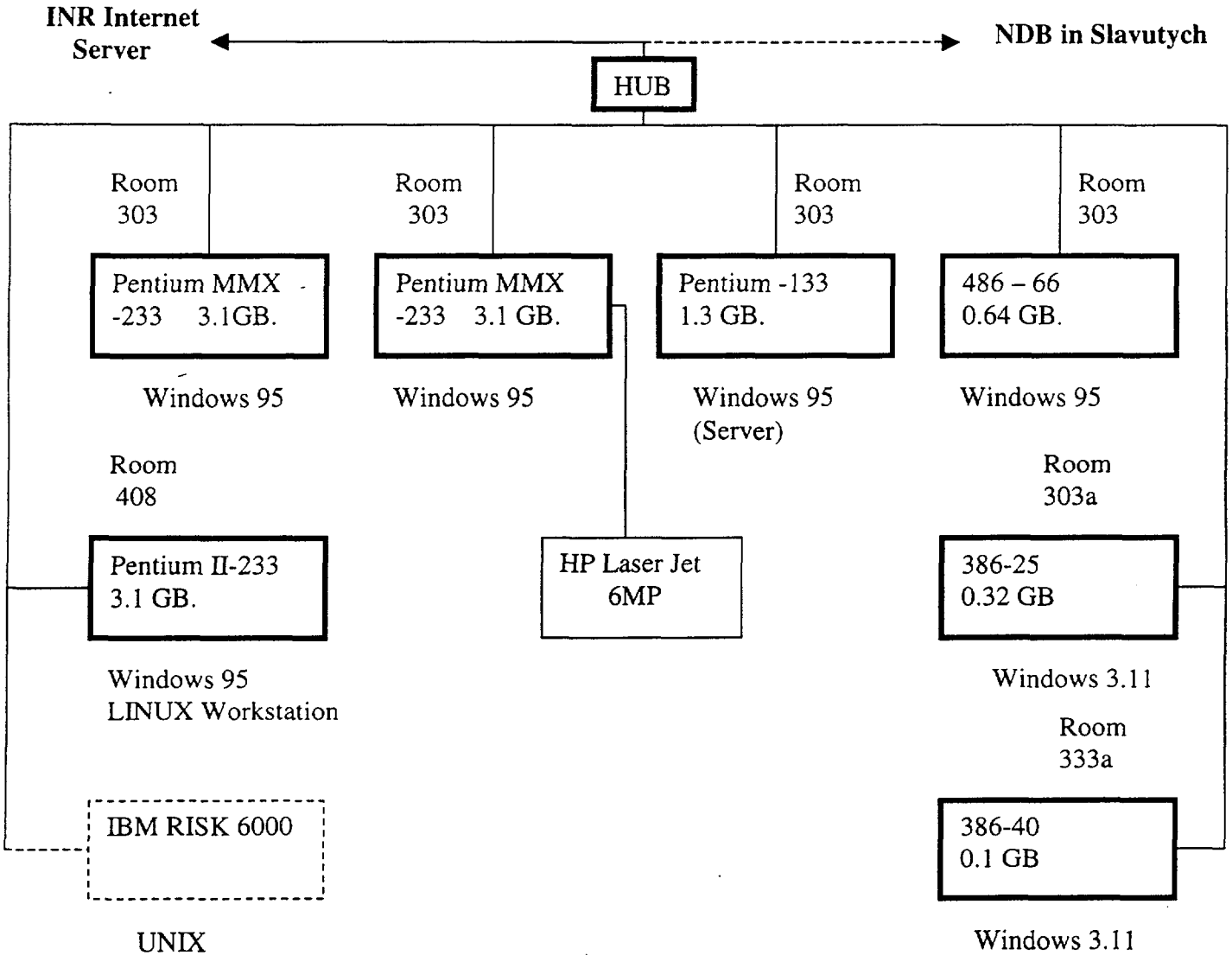
State Committee on Nuclear Power
Ministry on Environment, Radiation and Nuclear Safety
Operating NPPs (14 Units)
Chornobyl Center, Slavutych
Object " Ukruttya " and others.

Nuclear Data Activity in Ukraine



Nuclear Data Analyses Important for Nuclear Industries in Ukraine

INR Nuclear Data Section Network.



SLAVUTICH NUCLEAR DATA BANK
Status Report to the Advisory Group Meeting on the Coordination of the Nuclear Reaction Data Centers 11-15 May 1998

M. F. Vlasov

Savutich is a small town situated about 40 km from Chornobyl NPP and 200 km from Kiev. The Nuclear Data Bank is in SLIRT (Slavutich Laboratory of International Research and Technology) which is a part of Chornobyl Center on Nuclear Safety, Radioactive Waste, and Radioecology. At present, the SNDB is operated by KINR (Kiev Institute for Nuclear Research) of the National Academy of Sciences.

Why is it in Slavutich? The history. Natural resources of mineral fuel are restricted, so nuclear power is considered to be the main base of the present and future energetics of the totalUkraine. There are 14 units at the Urainian nuclear power plants. In1997, 44.9% of the electricity (79.4 out of a total 176.7 bil.kwh), and 47.4% as of the beginning of May 1998, was produced by reactors.

The activity in the field of nuclear data: measurements and theoretical calculations has been ongoing for a long time at the Institute for Nuclear Research in Kiev while assistance and support as for evaluated data files, etc., was provided by the regional nuclear data center in Obninsk.

After the USSR disintegration, in a new political and economical situation, when connections with Obninsk center deteriorated, it was decided to establish a national nuclear data center in The Ukraine. The technical project of the IAEA UKR/0/003 "Organization of Ukrainian Nuclear Data Centre" has begun (1995-1996). The project was approved by the Agency, but funds were not available until a donor country decided to pick up the project. Due to the IAEA NDS assistance three our specialists were trained in advanced scientific centers in the USA and Germany. In May 1995, we contacted the U.S. Department of Energy (DOE) asking with help to provide equipment in framework of the International Programme on Nuclear Safety.

After long negotiations, the equipment was selected with the help of the specialists from Brookhaven National Laboratory (BNL) and Pacific Northwest National Laboratory (PNNL), but DOE decided not to send it to Kiev, but to Slavutich and to establish a nuclear data bank there. The computer, a DEC ALPHA 2100A-4/275 with Open VMS 7.1, arrived at Slavutich in the spring of 1998 . All databases and service programs were installed and checked with the help of BNL specialists (Dr. C. Dunford and Mr. W. Kropp) in June 1997 and updated in May 1998 (Ms. V. McLane) with the active participation of Dr. V. Zerkin (KINR).

Another computer, a DEC ALPHA-1000/DECUNIX, will arrive in Slavutich in June of 1998 and will be used for applications, *e.g.*, the preparation of specialized multigroup cross section libraries. The final configuration of hardware, software, databases, and satellite communication with the PNNL is given in Fig. 1 and 2.

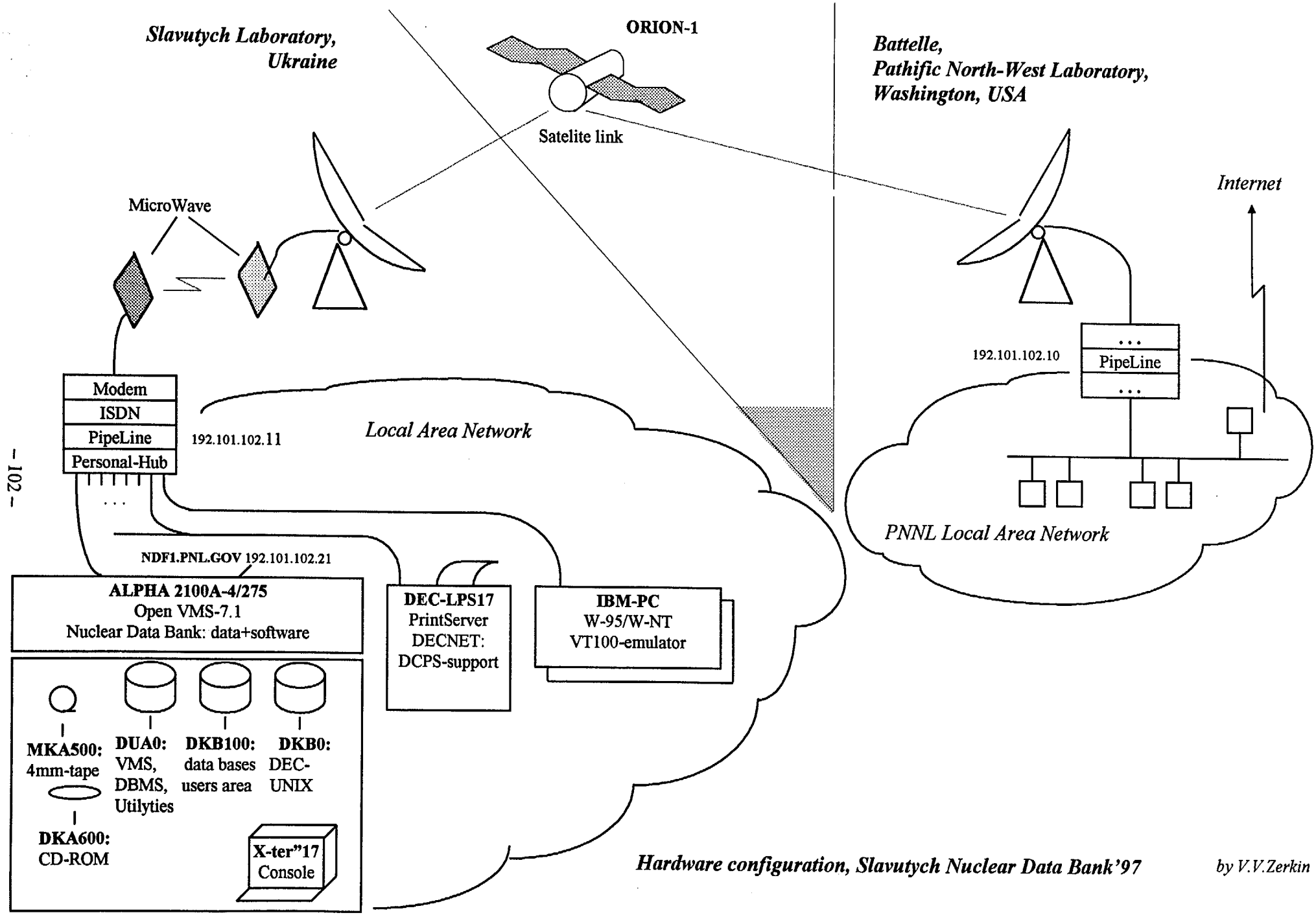
The computer programs which we plan to use (NJOY, MCNP and others) have been ordered through the Radiation Shielding Information Center (RSIC). One of our staff members is now in Oak Ridge National Laboratory for three months training.

Staff, local staff training.

