

International Atomic Energy Agency

INDC(NDS)-279
Distr. G, NC

INDC

INTERNATIONAL NUCLEAR DATA COMMITTEE

Report on the Consultants' Meeting on
TECHNICAL ASPECTS OF THE CO-OPERATION
OF NUCLEAR REACTION DATA CENTERS

IAEA Headquarters, Vienna, Austria
1-3 September 1992

Edited by

H.D. Lemmel, O. Schwerer, H. Wienke
February 1993

IAEA NUCLEAR DATA SECTION, WAGRAMERSTRASSE 5, A-1400 VIENNA

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Printed by the IAEA in Austria
May 1993

93-02121

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**Consultants' Meeting on
Technical Aspects of the Co-operation of
Nuclear Reaction Data Centers**

IAEA Headquarters, Vienna, Austria
1-3 September 1992

Introduction

The IAEA Nuclear Data Section convenes in annual intervals co-ordination meetings of the Network of the Nuclear Reaction Data Centers. The last meeting, with center heads and technical staff present, took place in Obninsk, Russia, 7-11 October 1991. See the report INDC(NDS)-262. The present meeting was attended by technical staff only to discuss technical matters of the nuclear data compilation and exchange by means of the jointly operated computerized systems CINDA, EXFOR, ENDF and others.

Traditionally, for these technical meetings, the participants used to attend at their own cost. Under the present conditions this would not have been possible for some of the centers. Despite of the difficult financial situation of the Agency, it was possible to provide financial support to some of the participants.

Two Russian participants attended from CJD Obninsk and CAJaD Moscow. Unfortunately, it was not possible to support three Russian participants. Therefore, the Moscow Photonuclear Data Center was, unfortunately, not represented at this meeting. Dr. Varlamov will, however, have the opportunity to travel to the US Nuclear Data Center in Brookhaven in October, so that photonuclear data matters can be discussed there.

For the first time, a representative from the ATOMKI Institute in Debrecen, Hungary, participated in the network meeting. It is hoped that the participation of this group will bring additional ideas into the network, to the goal to produce charged-particle nuclear reaction data files for several applications. The need for such specialized data files has been emphasized already years ago by several Agency meetings in the fields of proton-beam monitoring, medical applications, and intermediate energy data.

It was appreciated that the Chinese Nuclear Data Center was represented by two participants, one for neutron data, the other for charged particle data.

Two Japanese charged particle data activities at the RIKEN institute and at the Sapporo University were represented. It is hoped very much that both will find continuing support for their activities.

Last but not least the representatives from the National Nuclear Data Center in Brookhaven and from the NEA Data Bank shall be mentioned. With these two centers the Agency's Nuclear Data Section had very close contacts in the past year when the new VAX computer was installed and many of the database management systems were transferred from the VAX computers at Brookhaven and Saclay to our VAX computer. The phase of transition from the IBM to the VAX computer is not yet finished, and some of the technical implications were on the agenda for discussion at the present meeting.

The Network of Nuclear Reaction Data Centers and Manpower Situation at the Centers

The network of Nuclear Data Centers

National and regional nuclear reaction data centers, co-ordinated by the International Atomic Energy Agency, co-operate 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 po Jadernym Dannym (= Nuclear Data Centre), Obninsk, Russia
CAJaD	-	Centr po Dannym o Stroenii Atomnogo Jadra i Jadernykh Reakcih (= Nuclear Structure and Nuclear Reaction Data Centre), Moscow, Russia
CDFE	-	Centr Dannyykh Fotojad. Eksp. (= Centre for Experimental Photonuclear Data), Moscow, Russia
CNDC	-	Chinese Nuclear Data Centre, Beijing, P.R. of China
ATOMKI	-	Nuclear Data Group of the ATOMKI Institute, Debrecen, Hungary
RIKEN	-	Nuclear Data Group, RIKEN Institute of Physical and Chemical Research, Wako-Shi, Japan
JCPRG	-	Japan Charged-Particle Nuclear Reaction Data Group, Sapporo, Japan
JAERI	-	Nuclear Data Center of the Japan Atomic Energy Research Institute, Tokai-Mura, Japan

1. Neutron Nuclear Data

- 1.a Bibliography and Data Index CINDA:
Input prepared by NNDC, NEA-DB, NDS, CJD, CNDC
Handbooks published by IAEA
Online services by NNDC, NEA-DB (and NDS from 1992)
- 1.b Experimental data exchanged in EXFOR format:
Input prepared by NNDC, NEA-DB, NDS, CJD
Online services by NNDC, NEA-DB (and NDS from 1992)
- 1.c Data Handbooks based on EXFOR published by NNDC

- 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 (IAEA)
CENDL-2 (China)	JEF-2 (NEA)
ENDF/B-6 (USA)	JENDL-3 (Japan)

Online services for BROND, ENDF/B-6, JEF, JENDL-3 by NNDC, NEA-DB (and NDS from 1992)

- 1.e Computer retrieval services upon request of customers:
NNDC, NEA-DB, NDS, CJD
- 1.f WRENDA: compilation of requested data that are known with insufficient accuracy. Compiled by NNDC, NEA-DB, NDS, CJD, published by IAEA

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

- 2.a Bibliography published by NNDC *)
- 2.b Numerical data exchanged in EXFOR format:
Input prepared by CAJaD, RIKEN, CNDC, ATOMKI (from 1992), NDS, NNDC, JCPRG
Online services by NNDC, NEA-DB (and NDS from 1992)
- 2.c Data Handbooks based on EXFOR published by NDS, CAJaD
- 2.d Computer retrieval services upon request of customers:
NNDC, NEA-DB, NDS, CAJaD

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 (and NDS from 1992)
- 3.b Bibliography published by CDFE
- 3.c Computer retrieval services upon request of customers:
NNDC, NEA-DB, NDS, CAJaD

*) Discontinued in 1990; partly incorporated in the bibliographic system "NSR" for nuclear structure and decay data.

Manpower situation at the Neutron Reaction Data Centers

NNDC:

After a sharp decrease in the annual number of neutron data measurements in the early 1980's, the situation has stabilized at a level of about 110 data sets (= EXFOR subentries) per year in the period 1987 to present. The reduced manpower at NNDC is used such that most but not all data are compiled in EXFOR. CINDA is complete only for published experimental data. (NDS has coded the ENDF index lines and some entries for non-experimental data).

NEA-DB:

The decrease in the annual number of neutron data measurements in West Europe and Japan occurred less drastic than in the US. The present rate (1989 to present) may be at a level of 270 data sets per year. The completeness of compilation seriously suffered from a half year's post vacancy. The manpower may be hardly sufficient to cover new data, but not to catch up with the accumulated backlog.

NDS:

The rate of data measurements in the NDS service area (countries outside OECD and former USSR) is strongly fluctuating, e.g. 60 data sets in 1988 compared to 160 in 1989. After a post vacancy a year ago the compilation manpower at present is adequate. Some backlog from the vacancy period is still being worked on.

CJD:

The average rate of data measurements in the former USSR countries is around 120 data sets per year with some fluctuations. The manpower will be adequate after a vacant post for CINDA will have been filled. The main problem is the continuing delay in the compilation and transmission of new data due to communication problems.

Programming manpower:

A lack of programming manpower is encountered in all centers to an extent that important updates in data processing computer codes, specifically codes for data checking and data plotting, as well as code changes required for new data types, cannot be implemented.

Conclusion:

Centers are urged to find means, e.g. by hiring consultants, to do urgent programming (jointly for all those centers that use a VAX computer) and to do the compilation backlog. It is emphasized that the EXFOR neutron reaction database represents an enormous value which will deteriorate fast if it is not kept up-to-date.

Approximate manpower at the Centers

	NNDC	DB	NDS	CJD	CNDC
CINDA + EXFOR compilation and file maintenance	1	0.5	2	1.5	3
evaluated files in ENDF format	0.5	0.75	2	10	6
services to customers	1.25	0.5	2.5	1	3

- Numbers should be treated with caution: For example, most of the evaluation work for ENDF formatted files is done in the center in the case of CJD, and externally in the case of NNDC and DB. Centers have different specialities such as CINDA book production at NDS. Customer services are mostly on-line at NNDC and DB, and by shipment of tapes at the other centers.

The Co-ordination of the CPND Centers

The active CPND centers compiling integral CPND in EXFOR, are now:

- (1) CAJaD, Russia
- (2) CNDC, China
- (3) ATOMKI, Hungary
- (4) RIKEN, Japan
- (5) NDS, IAEA (few data at low priority)
- (6) NNDC, USA (few data at low priority)

In addition, differential CPND are converted from the Japanese NRDF file into EXFOR by

- (7) JCPRG, Japan

Centers (1) to (6) have overlapping fields of interest, so that a simple formula for compilation responsibilities is not possible.

The overall co-ordination responsibility to avoid duplication remains with F. Chukreev, CAJaD. It is realized, however, that there are communication problems as long as CAJaD cannot be reached by FAX or e-mail. As an interim measure, it is recommended to contact CAJaD through V. Varlamov, CDFE, FAX 0959395034, e-mail VARLAMOV@COMPNET.NPIMSU.MSK.SU, but to send a copy also by normal mail for safety.

- A.** The main interest is in proton beam monitor reactions and in reactions for medical radioisotopes production. In this area it is assumed that centers (1) to (4) give priority for compiling data from their own country.

If, for example, ATOMKI wishes to have in EXFOR some Japanese data, this data should be requested from RIKEN; only in the case that RIKEN has no manpower to compile and transmit the requested data fast, this should be compiled at Debrecen.

When wishing to compile data from other countries, each center should inform the other centers of this intention, so that these centers avoid to start compilation of the same data at the same time. CAJaD has the responsibility to check for duplication and inform the centers accordingly.

- B.** Interest exists also in the compilation of the following data types:

- Neutron source reactions: NDS, NNDC, CAJaD
- Reactions for activation analysis and thin layer activation techniques: ATOMKI
- Intermediate energy data: CAJaD
- Differential CPND: JCPRG

In these cases centers should undertake appropriate consultations with F. Chukreev and among the centers to avoid incidental duplication of compilation.

CONCLUSIONS and ACTIONS

D = Dictionary update required
M = Exfor Manual update required
P = Programming required
L = Lexfor update required
C = CINDA manual update required

General matters

- 1) **Act CJD** Transmit the group data libraries derived from BROND to the other centers.
- 2) **Act Blokhin** Send summary of the CJD decay data file to Lemmel for the ENSDF meeting in November 92.
- 3) **Act NDS** To intensify and widen the cooperation of CPND centers.
- 4) **Act NDS** Request to Chukreev for more information of the evaluation method of charged-particle data.
- 5) **Concl.** CJD continues to remain responsible for data compilation from and data center services to the previous USSR countries.
- 6) **Act NDS** Try to make publications from the previous USSR countries in the nuclear data field known to other centers.
- 7) **Concl.** Next NRDC meeting: Paris 18-22 October 1993.

Nuclear data systems on the VAX

- | | |
|----------|---|
| D | 8) Act NDS Omit those dictionaries relevant only for the obsolete ISO-QUANT formalism (10-12, 14, 41) from the next transmission. |
| | 9) Act NDS NDS will make an effort to send 2 update files for the dictionaries, a VAX version and an IBM version, to the other data centers. The details of the VAX update file still have to be worked out. |
| M | 10) Concl. Optionally, free text may be sent in EXFOR in lower case. (Note 1: Free text does NOT include AUTHORS!, Note 2: The VAX dictionaries contain some lower case already) |

- P 11) **Recom All** The originating center will coordinate program updates. Each center is invited to update the (VAX)EXFOR check program and other programs. Centers should communicate their intention to update a program to the originating center before any updates are done in order to avoid duplication of programming. Suggested updates should be transmitted to the originating center. Only the originating center will transmit corrected versions to the other centers.

EXFOR, general

- D 12) **Concl.** Memo CP-S/9208 is accepted with the modification: A-BNT- is replacing BNTA-; the report code BNAL is not needed. The entry in TRANS-S005 containing BNAL will be retransmitted by CNDC.
- D 13) **Concl.** New country codes, as proposed in memos CP-D/228 and CP-D/229, are approved.
- 14) **Act Blokhin** To clarify status of Dubna institute (still international?).
- 15) **Act CJD** To inform NDS whenever an institute name is changed.
- P 16) **Concl.** It is confirmed that the unit-keyword MEV/A is accepted in EXFOR; this requires programming for converting it to MeV in indexing and plotting programs (memo CP-D/225).
- L,D 17) **Act McLane** To update and submit dictionary 36 entries on photonuclear quantities (with expansions) and to make appropriate changes in Lexfor entry. (See memo CP-C/200 and reply in CP-D/219.)
- D 18) **Concl.** RSD (residual nucleus) in REACTION SF7 approved; however, to solve all thinkable cases, a nuclide code in SF7 may have to be introduced as soon as programming manpower is available. It should be noted also that RSD in SF8 has a different meaning and confusions could occur. It was agreed also that RSD in SF7 may be used only when no particle code applies.
- L,D 19) **Concl.** The high and low energy components of a cross section (HEN,SIG and LEN,SIG, resp.) are evaluated quantities so far used for photonuclear data only. They will be added to LEXFOR under an appropriate heading.
- L 20) **Act McLane** To provide Lexfor entry for energy spectra of particle pairs and PAR,SIG,P/T.

- D 21) **Act Schwerer** To update dictionary 36 accordingly, possibly introducing longer expansions for these quantities.
- D 22) **Act NDS** Submit new codes for renamed journals.
- 23) **Concl.** (Memo CNDC-003) PR,TEM,N should not be introduced; PR,AKE,N should be used instead; data should be converted to AKE using $E=3/2T$.
- D 24) **Concl.** The journal code JSIU is accepted.
- P 25) **Recom All** The interactive renormalization of EXFOR data, for plotting and processing, should be considered.
- 26) **Recom CNDC** Try out the computation format of NNDC (output option of the program COFFEE).
- M 27) **Act McLane** If manpower permits, update the EXFOR manual and inform NDS whether it will be possible.
- 28) **Act NNDC** To verify whether the conversion of the temporary EXFOR files 6, 7 and 8 has been finished; if not, remind the centers what still has to be done.
- 29) **Concl.** It is essential that, in case of several bibliographic references in an EXFOR entry, the primary reference is given first; it is this reference which is used by computer codes (plotting) to identify the dataset.
- 30) **Concl.** Corrections done to an EXFOR entry must be described briefly under HISTORY. Flags have to be written in column 80 to indicate which records were altered/inserted/deleted; to know what has been changed is most essential to receiving data centers and customers. The style of HISTORY entries should be such that it is understandable by external customers and not only by data centers staff.
- 31) **Act All** Retransmit those entries listed in McLane's list of pending retransmissions.
- D 32) **Act NDS** The structuring of information in certain dictionaries will be transmitted in the next dictionary transmission as proposed in Memo CP-D/220 (without dashes in the first field).

- 33) **Concl.** On CAJad's example (sample Exfor entry APROB) for shortlived isomers; it is agreed that still there is no need for a new formalism.
- 34) **Recom All** Whoever uses ANDEX is encouraged to submit comments and proposals for improvement to NDS.
- 35) **Act McLane** To transmit TRANS M015 to NDS.
- 36) **Act NDS** To send TRANS 4084, 4086, 4087, 4088 to NNDC.
- 37) **Act Schwerer** Check the very old pending retransmissions (particularly area 1) whether still valid.
- M,P 38) **Concl.** If one or more column headings for DATA errors are given in COMMON/DATA section, they must be coded under ERR-ANALYS, i.e., coding under ERR-ANALYS is now obligatory also in the case of only a single DATA-ERR column. (Change of wording in EXFOR Manual under ERR-ANALYS).
- 39) **Act NNDC** To update the EXFOR manual Chapter 7 (dictionaries) on dictionary 6: how to invent report codes for annual reports without a report code on the cover. Accepted procedure is A-(3-digit labcode from dict. 3, e.g. A-ALB-.).

Neutron EXFOR compilation and completeness

- 40) **Information Nordborg** Dr. Moxon (UK) has unpublished old neutron data waiting for EXFOR compilation. NEA-DB will compile them as soon as available manpower permits, which is however hardly sufficient to cover new data.

Fission-product yield data

- P 41) **Act NNDC and NDS** The FY-CRP meeting requested that EXFOR retrievals by fission-product nuclides be possible. While the NDS EXFOR index provides this possibility, it is not yet possible in the VAX EXFOR retrieval system, which should be updated accordingly.
- L 42) **Act Lammer** To revise the LEXFOR entry on FP yields.
- 43) **Act CJD** To send the ASIYAD-MIFI FPY library with brief documentation to NDS (for distribution).

- 44) **Act Lammer** Submit a proposal on the coding of mass yields as a CP memo with information on corresponding measurements.
- D,L 45) **Concl.** (Regarding coding of isomeric FY ratios) Proposal 2 in the working paper of Lammer is accepted except for the heading SPINISO etc. Spin information should be given in free text under DECAY-DATA.
- D 46) **Concl.** New code AMFF (ang. mom. of fission fragments) for dict. 20 (ADD-RES) approved.
- L,D 47) **Concl.** Memo CP-D/222 on delayed-neutrons for individual precursors was accepted.

CINDA

- 48) **Act CJD and NDS** To observe what publications come out in the former USSR (in particular the Baltic states).
- 49) **Act NEA-DB and NNDC** To update EXFOR manual and CINDA manual with information about using diskettes (which format and density etc.) for EXFOR/CINDA transmissions. CAJaD and CNDC can accept only 5.25 inch diskettes, while the other centers can accept both diskette formats.
- 50) **Act CNDC** To send regularly a copy of the Chin. Journal of Nuclear Physics to NDS starting with Vol. 12, no. 4 (1990).
- 51) **Act CNDC** To cover literature published in Chinese language systematically for CINDA and send the entries to NDS.
- 52) **Act NDS** To send the "Chinese CINDA" file as a listing (and/or on diskette) to CNDC.
- 53) **Act McLane** To send to CNDC the reader format CINDA checking code SINBAD.
- 54) **Concl.** All CINDA checking codes should check at least Z-A-Q.
- 55) **Act NDS** Send copy of Osorio's program which makes CINDA entries for an ENDF library to NEA-DB and NNDC.
- 56) **Concl.** Blank E-MIN field is now permitted.
- C 57) **Act NEA-DB** To make the appropriate manual update.

- P 58) **Act CINDA Centers** To update Cinda programs accordingly, where necessary.
- C 59) **Act Lammer** To provide a manual revision for pages II.2.8 (hints for coding reactions like $(2n,f)$ or $(n,n'f)$) and II.2.17 (note under the heading "fission quantities") to NEA-DB.

6.4 Evaluated data libraries

- 60) **Act NEA-DB** To distribute JEF-2 to the other neutron-data centers (Dr. Nordborg, NEA-DB: "JEF-2 will be released before Christmas, it will not include complete pointwise data").
- 61) **Act CJD** NDS had received a preliminary file of BROND-2, mainly for consideration in the FENDL project. CJD is asked to transmit the final BROND-2 as soon as possible.
- 62) **Act All** When preparing evaluated data libraries, characteristic values (thermal cross sections, resonance integrals, etc.) should be quoted in the text or in accompanying documents together with their uncertainties; however, these values (and uncertainties) would be better usable if they were in a computer-readable file.
- 63) **Act NDS** To find means and funding for the participation of CJD and CNDC in the joint effort to improve the evaluated data files (meeting in Cadarache, June 93).
- 64) **Act All Library Originators** To collect lists of known defaults in the evaluated data libraries, communicate these lists to the other originators data centers, possibly to include such lists in the forthcoming issue of NNDEN.
- 65) **Act CNDC** Send CENDL-2 supplement as soon as ready.
- 66) **Act CNDC** To convert the ENDF-5 parts of CENDL-2 to ENDF-6 format.
- 67) **Recom** One library should use only one format.
- 68) **Act Liang** Submit memo's CNDC-002, 004 on format changes in ENDF/B to Dr. R. Roussin, RSIC who is in charge of the format-and-procedures subcommittee. As any format change requires a series of programming changes, it is essential that a proposal for a format change is supported by a convincing justification, demonstrating the deficiency in the present format and the advantages of the proposed format.

Remaining CPND matters

- | | |
|--|---|
| 69) McLane | To compile and distribute, after consultation with F. Chukreev, the EXFOR converted CPND file of R. White (Livermore) on light-element neutron-producing reactions. |
| 70) Act NDS | To contact CAJaD and Arzamas to obtain the quasi-EXFOR file of experimental data underlying the Arzamas evaluation. |
| 71) Recom
Chukreev | To compile and evaluate the B-11 + p reaction. |
| 72) Act
CAJaD
CNDC
RIKEN
ATOMKI | To continue to work, under mutual consultation, towards compilation and evaluation of monitor reactions and of medical radioisotope production reactions according to the needs stated at earlier meetings. |
| 73) Act NDS | To try to arrange a CRP on this topic which would be an essential stimulation for finding support for this work at CAJaD, CNDC, RIKEN, ATOMKI and perhaps others. |
| 74) Concl. | It is confirmed that no monitor data for deuteron beams exist and that there is a strong need for such data. |
| 75) Act NNDC | To produce a "Short guide to ENDF" for evaluators of integral charged-particle data and send it to Dr. Chukreev. |
| 76) Act CAJaD
and all who
need it | To send list of references of publications needed but not available, to NDS who will try to deliver copies of those publications. |
| 77) Act NDS | To send complete integral CPND file to Dr. Tárkányi, DEBRECEN/ATOMKI (including index). |
| 78) Act CAJaD | To request assistance from other centers in case of difficulties to contact authors. |
| M 79) Concl. | Dr. Chiba announced new name of their group: All correspondence should be addressed to Dr. Chiba, Japan Charged-Particle Nuclear Reaction Data Group. This requires an EXFOR manual update. Leader of JCPRG continues to be Prof. H. Tanaka. The network-internal abbreviation will be JCPRG; this is not an official abbreviation. |

- 80) **Act NDS** Add Tárkányi to Newsletter distribution.
- 81) **Concl.** ATOMKI will use EXFOR accession-numbers starting with D4001 and up and send these entries to NDS.

Photonuclear data

- 82) **Act McLane** To send report on the agreement between CDFE, LLNL and NNDC (on cooperation in compilation and evaluation) to NDS for inclusion in the minutes.
- 83) **Information** CSEWG has a subcommittee (under Roger White, Livermore) on CPND and PhotoND in ENDF format, which can be contacted for enquiries and proposals.
- 84) **Act Blokhin and Varlamov** To write up their proposals for format changes for photonuclear data in ENDF and to send them to Roger White, Livermore.

GLOSSARY OF ABBREVIATIONS

A + M	Atomic and Molecular Data for fusion applications
AGM	Advisory Group Meeting of the IAEA
BNL	Brookhaven National Laboratory, Upton, N.Y., USA
BROND-2	Russian evaluated neutron reaction data library
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
CINDA	A specialized bibliography and data index on neutron nuclear data operated jointly by NNDC, NEA-DB, NDS and CJD
CJD	USSR Nuclear Data Center at F.E.I., Obninsk, Russia
CNDC	Chinese Nuclear Data Center, Beijing, P.R. China
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
FPND	Fission-product nuclear data
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
JEF	The Joint Evaluated File of neutron data, a collaboration of European NEA member countries and Japan
JENDL-3	Japanese evaluated neutron reaction data library
LEXFOR	Part of the EXFOR manual containing physics information for compilers
NDS	IAEA Nuclear Data Section, Vienna, Austria
NEA	Nuclear Energy Agency of the OECD, Paris, France
NEA-DB	NEA Data Bank, Saclay, France
NEANDC	NEA Nuclear Data Committee, discontinued, see NSC
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
NSC	Nuclear Science Committee of NEA
NSDD	Nuclear structure and decay data
NSR	Nuclear structure references, a bibliographic system
OECD	Organization for Economic Cooperation and Development, Paris, France
PC	Personal Computer
PhND	Photonuclear data
RCM	Research Co-ordination Meeting
RI	Radiyvj Institut, Sankt Peterburg, Russia
RIKEN	Nuclear Data Group, RIKEN Inst. of Phys. and Chem. Res., Wako-Shi, Saitama, Japan
SG,SGIP	Study Group for Information Processing, Sapporo, Japan. Changed to JCPRG
TRANS	Name of transmission tapes for data exchange in the EXFOR system
WRENDA	World Request List for Nuclear Data
4C...	Numbering code of memos exchanged among the four Neutron Data Centers

Technical NRDC Meeting
Vienna, 1 - 3 September 1992

AGENDA

- 1. Opening and adoption of the agenda**
- 2. General matters**
 - 2.1 Brief status reports of the centers
 - 2.2 General situation of the centers
 - 2.3 Review of general actions from last NRDC meeting
(INDC(NDS)-262, pp.13-14)
- 3. The Debrecen Nuclear Data Group**
 - 3.1 Brief report on the Debrecen activities
 - 3.2 The CPND network and the Debrecen group
 - 3.3 Work towards a data file for monitor reactions and
reactions for radioisotope production
- 4. The nuclear data systems on the VAX**
 - 4.1 Status
 - 4.2 EXFOR/CINDA dictionary system: new formats and procedures
based on NNDC's dictionary database
 - 4.3 Further development
- 5. EXFOR, general**
 - 5.1 Review of actions from last NRDC meeting
(INDC(NDS)-262, pp.15-17)
 - 5.2 Pending EXFOR matters

Item	Memos
- Chinese institute and report codes	CP-S/9208, CP-D/227
- Country code for Monaco	CP-D/229
- New area 3 and 4 country and lab codes	CP-D/228,229
- Units MEV/A: conversion to MeV?	CP-D/225
- Delayed neutron yields from individual precursors	CP-D/222
- New quantities for photonuclear data used in TRANS M011-14: some of them are not yet included in dictionaries (clarification pending since July 1991)	CP-C/200+D/219; reminder in CP-D/224
- Coding of re-named journals	new item (M.Lammer)
- New code AMFF for dict.20 (ADD-RES)	new item (M.Lammer)
- Coding of isomeric fission yield ratios	new item (M.Lammer)
- New code PR,TEM,N for dict.36	CNDC-003 (new)

- 5.3 TRANS tapes transmitted since last NRDC meeting
 - Did all centers receive all tapes?
(comparison of last TRANS tapes sent/received)
 - Pending retransmissions
 - Disturbing mistakes

6. Neutron data

- 6.1 Neutron EXFOR compilation and completeness
- 6.2 CINDA
 - Review of actions from last NRDC meeting
(INDC(NDS)-262, p.15)
 - Checking of incoming exchange format entries
 - File comparison between NNDC, NEA-DB and NDS
 - Indexing of evaluated data files
(see minutes of 1990 NRDC meeting, Actions 37-40)
 - Manual updates
- 6.3 Fission-product yield data
 - Review of actions from last NRDC meeting
(INDC(NDS)-262, pp.17-18)
- 6.4 Evaluated data libraries
 - Review of actions from last NRDC meeting
(INDC(NDS)-262, pp.18-20)
 - Proposals about ENDF-6 format
(Memos CNDC-002, CNDC-004)
 - BROND-2

7. CPND, remaining matters

- Review of actions from last NRDC meeting
(INDC(NDS)-262, pp.20-21)

8. Photonuclear data

9. Computer matters (other than VAX)

- PC codes
- TRANS tape transmission on diskettes, archive format
- Demo by M. Konieczny of a program displaying alpha and gamma radiations

10. Customer services

11. Miscellaneous

- 11.1 Review of remaining actions from last NRDC meeting
(WREND, et al.; INDC(NDS)-262, pp.14-15, 22-23)
- 11.2 Next NRDC meeting
- 11.3 Other nuclear data meetings
- 11.4 Conclusions and actions of this meeting

**Consultants' Meeting on
Technical Aspects of the Co-operation of
Nuclear Reaction Data Centers**

IAEA Headquarters, Vienna, Austria
1-3 September 1992

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RUSSIAN NUCLEAR DATA CENTER

Status report

"The CJD activities in the neutron data exchange
for the period 1991-1992"
to the

Consultants' Meeting

"Technical Aspects of the Nuclear Reaction
Data Centre Co-operation"

1 - 3 september 1992, Vienna

A.I.Blokhin, V.N.Manokhin, S.A.Maev, I.V.Kravchenko,
S.M.Nasyrova, O.A.Pakhomova

E X F O R

We have been continuing to collect cross-section data for area 4. In the period from may 1991 through august 1992 CJD has prepared and transmitted 5 neutron data transmission tapes (TRANS 4084 - 4088). The tapes contained 43 new compilations and an additional 58 re-transmissions. Table 1 summarizes the statistics for these TRANS's.