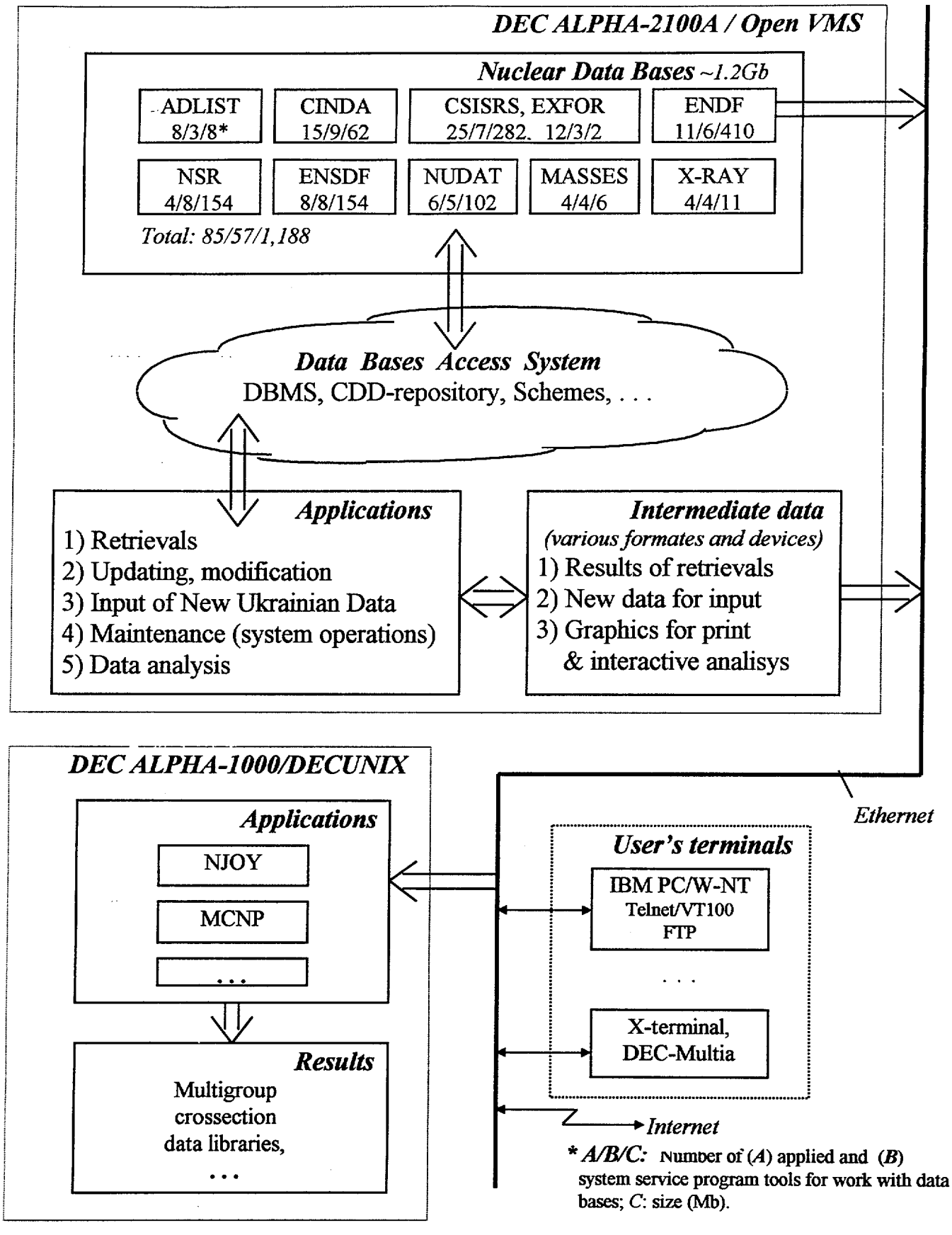
The Nuclear Data Sector of the KINR, which is responsible for the organization and support of normal operations of the Slavutich Nuclear Data Bank and for the teaching and training of local personnel in the use of the databases and in system maintanence, includes 8 nuclear data specialists, mainly physicists. At present, Dr. M. Vlasov and Dr. V. Zerkin have the primary responsibility for overseeing this operation.

Tasks and Perspectives

The main applications for this nuclear data in the near future are connected with the decommissioning of RBMK reactors, the modernization and improvement of nuclear safety of the reactors in operation (mainly VVER type), and with all problems created by Chornobyl accident, including the 4th (destroyed) unit problem. This database will be used to create specialized multigroup cross section libraries for reactor physics calculations. It will also serve as the Ukranian National Nuclear Data Center, including the compilation and exchange of experimental nuclear reaction data produced in The Ukraine, maintanance of the databases, and providing retrievals for users in The Ukraine.



Hardware configuration, Slavutych Nuclear Data Bank'97 *by V.V.Zerkin*



Computers, sotware, data bases: final configuration.

Nuclear Data Bank, Slavutych.

by V.Zerkin, 13/04/98

LIST OF WORKING PAPERS

*) Available on request from the IAEA Nuclear Data Section

DISTRIBUTION OF TRANS TAPES

The distribution pattern of EXFOR TRANS tapes is the following:

- Each of the four centres producing neutron EXFOR TRANS tapes (NNDC, NEA-DB, NDS, CJD) will continue to send their tapes to each of the other three centres.

- All centres will send their "non-neutron" TRANS tapes only to NDS.

- NDS will, after checking them, send these "non-neutron tapes to all centres needing the particular data type:

NNDC:	all data types
NEA-DB:	all data types
CJD:	all data types
CAJaD:	CPND only
CDFE:	PhotoND only
CNDC:	receives from NDS all data types (including neutron data) in CSISRS backup format
RIKEN:	none
JCPRG:	CPND only
Debrecen:	CPND only
NDG-RFNC:	all data types

List of TRANS tapes exchanged since the 1997 NRDC meeting

NEUTRON DATA

Center	TRANS	Dated	
NNDC	1268	97-06-30	
	1269	97-11-06	
	1270	98-04-01	
NEA-DB	2142	97-07-15	
	2143	97-10-31	
	2144	97-11-19	
	2145	97-11-20	
NDS+CNDC	3102	97-06-18	
	3103	97-10-17	
CJD	4105	97-07-07	
	4106	97-07-25	
	4107	97-12-22	
	4108	98-03-17	
NDS	(V025	92-07-29)	

CPND

CAJaD	A040	97-05-12	
	A041	97-09-24	
	A042	97-10-30	
	A043	98-04-25	
NNDC	C024	97-07-02	
	C025	98-03-11	"preliminary", not yet processed at NDS
NDS+ATOMKI	D021	97-10-23	
JCPRG	(E015	95-04-28)	
NDG-RFNC	F001	97-07-25	
	F002	97-09-19	
	F003	97-10-28	
	F004	98-01-18	
	F005	98-02-01	
	F006	98-02-28	
	F007	98-03-20	
NEA-DB(CAJaD)	O006	97-01-18	(distributed March 1998)
	O007	97-10-13	(distributed March 1998)
	O008	97-11-03	(distributed March 1998)
RIKEN	R012	97-07-21	
CNDC	(S009	95-11-17)	

Photonuclear Data

NDS/Martins	G008	98-02-03
CDFE	M020	97-12-10
	M021	98-02-04
	M022	98-04-10

WP6: Pending EXFOR items (dictionary codes, coding rules)

		Code	Ref.memo	page
1)	Dict.3	1USATTU 1USACBF	CP-D/291 (TRANS C023)	2 -
2)	Dict.27	9-F-19	CP-D/291, CP-C/237	2,4
3)	Dict.27	77-PT-188	CP-D/291, CP-C/231	2,5
4)	Dict.34	SS	CP-D/291,292, CP-C/230	2,6-8
5)	Dict.36	PAR,SIG,,SPC	CP-D/291, CP-C/237	2,4
6)	Dict.36	Use of RCL and RSD in SF5	CP-D/292	8
7)	Dict.2 LEXFOR	ANG-SEC Secondary-particle angle	CP-A/84 CP-A/89	10 11-12
8)	Dict.21	JET, MASSP	CP-A/81,82	13
9)	Dict.36	PAR,DA/CRL,PN/PN	CP-D/291, CP-C/235	14
10)	Dict.25	B*KEV	CP-C/241	15
11)	Dict.36	PAR,COR,G/N	4C-3/389	16
12)	Dict.6	NEANDC(E)-GE/R/ND/01/96	4C-3/389	16
13)	Dict.19	D-N14	4C-3/389	16
14)	Dict.5	MSK	e-mail 98-04-03	17
15)	Lexfor	Momentum transfer	CP-A/87	18-19
16)		Compilation question	see WP9, item 6	
17)	Dict.36,34	,POL/DA,,AXX	(TRANS C022)	
18)	DANIEL dict.	Correct "REACTION TYPE" flag for ,POL/DA,,C and related quantities		
19)	Lexfor	Quantity DL,NU: allow both units PC/FIS and NO-DIM		

Copies of the relevant memos are available from the IAEA Nuclear Data Section.

EXFOR and CINDA items (S. Maev, CJD) WP 9

List of Actions for 1998 NRDC Meeting in Vienna,

11 - 15 May 1998

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1. Codes for LI-6(N,D) and LI-7(N,T) Reactions.
EXFOR CHEX Program accepts them as valid. CINDA Cindup Program rejects them as ERROR.

References: 88MITO,249,1988. S.Shirato+
EXFOR 22361.002: (3-LI-6(N,D)2-HE-5,,DA)
22361.004: (3-LI-7(N,T)2-HE-5,,DA)

To be discussed at T1, T2 sessions. T.5.3

2. Use of KT Data Heading for Maxwell-Averaged Cross Sections. XTRACT Program interpret this headint as ENERGY and not as 2/3 of it. On this reason there may be two possibilities:
either to refuse of usint KT
or to correct XTRACT program in order to distinguish between KT and EN.
By the way, EXFOR CHEX Program allows simultaneous use of both KT and EN-MEAN.

To be discussed at T2, T3 sessions. T.3.5

3. During coding of ResInt in the finit energy limits
),,RI,,LIM)

EXFOR CHEX Program marks as Errors the absence of SEC.ENERGY

To be discussed at T2 session. T.3.5

4. Presence of the COPY option in CINDUP sub-menu would facilitate significantly CINDA compilation. Is it possible to introduce such option in CINDUP code?

To be discussed at T1, T5 sessions. T.5.3

5. Make as roule transmission of file via FTP in compressed form - .ZIP or .ARJ. This would facilitate considerably data transmission via INTERNET.

To be discussed at P7 session. T.3.3

6. There are several data sets containing self-indication functions measurements for fission, neutron capture and so on. Is it worth to compile these data sets in EXFOR and, consequently, in CINDA?

Reference: YU.V.Grigor'ev,V.V.Sinitsa,N.A.Gundorin.
YK, 1997(1-2), p.3,1997

T.3.4

To be discussed at T3, T4 sessions.

7. Reference code of IRMM Institute: WP6, item 12
NEANDC(E)-GE/R/ND/02/95
EANDC(E)-GE/R/ND/01/96
are both denoted as INVALID by CHEX code. Is there necessary to introduce new IRMM REPORT code in Dictionary 6 or some other way may exist?

To be discussed at T3 session.

8. Include ADNDT in the list of acronyms. Code AND exists

CINDA BATCHES EXCHANGED SINCE THE LAST NRDC MEETING

Area 1:

batch	dated	records	stored #)	reader	
					CINDA97
BNL149	97-06-17	146	98-02-17		
BNL150	97-09-04	436	98-02-17	3	
BNL151	97-11-13	89	98-02-17		
BNL152	98-02-25	191			
total area 1:		862			

Area 2:

batch	dated	records	stored #)	reader	
NEA046	97-06-02	197	97-06-04		
NEA047	97-06-02	149	97-06-04		
					CINDA97
total area 2:		346			

Area 3:

			reader				
batch	records	stored	total	area1	area2	area4	
NDS017	124	97-06-03	123	13	47	63	
NDS018	7	97-06-09	2		2		
							CINDA97
NDS019	247	98-02-17	1347	14	43	1290	
total area 3:		247 since CINDA97, 378 since NRDC'97					

Area 4:

batch	dated	records	stored #)	reader	
CJD022	97-06-03	118	97-06-04		
					CINDA97
CJD023	97-06-14	58	98-02-17		
CJD024	97-07-25	664	98-02-17		
CJD025	97-12-23	189	98-02-17		
CJD026	98-03-19	804			
CJD027	98-04-21	1177 *)			
total area 4:		2892 since CINDA97, 3010 since NRDC'97			

#) blank date: not yet loaded by NDS

*) contains mainly retransmissions of batch NDS019 area 4 reader entries

Action 69 from 1997 NRDC meeting on Meinhart Lammer:

Version as distributed at 1996 NRDC meeting, with some small changes but no comprehensive check and revision was made. I need your assistance: please, check and submit changes to me. After completion I will distribute an update.
****

COVERAGE SURVEY OF IMPORTANT JOURNALS BY THE CINDA CENTRES

Part 1: Important journals scanned: sorted by area of publication

Summary of coverage:

Abbreviations:

CCOD ..... Current contents on diskette (NDS generally 1 year behind)
circ ..... received in circulation
cov ..... coverage, covered
ent ..... entry, entries
not since .. no entries made since
tbd ..... to be done
'yes' ..... CINDA relevant articles/information (found)

area 1: no scanning by NNDC, other centres scan selected journals:

AND ..... basically cov by NDS, up-to-date
ANS ..... not cov regularly
AP ..... checked by NDS: no relevant article
BAP ..... not covered regularly
CJP ..... checked by NDS: no relevant article
IRE ..... not cov regularly
NSE ..... cov by all centres; ent up-to-date
NT ..... nothing relevant for the last 8 years
PR/C ..... cov by all centres; ent up-to-date
PRL ..... cov by NDS (few relevant articles)

area 2: NDS cov for areas 1+3, sometimes ent for area 2

AEJ ..... cov by JNDC, no new information for last 2 years
ANE ..... cov by NEA; no new information for last 2 years
ARI ..... cov by NEA, no new information for last 2 years
EUL ..... cov by NEA, nothing relevant; NDS: CCOD
JP/G ..... cov regularly by NEA, NDS (circulation)
JPJ ..... cov by JNDC, no new information for last 2 years
KT ..... cov by NEA: no new information; NDS by CCOD
NC/A ..... cov by NEA: no new information; NDS by CCOD
NIMA, NIMB: cov by NEA: no new information; NDS by CCOD
NP/A ..... cov regularly by NEA, up-to-date; NDS: circ resumed
NST ..... cov by JNDC, up-to-date; NDS by circ
PL/B ..... NEA: no new information; NDS: by circ, 1 ent last 3 years
PNE ..... NEA: no new information; NDS: by circ, some ents done
RCA ..... NEA: no new information; NDS: by CCOD
ZN/A ..... NEA: no new information; NDS: by CCOD
ZP/A ..... NEA: no new information; NDS: by CCOD

area 3: when not listed here: up-to-date, survey list sufficient;
CCOD: generally 1 year delay, waiting for copies -> ent delayed
translations (from Russian): ent waiting for area 4 original ent

JEL	..... NDS: CCOD, cov regularly (but now with considerable delay)
AE/T	..... NDS: circ, cov regularly, ent waiting CJD for AE
ASI	..... from contents in CP, circ of CP stopped, not in CCOD yet
ASL	..... inclusion in CCOD stopped; not available to NDS
BAS	..... NDS: circ, cov regularly, ent waiting CJD for IZV
CP	..... IAEA subscription stopped in 1992; not in CCOD yet
CST	..... NDS received from CNDC, cov not up-to-date
CZJ	..... NDS: circ, cov regularly; last relevant article from 1995
FIZB	..... NDS: not received in circ since 1995, checked at VIC library
JEL	..... NDS: CCOD, cov regularly (with delay), ent waiting CJD for ZEP
JRN, JRNL	.. NDS: circ resumed (delay from CCOD)
PAN	..... NDS: circ, cov regularly, ent waiting CJD for YF
PHE	..... not received in circ sice 94-04; cov by CNDC possible?
PRM	..... NDS: circ, cov regularly; last relevant article from 1993
RJP	..... NDS: circ, but IAEA received with 1 year delay
RRIP	..... NDS: circ stopped end of 1996; not received by IAEA anymore
SRA	..... inclusion in CCOD stopped; not available to NDS

area 4:

AE, IZV, YF	generally covered regularly, no new information
RAK	..... nothing relevant for many years
YK	..... often delays, no new information
ZEP	..... not covered? ent only when submitted by NDS

Part 2: Important journals scanned: sorted by journal code

Abbreviations in table:

NEADB:
- all ..... scanned+entries for all areas
- area 1+2..... scanned+entries for area 1 and 2 labs
- area 2 ..... only scanned+entries for area 2 labs
- ? ..... coverage (by external reader?) unknown

NDS:
- journal code ..... covered by translation journal
- circ ..... circulated, covered regularly, up-to-date
- circ date ..... circulation resumed as of 'date' (=date of circ)
- CCOD ..... covered via "Current Contents on Diskette" with delays
- library ..... not circulated, to be checked at VIC library
- stopped ..... not circulated any more (not yet from CCOD)

CJD: only area 4 publications
- reg ..... covered regularly
- occ ..... covered occasionally (not available at library)

JNDC: only Japanese literature
- cov ..... covered regularly + entries made

jour. code	published in area	coverage by NEADB	NDS	CJD	JNDC	NNDC
AE	4		AE/T	reg		
AEJ	2	?	CCOD			
AE/T	3		circ			
AND	1	area 2	circ			
ANE	2	all	circ 3/98			
ANS	1		-			
AP	1		CCOD			
APPB	3		CCOD			
ARI	2	area 2	circ 3/98			
ASI	3		CP/stopped			
ASL	3		stopped			
AUJ	3		circ			
BAP	1		-			
BAS	3		circ			
CJP	1		circ			
CNP	3		circ			
CP	3		stopped			
CST	3		circ			
CZJ	3		circ			
EUL	2	all	CCOD			
FIZB	3		library			
HEN	3		CCOD			
HFH	3		circ			

jour. code	published in area	coverage by NEADB	NDS	CJD	JNDC	NNDC
IJPA	3		circ			
IPA	3		circ			
IRE	1		CCOD			
IZV	4		BAS	reg		
JEL	3		CCOD			
JP/G	2	all	circ			
JPJ	2		CCOD		?	
JRN	3		circ 3/98			
JRNL	3		circ ?/98			
KT	2	?	circ			
NC/A	2	?	CCOD			
NIMA	2	?	CCOD			
NIMB	2	?	CCOD			
NP/A	2	all	circ 3/98			
NSE	1	area 2	circ 3/98			
NST	2		circ		cov	
NT	1		CCOD			
PAN	3		circ			
PHE	3		stopped			
PL/B	2	area 2	circ			
PNE	2	?	circ			
PR/C	1	area 2	circ			96-05
PRL	1	area 1+2	circ			95-08
PRM	3		CCOD			
RAK	4		stopped	reg		
RCA	2	area 2	CCOD			
RJP	3		circ			
RRIP	3		stopped			
SRA	3		CCOD stopped			
YF	4		PAN	reg		
YK	4		INDC	reg		
ZEP	4		JEL	not		
ZN/A	2	?	CCOD			
ZP/A	2	?	CCOD			

#ENTRY	Compilation date	#ENTRY	Compilation date	Reference
A0133	820628	B0096	790115	(J,JIN,38,13,76)
A0140	860723	B0160	800728	(J,ARI,28,561,77)
A0157	820909	F0036	831011	(J,PR/C,25,2174,82)
A0161	830103	R0002	840131	(J,ARI,27,465,76)
A0175	830107	R0023	850918	(J,RCA,29,1,81)
A0206	840213	D4065	970505	(J,IZV,48,38,84)
	delete D4065			
A0265	850828	R0024	850918	(J,ARI,26,279,75)
A0287	860428	S0030	920820	(J,JRN,82,135,84)
	delete S0030			
A0351	871021	D4074	970521	(J,AE,62,411,87)
	delete D4074			
A0352	871216	C0411	880205	(J,PR/C,34,899,86)
A0366	880330	C0412	880202	(J,PR/C,32,1612,85)
	delete C0412			
A0384	880530	C0306	880115	(J,PR/C,34,60,86)
A0394	881029	D4041	951025	(J,RCA,43,185,88)
A0412	890518	C0109	961203	(J,PR/C,41,1391,90)
	A0412 will be deleted after all mistake in C0109 will be corrected.			
A0569	970206	D4070	970514	(J,ARI,41,177,90)
A0600	941018	S0041	950420	(J,CNP,15,337,93)
	delete A0600			
A1135	810318	A1352	810309	(J,BAP,1,93,56)
	include PAPER#			
A1176	820816	A1177	820816	(J,PR,70,101,46)
	include PAPER#			
A1252	871215	C0295	870724	(J,PR/C,35,1999,87)
A1395	800728	D0034	830208	(J,NIM,105,519,72)
	delete A1395			
A1400	800728	P0031	830620	(J,PRL,19,1141,67)
A1403	800730	D0039	830225	(J,NP/A,182,321,72)
	delete A1403			
A1413	800828	D0037	820218	(J,PR/C,10,1299,74)
	delete A1413			
A1438	810409	C0417	880301	(J,NP/A,455,179,86)
	delete A1438			
A1470	810908	D0038	830222	(J,PR/C,14,438,76)
	delete A1470			
B0003	750204	C0321	871218	(J,JIN,33,3627,71)
B0019	760318	C0330	871213	(J,JIN,30,2017,68)
B0041	750804	C0327	871214	(J,JIN,32,1419,70)
B0080	771104	C0116	970124	(J,PR,120,1354,60)
	C0116 is copy of B0080(771104), but B0080 was corrected by CAJAD 950510. Original version of B0080 was incorrect.			
B0094	780413	C0209	870324	(J,NP,24,28,61)
	delete C0209			
B0149	800623	C0058	800213	(J,NP,78,476,66)
B0180	810215	R0001	840131	(J,ARI,30,631,79)
C0009	780530	D0008	790216	(J,PR/C,7,882,73)
C0032	781211	D0012	790216	(J,AE,16,141,64)
C0051	960621	P0039	830620	(J,PR,109,105,58)
C0062	800215	P0026	830620	(J,NP,62,81,65)
C0063	970711	O0053	941102	(J,PR/C,39,1222,89)
	C0063 contains neutron data only. O0053 contains proton data only.			
C0098	970205	S0028	920825	(J,PR/C,33,1235,86)
C0141	970415	O0043	941028	(J,PR/C,41,2504,90)
C0142	970410	O0068	941123	(J,PR/C,43,1272,91)

C0144	970415	O0071	941123	(J,PR/C,43,2103,91)
C0148	970421	O0069	941124	(J,PR/C,47,1615,93)
C0154	970423	C0156	970423	(J,PR/C,49,2068,94)
C0272	870610	O0082	950222	(J,PR/C,4,1257,71)
C0274	870612	O0140	950620	(J,PR,166,1089,68)
C0276	870615	O0309	960311	(J,PR,107,1695,57)
C0277	870615	O0310	970311	(J,PR,113,674,59)
C0291	870710	O0311	970312	(J,PR,131,1765,63)
C0310	871117	O0141	950621	(J,PR/C,28,105,83)
C0446	970328	C0447	970404	(J,PR/C,54,1267,96)
D0002	790105	D0003	790105	(J,NSE,67,190,78)
D0002	790105	D0004	790105	(J,NSE,67,190,78)
D0002	790115	D0005	790115	(J,NSE,67,190,78)
D0002	790115	D0006	790115	(J,NSE,67,190,78)
D0002	790115	D0007	790115	(J,NSE,67,190,78)
D0028	820210	D0029	820210	(W,GRUETTER,8202)
	published?			
D0035	830211	F0020	820511	(J,NIM,138,321,76)
	delete F0020			
D0036	830215	F0007	820108	(J,NIM,133,253,76)
	delete F0007			
D0047	831129	D0048	831201	(R,AERE-R-10502,82)
	data are different			
D0050	840208	D0051	840209	(W,NASSIFF,840110)
	published?			
D4045	960916	D4046	960823	(W,TAKACS,96)
	published?			
E0691	881019	E1456	950428	(J,PL/B,112,206,82)
E0769	881019	E1458	950428	(J,PL/B,106,171,81)
E0776	881019	E1454	950428	(J,PRL,49,1318,82)
E0780	881020	E1441	950425	(J,NP/A,410,137,83)
E0835	881025	E0868	900913	(J,PR/C,27,493,83)
E0928	881025	O0051	941102	(J,PR/C,30,746,84)
E1144	900913	E1379	941025	(J,NP/A,448,205,85)
E1145	900913	E1412	941018	(J,NP/A,456,61,86)
E1187	890801	E1424	941018	(J,NP/A,403,317,83)
E1258	910814	E1359	941004	(J,ZP/A,331,359,88)
E1317	941011	O0061	941110	(J,NP/A,514,273,90)
E1365	941004	O0230	960830	(J,NP/A,470,377,87)
E1436	941018	O0031	941024	(J,NP/A,403,1,83)
E1442	950428	O0201	960423	(J,PR/C,40,1595,89)
F0078	890708	F0295	890708	(J,BAP,29,11,54)
	include paper #			
P0076	830620	R0038	920601	(J,PR,130,265,63)
S0003	850327	S0005	850**6	(C,72LANZH,,3,72)
	data are different			

CINDA EXFORE feedback from JNDC(Japan)

NRDC AGM
JAERI Nuclear Data Center A. Hasegawa
11 May 1998

- CINDA

・CINDA distribution in book form is highly necessary especially for Library sectors such as Public libraries, University and Company libraries in Japan. But we agree to the reduction of publication cost. We would like to reduce the number of copies for the individuals who accept stopping the distribution in book form in Japan (estimation about 20 % reduction).