Table 1. Statistics of tapes for area 4.

```
-----
Number of Entries: 101 ( 43-new )
Number of SubEntries: 985 ( 404-new )
Number of records: 28096 ( 7115-new )
Number of data's records: 12024 ( 2353-new )
-----
```

Compilation of the data from the Rider Fission Product Yield data file has been completed and some of these data has been entered into the EXFOR library (Memo 4C-4/53).

C I N D A

Two CINDA data batches with 1022 records have been prepared and sent to the other centers by e-mail. In 1991 we have finished the introduction of the missing EXFOR references in the CINDA. Table 2 gives a summary of CINDA activities in 1991-92.

Table 2. CINDA Activities

```
-----
              Number      Number
            of Batches    of records
-----
area 1         8          1479
area 2         5          1390
area 3         3          1712
area 4         2          1022
-----
```

REQUEST STATISTICS

191 Requests for data and documents from 21 institutes were answered in 1991-92. In table 3 the requests statistics are attached. We see a strong increase in the requests for evaluated data and corresponding documents. It can be explained by the fact that the new evaluated data libraries were released in 1990-92.

Table 3. Request statistics for area 4.

Expt Data	Bibl Data	Doc's	Codes	Eval Data	Total
38	14	49	16	74	191

The main evaluated data libraries asked for are:

BROND-2 - 16; IRDF-90 - 6;
ENDF/B-VI - 18; ENDF/B-IV - 4;
JENDL-3 - 11; BOFOD-90 - 6;
JEF-1 - 7; Other data - 3;
CENDL-2 - 3;

Part of these data the CJD prepared on the magnetic diskettes.

EVALUATED DATA

In 1990-91 the CJD obtained a large number of new evaluated neutron data libraries. Significant efforts were required to make these libraries available to customers. Most of these libraries were adapted on micro-VAX and PC computers.

CJD produced the following libraries:

"BROND-2" - documented in J.,YK,1991,v.2,3 (in engl.) and R., IAEA-NDS-90 (1992);

"BOFOD-90" - the evaluated photo-neutron data library for 27 materials, documented in J.,YK,1992,v.3 (in russ.);

"DEC DAT" - the decay data library for 2234 radionuclides, documented in J.,YK,1992,v.4 (in press);

COMPUTER

Up till now we have used the EC mainframe for the operation with the EXFOR and CINDA systems. Today we have four PC/AT computers and an access to micro-VAX. In the near future the main event will be the transition from the EC mainframe to a micro-VAX computer. In this respect we would like to consider a possibility of adaptation of the NNDC maintenance programs for the EXFOR and CINDA systems.

by A. F. Grashin, A. D. Efimenko (MIFI, Moscow)

1988 Version

Summary by

A. I. Blokhin, M. V. Mikhaylukova

The ASIYAD-MIFI fission product yield library were realised on 12 february 1992 by the Centre po Jadernym Dannym (CJD) on two magnetic diskettes. This library includes the independent fission product yield data and consists from two parts:

part 1: ASIYADP1.FPY - the data for U-232, 233, 234, 235, 236, 237, 238, 239 and Np-236, 237, 238, 239.

part 2: ASIYADP2.FPY - the data for Pu-236, 239, 240, 241, 242, 243; Am-241, 242, 243 and Cm-245.

The ASIYAD-MIFI fission product yield library is in ENDF-6 format and has N-LIB=44 for identifying the library. The original format of numerical arrays was converted to ENDF-6 format by CJD.

TABLE OF CONTENTS:

Nuclide	MAT	Incident neutrons	Nuclide	MAT	Incident neutrons
U-232	9232	0.0253 eV, 0.5 MeV	Pu-236	9436	0.0253 eV, 0.5 MeV
U-233	9233	0.5 MeV	Pu-239	9439	0.0253 eV, 0.5 MeV
U-234	9234	0.5 MeV	Pu-240	9440	0.5 MeV
U-235	9235	0.0253 eV, 0.5 MeV	Pu-241	9441	0.0253 eV, 0.5 MeV
U-236	9236	0.5 MeV	Pu-242	9442	0.5 MeV
U-237	9237	0.0253 eV, 0.5 MeV	Pu-243	9443	0.0253 eV, 0.5 MeV
U-238	9238	0.5 MeV	Am-241	9541	0.0253 eV
U-239	9239	0.5 MeV	Am-242	9542	0.0253 eV, 0.5 MeV
Np-236	9336	0.5 MeV	Am-243	9543	0.0253 eV
Np-237	9337	0.5 MeV	Cm-245	9645	0.0253 eV
Np-238	9338	0.0253 eV, 0.5 MeV			
Np-239	9339	0.5 MeV			

Appendix 3

BOFOD-90

The evaluated photo-neutron data library.

A. I. Blokhin, N. N. Buleeva, S. M. Nasyrova, O. A. Pakhomova
(Institute of Physics and Power Engineering, Obninsk)

This is the preliminary version of the evaluated photo-neutron data library for 27 materials from Be-009 to Am-243. The BOFOD-90 library is in "ENDF-6" format and has N-LIB=42 for identifying the library. We used next MT's numbers for the photo-nuclear reactions:

MT= 4 for (G,N) reaction;

MT=16 for (G,2N) reaction;

MT=18 for (G,fiss) reaction;

MT=10 sum of (G,N), (G,2N) and (G,fiss) reactions or their combination.

In table the materials included in in the BOFOD-90 library are listed. A complete summary description of the evaluations in the BOFOD-90 library is given in J., YK, 1992, v. 3 (in press). Plots of data are published in the report INDC(CCP)-337, 1991. The complete data tables are contained on 1 PC diskette and available from the authors.

Table. Contents of the BOFOD-90.

NUCLIDE	MAT	MF	MT	CARDS	MOD	NUCLIDE	MAT	MF	MT	CARDS	MOD
Be-009	409	1	451	18	0	Bi -209	8309	1	451	21	0
	409	3	4	23	0		8309	3	4	12	0
Na-023	1123	1	451	17	0		8309	3	10	13	0
	1123	3	4	10	0		8309	3	16	8	0
Cr-052	2452	1	451	17	0	Th-232	9032	1	451	23	0
	2452	3	4	15	0		9032	3	4	15	0
Mn-055	2555	1	451	17	0		9032	3	10	27	0
	2555	3	4	11	0		9032	3	16	10	0
Ni -000	2800	1	451	17	0		9032	3	18	18	0
	2800	3	4	12	0	U-233	9233	1	451	21	0
Zr-000	4000	1	451	21	0		9233	3	4	13	0
	4000	3	4	13	0		9233	3	10	22	0
	4000	3	10	17	0		9233	3	18	17	0
	4000	3	16	8	0	U-234	9234	1	451	21	0
Mo-092	4292	1	451	17	0		9234	3	4	17	0
	4292	3	4	14	0		9234	3	10	28	0
Mo-094	4294	1	451	19	0		9234	3	18	19	0
	4294	3	4	18	0	U-235	9235	1	451	17	0
	4294	3	16	7	0		9235	3	18	50	0
Mo-096	4296	1	451	19	0	U-236	9236	1	451	21	0
	4296	3	4	19	0		9236	3	4	22	0
	4296	3	16	9	0		9236	3	16	15	0
Mo-098	4298	1	451	19	0	9236	3	18	17	0	
	4298	3	4	19	0	U-238	9238	1	451	17	0
	4298	3	16	10	0		9238	3	18	52	0
Mo-100	4299	1	451	19	0	Np-237	9337	1	451	21	0
	4299	3	4	20	0		9337	3	4	22	0
	4299	3	16	12	0		9337	3	16	15	0
W-182	7482	1	451	17	0		9337	3	18	17	0
	7482	3	4	20	0	Pu-239	9439	1	451	19	0
W-184	7484	1	451	17	0		9439	3	4	24	0
	7484	3	4	21	0		9439	3	16	14	0
W-186	7486	1	451	19	0	Pu-241	9441	1	451	17	0
	7486	3	4	21	0		9441	3	4	24	0
	7486	3	16	14	0	Am-241	9541	1	451	17	0
Pb-000	8200	1	451	21	0		9541	3	18	17	0
	8200	3	4	13	0	Am-243	9543	1	451	17	0
	8200	3	10	16	0		9543	3	18	17	0
	8200	3	16	9	0	ORIGINAL CARD COUNT				1542	

Conversion of Rider's quasi-exfor ENTRIES
for the area 4 into EXFOR-format.

Appendix 4

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

Having obtained the QUASI-EXFOR file of ENTRIES compiled by Micky and Rider, we have checked the existing Area-4 list of ENTRIES having in mind to obtain the correspondence between the both sets of data. It appeared that some of the existing Area-4 ENTRIES coincide with Rider's ones, other Rider's ENTRIES are totally new. The results of such activity are the follows.

Correspondence of the existing Area-4 ENTRIES to the Rider's:

Existing Entry	40145	corresponds to Rider's 90517;
Existing Entry	40173	corresponds to Rider's 90365(in part);
Existing Entry	40205	corresponds to Rider's 90577;
Existing Entry	40206	corresponds to Rider's 90615;
Existing Entry	40389	corresponds to Rider's 90578(in part);
Existing Entry	40489	corresponds to Rider's 90755;
Existing Entry	40545	corresponds to Rider's 90751;
Existing Entry	40554	corresponds to Rider's 90691(in part).

Entry 90365 was included entirely in 40173 on the reason that its data systematically unify those dispersed in various Subentries of Entry 40173. Entry 90691 is converted to 41086 because its figures differ slightly from those of 40554. On that reason all Subents of 41086 bear Status code RNORM.

The following Rider's ENTRIES were absent in our library and were converted to the new Area-4 ENTRIES according to the list of correspondence given below:

Rider's ENTRY	90201	is converted to AREA-4 ENTRY	41070
Rider's ENTRY	90205	is converted to AREA-4 ENTRY	41071
Rider's ENTRY	90214	is converted to AREA-4 ENTRY	41072
Rider's ENTRY	90215	is converted to AREA-4 ENTRY	41073
Rider's ENTRY	90319	is converted to AREA-4 ENTRY	41074
Rider's ENTRY	90344	is converted to AREA-4 ENTRY	41075
Rider's ENTRY	90345	is converted to AREA-4 ENTRY	41069
Rider's ENTRY	90354	is converted to AREA-4 ENTRY	41076
Rider's ENTRY	90437	is converted to AREA-4 ENTRY	41077
Rider's ENTRY	90442	is converted to AREA-4 ENTRY	41078
Rider's ENTRY	90462	is converted to AREA-4 ENTRY	41079
Rider's ENTRY	90487	is converted to AREA-4 ENTRY	41080
Rider's ENTRY	90525	is converted to AREA-4 ENTRY	41081
Rider's ENTRY	90552	is converted to AREA-4 ENTRY	41082
Rider's ENTRY	90688	is converted to AREA-4 ENTRY	41084
Rider's ENTRY	90699	is converted to AREA-4 ENTRY	41085
Rider's ENTRY	90706	is converted to AREA-4 ENTRY	41086
Rider's ENTRY	90712	is converted to AREA-4 ENTRY	40257

24 August 1992

To: Distribution

From: Liang Qichang, CNDC, P. R. China

Subject: The activity on EXFOR compilation and exchange in China

According to the research contract to IAEA, recently years, many efforts have been paid to develop the EXFOR software system for nuclear data compilation and to compile the EXFOR nuclear data measured in China. Now the PC EXFOR software system, which includes three parts, i. e. Edition, Check, and Retrieval, has been completed basically and used in the EXFOR compilation.

The main purpose of EXFOR work in CNDC is the data compilation itself, and it will be a long-term task, in order to coordinate the activity on EXFOR nuclear data compilation in China, the Network for EXFOR data compilation consisted of several institutes and universities has been established in 1990, since then, we have compiled 38 EXFOR entries in all, checked by using above mentioned software system and sent them to IAEA as follows:

TRANS-3000 (NOV., 1989), 4 entries: 32501-32503, 32508.

TRANS-3001 (MAR., 1990), 5 entries: 32504-32507, 32509.

TRANS-3002 (MAY, 1992), 7 entries: 32510, 32511, 32513, 32576-32579.

TRANS-3003 (AUG., 1992), 22 entries: 32516-32525, 32528-32538, 32541.

Now the additional hard disk provided by IAEA has been installed in our MICRO-VAX-2 computer, we also have received the whole EXFOR data library from IAEA, we hope to load it in the disk as soon as possible, and on-line serve the users.

By the way, the CENDL-2, ENDF/B-6, JENDL-3, and BROND-2 were online services to users by CNDC.

THE COMPILATION, CALCULATION AND EVALUATION
OF CHARGED PARTICLE NUCLEAR DATA (CPND) AT CNDC

Zhuang Youxiang
Chinese Nuclear Data Center

1. Compilation

The twenty five sets S0001-S0025 of data measured in China have been compiled in EXFOR format and sent to IAEA. The ten sets of (p,n) and (α ,n) data measured in other countries are being compiled and will be sent to IAEA.

2. Evaluation

Some thermal-nuclear reactions and activation cross sections induced by charged particles are being or have been evaluated in ENDF/B-6 format for fusion application.

3. Calculation

The general and united codes for CPND have been set up at CNDC. For instance, a comprehensive R-matrix analysis RCA code based on the multichannel and multi-level R-matrix theory is for light nuclei; the model calculation codes CMUP2 based on the optical model and the unified treatment of exciton model and evaporation model is for medium and heavy weight nuclei, and CFUP1 based on MUP2 code for fissile ones; they can be used to calculate the related CPND in the energy region from threshold to 50 MeV.

Some nuclear data of $p+^{63}\text{Cu}$, $p+^{89}\text{Y}$, $^{235}\text{U}(p,n)$ and $^{241}\text{Am}(d,2n)$ reactions at energy region of threshold-50 MeV have been calculated by means of CMUP2 and CFUP1, respectively.