・CD-ROM distribution of CINDA is highly recommended for the PC users.

Cost of publication and distribution is not so expensive for CD-ROM.

WWW access of CINDA is sometimes very slow and high cost depending on the infrastructure of communication line. For users from home or small companies, telephone line charge is relatively expensive and capacity of the line is very limited in ordinary cases in Japan.

- EXFOR

・For the convenience of the users in Japan, we (JAERI NDC) are now intending to become a mirror site of NEA/DATA BANK to enhance the performance of data retrievals. Although the latest version of data base should be maintained by on-line data base, CD-ROM distribution at some frozen time is highly recommended for PC users.

・We would like to request following things to the responsible body of CINDA and EXFOR compilation.

Although we appreciate very much maintenance work of the EXFOR data base, inconveniences for the time delay of the compilation and the quality anxiety of the stored data.

For the data users of the on-line retrieval, freshness of data is one of the important factors. The EXFOR data base should be updated by the latest data. So the time delay of the compilation should be minimized. But the inclusion of newly measured data in the EXFOR, more than one year delay after the publication of the data are often observed. Please enhance the compilation power to meet the user's request. In some case, the procedure for the update of Data Base should be re-examined, for ex. on-line update instead of batch update. Especially for charged particle data retrieval, which was made as one of the heaviest search in JNDC, severe concern is raised from the

users in Japan. For some items, they found, there are many cases where ACC number is given, but no data are available at all. And also polishing up of the quality of the stored data is raised

Following are the user's requests for the retrievals of EXFOR.

・Inconsistency of ACC number between index part and the retrieved data: First character of ACC number especially a,v,c,h representation is not consistent with index.

・more powerful retrieval option for wild card search,

for ex., (n,*n) can give (n,2n), (n,3n) reaction as expected,

but the expression (n,n*) could not give (n,np), (n,na), (n,n2p) etc.

IntelligentPad as media for nuclear data community in exchanging and reusing nuclear reaction data information

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1. Introduction

We would like to introduce IntelligentPad as new media of nuclear reaction data information. The nuclear reaction data information herein includes nuclear reaction data themselves and various tolls for the data. As an example of the application using IntelligentPad, newly designed system for the NRDF database[1] will be shown. In the system, every component of the user interface is represented by reactive media objects called pad. Any pads may be synthesized in the uniform way, and decomposed to primitive pads. The IntelligentPad architecture enhances the usability and reusability of the tools developed. Any pads may also be included in any HTML documents. All the pads developed for the system can be shared among the nuclear data community all over the world. Therefor the IntelligentPad could be media for the nuclear data community in exchanging and reusing nuclear reaction data information.

In the following, the IntelligentPad architecture is explained briefly, and then several pads specially designed for the NRDF database system are shown together with the examples of how to use them.

2. IntelligentPad system architecture

The IntelligentPad is a new object-oriented media system, which was proposed and developed at Hokkaido University so as computers to work as meta-media[2,3,4,5]. Any information when presented to users or manipulated by the users, can not exit without any media. The IntelligentPad provides us the meta-media with an overall integrated environment for our intellectual activities: a unified framework for the modeling, the presentation, the synthesis and the management of multimedia documents, system-provided functions, and application programs. Every intellectual resource is represented as a pad. This system can provide a unified framework that supports the continual process of recording, storing, distributing, sharing, editing and representing

these various kind of information in an integrated manner on computers.

In the IntelligentPad system, every object manipulated directly is represented as a media object called a pad. A pad looks like a sheet of paper or a card on the computer display(Fig. 1).A pad in the IntelligentPad system can represents any of wide varieties of intellectual resources such as multimedia documents, system utilities, application programs and user environments etc.

You can easily compose any document or any tools by directly pasting some pads on top of another. Such paste operation simultaneously defines both the layout of its components in the composed pad and the functional linkage among the component pads. A composite pad is also simply referred to as a pad. When distinction is necessary, a pad that is not a composite pad is referred to as a primitive pad. Users can easily replicate any pads, paste pads on another, and peel a pad off a composite pad. these operations can be equally applied to both any primitive pads and any composite pads.

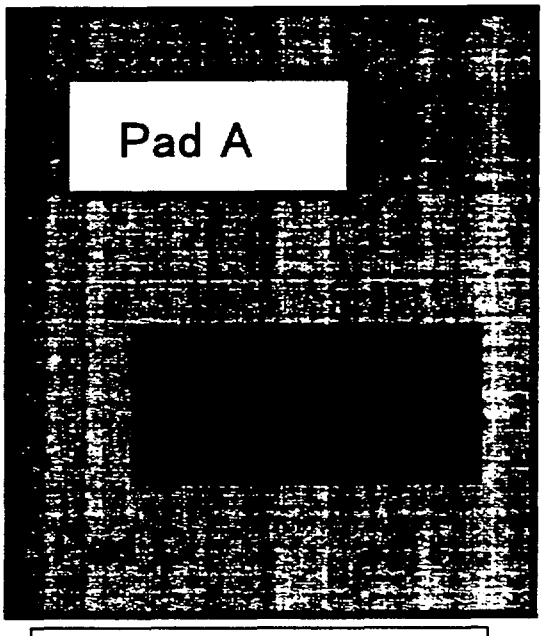

Fig. 1. Pads pasted together

2.1 Content and Shell

In order to make functional linkage among various kinds of pads, the IntelligentPad architecture uses a way that separates media from their contents, and standardizes the logical structure and the interface of media(Fig. 2). Each primitive pad consists of its shell and its content. The shell defines its standard media structure and interface.

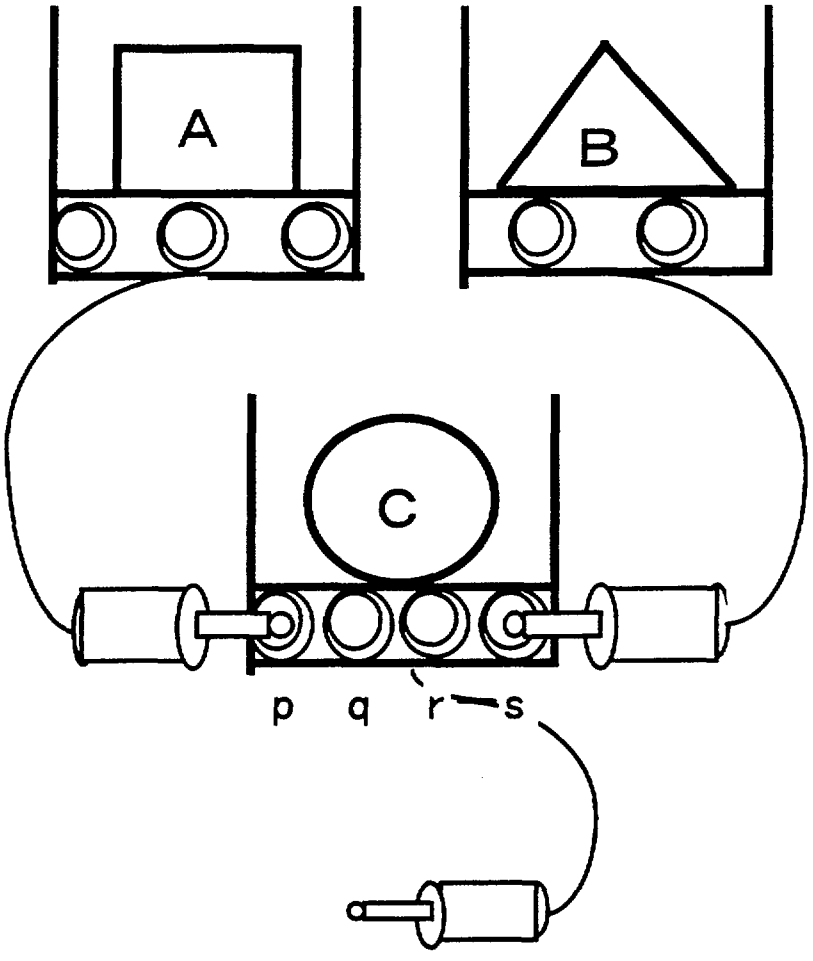

Fig. 2. Functional linkage among pads based on media architecture

In the IntelligentPad, each shell has any number of connection jacks called slots. One of them is called a primary slot. Each shell has a single pin-plug to connect itself to one of the slots of another shell. The shell architecture and the standard linkage facility are provided by the kernel of the IntelligentPad systems. Neither users nor developers have to worry about them.

2.2 Structure of a Pad

A pad in the IntelligentPad has a simplified MVC structure(Fig. 3). The pad consists of a display object and a model object. The display object of a pad defines its GUI, while the model object of it defines its internal state and behavior. Each display object

further consists of a controller object and a view object. The view object defines its view on the display screen, and the controller object defines its reaction to user events.

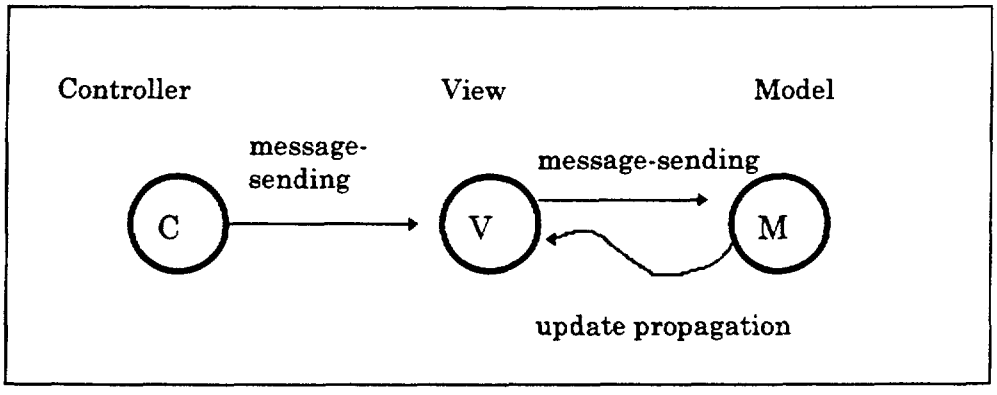

Fig. 3. Internal structure of a pad

The application linkage interface of a pad is defined by a list of slots. Each slot is accessed either by a 'set' message: 'set *<slot_name> value*' or by 'gimme' message: 'gimme *<slot_name>*'. Each of these two messages invokes the respective procedure attached to the slot. Slots and attached procedures of each pad define the internal mechanism of the pad. The slots and the procedures are defined by a developer of the pad.

2.3 Linkage between master and sub pads

When a pad P2 is pasted on another pad P1, dependency of P2 on P1 is defined and a linkage of the pads is constructed between their view parts(Fig. 4). The pad P1 is called a master_pad and pad P2 is called a sub_pad. A sub_pad must select one of the slots the master_pad has. You can do this selection by a pop up menu of the connection sheet opened on a sub_pad as available slots of the master_pad are listed in the menu. The selected slot name is stored in a standard slot named connectslot, of the sub_pad.

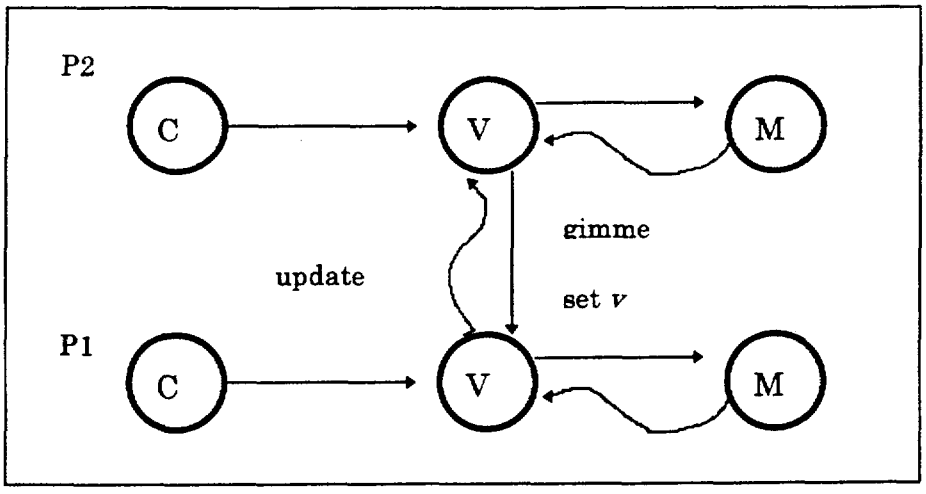

Fig. 4. Linkage mechanism between pads

A sub_pad sends either 'set ↑*connectslot* <*value*>' message or 'gimme ↑*connectslot*' message to its master_pad. The master_pad, when its state is changed, sends an 'updeate' message which has no parameter to its sub_pads in order to propagate an update event. Where, '↑*connectslot*' means that the slot name stored in *connectslot* is used as real parameter of the messages. The interpretation of this update message also depends on the implementation of the sender and the receiver.

Besides these three standard message, there some additional messages prepared for geometrical operations to pads. They are the messages of move, copy, delete, hide, show, close, resize, and paste.

2.4 Database proxy

The IntelligentPad system alaso provides a very powerful framework to assimilate any computer-controlled external object into its environment. For each external object, you only need to define its proxy pad. The proxy pad of an external object provides both its view as a pad and an interfacing program that communicates with this object.

Any relational or object-oriented database system, when provided with its proxy pad,

can be easily integrated with other tools in the IntelligentPad environment.

A database proxy pad looks like a blank-sheet pad, and provides a list of slots including the query slot, the result slot, the search slot. The query slot receives an SQL query. When the proxy pad receives "true" in its search slot, it sends the SQL query stored in the query slot to the database system to perform this search. When a search result is sent back from the database, the proxy pad stores this list of records in its result slot.

Once you have finished with the definition of this proxy pad to the database system, you may easily paste various pads on it to define a visual interface of this database. The whole set of pads available in the IntelligentPad works as a form construction kit for the visual interface of this database.

In the IntelligentPad system, a database proxy pad for UniSQL/X database management system is prepared. This proxy pad uses CGI protocol in the program interfacing to the UniSQL databases. Therefor any applications using this proxy pad at any local sites can access this UniSQL databases at the remote site.

3. IntelligentPads for the NRDF system

we will now show several pads specially designed and developed for the NRDF database system. We are using these pads to compose various interactive tools for the database access, the graphical visualization of the record distribution, the filtering of these records, and the viewing of their details.

3.1 Overall appearance of the system

Any application of the IntelligentPad system appears on a RootPad that is actually an X-window. Fig.5 shows a display snapshot of the NRDF database system. In the Figure, several application pads specially developed for this application and some tool pads

used in this application are arranged. Now, we will explain some Pads developed specifically for the NRDF database application in the following sections.

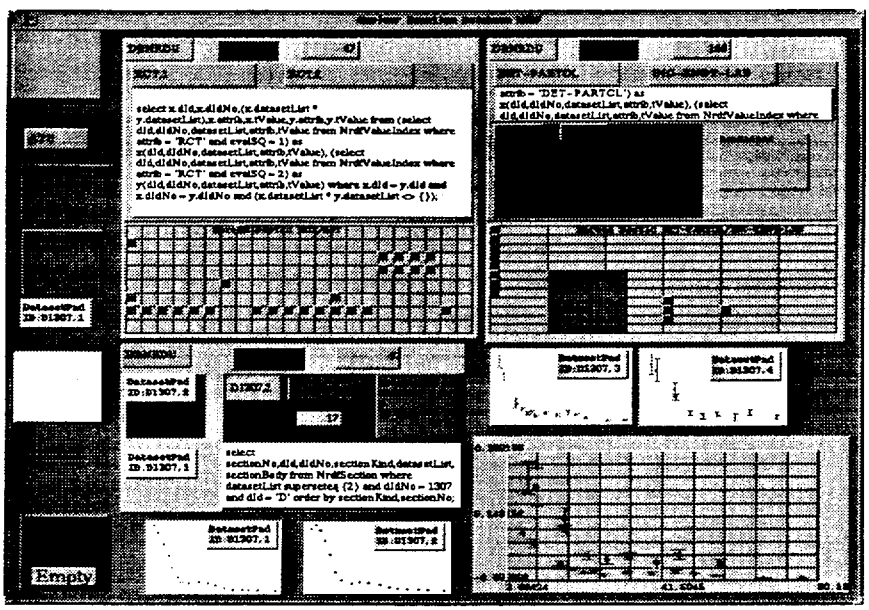

Fig. 5. Overall appearance of the NRDF system on IntelligentPad in a Window

3.2 Visualization of record distribution with respect to arbitrarily selected attributes

The pad in Fig.6 is a composite pad for the access of NRDF database and graphical visualization of record distribution. This pad is composed of one DatabaseProxyPad, five Input/OutputPads, one ButtonPad, one SqlQueryMakerPad and one RecordDistributionPad.

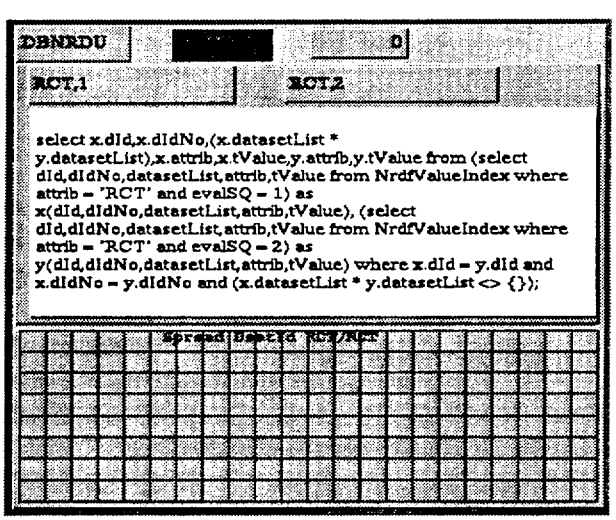

Fig. 6. A composite pad for index record retrieval

First, you can specify one or two attributes that describe information in the NRDF database. Among candidate attribute are RCT,1 and RCT,2; where RCT,1 and RCT,2 mean target

nucleus and projectile respectively in the nuclear reaction formalism. Then the SQL query is made up with the attributes specified, which can be seen by an OutputPad connected to the query slot of the DatabaseProxyPad.

If you click SearchButtonPad, the NRDF database (named DBNRDU) is retrieved. When database search has finished, the number of retrieved items is displayed on the OutputPad as "47" for example, and the records found are graphically distributed as pads (DatasetIDPad) on the RecordDistributionPad (Fig. 7). The RecordDistributionPad represents the target variety as its X-coordinate, and the incident particle variety as its Y-coordinate. In this case, you can see the target nucleus and the incident particle of the corresponding record when you select a DatasetIdPad (which is enlarged as shown Fig.7) on the RecordDistributionPad.

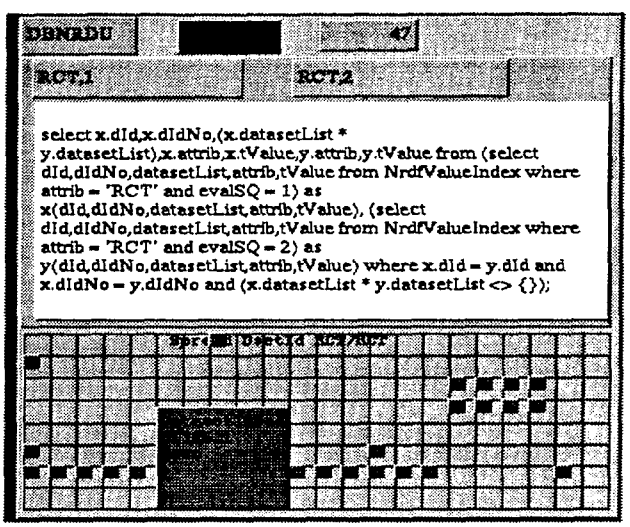

Fig. 7. Retrieved records as pads shown in two dimensional

3.3 Getting full information of each dataset

You can make DatasetPads from a DatasetIdPad. To do so, you can use the composite pad shown in Fig.8. You may paste any DatasetIdPad on

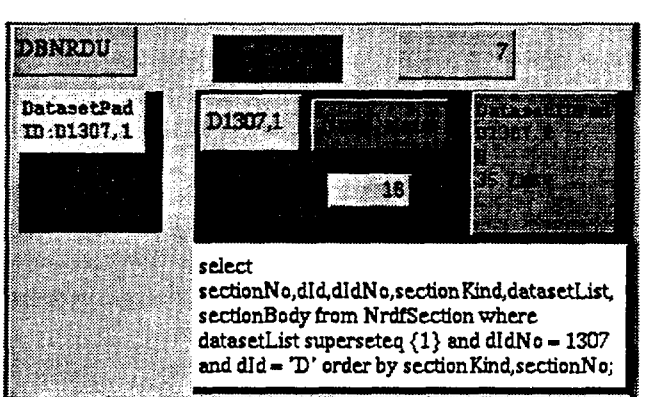

Fig.8. Getting full information in a datasetPad

it; the first element in the set of dataset identification records is removed and displayed such as "D1307,1" (Fig. 8). This identification code of the record is also put into SQL select statement as a parameter. Now, if you click the GetDatasetButtonPad, the DatasetPad for the DatasetId will be created. You can click the NextDatasetButtonPad to create the DatasetPad for the next element in the set of dataset identification records. After you have obtained a DatasetPad, you can see any details of the dataset through providing some appropriate viewer pads for each of the different purposes. For Example, we provide three pads: one text viewer and two graphical viewing pads

3.4 Viewing the description of a dataset as text

We provide one textViewerPad to see the description of a dataset as text(Fig. 9). When a datasetPad is paseted on the textViewerPad, the descriptive information of the dataset is transferred to each of the slot on the textViewerPad according to the section kind in which the information is described. Then the extent of the textViewerPad is expanded as large as the padd can show the description on it. At that time, if the sectionKind slot has a value of either "BIB", "EXP", "DATA" or "TABLE", only the information in the BIB, EXP, DATA section or DATA table is displayed on the pad respectively.