The main subject of data compilation in CAJaD

S.Y. Babykina
Kurchatov Center

After the conference in Obninsk the CAJaD has paid attention to the software for personal IBM compatible computers of both domestic and foreign production.

This problem has occurred also with the possible switching of the CAJaD database to the VAX computer.

The input of data is implemented in CAJaD by means of the EDIT program developed by W.J. Paul. We could share the experience acquired in the utilization of this program. The system of macros used in the program is very convenient and proves to be more universal as compared to the input code submitted by V. Osorio.

During the conference in Obninsk the CAJaD demonstrated running the text-checking EXFOR program developed for IBM compatible PC's. During the last year a number of corrections was made in the program aimed at better quality of checking.

Following recommendations of Obninsk conference of Centers we prepared TRANS A026 which contains corrections to codes submitted already and includes separate SUBENTRY's and not complete ENTRY's. We would be grateful to our colleagues from BNL and NDS for their remarks which could help us to find out possible errors in our technology.

It would be relevant to acknowledge remarks of V. McLane concerning this subject.

During last year we developed two TRANS (A026 and A027) one of which was submitted earlier to the International network of data centers. At present we compile papers submitted to the conference "Nuclear data for science and technology" (Jülich, May 13-17, 1991). These experimental data are, in our opinion, of great interest for users and should be included in the "Generalized EXFOR" library as soon as possible.

Requests of scientists related to the consequences of the Chernobyl catastrophe necessitated our efforts for compilation of experimental data concerning interactions of alpha-particles and protons with light nuclei ranging from Li to Cl.

For detecting fuel compositions in soils we developed a code for the calculation of neutron yield due to alpha-particles emitted by long-living (more than one year) radioactive nuclides.

According to present regulations trans are transmitted on magnetic tapes. Now the data transmission of IBM compatible floppy disks is also widespread. This is quite understandable since the second way is more reliable, convenient and cheap.

As to the Center of neutron data, we are not aware of the volume of information transmitted by him and thus we cannot make any conclusion whether this method is convenient for the Center. For information transmitted by our Center the floppy disk is sufficient. In the cases when transmitted information required larger memory volume it is expedient to use archivization of data.

We suggest:

- to legalize transmission of data on IBM compatible floppy disks;
- to set a unified code for data archivization.

Centre for Photonuclear Experiments Data (CDFE)

STATUS REPORT - 1992

Appendix 8

I.N.Boboshin, V.V.Varlamov, N.G.Efimkin, V.V.Sapunenko,

M.E.Stepanov

*CDFE, Institute of Nuclear Physics,
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This report contains the review of the works carried out by the CDFE after the 11th IAEA Consultant's Meeting of the Nuclear Reaction Data Centers (Obninsk/Moscow, 7 - 11 October, 1991).

NEW COMPUTER. The main concern of the CDFE during this year was the problem of new mainframe to substitute the 10 years old computer "ES-1022". During the 11th IAEA Consultant's Meeting the Centre had at disposal only IBM PC/AT-286, which can not solve any of significant CDFE's problems.

Now the CDFE in addition to PC/AT have the PHILIPS 3370 computer (IBM-compatible 100 %):

- processor Intel 80386/387, 33 Mhz,
- hard disk 611 MB,
- RAM 8 MB,
- streamer TDC 3650,
- floppies 3.5" and 5.25",
- UNIX system V/386 (Interact. Syst. Corp.), Release 3.2.

E-MAIL. The CDFE have created several e-Mail P.BOXs on this computer:

CDFE@COMPNET.NPIMSU.MSK.SU
VARLAMOV@COMPNET.NPIMSU.MSK.SU

Another concern associated with the new type of computer was the problem of new software for photonuclear data processing. The CDFE has tried to solve this problem by various methods. For example, ANDEX (A PC Software Assisting the Nuclear Data Compilation in EXFOR, by

V. Osorio, IAEA NDS) has been installed on PHILIPS. As a result of great efforts the CDFE have now a certain possibilities to continue some kinds of its activity.

EXFOR. In accordance with the Draft Proposal of Photonuclear Data Cooperation Project between the MSU INP CDFE and the USA BNL NNDC of 7 June 1991 the CDFE prepared the new TRANS M016 which includes 21 new EXFOR ENTRIES. The data for 5 of them have been received by e-Mail from Drs. S.I. Warshaw (USA LLNL) and J. Ahrens (Mainz, Germany). This new CDFE TRANS M016 in the form of file on PC diskette is a supplement to this Status report.

Sticking the photonuclear data evaluation program the CDFE have processed a lot of data having been digitized previously in the USA Institute of Standards and Technology (former USA NBS, photonuclear data group of Prof. E.G. Fuller) and kindly given to Dr. V.V. Varlamov during his visit to USA BNL in 1991. The data in forms of EXFOR DATA's tables have been used for the analysis of total photoneutron reaction cross sections for large number of nuclei from ${}^6\text{Li}$ to ${}^{238}\text{U}$. The evaluation of these cross sections for energy range of giant dipole resonance ($E_\gamma = 10\div 50$ MeV) has been done for several nuclei (${}^{12}\text{C}$, ${}^{16}\text{O}$, ${}^{63,65}\text{Cu}$, ${}^{141}\text{Pr}$, ${}^{208}\text{Pb}$ etc.).

The method of reduction, independent on nuclear models, a priori information, and any regularization was used as the tool for photonuclear reaction cross section evaluation^[1,2].

ENSDF, NSR. In addition to EXFOR-activity the CDFE has continued the activity in the field of using the other international computer files such as ENSDF and NSR both for investigations of nuclear shells and subshells as processing of requests of Russia scientists at first from universities and institutes. But new IBM PC type computer demands the new kind of software for these files operation.

INFORMATIONAL PUBLICATIONS. Sticking the program of photonuclear data information publication the CDFE has published the new Photonuclear Data Index^[3]. This Index continues the series of previous CDFE publications which contain the systematized information about the experimental works on photo- and electronuclear reactions and inverse reactions of radiative capture. The Index includes the features of experimental methods have been used in works, physical

results obtained, bibliography, and index of authors of the works carried out during the 1986 - 1990. The Index also in form of data file on PC diskette has been sent to the IAEA NDS for distribution abroad Russia.

Though PHILIPS computer gives to the CDFE the possibility to continue some kinds of nuclear data activity the CDFE would like to have the more powerful one, for example, MICRO-VAX, or VAX-STATION. So the CDFE would like ask IAEA NDS about possible help again.

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The Method of Reduction as Photonuclear Data Evaluation Tool.
Proceeding of the International Symposium on Nuclear Data
Evaluation Methodology, Brookhaven, October 1992, to be
published.

- [3] V.V.Varlamov, M.E.Stepanov, V.V.Sapunenko.
Photonuclear Data 1986 - 1990. Index.
Izdatel'stvo Moskovskogo Universiteta, 1992.

NEA DATA BANK Progress Report

to the NRDC Meeting in Vienna, Sept.1992

GENERAL

The major event at the Data Bank in 1992, has been our relocation to new premises at Ile St.Germain, just outside Paris city limits, which finally took place in July. Naturally, such a move has meant a change in all forms of communication to the data bank i.e., phone, fax, and e-mail. All known users have been contacted to inform them of these changes.

At present we are still in a transitional period. Our computers remain at Saclay, together with a skeleton staff, until installation of the new VAX at Issy-les-Moulineaux, which is expected to take place in September. Some scientific staff split their time between the new and old premises, so in the event a staff member cannot be reached at Issy, customers have been advised to try their old number at Saclay.

At present all e-mail addresses remain unchanged, although we have been experiencing considerable network problems in recent months. Upon installation of the new machine the addresses will change; only BITNET will remain the same.

NUCLEAR DATA SERVICES

Following the departure of Simon Webster in July 1991 all work on CINDA and EXFOR was temporarily suspended until January 1992, when his position was filled. Since then, work has concentrated on clearing the backlog with varying degrees of success.

CINDA:

In 1992, four exchange batches have been dispatched. Last years backlog, including all Julich Conference references, has been cleared, and with the next batch, presently being compiled, it is expected that Area 2 journal coverage will be current. Lab report are expected to take a little longer to compile given the difficulty in obtaining the relevant documents. This difficulty arises partly as a result of the breakdown of the Reader network.

A version of the CINDA database for use on Personal Computers has been developed at the Data Bank.

EXFOR:

In 1991 four EXFOR data tapes were produced and transmitted to other data centres. Upon the departure of Simon Webster, a considerable backlog already existed. Since then, no further EXFOR compilation has taken place due to lack of manpower. EXFOR activity has been reduced to loading of exchange tapes from other Areas.

It is envisaged that some EXFOR compilation will recommence before the end of the year. The greatest perceived problem is the difficulty in checking the correctness of the compiled entries. To this end, it is likely that the ANDEX program will be employed.

CUSTOMER SERVICE

NEADB On-Line Statistics

	1990	1991	1992 (Jan-July)	1992 (Projected Total)
EXFOR	132	119	76	130
CINDA	29	42	68	117
EVA	155	201	85	146
ENSDF	314	157	92	158
NSR	424	324	190	326
NUDAT	79	99	51	87
TOTAL	1133	942	562	963

On-line accesses to the databases in 1991 were down by about 15% on 1990 levels. The projected total for 1992 is expected to remain roughly equivalent to 1991 levels, at just below 1000 retrievals.

Manual requests for data and documents in 1991 remained close to the figures for 1990, with 242 requests from 87 different requestors. The main items requested were: JEF data (40%), other evaluated data (25%) and EXFOR data (14%). The high level of manual request activity in 1992 suggests that figures will once again be comparable with previous years.

JOINT EVALUATED FILE (JEF)

The latest version of the Joint Evaluated File, JEF-2.2, was released at the end of 1991. Also, the JEF-2.2 version of the Radioactive Decay data file was compiled at the data bank during 1991.

A PC computer code for displaying alpha and gamma radiations from the JEF-2.2 Decay Data file was developed for the Data Bank at the University of Birmingham, U.K., and is expected to be released shortly.

-36-
**Data Bank Services from the
 NEW LOCATION OF THE
 OECD NUCLEAR ENERGY AGENCY**

OECD Nuclear Energy Agency
 Le Seine Saint-Germain
 12, boulevard des Iles
 F-92130 Issy-les-Moulineaux

Telephone: +33 (1) 45 24 (plus 4 digits)

OECD Switchboard: +33 (1) 45 24 82 00

Telefax: +33 (1) 45 24 11 10

Telex: OCDE 620 160 F

Principal telephone numbers:

		Secretariat
K. Uematsu, Director General	1000	1001
S. Thompson, Deputy Director General	1002	1003
J. Rosen, Director for Science and Computing	1006	1007

Data Bank Services

N. Tubbs	1070	1071
----------	------	------

Nuclear Data Services

C. Nordborg	1092
M. Konieczny	1085

Computer Program Services

E. Sartori	1072
S. Greenstreet	1077

Chemical and Environmental Services

I. Puigdomenech	1083
S. Koo-Oshima	1084

On-line Services

P. Nagel	1082
R. Posca	1086

Computer systems

L. Pellegrino	1095, 1096
---------------	------------

General calls

1071

The Data Bank will move from Saclay on 10th July 1992, leaving a skeleton technical staff to work the computer until the installation of the new computer in Issy-les-Moulineaux is completed in September. If you are occasionally unable to reach a member of the scientific staff on the new number, please try their previous number in Saclay.

Electronic Networks

The electronic networks for the new address will be fully operational in mid October.

BITNET/EARN	name@FRNEAB51
INTERNET	Not yet known
X25 (Transpac)	(1) 92 160 775
X-400 (Atlas)	Not yet known
PHYSNET/HEPNET	Discontinued until further notice

STATUS OF THE RIKEN NUCLEAR DATA GROUP

Consultants' Meeting of the NRDC for Technical Aspects
Vienna, 1-3 September 1992 *

Y. Tendow

EXFOR

We continue to collect production cross section data for 20 medical isotopes as well as some other related isotopes. Although the bulk of them has already been incorporated into the EXFOR master file, not a small number of important works are still left untouched. At the moment, we have found and collected about 50 works not included in the EXFOR, and started on the compilation of them. We have transmitted the trans R007 (corrected trans R006) to NDS.

ENSDF, NSR

We continue the mass-chain evaluation as a member of the ENSDF working group under the Sigma Committee in JAERI. Re-evaluation or update for $A = 129$ is now in progress. NSR file compilation for 1991 secondary sources of Japanese origin has completed and transmitted to NNDC. We have started on the compilation for 1992 secondary sources.

Computers

We are using the mainframe computer FACOM M1800/20, 128 MB main memories and 256 MB system memories, 120 GB disks, 400 GB MT library) running under double operating system, MSP (IBM compatible) and UXP/M (UNIX). We are using several PC's also for primary input and pre-processing of data. Some of the PC's are as follows:

FUJITSU FM-R70, terminal of the mainframe. 40 MB HD.

NEC PC-9801. 120 MB HD, math. co-processor.

IBM PS/5530 (equivalent to PS/2). 40 MB HD, math. co-processor.

Macintosh-IIci. 100 MB HD.

We also have a VAX network system (FACOM M380, VAX6510, workstations, etc.) in the RIKEN Accelerator Facility area, linked to the mainframe. We are not extensively using them for data compilation works at the moment but are considering to utilize them in future.

Staff

There are no apparent changes in the staff this year. But practically, the man-power is in a decreasing tendency because some members can afford to spare less time than ever. Efforts to enhance man-power are being continued.

- | | | |
|----|-------------|--------------------|
| 1, | permanent, | EXFOR, ENSDF, NSR. |
| 1, | concurrent, | EXFOR. |
| 1, | concurrent, | Computer. |
| 2, | part-time, | EXFOR, ENSDF. |
| 1, | assistant. | |

Report of SGIP to the 1992 Technical NRDC Meeting

Appendix 12

Japan Charged-Particle Nuclear Reaction Data Group

CPND compiling with NRDF

In 1991, we compiled 56 entries with NRDF format. For these entries, we present two tables. Table 1 shows number of entries and physical quantity. Each figure indicates the number of entry which contains the physical quantity. Table 2 shows Data Headings of a data table in column 1 and 2, and number of data tables which have these Data Headings.

Total number of entries exceeds 1200 in the NRDF library.

Into EXFOR translation

TRANS E010 was submitted to NDS in August. The TRANS contains 29 entries, which are converted out of those entries compiled in 1991. The converted data accounts for 51 % in entry base of the NRDF data compiled in 1991. We have converted all NRDF data which is possible to translate to EXFOR format. We are still studying our NRDF format to increase translation rate.

NRDF ANNUAL REPORT 91

Our activities in 1991 is reported in "NRDF ANNUAL REPORT 91". In the Report, compiling of the intermediate energy data is discussed and NRDF activities of the data compiling and the data exchange are summarized.

Contributions of NRDF in the CPND master file

We have received 1467 entries from NDS by May 1992. There are 64 "B" entries found in the data. We are realizing that contributions of NRDF in the CPND master file is 4.6 percent[Fig]. We are going to do more effort to increase this figure.

Customer Services in the future

We are now concentrating our manpower upon CPND compiling with NRDF. However we realize that Customer services should be emphasized.

We are intending to have new customer services for CPND in both NRDF and EXFOR format. The new services are to be developed through National Center for Science Information Systems (NCSIS). For details of NACSIS, please consult the pamphlet.

We would like to confirm that there are no problems for/in the network of Nuclear Data Centers in the case that such systems would be developed in NACSIS.

Table 1. Number of entries which contain the Physical Quntity

Physical Quntity	Number of Entries
ANGL-DSTRN	39
DSIGMA/DOMEGA	29
ENGY-SPEC	12
XSECTN	8
ANALPW	7
EXC-ENGY	6
EXC-FUNCT	6
MOM-DSTRN	6
OPT-POTL-PARA	5
DSIGMA/DOMEGA-RATIO	4
DSIGMA/DOMEGA/DE	4
QVL	4
SPEC-FCTR	4
SPIN	4
VCTR-ANALPW	4
PTY	3
TNSR-ANALPW	3
XSECTN-RATIO	3
DEPM-PARA-2	2
POL	2
POL-TRNSF	2
TOT-RCT-XSECTN	2
XSECTN-LEVEL	2
A	1
ALGN	1
BE-L	1
BM-L	1
DSIGMA/DE	1
ENGY	1
INTNSTY	1
ISOSPIN	1
LIPE	1
MASS-EXCS	1
PART-WDTH	1
RESN-ENGY	1
SIGMA	1
TRNSF-L	1
WDTH-RATIO	1
Z-DSTRN	1
DATA	4

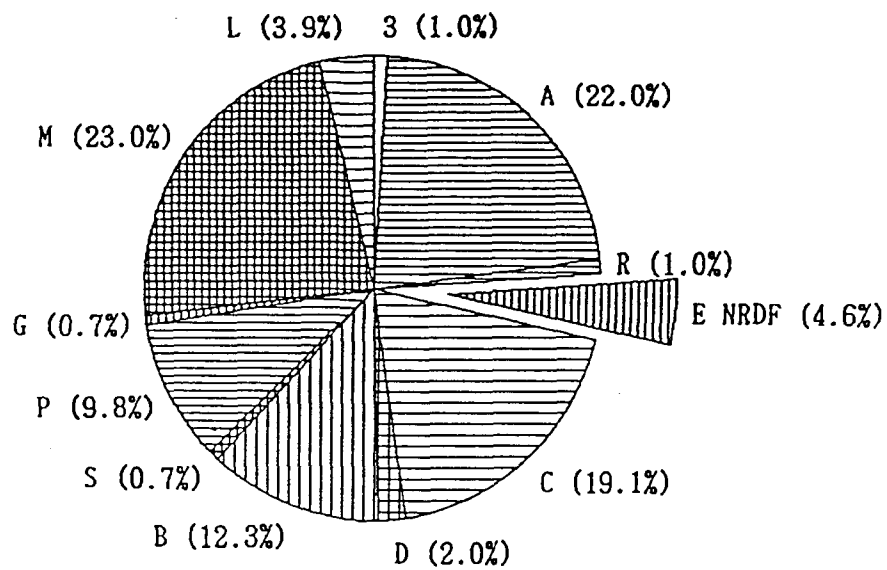
- 42 -

Table 2. Data Headings in the Data Table and Number of tables

Heading in 1st col.	Heading in 2nd col.	No. of Tables
A	DATA1	1
ABST	ANALPW	1
ABST	THTL	2
DATA	DATA	1
DATA	DATA6	2
DATA	DELTA-DATA	4
DATA1	DATA2	18
DATA1	DATA4	1
DATA13	DELTA-DATA13	2
DATA14	DELTA-DATA14	2
DATA15	DELTA-DATA15	2
DATA2	ALGN	5
DATA2	DATA1	5
DATA2	DATA3	2
DATA2	DATA4	2
DATA5	DATA4	4
DATA5	DATA6	3
DATA5	DATA7	1
DATA5	DATA8	1
DATA5	DELTA-DATA5	1
DATA7	DATA10	5
DATA7	DATA4	1
DATA7	DATA8	1
DATA7	DATA9	1
DET-PARTCL	DATA3	1
DET-PARTCL	DATA4	1
DET-PARTCL	DATA5	1
DET-PARTCL	DATA6	1
ENGY-EMT-CM	DSIGMA/DE	9
ENGY-EMT-CM	DSIGMA/DOMEGA/DE	13
ENGY-EMT-LAB	ANALPW	5
ENGY-EMT-LAB	DSIGMA/DOMEGA/DE	10
ENGY-EMT-LAB	POL	5
ENGY-EMT-LAB	POL-TRNSF	5
ENGY-EMT-LAB	VCTR-ANALPW	1
ENGY-GAMMA	INTNSTY	2
EXC-ENGY	J-PTY	7
EXC-ENGY	SPIN	3
EXC-ENGY	XSECTN-LEVEL	2
INC-ENGY	DATA	7
INC-ENGY-CM	ENGY	8
INC-ENGY-CM	SIGMA	11
INC-ENGY-LAB	DATA1	14
INC-ENGY-LAB	DSIGMA/DOMEGA	11
INC-ENGY-LAB	DSIGMA/DOMEGA-RATIO	4
INC-ENGY-LAB	ENGY-EMT-CM	1
INC-ENGY-LAB	INC-ENGY-CM	4
INC-ENGY-LAB	V	18
INC-ENGY-LAB	XSECTN	16
INC-ENGY-LAB	XSECTN-RATIO	4
MOM	DATA1	14

MOM	DATA2	- 43	1
N-TGT	XSECTN		2
PHIL	INTNSTY		4
QVL	DELTA-QVL		3
RSD	DATA1		1
RSD	DATA2		1
RSD	DATA3		1
RSD	HALF-LIFE		1
RSD	MASS-EXCESS		1
TGT	DATA2		1
TGT	DATA3		1
THTC	A		3
THTC	ANALPW		57
THTC	DSIGMA/DOMEGA		354
THTC	DSIGMA/DOMEGA-RATIO		23
THTC	DSIGMA/DOMEGA/DE		16
THTC	POL-TRNSF		1
THTC	TNSR-ANALPW		70
THTC	VCTR-ANALPW		17
THTC	XSECTN		80
THTC	XSECTN-RATIO		2
THTL	DELTA-THTL		1
THTL	DSIGMA/DOMEGA		2
THTL	INTNSTY		4
THTL	THTL		4
Z	ENGY		5
Z-EMT	XSECTN		1

Contribution of NRDF in CPND Library
up to 1991



Comments on the EXFOR/CINDA dictionary database on the VAX

=====

(Agenda 4.2)

O.Schwerer

Reference: - Conclusion/Action from 1991 NRDC Meeting
(INDC(NDS)-262, p.16, near bottom of page)

- CP-C/203 of 26 September 1991 (~~attached~~)

- We (NDS) have updated our VAX dictionary database with TRANS 9064 (the last regular dictionary transmission) and have looked into the dictionary format as defined in CP-C/203. However, we are not yet familiar with all details of the system; NNDC's cooperation will be needed in defining new procedures for dictionary transmissions.
- Anyway, NDS will keep the EXFOR systems on the IBM running in parallel to the VAX for some time. Therefore, NDS is prepared to keep sending out the "old-style" dictionary updates.
- We are prepared to transmit in addition any updates required for keeping the VAX dictionaries up to date because we think it is important to have one centre responsible for all dictionaries to keep them identical.

Some special questions:

- How to process interim updates
- Rough comparison between "old" and VAX dictionaries, possible problem areas:
 - Use of existing dictionary numbers for entirely different dictionaries (10,11,12,13,14)
 - Severely modified: dictionaries 24, 27, 33, 36
 - Omitted: dictionaries 9, 41, 42, 43, (50)
 - All other dictionaries are modified to some extent too, but have essentially the same (or slightly extended) content
- Special features of dictionary 36 (Quantities):
 - Expansions restricted to 1 line
 - Contains codes not yet approved
 - Alphabetical sorting of codes, no grouping

Appendix 14

Working Paper 14: Pending EXFOR matters

=====

This working paper included copies of the following memos which are not reproduced here:

CP-S/9208, CP-D/227, CP-D/229, CP-D/228, CP-D/225, CP-D/222,
CP-D/224, CP-C/200, CP-D/219.

In addition, the following pages were added during the meeting (see next pages of this report):

- List of journals that have changed their names
- Proposed code for dictionary 20: AMFF

LIST OF JOURNALS THAT HAVE CHANGED THEIR NAMES

CST	.....	YUANZINENG KEXUE JISHU
CST	.....	NEW NAME: "ATOMIC ENERGY SCIENCE & TECHNOLOGY" (FORMERLY: CHINESE J. SCIENCE & TECHNIQUE ATOMIC E..)
CZJB	.....	CZECHOSLOVAK JOURNAL OF PHYSICS, SECTION B (INTERNATIONAL SERIES). EXTINCT, CONTINUED AS
CZJ	.....	CZECHOSLOVAK JOURNAL OF PHYSICS
CZJA	.....	CZECHOSLOVAK JOURNAL OF PHYSICS, SECTION A (NATIONAL SERIES, IN CZECH)
CZJA	.....	CONTINUED AS: CESKOSLOVENSKY CASOPIS PRO FYZIKU (IN CZECH) AS OF VOL. 40
HFH	.....	HE HUAXUE YU FANGSHE HUAXUE
HFH	.....	NOW CALLED "J. NUCLEAR AND RADIOCHEMISTRY"
NSB	.....	NUCLEAR SCIENCE AND APPLICATION (DHAKA). RESTARTED WITH VOL 1 IN 1989 (COMBINING NSDA AND NSDB)
NSD	.....	NUCLEAR SCIENCE AND APPLICATION (DHAKA). UP TO VOL. 4 NO. 1 (APRIL 1968): CONTINUED AS NSDA AND NSDB.
NSD	.....	EXISTING ISSUES: 1(1), 2(1), 2(2), 3(2), 4(1), 4(2) PUBLISHED AS NSDB VOL. 4 (OCT. 1968)
NSDA	.....	NUCLEAR SCIENCE AND APPLICATION (DHAKA). SERIES A: BIOLOGICAL (BEFORE: APPLIED) SCIENCES. STOPPED IN 1986.
NSDA	.....	RESTARTED WITH VOL. 1 IN 1989 (CODE = NSB), COMBINING SERIES A AND B.
NSDB	.....	NUCLEAR SCIENCE AND APPLICATION (DHAKA). SERIES B: PHYSICAL SCIENCES. STOPPED IN 1986.
NSDB	.....	RESTARTED WITH VOL. 1 IN 1989 (CODE = NSB), COMBINING SERIES A AND B.
PHE	.....	PHYSICA ENERGIAE FORTIS ET PHYSICA NUCLEARIS (UP TO VOL. 10, 1986)
PHE	.....	HIGH ENERGY PHYSICS AND NUCLEAR PHYSICS (STARTING VOL. 11, 1987)
RBF	.....	REVISTA BRASILEIRA DE FISICA
RBF	.....	NEW NAME, STARTING VOL. 22: BRASILIAN JOURNAL OF PHYSICS
SCS	.....	SCIENTIA SINICA, SERIES A - MATH., PHYS., ASTRON. & TECHN. SCIENCES
SCS	.....	FROM VOL. 32 ONWARDS CONTINUED AS: SCIENCE IN CHINA, SERIES A - MATH., PHYS., ASTRON. & TECHN. SCIENCES
WULI	.....	WULI (PHYSICS)

EXFOR dictionary 20: Additional results (ADD-RES)

Proposal by M.Lammer of a new code for dict. 20:

AMFF (angular momentum of fission fragments)

Background:

In some BARC (India) measurements of isomeric yield ratios, the angular momentum of fragments was deduced. Since there is no EXFOR code foreseen yet for this quantity, I asked the participants in my CRP on Evaluation of Fission Yields for their opinion:

Would it be sufficient to include the deduced value in free text under the keyword "ADD-RES" (= additional result), or is it important enough to introduce a new EXFOR reaction code?

It was the unanimous opinion that no special reaction code should be introduced, but it was also suggested to introduce a code for ADD-RES to make this information retrievable.

Proposal by M.Lammer of coding rules

Presently, isomeric fission yield ratios are coded with the fission product in REACTION SF4, followed by an isomer ratio code, and RAT in SF6, e.g.:

(92-U-235(N,F)53-I-145-M/G,IND,FY/RAT).

This requires a separate subentry for each isomeric ratio measured.

Up to recently there were only few (1 or 2) isomeric yield ratios determined in each experiment. However, now we are confronted with longer tables of isomeric yield measurements (see attachment). Therefore I want to propose the introduction of a new formalism that enables one the coding of all ratios for one reaction in one subentry.

Proposal 1:

Allow the combination of ELEM/MASS and an isomeric ratio code in SF4, e.g.:

(92-U-235(N,F)ELEM/MASS-M/G,IND,FY/RAT).

Advantage: no data heading keywords are needed for the isomeric states.

Drawback: different isomeric ratios like M/G, M/T, M1/M2 cannot be coded in the same subentry.

Proposal 2:

Use existing codes but introduce new data heading keywords:

Reaction code: (92-U-235(N,F)ELEM/MASS,IND,FY/RAT).

Dict. 36: IND,FY/RAT (INDEPENDENT FISS.PROD. YIELD,ISOMERIC RATIO)

The isomeric ratios can be defined either by isomer (M, G, T, M1, etc.), or by the spins of the isomers, as in the attached example. Accordingly, I propose 2 different sets of data heading keywords, each with the extensions -NM and -DN for numerator and denominator respectively.