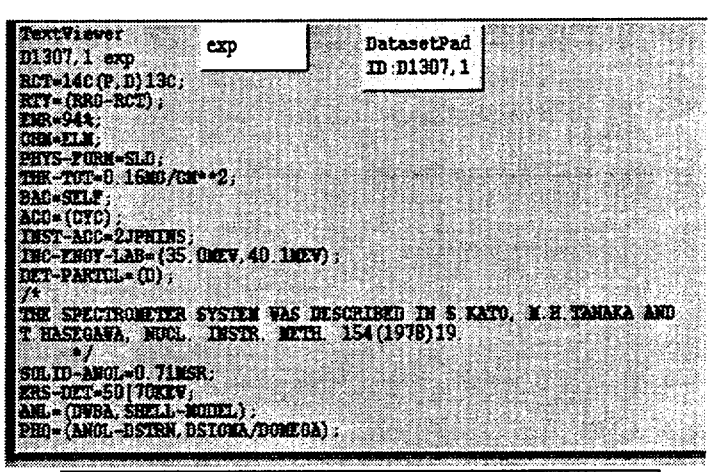

Fig.9 A textViewePad on which a datasetPad is pasted

3.5 Graphical representation of table data

We provide two graphical viewing pads for datatables: GraphPad and GraphBasePad. The GraphPad shows a numerical data table as a data point graph. When the data table has error information, the data point graph is depicted with error bars. The GraphBasePad is used to compare several datatables visually. This pad makes the background color of each GraphPad transparent. It also adjust the scale of coordinates of all the GraphPads pasted on itself. Fig. 10 shows two GraphPads showing two datatables of Dataset D1301,3 and D1301,4 (above), and a GraphBasePad (below). On the GraphBasePad, these two GraphPads are overlaid.

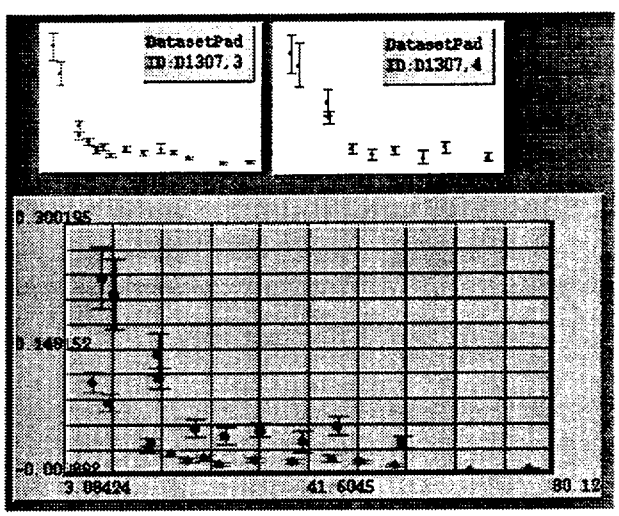

Fig.10 Two GraphPads and one GraphBasePad overlaying the two GraphPads

4. Distribution and share of Pad through WWW

A web browser pad called HTML viewer pad and pad distribution mechanism are also developed in the IntelligentPad system. Therefor you can include any Pads in a HTML documents and distribute them through WWW using this mechanism.

Anyone working at the IntelligentPad platform can use the HTML viewer pad. When an HTML viewer pad accesses a web page with some embedded pads, it receives the save format representation file of each pad from remote site and constructs the corresponding composite pad and put it in the web page at the local site. The embedded pads may also be copied and reused locally in the IntelligentPad platform. Fig. 11 shows an example of the HTML viewer pad viewing an HTML document on WWW

including some pad tool.

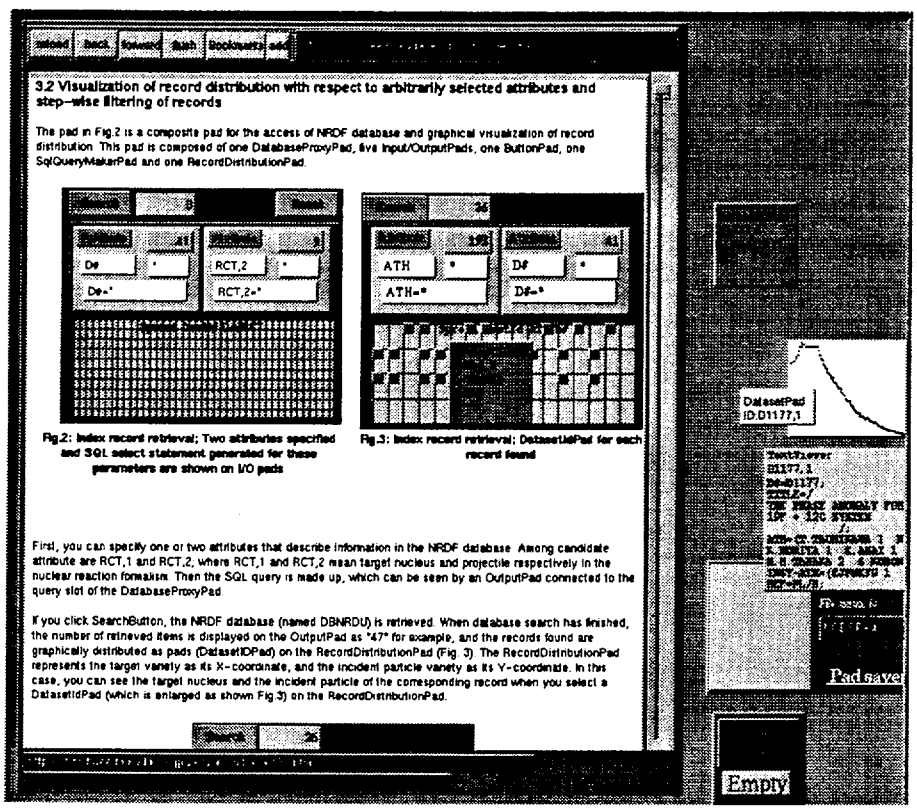

Fig.11. HTML viewer pad viewing a document embedding pads

5. Concluding remarks

As an example of IntelligentPad application, the NRDF database system was shown. This system was designed and developed for the distribution, exchange, and reuse of various intellectual resources including observed data and their descriptive information, and analysis tools in nuclear reaction experiments. All of the components in this system such as nuclear reaction data, database search programs, graph drawing tools, and their operation environments were represented by composite pads. Therefor they are all reactive media objects and work as GUI to the system. The users of the

system can distribute any pads developed through WWW. The exploitation of the IntelligentPad system enhanced the usability and reusability of the tools developed.

Once a new pad is developed, it may be registered in a common pool of pads as a shared resource: it may be reused in different contexts by different people in the community. The IntelligentPad system itself is now evolving as a meme media system[6,7], in which you will be able to distribute any composite pads worldwide through the Internet and exchange them with other researchers. We could be convinced that the IntelligentPad architecture might be effective in developing application systems shared in our nuclear reaction data community.

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NDS Standards in Nuclear Data User Services Statistics

V.G. Pronyaev and O. Schwerer
(Revised, as July 14, 1998)

Due to the different media used for the nuclear data user services and the expansion of free available access by users to the data with a minimal control of the centres, there is a need to co-ordinate the definitions of the elements of the service statistics used by centres. The most important elements are retrievals and request.

Ordinary Mail

One request is one letter, one e-mail letter, one phone call or any other type of message from user requesting information materials and/or data files or libraries.

One surface mail dispatched is a letter of package sent to user with materials prepared on request.

One retrieval contains one homogenous piece of information. It can be one report, or a set of different data retrieved from one library or database, or computer code or codes when they are distributed as a package.

One request may contain a few retrievals.

Nuclear Data Information System (Telnet NDIS)

The program accounting NDIS statistics was developed by NNDC.

One request maybe considered as one entry into any component of the data NDIS (EXFOR, CINDA, ENDF,...).

One retrieval is considered as at least one user creating output either on hard disk or in screen mode.

As seen there can be requests without retrievals. Also if the user entered into (say, for example) EXFOR system, searched and retrieved data, went out from the EXFOR system and then during one Telnet session repeated the search and retrieval from EXFOR, - it will be accounted as two separate retrievals.

File Transfer with FTP

The total number of FTP sessions can be accounted. If centre keeps detailed FTP log records, the statistics of retrievals by user and filename (database, data library) can also be generated.

World Wide Web Service

At present, the centres use different software which prepares statistical reports of Web retrievals by users or topics. Usually, the installed Web server software produces detailed records in Web log file on each user's action. But existing statistics preparing programs allow to evaluate only approximate number of Web sessions by month and country (laboratory). The accuracy of this statistics is limited by the absence of complete table of correspondence between IP/host addresses and countries, by the difficulty in determining what is one user session and in the difference between simple superficial browsing and serious user's retrieval.

The one user's Web session may be determined at present as one continuous set of Web log records belonging to this particular user. If two sequential log records belonging to the same user are separated more than half-an-hour time interval they have to be considered as belonging to the different sessions.

The statistics of the Web retrievals by country (laboratory) and topic can be created from Web log records analysis. Number of hits per Web page may show only the present interest of users to the topics displayed on this particular page. The number of successfully (retrieved) downloaded files separated by topics will present the statistics of the data retrievals. Possibly the most superficial browsing users are not interested in downloading of files.

Summary

There is a big difference in the elements of statistical account which reflects the use of different media to meet the users requests. The efforts spent in the centre to fulfil requests through different media are usually very different. The accuracy of statistics for these different types of services is also very different. At present it seems logical to keep separately the statistical account of retrievals based on different media. The statistical account can be given on (with definitions given above):

- number of requests and retrievals (including by country, topic and type of media) for ordinary mail;
- number of retrievals (including by country and topic) for Telnet NDIS;
- number of Web sessions, Web pages hit and retrieved (downloaded) files (including by country and topic).

The volume of retrieved information through electronic media (online and offline) can be evaluated and included in the statistics.

IAEA Advisory Group Meeting on Co-ordination of Nuclear Reaction Data Centres
11--15 May 1998, Vienna, Austria

Time Development of Records on Nuclear Physics and Data in INIS Bibliographic Database

Claus -D. Hillebrand, Division of Scientific and Technical Information, IAEA, Vienna

This note is a contribution to the IAEA Advisory Group Meeting on Nuclear Reaction Data Centres. The time development of records in the field of Nuclear Physics and records related to Nuclear Data stored in the International Nuclear Information System (INIS) bibliographic database over the last 22 years is presented and the possibility of preparing a more detailed study on Nuclear Physics is outlined.

The decentralized multidisciplinary bibliographic database of the IAEA is part of INIS, which was created in 1970 and is administered by the INIS Section of the IAEA with the purpose of collecting and disseminating information on the peaceful use of nuclear science and technology through its Member States. INIS has 119 Members including 18 International Organizations, which provide records on nuclear science and technology documents published in the Member States or by the International Organizations.

The largest subject category in INIS is physics with about one third of all records (in total more than 2 Mio records). At present, there are about 180.000 records in the field of Nuclear Physics in the bibliographic database. Figure1 shows the time development of these records versus publication year for the last 22 years. The last two years are not complete as the database input especially books, reports and non-conventional literature usually arrives with a delay. The projection of input for the last two years is indicated with the dashed lines. The number of records per publication year in the 80's were between 6000 and 8000. In the 90's the number of records is between 6000 and 7000. Between 1993 and 1995 the number of records per year experienced a steady increase.