ISOMER-NM and ISOMER-DN with 0., 1., etc. in the data table, for ground state, (first) metastable state, etc. Still questionable is whether a blank is adequate for the total (g+m) yield.

SPINISO-NM and SPINISO-DN, if the spin values are given in the data table.

The Lexfor entry on ratios will have to be modified accordingly.

Fractions of High Spin Isomers Obtained Experimentally in Various Neutron Induced Fission Reactions

Isotop	Spins	Th-232 ¹	U-233 ²	U-235 ³	Pu-239 ⁴	Cf-249 ⁵
Y-96	0/3			0,46±0,03		
Y-97	0,5/4,5		0,67±0,03	0,73±0,03	0,570,04	0,52±0,05
Y-98	1/4			0,07±0,01		0,05±0,02
Nb-99	0,5/4,5			0,25±0,07		
Nb-100	1/4(5)					0,84±0,05
Nb-102	1/4(5)			0,52±0,05		
Sn-130	0/7		0,07±0,01	0,11±0,02		0,40±0,05
Sb-130	4(5)/8					0,66±0,05
Sn-131	1,5/5,5			0,67±0,03		
Sb-132	4/8		0,24±0,05	0,32±0,04		0,45±0,05
Te-133	1,5/5,5		0,64±0,04	0,59±0,02		0,86±0,03
I-134	4/8	0,47±0,05	0,28±0,03	0,26±0,05	0,32±0,05	0,55±0,05
I-136	2/5	0,71±0,05	0,72±0,04	0,65±0,05		0,90±0,05

1. R. Hentzschel, H. O. Denschlag; Radiochim. Acta 50, 1 (1990)
2. C. Lietz, Diplomarbeit, Mainz (1985)
3. H. O. Denschlag et. al., Physics and Chemistry of Fission, IAEA (1980)
4. S. Hörner, Diplomarbeit, Mainz (1985) and further results
5. A. Srivastava et al., Jahresbericht 1986, Institut für Kernchemie, Mainz (1987)
6. V. Scheuermann, Diplomarbeit, Mainz (1991). (Preliminary results !)

24 August 1992

To: Distribution

From: Liang Qichang, CNDC, P.R. China

Appendix 16

Subject: Dictionary update

1. Dictionary 36 Quantities (REACTION SF5-SF8):

Special quantities for fission

Code	Dimension	Expansion
PR,TEM,N	E	The temperature of Maxwellian distribution for prompt neutrons, T.

For example:

REACTION CODING: (....(O,F),PR,TEM,N)

DATA HEADING: DATA

DATA UNIT: MEV

Comparison:

REACTION CODING: (....(O,F),PR,AKE,N) for average kinetic energy of Maxwellian distribution for prompt neutrons, AKE.

Note: $\bar{E}_k = T * 3/2$

2. Dictionary 5 (JOURNAL)

Code	Expansion
JSIU	(Journal of Sichuan University (Natural Science Edition)) 3CPR

Note: This code was used widely in the entries contained in TRANS 3003.

The Institute code SIU for Sichuan University has already existed in Dictionary 3.

Appendix 17

Last TRANS tapes received by NDS as of 20 August 1992

=====

(Year of transmission is 1992 unless otherwise indicated)

A026	(A027 received by 1 Sept.)
C013 (1988)	
D017 (1990)	
E010	
G007	
L004 (1991)	
M014 (1991)	(M016 received by 1 Sept.; M015 had been received by some centers but not by NDS)
R006 (1991)	(R007 received by 1 Sept.)
S005	
V025	
1250	
2131 (1991)	
3083	
4087	(4088 received by 1 Sept.)

CSISRS Library Statistics

August 25, 1992

Area	# subentries	# data points	Last tape added
Neutron			
1	17 174	1 705 881	1250
2	14 478	1 178 647	2131
3	4 794	51 245	3081
4	6 548	161 583	4083
Charged Particle			
A	3 011	54 200	A026
B	1 538	16 845	B011
C	1 472	25 933	C013
D	388	8 815	D017
E	1 116	19 074	E009
P	708	11 619	P001
R	309	4 555	R006
S	167	3 352	S005
Photonuclear			
G	29	455	G007
L	651	32 772	L004
M	2 453	64 430	M015
Q			
Evaluation			
V	618	36 380	V025

CSISRS LIBRARY STATISTICS FOR AREA 1 LISTED BY REFERENCE August 25, 1992

Year	# Subentries	# Data points	Last Transmission 1250
1986	162	10195	
1987	118	5521	
1988	117	99475	
1989	117	42089	
1990	75	55371	
1991	91	34792	
1992	5	1399	
Total	685	248,842	

CSISRS LIBRARY STATISTICS FOR AREA 2 LISTED BY REFERENCE

Year	# Subentries	# Data points	Last Transmission 2131
1986	552	22971	
1987	591	67015	
1988	498	15585	
1989	268	14984	
1990	230	14209	
1991	19	2466	
Total	2,158	137,230	

CSISRS LIBRARY STATISTICS FOR AREA 3 LISTED BY REFERENCE

Year	# Subentries	# Data points	Last Transmission 3081
1986	189	6838	
1987	86	1089	
1988	57	730	
1989	161	1372	
1990	33	170	
1991	42	277	
Total	568	10,476	

CSISRS LIBRARY STATISTICS FOR AREA 4 LISTED BY REFERENCE

Year	# Subentries	# Data points	Last Transmission 4083
1986	123	2446	
1987	364	3138	
1988	184	3955	
1989	53	2490	
1990	115	842	
Total	839	12,871	

Pending EXFOR retransmissions

=====

Appendix 19

O.Schwerer, H.Wienke

Please find attached a reminder as for which EXFOR entries are still pending for retransmission as requested by NNDC and NDS from NNDC, NEA-DB, NDS, CJD, CAJaD and CFE.

When mistakes are found in TRANS tapes, retransmission is requested for those cases where the correction to be done is not obvious. According to our records, requests for retransmission remained without response for the EXFOR entries listed. May we ask each center to review this list, update the listed entries and retransmit them.

Concerning retransmissions received at NDS, all TRANS tapes received until 25 August 1992 have been included. However, requests for retransmission distributed by us only recently were not included because the originating center has had no chance to react to it until the meeting.

19 AUG 92

TRANS =====	ACCESSION # =====
A017	A0229004
A017	A0317004
A017	A0329002
A018	A0320002
A019	A0178001
A019	A0198001
A019	A0202002
A019	A0202003
A019	A0202004
A019	A0345003
A019	A0345010
A020	A0319023
A020	A0319030
A020	A0322005
A020	A0347004
A020	A0352004
A020	A0363001
A020	A0364001
A020	A0365001
A021	A0366001
A021	A0371001
A021	A0387007
A021	A0388001
A021	A0393002
A021	A0393004
A022	A0399001

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TRANS =====	ACCESSION # =====
L003	L0006010
L003	L0011002
L004	L0052005
L004	L0052005

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TRANS =====	ACCESSION # =====
M011	M0028006
M011	M0028007
M011	M0035020
M011	M0046002
M011	M0046003
M012	M0080001
M012	M0098002
M012	M0140011
M012	M0140012
M013	M0152006
M013	M0244002
M013	M0291002
M013	M0291003
M013	M0293002
M013	M0293003
M014	M0327016
M014	M0333001
M014	M0340001

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SEARCH EXFOR XREF FILE

TRANS =====	ACCESSION # =====	RE-TRANSMITTED =====
1072	11532006	
1077	11863002	
1077	11863003	
1085	12435002	
1085	12435003	
1101	12627002	
1119	11281010	
1136	12355002	
1136	12355006	
1136	12355007	
1159	10391081	
1217	10142002	
1229	13119002	
1230	12991002	
1230	12991003	
1232	11010001	
1232	13132001	
1232	13156001	
1233	13066003	
1233	13066004	
1233	13073002	
1233	13092002	
1233	13092003	
1242	13195002	
1242	13195003	

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TRANS	ACCESSION #	TRANS	ACCESSION #	TRANS	ACCESSION #
=====	=====	=====	=====	=====	=====
		2117	22027005	2129	22143003
2081	20775003	2117	22031151	2129	22161002
2083	20876018	2117	22031152		
2083	20876021	2117	22031153		
2089	20742005	2117	22031154		
2091	21793003	2117	22031155		
2100	21904002	2117	22031156		
2100	21904003	2117	22031157		
2100	21904004	2117	22031158		
2100	21904005	2117	22031159		
2100	21914003	2118	22050001		
2101	21910004	2118	22039002		
2101	21910005	2122	22032002		
2101	21910006	2122	22032003		
2101	21910009	2122	22052004		
2101	21910010	2122	22057003		
2101	21910011	2128	22156015		
2102	21944002	2128	22157055		
2103	21883004	2128	22157057		
2103	21883005	2128	22157073		
2103	21883006	2128	22157087		
2103	21883007	2129	21928001		
2103	21883008	2129	22116002		
2103	21883010	2129	22116003		
2110	21993002	2129	22116004		
2110	22000001	2129	22129001		
2110	22001021	2129	22130001		
2110	22001022	2129	22143002		
2110	22003002				

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SEARCH EXFOR XREF FILE

TRANS =====	ACCESSION # =====	RE-TRANSMITTED =====
3061	30755010	
3062	30739004	
3064	30808005	
3069	30817001	
3071	30390001	
3071	30394013	
3071	30640001	
3071	30640002	
3071	30710003	
3071	30932003	
3072	30264041	
3077	30139001	
3078	30016002	
3078	30218002	

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TRANS =====	ACCESSION # =====
4034	40181002
4034	40181003
4034	40264004
4034	40348003
4043	40420021
4043	40420041
4043	40580002
4052	40651003
4053	40577001
4055	40788001
4055	40792001
4055	40793001
4056	40576003
4057	40731004
4057	40749002
4058	40839002
4058	40839003
4058	40839004
4058	40839005
4058	40839006
4060	40528009
4060	40611003
4060	40611004
4060	40611005
4060	40611006
4060	40869002
4066	40915003
4066	40916002

TRANS =====	ACCESSION # =====
4069	40930001
4075	40965001
4075	40974003
4082	40541001
4084	41047002
4084	41047003
4084	41047004
4084	41047005
4084	41047006
4084	41047007
4084	41047008
4084	41051002
4085	40173014
4085	41074006
4085	41077002

Disturbing mistakes in EXFOR TRANS tapes

=====

O.Schwerer

This time there are not many "typical" errors which can be summarized easily. In many TRANS tapes a variety of "incidental" or "one-time" errors were found. Anyway, error summaries were distributed in memos 4C-3/364, 4C-3/362, 4C-3/360, CP-D/224 and CP-D/223.

- Missing HISTORY entries and/or alter flags in retransmissions
- In fission-product yield entries (particularly from area 4)
M.Lammer found a number of problems which are summarized in 4C-3/364 and 362. Among other things, they include problems with ELEM/MASS in REACTION SF4,
monitors for fission yield measurements,
and missing METHOD codes.
- Redundant, missing or non-specific error headings
e.g.: coding DATA-ERR in the DATA section and mentioning
a total error in free text, which is rather confusing
- EN-MIN and/or EN-MAX given in COMMON and EN given in DATA section
- Confusion between ISOMER = 0. and ISOMER = blank
- Inconsistency between headings and units
(e.g. ARB-UNITS with heading E)

Area 3 fission yield entry conversion: RIDER --> EXFOR90000 --> regular EXFOR

=====

all entries have been transmitted (except 30951)

RIDER ref.	EXFOR 90000	regular EXFOR	already in EXFOR	comments
63Iyel	90236	30947	-	revised by ML
65Iyel	90265	30944	-	revised by ML
65Raol	90272	30945	-	new access.no., not checked
66Yosl	90317	30946	-	new access.no., not checked
67Jadl	90330	30948	-	new access.no., not checked
67Ste3	90338	not	-	area 2 (Italy); sent to NEA-DB
68Leel	90355	30949	-	new access.no., not checked
68Naml	90360	30950	-	new access.no., not checked
69Bral	90376	30951	-	not fission product yields, but dn yields! entry will be changed to dn yields; not yet transmitted
69Bra2	90377	30952	-	new access.no., not checked
69Ehrl	90382	not	see 30953	superseded by EXFOR30953 (=90507)
69Isal	90390	30954	-	revised by ML
69Yell	90406	30955	-	revised by ML
70Izal	90421	30956	-	new access.no., not checked
70Jail	90422	30957	-	new access.no., not checked
71Jail	90471	not	30504	already compiled
71Raml	90483	30959	-	superseded! Ml:revised+information added
72Ehrl	90507	30953	-	revised by ML
73Chil	90545	not	30514	already compiled
73Dar2	90548	not	30639	already compiled
73Dar3	90549	not	see 30639	superseded, same work as EXFOR30639
73Man2	90569	not	see 30511	superseded, same work as EXFOR30511
73Purl	90573	30958	-	new access.no., not checked
73Venl	90586	30964	-	new access.no., not checked
74Ami2	90588	30965	-	revised by ML
74Raol	90609	not	30496	already compiled
78Izal	90721	not	30425	already compiled
78Iza2	90722	not	30425	already compiled
78Manl	90727	not	30516	already compiled
78Marl	90728	not	30439	already compiled
79Manl	90742	not	30511	already compiled
79Raml	90747	not	30495	already compiled
79Ram2	90748	not	30437	already compiled
79Raol	90749	not	30496	already compiled
79Shml	90750	split:	-	split into 2 entries
		30960	-	indep. yields, revised by ML
		30961	-	cumul. yields, revised by ML

Area 3 fission yield entries converted from Rider file: errors found

=====

Comments on errors refer (partially) to (sub)entries in the converted EXFOR90000 series as the original Rider file is not available.

RIDER ref.	EXFOR 90000	regular EXFOR	error(s) found or comment
63Iyel	90236	30947	Rider data correct
65Iyel	90265	30944	errors: data in EXFOR90265 are given as absolute yields but measured were relative yields; see comments in EXFOR30944 (subentries) 90265 all subentries: measured data are relative monitor yield ratio X/U-235=1 (arbitrary) 90265002: not an absolute yield measurement 90265003: REACTION SF8 = REL DATA units = ARB-UNITS 90265004-008: target is Np-237 90265004,005,009: as 90265002 90265006,007: R-values rel to Ba-140 (as in 008) 90265008,010: as 90265003 comment: in EXFOR30944 all data are relative and all data with the same target in the same subentry. Numerical values in the Rider file are correct.
65Raol	90272	30945	error: 2nd line in data table should be Z=45 (Rh105)
66Yosl	90317	30946	comment on 90317002: (any other reference?) (1) the fractional independent yield for I-134 was taken from literature; (2) no data are given in the publication for individual isomers (calculated by Rider?), nor was an isomeric ration given.
67Jadl	90330	30948	Rider data correct
68Leel	90355	30949	Rider data correct
68Naml	90360	30950	Rider data correct, but subentry 3 data should be for Sn-125 (not mass=125) as published and combined with data in subentry 2.
69Bral	90376	30951	not fission product yields, but dn yields! (see forthcoming memo CP/D-222)
69Bra2	90377	30952	numerical values correct but incomplete and monitor/normalization not given in entry.
69Ehrl	90382	not	superseded by EXFOR30953 (=90507)
69Isal	90390	30954	published: upper limit = 0.008, converted by Rider to 0.004+-0.004
69Yell	90406	30955	Rider data correct
70Izal	90421	30956	cannot be checked
70Jail	90422	30957	no Cs-135 yield in publication, cannot be checked
71Raml	90483	30959	- superseded! Ml:revised+information added entry transmitted
72Ehrl	90507	30953	- revised by ML and transmitted
73Dar3	90549	not	see 30639 superseded, same work as EXFOR30639
73Man2	90569	not	see 30511 superseded, same work as EXFOR30511
73Purl	90573	30958	- new access.no., not checked+transmitted
73Venl	90586	30964	- new access.no., not checked+transmitted
74Ami2	90588	30965	- revised by ML, not yet transmitted
79Shml	90750	split:	- split into 2 entries
		30960	- indep. yields, revised by ML, transmitted
		30961	- cumul. yields, revised by ML, transmitted

Others have already been compiled (see 1st page);
Converted Rider file not checked.

24 August 1992

To: Distribution

From: Liang Qichang, CNDC, P. R. China

Subject: Proposal for ENDF format modification

1. The theoretical and evaluation scientists feel that the highest order Legendre polynomial $NL \leq 20$ is not enough to describe the angular distribution of secondary neutron for medium-heavy nuclides at higher energy region, it is appropriate to increase the NL up to ≤ 30 .
2. The requirement for giving the angular and energy distribution of secondary neutrons emitted by 1st, 2nd, 3rd, 4th chance fission (i.e. MF=4,5 MT=19,20,21,38) are not necessary even their cross section have been given in MF=3, because their average number of neutrons emitted by these chance fission are not given in MF=1 correspondingly, and we can't obtain the absolute differential cross section by following formula:

$$\frac{d\sigma}{d\Omega}(\Omega, E) = \frac{m \sigma(E)}{2\pi} P(\mu, E)$$

$$\frac{d\sigma(E \rightarrow E')}{dE'} = m \cdot \sigma(E) \cdot P(E \rightarrow E')$$

here m is the neutron multiplicity for reaction, in the case of fission, it equals the average number of neutron emitted by each chance fission.

So I'd like to propose that:

- No longer require to give the MT=19,20,21,38 for MF=4,5 in the evaluation even their cross section are given in MF=3; or
- To give the average number of neutron emitted by each chance fission in corresponding section(MT) in MF=1, when the MT=19,20,21,38 for MF=3,4,5 are given in the evaluation.

30 August 1992

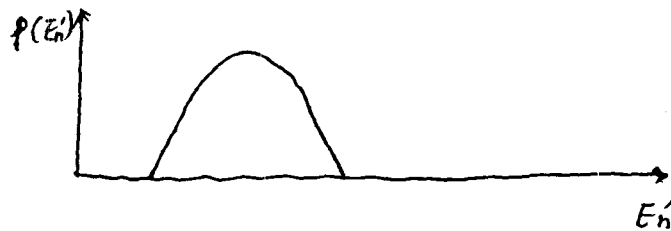
TO: Distribution

From: Liang Qichang, CNDC, P.R. China

Subject: The problem on energy distribution ($MF=5$) interpolation between different incident energy in ENDF/B format

When the energy distribution represented with tabulated function, the interpolation between the incident neutron energy usually used the linear-linear interpolation scheme (2), but it sometime meets problem, for example:

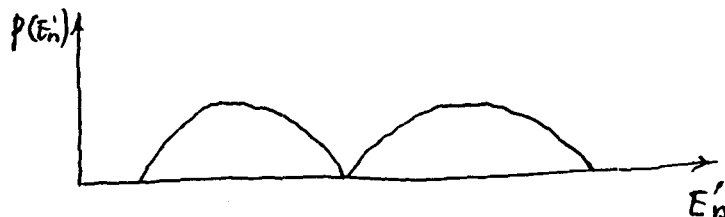
for incident neutron energy E_1 , the spectrum is:



for incident neutron energy E_2 , the spectrum is



then, the interpolation spectrum between E_1 and E_2 should be:



It is obvious that this interpolation spectrum is unreasonable, and it is necessary to find another interpolation law except five existed interpolation law in ENDF/B format.

Report

on the Debrecen Charged Particle Nuclear Reactions Data Group
to the 1992 Technical NRDC Meeting

GENERAL

The Debrecen Charged Particle Nuclear Reactions Data Group was founded in 1992 with collaboration of IAEA Nuclear Data Centre and the Hungarian National Committee for Technological Development.

The main activity areas of the Group are:

- 1., Establishment of a charged particle database for support applications of isotope production for nuclear medicine, thin layer activation (TLA) technique, charged particle nuclear analytical methods and monitoring charged particle beams.
- 2., Experimental verification of the most important data.
- 3., Compilation of experimental data of the above mentioned fields and convert them into EXFOR format in the frame of Data Centre Network.
- 4., Producing evaluated data for the running applications.

ACTIVITIES

DATABASE

Concerning the limited number of files of the existing integral charged particle data used for applications a Personal Computer based system was chosen for storing and processing data. (IBM compatible PC/AT 486 mainframe, hard-disc and floppies, scanner, e-mail). A WAX computer also available in case of necessity at the University computer centre.

EXPERIMENTAL WORK

Excitation functions of (p,xn) reactions on ^{nat}Ti for monitoring bombarding proton beams have been measured and prepared for publication. Measurement of excitation functions of other monitor reactions and reactions used for medical isotope production have been started.

EXFOR

In 1992 installation of the PC version of the computer codes for EXFOR software (edition, retrieval) and for EXFOR based data evaluation (numerical format, plotting) have been started and the first results have been obtained. In the future the group wishing to compile data published on the above mentioned fields especially those which are also measured by this group experimentally.

NATIONAL NUCLEAR DATA CENTER

Status Report to the Consultants' Meeting on Technical Aspects of Co-operation of the Nuclear Reaction Data Centers 1 - 3 September 1992

General

Since the last meeting of the Nuclear Reaction Data Centers in October 1991, our staff has been decreased by three full-time and 4 part time positions (there are currently 8 full-time equivalent scientific/professional and 3 support staff). In addition, we currently have one visiting scientist. Wolfgang Rothenstein (from Haifa, Israel) is at the Center on sabbatical, working on data and methods testing for thermal reactor applications.

Computer Facilities

We plan to replace the VAX 11/780 and the VAX 8820 in the coming year, and are now investigating an upgrade to an alpha version VAX system.

Bibliographies

The NSR activity has continued. 3 supplements of *Recent References* have been published.

The CINDA compilation activity has continued at a reduced level. Only those references associated with the experimental data compiled at the Center and the ENDF index lines have been entered. In the period from October 1991 to September 1992, 6 CINDA transmissions have been sent (BNL129-135).

Data Libraries

In the period from October 1991 through September 1992, 5 neutron data transmission tapes (TRANS 1246-1250) were sent containing new and corrected entries.

Evaluated Nuclear Reaction Data

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

The Symposium on Nuclear Evaluation Methodology which will be held at Brookhaven on 12-16 October 1992. It will be preceded by a Photonuclear & Charged Particle Data Workshop to be held from 7-9 October also at BNL organized by Roger White of LLNL.

Nuclear Structure Data

NNDC continues to publish the *Nuclear Data Sheets*. As of September, 1992, issues through Volume 67, #1 have been sent to Academic Press.

Customer Services

The use of the online data service has steadily increased. There are nearly 500 customer accounts which may have more than one user. about 2000 retrievals per month in 1991; 52% NSR, ~13% ENSDF, 18% NUDAT, 7% ENDF, 6% CSISRS.

Photonuclear Data Cooperation Project
between
CDFE - Moscow State University
and
NNDC - Brookhaven National Laboratory

Project subject: Production of experimental and evaluated photonuclear data files.

Participating organizations: USA BNL NNDC,
----- USA LLNL
USSR MSU CDFE.

Personnel: Dr. S.Pearlstein, NNDC Head (USA)
----- Dr. V.Varlamov, CDFE Head (USSR)
Dr. S.Warshaw, LLNL (USA).

Project duration: First phase, 3 years (June, 1991 - June, 1994).

CDFE RESPONSIBILITY

CDFE will:

1. give NNDC all CDFE - compiled photonuclear data prepared up to June, 1991 (ENTRIES M0001 - M0500).
2. send NNDC all compiled photonuclear data in EXFOR format which CDFE will prepare in future.
3. prepare and give NNDC all photonuclear information from the CDFE Information Bulletins (NN 1 - 14 and subsequent) in computer - readable form for merging them in the CINDA system.
4. organize EXFOR compilation of the experimental data contained on the tape obtained from the USA NIST.
5. give NNDC all new materials (Bulletins, Indexes, Reviews etc.) to be published by CDFE in the future.
6. give NNDC the description of CDFE's photonuclear data evaluation software and the software itself.
7. organize the EXFOR-compilation of experimental papers and the digitizing of the data as agreed by Dr.S.Warshaw and Dr. V.Varlamov.
8. organize the creation of the evaluated photonuclear data in ENDF format as agreed by Dr.S.Warshaw and Dr.V.Varlamov.
9. organize the permanent contacts with LLNL by means of e-Mail.
10. promote visits of USA scientists to CDFE.

NNDC RESPONSIBILITY

NNDC will:

1. give CDFE the latest version of Berman's compilation in EXFOR format (L0001-L0059).
2. give CDFE Fuller's photonuclear digital data obtained from USA NIST.
3. give CDFE the various software for VAX and IBM/PC processing of the NSR-, EXFOR-, ENDF/B- and ENSDF data.
4. merge the photonuclear data from the CDFE Information Bulletins with the data in CINDA system if staff available.
5. give CDFE the CINDA system software (for VAX) and the CINDA photonuclear data.
6. study the possibilities of joint (with CDFE) publication of materials (atlases, catalogues etc.) with photonuclear data.
7. give CDFE various nuclear data (maps, schemes, booklets, notebooks etc.) published by NNDC.
8. give CDFE all photonuclear materials (published and computer) which NNDC will receive from other (non-CDFE) sources.
9. organize the permanent contacts with LLNL in accordance with the CDFE-LLNL agreement.
10. promote visits of USSR scientists to NNDC.

ANNEX.

The CDFE and LLNL Photonuclear Data Processing Activities.

REQUIREMENTS:

- | | |
|------------------------|--|
| - Photon energy range: | Threshold to about 40 mev. |
| ----- | |
| - Photon source types: | 1. Mono radioactive nuclei,
radiative capture reactions
(X,G),
Compton-scattering;
kinematic selections;
threshold technique; |
| ----- | 2. Quasimono (B+) -annihilation,
tagging; |
| | 3. Bremsstrahlung "whole",
"hardened",
"difference". |

- Experimental categories: 1. Photoneutron production

 (for medicine, electronics, shielding)
 - quantities: Y, SIG
 - reactions: (G,N), (G,2N), (G,3N),...,
 (G,XN), (G,N+P), (G,2N+P),...
2. Specific isotope production
 (for activation, radiation damage)
 - quantities: SIG, DA, DE, DA/DE
 - reactions: (G,N), (G,N+P), (G,P), (G,A)
3. Total photoabsorption
 (for shielding, atomic data benchmarks)
 - quantities: SIG
4. Photofission
 - quantities: Y, SIG
5. Nuclear (non-atomic) scattering
 - quantities: SIG
-
- Scope of isotopes: 1. Lightest nuclei

 H, He, Li, Be, B

2. Industrial and shielding materials
 Al, Fe, Cu, Ni, W, Pd
 --
3. Electronic materials
 Si, Ge,
4. Biological materials
 C, N, O

5. Nuclear fuels
 Th, U, Pu, Am

From the USA BNL NNDC

_____ S.Pearlstein

From the USSR MSU INP CDFE

_____ V.Varlamov

IAEA Nuclear Data Section

PROGRESS REPORT

1992 NRDC Meeting

Staff

End of March 1992 Joe Schmidt retired. He was the head of the IAEA Nuclear Data Section for more than 22 years from 1969 to 1992. More than anyone else he promoted international cooperation in the field of nuclear data. The International Nuclear Data Committee, data centre networks, specialists meetings to assess data needs, training courses, and research contracts are some of the keywords of his activities, which were notably successful due to his broad knowledge, initiative, and exceptionally friendly personality. - The staff of the IAEA Nuclear Data Section wishes to express its deep gratitude for his guidance throughout the years.

Soon after, Doug Muir left who was the Deputy Head of the Section and the head of the computer unit. His primary merit was the purchase of the new VAX computer, which required careful analysis of the data processing needs and of the technical possibilities under the financial limitations.

End of 1991 Harm Wienke joined the Section on the EXFOR compiler's post which had been vacant since Vicente Osorio changed to the Physics Section.

CINDA

CINDA compilation is on schedule. The printing of the book got delayed in 1991 due to the transition from the old phototypesetting machine to a new laserprinter, which required a lot of re-programming and test runs. CINDA91 was distributed only at the end of the year. We wish to keep this new schedule so that also forthcoming issues will have the input deadline in summer and the distribution date in fall.

Due to financial problems CINDA92 could be published only as a Supplement to CINDA91. It is likely that also in 1993 only a limited size CINDA book can be published.