The keyword (in INIS terminology -"descriptor") " Nuclear Data Collections" is a controlled term which is listed in the INIS Thesaurus. The descriptor is chosen according the INIS input preparation rules. The input is prepared by subject indexers. The descriptors are used to better describe the content, concepts and methods etc. of a record. Descriptors are, as subject indexes in books, an essential retrieval aid. The number of records with this descriptor over the publication years is plotted in figure 2. The number of records has on average steadily increased within the last 20 years. The records of the last two years are not complete (see above).

An alternative retrieval tool to descriptors is the search by "free text"(that is language-words and phrases occurring in all textual fields, including titles, abstracts , author affiliations. For the free text "Nuclear Data" the time development is displayed in figure 3.

A basic survey on Nuclear Physics records in INIS can be performed upon request in order to analyze publications in this field and to evaluate research and development activities, e.g. retrieving research and technology indicators. Such a study has already been done in the field of Fusion R&T[*)] .

[*)] Fusion Research and Technology in the INIS Bibliograhic Database, A survey on publications in Fusion R&T. Science and Technology indicators in Fusion R&T. by Claus -D. Hillebrand, Div. of Scientific and Technical Information, IAEA, Vienna.

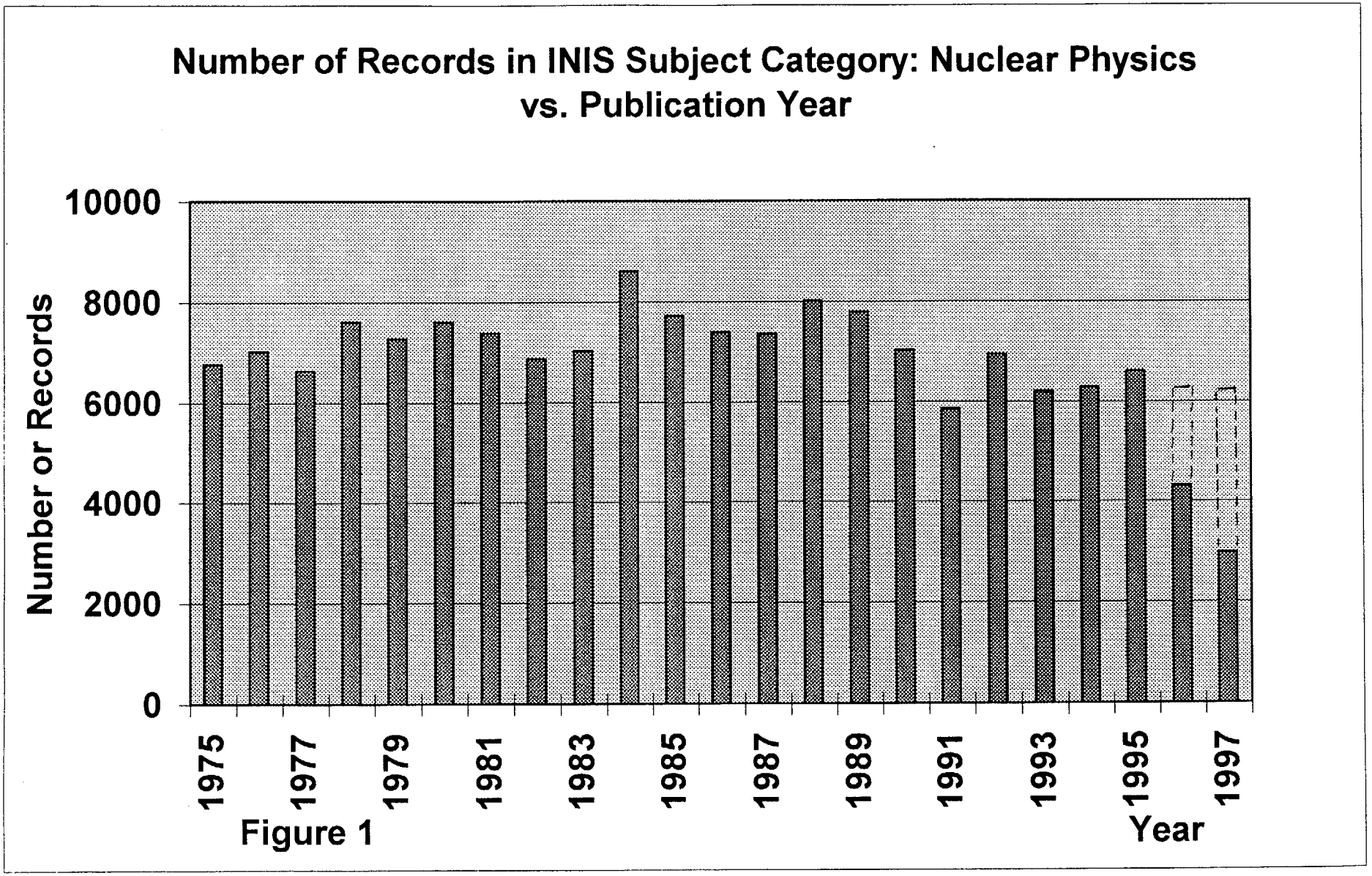

Number of Records in INIS Subject Category: Nuclear Physics
vs. Publication Year
Number or Records
10000
8000
6000
4000
2000
0
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
Year

Figure 1

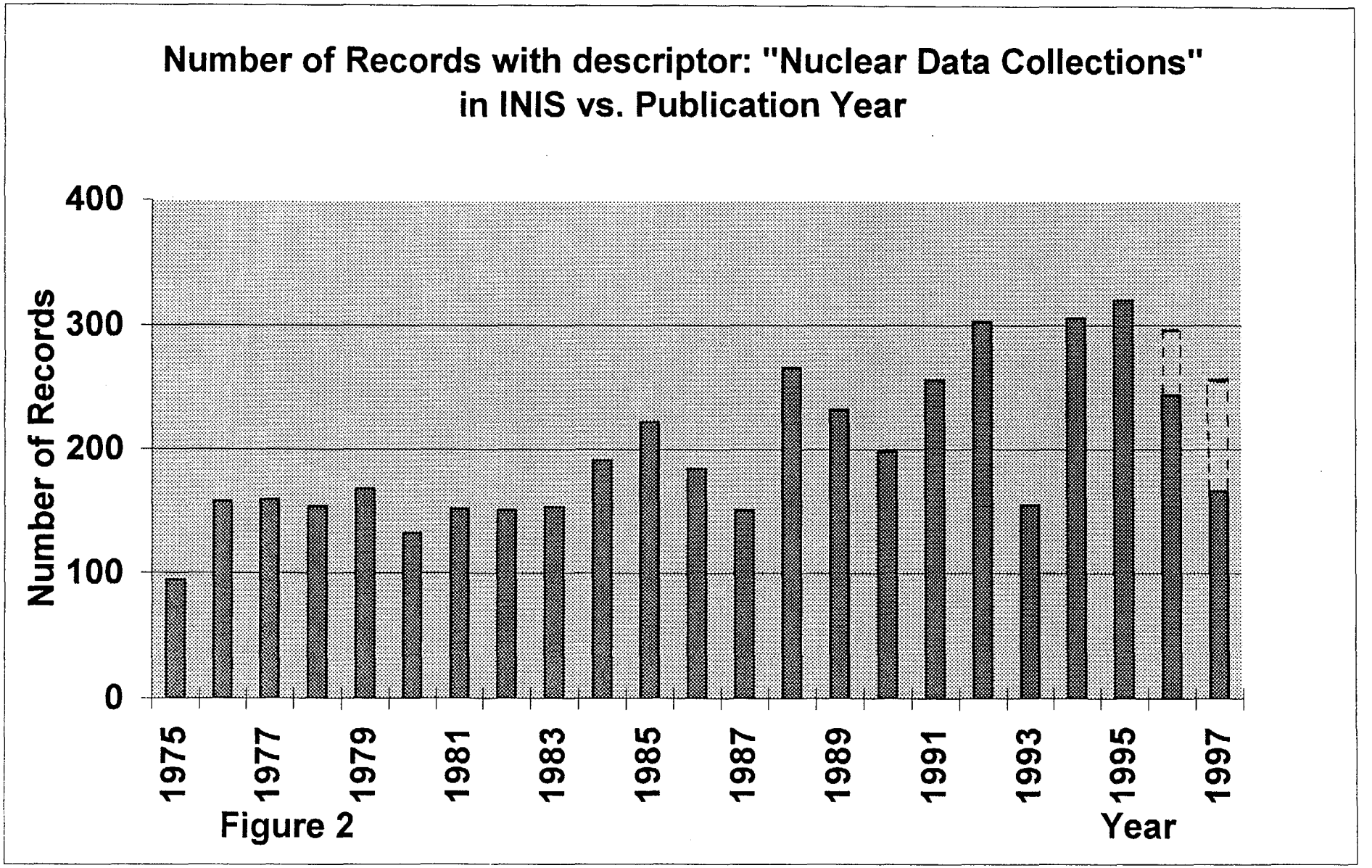

Number of Records with descriptor: "Nuclear Data Collections"
in INIS vs. Publication Year
Number of Records
400
300
200
100
0
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
Year

Figure 2

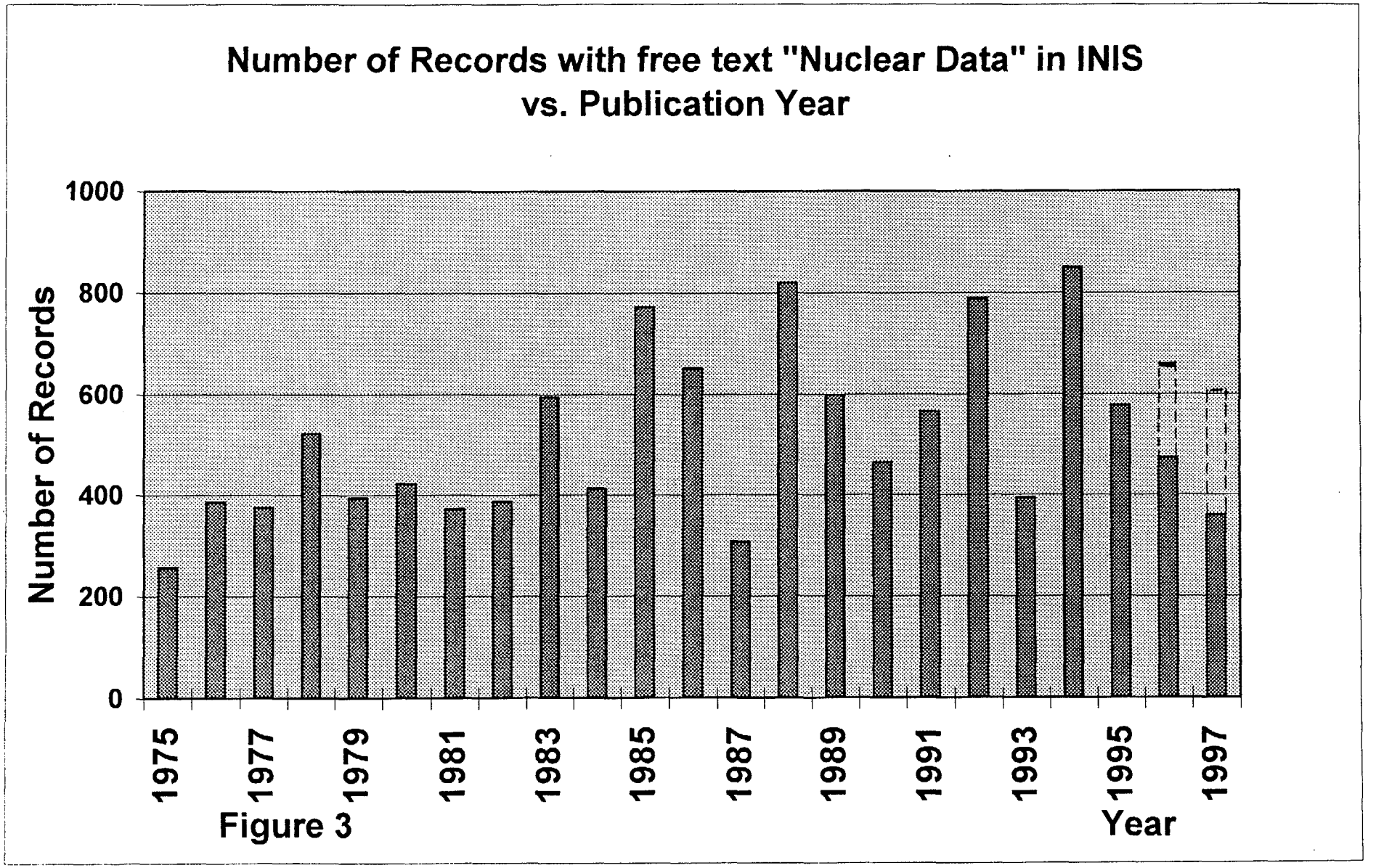

Number of Records with free text "Nuclear Data" in INIS
vs. Publication Year
Number of Records
1000
800
600
400
200
0
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
Year

Figure 3

Web Server Log Analysis

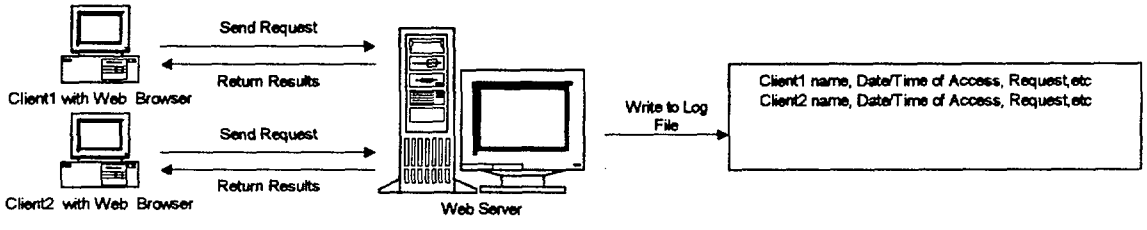
Scott Miller
IAEA RIPC Nuclear Data Section
May 11, 1998

Contents

Introduction

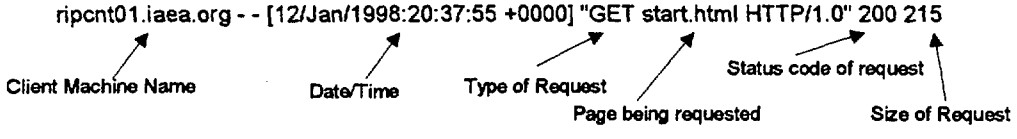
The Nuclear Data Section has developed a web site for the distribution of nuclear data and other related information. The site is actively being used by a diverse group of people in many parts of the world. We wanted a way to determine information on such things as who is using our web site, where are they located, and what information they are viewing.

Web Server Logging



The figure above shows a diagram of how information is stored in a web server log file. A client connects to a web server through a web browser. Each time a request is made to the server the information about the request is stored in a log file. This log file is usually a text file. What is put into the log file is dependent on the web server. However, there is a standard mechanism for logging that is used by most web servers know as the Common Log File format. It contains such information as the client machine name, the date of the request, the page being requested, whether it was a successful request, and the size of what was being requested.

Below is a sample of what would be put in the log file if the web server was using the Common Log File format.



Most of the commonly used web servers allow you to "extend" the information that is written to the servers log file. For instance, you could store browser information. Now you can get information on the web browser of your users. You might want to use this information to determine how to develop your web site. For instance, if you knew that most of your users were using an older version of a web browser then you wouldn't want to spend much effort on developing features for the latest version of that browser.

Log File Analysis

Once the server has been logging the information the next step is to analyze the information to determine trends. Our OpenVMS web server is using the Common Log File format. So instead of writing custom software we decided to look for a commercial product. We decided upon the "Log Analyzer" by a company called WebTrends. The software is able to read our log file and produce a report. We have run the LogAnalyzer and produced a sample report that can be viewed with a web browser. The results can be found at:
http://ripcnt01.iaea.org/ndswebadmin

You can get more information, including a trial version of the software, by pointing your browser to the Web Trends home page at http://www.webtrends.com

Conclusion

Analyzing your web server log file should be an integral part of any web development. Web server log analysis allows you can get some idea of your web server usage trends. These trends can help you make better decisions in developing your web site.

WAN Monitoring

Scott Miller
RIPC Nuclear Data Section
May 11, 1998

Contents

Introduction

At the Nuclear Data Services there is a ongoing need to gather Wide Area Network(WAN) data to a number of remote sites. This is to allow us to better understand and diagnose networking problems. To facilitate this process I have setup a web page that serve a dual purpose. The first is to display the data we are continuously gathering and the second is to allow access to a number of network diagnostic tools.

This information along with the tools can be found at the following location.

http://ripcrs02.iaea.or.at

Ongoing Monitoring

We are currently monitoring the network connections between 19 hosts and the IAEA's Nuclear Data Section. This work uses the PingER scripts developed at Stanford Linear Accelerator Lab(SLAC).

Ping is a tool that requests a remote host to "echo" a packet. If packets can travel back and forth between the two hosts the ping will be successful. If you cannot ping a remote host it is a good indication that you have a networking problem and no other networking service (ie Web access) will work. You can also use ping to give you an indication of the speed of the connection. For instance, there is a very high correlation between FTP transfer rates and ping times.

Every 15 minutes our collection server pings a set of remote site hosts with 11 pings of 100 bytes each, followed by ten pings of 1000 bytes. The minimum separation between pings is 1 second and the timeout is 20 seconds. The first ping is thrown away (it is presumed to be slow since it is priming the name caches etc.). The minimum / average / maximum and packet loss for each set of 10 pings is recorded.

On our web page you can graph this ping data over a selectable period of time or you can see the results from the most recent set of ping measurements.

Diagnostic Tools

You can also use our web site to do an interactive ping, name service lookup, or traceroute. An interactive ping allows you to choose the machine you would like to ping. Name service lookup will translate an Internet machine name into an IP address, or vice-a-versa. Traceroute will give you an indication of the routers that you have to travel through to reach the remote host. All of these tools are accessible from our web page.

Conclusion

When we started the ongoing monitoring we noticed that during IAEA core working hours we were seeing large fluctuations in the response times to all our monitored hosts. After the core hours the response times to these hosts would stabilize. We concluded that the IAEA connection to the Internet was seriously limiting our ability to distribute information to member countries. On January 25, 1998 the agency upgrade to a faster Internet connection. When this upgrade was installed our monitoring immediately showed a noticeable improvement in response times.

The monitoring tools have helped us to both understand and diagnose networking problems. When we do notice problems we can use the set of diagnostic tools to determine the cause and perhaps solve it.

Nuclear Data Services

Network Monitoring

You can plot the average ping round trip time and packet loss percentage of the monitored sites.
Select the hosts and the period of time you are interested in and then press the button **OK**

Ping Data from

vienlbr1.vi.at.ibm.net
www.univie.ac.at
www.nndc.bnl.gov
uspnet.usp.br

Note: **Selecting no From or To times causes data from so far today to be plotted.**

FROM

Day: Month: Year: 1998

TO

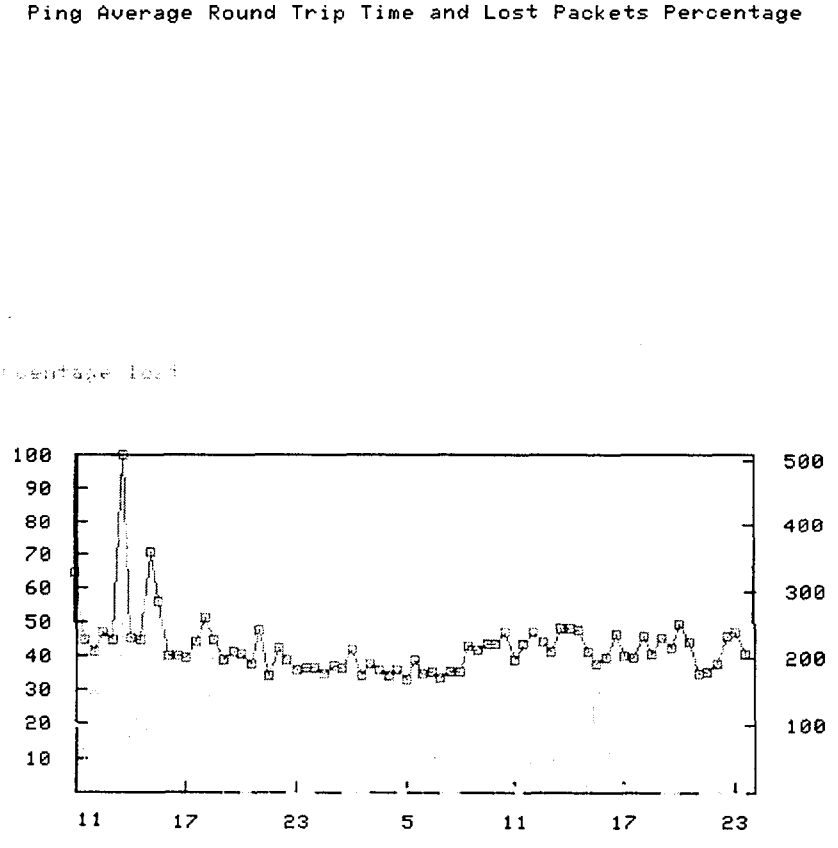
Day: Month: Year: 1998

OK Clear Form

Nuclear Data Services

Network Monitoring

Remote Host is www.nndc.bnl.gov
packet size is 100
from Tue Mar 10 11:33:20 CUT 1998 **to** Wed Mar 11 23:46:13 CUT 1998
There is an x-axis time tic every 6 hours



Remote Host is www.nndc.bnl.gov
packet size is 1000
from Tue Mar 10 11:38:50 CUT 1998 **to** Wed Mar 11 23:45:13 CUT 1998
There is an x-axis time tic every 6 hours

Names of Trans-Fermium Elements 101-109

September 1997

Effective immediately, the American Chemical Society is adopting the following names for elements 101 to 109 for its primary and secondary publications. These names were adopted in August by IUPAC and endorsed at the recent national ACS meeting by the ACS Committee on Nomenclature. The new names differ in only two cases from the names supported by the ACS Committee on Nomenclature and adopted by the ACS publications in 1995. Dubnium now replaces Hahnium for element 105 and Bohrium replaces Nielsbohrium for element 107.

	Element	New Name	Symbol	Previous CA Name	CAS Reg No
	101	Mendelevium	Md	Mendelevium	7440-11-1
	102	Nobelium	No	Nobelium	10028-14-5
	103	Lawrencium	Lr	Lawrencium	22537-19-5
	104	Rutherfordium	Rf	Rutherfordium	53850-36-5
==>	105	Dubnium	Db	Hahnium	53850-35-4
	106	Seaborgium	Sg	Seaborgium	54038-81-2
==>	107	Bohrium	Bh	Nielsbohrium	54037-14-8
	108	Hassium	Hs	Hassium	54037-57-9
	109	Meitnerium	Mt	Meitnerium	54038-01-6

The CAS Registry nomenclature records for these two elements (and their isotopic and compound forms) are being updated to reflect the new names. Appropriate cross-references from the previous index names and synonyms will guide the users of the printed index. The previous names will also remain as synonyms on the CAS Registry File.

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usernames: ANONYMOUS for FTP file transfer;
FENDL2 for FTP file transfer of FENDL-2.0;
RIPL for FTP file transfer of RIPL
Web: http://www-nds.iaea.or.at