EXFOR

Due to the vacancy of the EXFOR compiler's post little had been compiled in 1991. But by the end of 1992 we believe to be on schedule again. EXFOR TRANS tapes have been sent to the other centers in our normal rhythm of 5 tapes per year.

Our EXFOR check program has not been updated for several years. We wish to work on the check program now within the VAX system. However, due to lack of programming manpower nothing can be done in the near future.

The Dictionaries have been updated regularly. Special efforts will be required for the new country names in East Europe.

Evaluated Data

For the 5 main evaluated data libraries that became available in the previous year, many additional sublibraries have been received in the current year. All were checked and documented in the IAEA-NDS-... documentation series. A new joint index IAEA-NDS-107 has been issued.

NDS staff worked mainly on the nuclear data libraries for the FENDL project. This work is not only essential for fusion neutronics calculations but also for fission reactor and other applications. Selected point data files and multigroup data files are now available.

A most important by-product of this work was the code validation done by S. Ganesan which led to a number of improvements in the ENDF data pre-processing codes and in NJOY.

VAX and "NDIS"

The main event during the past year was the purchase and installation, in the IAEA Computer Center, of a VAX computer which is primarily reserved for nuclear data. Consequently, our computer configuration is now similar to that of the data centers in Brookhaven and at NEA.

The software for maintaining and updating the major nuclear data bases on the new IAEA VAX/VMS system, and the software for on-line access to the data bases by outside customers developed by NNDC, have been implemented. The assistance of staff from NNDC and NEA-DB is gratefully acknowledged. At the time of the NRDC meeting most parts of the system are in operation, so that the on-line service can be advertised to customers. It has been given the name "NDIS - Nuclear Data Information System". It is the fourth widely used on-line system offered by the IAEA after INIS (bibliography for nuclear sciences), AGRIS (bibliography in the field of food and agriculture), and PRIS (power reactors). The NDIS information sheet is attached.

Publications

The publication of INDC reports and translations continued but had to be reduced significantly due to lack of funds.

Request Statistics

The request statistics for 1992 is attached.

Meetings

The NDS meeting calendar for 1992 is attached. For the next year (1993) several planned meetings are still uncertain due to lack of funds.

NDIS

Nuclear Data Information System

ON-LINE ACCESS

RIPC Nuclear Data Section offers now on-line access to NDIS, the Nuclear Data Information System. It is a one-Gigabyte database containing numerical nuclear physics data files describing the interactions of radiation with matter. It includes the following data types:

- evaluated neutron reaction data in ENDF format;
- experimental nuclear reaction data in EXFOR format, for reactions induced by neutrons, charged particles, or photons;
- nuclear half-lives and radioactive decay data in the systems NUDAT and ENSDF;
- related bibliographic information from the databases CINDA and NSR;

and others. Manuals and documentation for the different files and formats are available upon request.

The databases are maintained and updated by networks of nuclear data centers coordinated by the IAEA Nuclear Data Section. The software for on-line access has been donated by the US National Nuclear Data Center, Brookhaven. The system has been installed on the new VAX computer.

For any questions feel free to contact

R. Arcilla, ext. 1723, room A23-32
for technical computer related matters;

O. Schwerer, ext. 1715, room A23-19 (NDIS manager)
for questions about the on-line databases;

H.D. Lemmel, ext. 1717, room A23-20
for other available nuclear data libraries, related documentation, and the Nuclear Data Newsletter.

How to access NDIS:

1. Users of the IAEA IBM computer:

NDIS can be accessed through the TSO/SPF Main Menu. To establish a connection

- 1.1 select option IP (INTERNET services)
- 1.2 once inside the TCP/IP Functions Menu
 - select option "2" (TELNET) and
 - specify "D5100.IAEA.or.at" for host name
- 1.3 at the "login:" prompt, enter "M4300::"
- 1.4 at the "username:" prompt, enter "IAEANDS".
For some essential hints see under "Notes" below.

continue with 4.1 below

2. Users of the IAEA VAX computer:

- 2.1 log in to the account IAEANDS. No password required.

continue with 4.1 below

3. External users from IAEA member states via INTERNET

- 3.1 enter "TELNET D5100.IAEA.or.at" - this is the TCP/IP address of the IAEA's gateway
- 3.2 at the "login:" prompt, enter "M4300::"
- 3.3 at the "username:" prompt, enter "IAEANDS"

continue with 4.1 below

4. All users

After finishing above steps:

- 4.1 when prompted "Enter NDS assigned authorization code:"
 - either enter "GUEST": you will have 30 seconds of CPU time allocated
 - or enter your assigned authorization code if you have one (see below)
- 4.2 specify the appropriate type of your CRT terminal - whether ANSI standard or not. Users of the IBM computer should specify "N" (non-ANSI terminal).

Then you should see the NDIS-Menu which should be self-explanatory. After logging out from NDIS you can

5. either exit, or register for an authorization code if you do not have one yet; this code still needs to be activated by the NDIS manager before you can use it for future on-line access.

Notes: a. If non-ANSI terminal is specified (including all users coming from an IBM computer), NDIS will work in "sequential mode" (or "line mode"). Here the user chooses between menu items by typing in the name of one of the options presented by NDIS. All functions of NDIS, including HELP, are available in sequential mode but it is somewhat less convenient than video mode.

In "video mode" (or "full screen mode") for ANSI terminals, NDIS has enhanced display capabilities. Here, the user may switch between menu items using the cursor keys, much like in commercial PC software.

Inhouse users wishing to consult NDIS more frequently should obtain a direct VAX connection in order to have NDIS in the more comfortable video mode.

- b. When, in sequential mode, the message HOLDING appears at the bottom-right corner of your screen, press CLEAR (or PAUSE if you have a PC keyboard) to scroll the screen.
- c. "Panic" button for TELNET users:
If your screen becomes corrupted (e.g. after specifying an ANSI-type terminal when using the IBM), or if you want to immediately terminate your TELNET session for another reason, press F4 and, at the prompt "Telnet command:" enter "quit".

MEETING CALENDAR

AGM = Advisory Group Meeting
 CM = Consultants Meeting
 RCM = Research Coordination Meeting
 TCM = Technical Committee Meeting

Meeting Calendar Nuclear Data 1992

<u>Date</u>	<u>Place</u>	<u>Organiser</u>	<u>Title, etc</u>
10 Feb - 13 Mar 1992	ICTP Trieste Italy	IAEA NDS Schmidt/ Muir	NDW: Workshop on Computation and Analysis of Nuclear Data Relevant to Nuclear Energy and Safety
31 Mar - 2 Apr 1992	Chiang Mai Thailand	IAEA NDS Wang	RCM: Measurement and Analysis of 14 MeV Neutron-Induced Double-Differential Neutron Emission Cross Sections Needed for Fission and Fusion Reactor Technology (3rd RCM)
15 Jun - 10 July 1992	Obninsk CIS	IAEA NDS Pashchenko	ITC: Interregional Training Course on Nuclear Data and Measurement Techniques in Nuclear Reactor and Personal Neutron Dosimetry
1-3 Sep 1992	IAEA Vienna Austria	IAEA NDS Lemmel	CM: Technical Aspects of the Nuclear Reaction Data Centres' Co-operation
7-11 Sep 1992	IAEA Vienna Austria	IAEA NDS Kocherov	AGM: Nuclear Data Requirements for Fission Reactor Decommissioning
8-9 Oct 1992	NNDC Brookhaven USA	IAEA NDS Pashchenko	CM: Charged-particle and photonuclear data libraries for the IAEA FENDL project
9-13 Nov 1992	CBNM Geel Belgium	IAEA NDS Lemmel	AGM: Evaluators' network on nuclear structure and decay data
17-19 Nov 1992	Debrecen Hungary	IAEA NDS Pashchenko	RCM: Improvement of Neutron-induced He Production Cross Sections (1st RCM)

Meeting Calendar Atomic Data 1992

May 1992	Vienna Austria	IAEA NDS Janev	RCM: A+M Data for Plasma-Interaction-Induced Erosion of Fusion Reactor Materials (2nd RCM)
15-16 Jun 1992	Vienna Austria	IAEA NDS Janev	11th Meeting of the A+M Data Centers and ALADDIN Network
17-19 Jun 1992	Vienna Austria	IAEA NDS Janev	Atomic and Molecular Data for Plasma Edge Studies (2nd RCM)
12-16 Oct 1992	Cadarache France	IAEA NDS Janev	A+M and PMI Data for Fusion Reactor Technology
16-17 Oct 1992	Cadarache France	IAEA NDS Janev	7th Meeting of the IFRC Sub-committee on A+M Data for Fusion

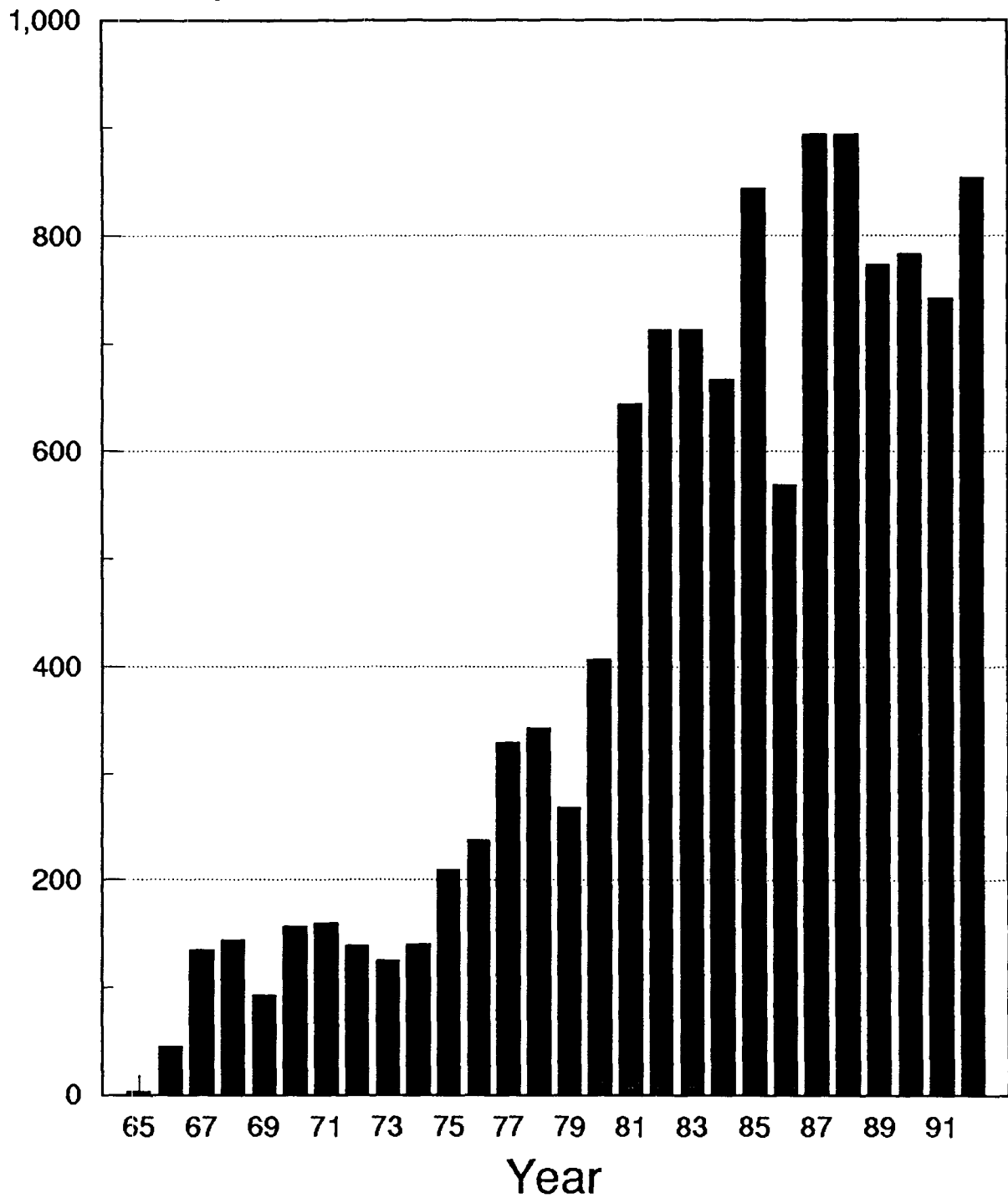
Data Request Statistics 1965 - 1992

Year	Experimental Data	Evaluated Data	Experimental and Evaluated Data	Documents + Bibliogr. Data	Computer* Codes	Totals per year	Totals Cumulative
1965	3	-	3	-	-	3	3
1966	40	-	40	-	5	45	48
1967	118	-	118	9	8	135	183
1968	119	-	119	16	9	144	327
1969	48	15	63	25	5	93	420
1970	95	20	115	34	8	157	577
1971	76	33	109	43	8	160	737
1972	48	23	71	60	8	139	876
1973	43	22	65	54	6	125	1 001
1974	49	24	73	61	6	140	1 141
1975	43	49	92	114	3	209	1 350
1976	34	43	77	153	9	239	1 589
1977	45	49	94	232	3	329	1 918
1978	62	71	133	193	17	343	2 261
1979	63	93	156	95	18	269	2 530
1980	40	86	128	239	42	407	2 937
1981	59	185	244	369	31	644	3 581
1982	76	174	250	403	60	713	4 294
1983	52	115	167	508	45	713	5 007
1984	54	113	167	462	38	667	5 674
1985	24	221	245	587	12	844	6 518
1986	37	93	130	407	32	569	7 087
1987	18	72	90	667	136	893	7 980
1988	34	108	142	684	67	893	8 873
1989	32	100	132	579	62	773	9 646
1990	34	199	233	520	30	783	10 429
1991	31	260	291	426	25	742	11 171
1992	22	208	230	495	129	854	12 025

* Since 1978 this category contains exclusively data processing computer programs.

Nuclear Data Requests **received by the IAEA Nuclear Data Section**

No. of requests



REQUESTS 1989 - 1992

COUNTRY STATISTICS

COUNTRY	TOTAL	BIBL.	CODES	DOCUM.	EVAL.	EXPT.
India	309	0	28	196	76	9
China	270	3	20	166	51	30
USA	205	1	10	148	44	2
Soviet Union	173	1	16	72	75	9
Hungary	143	1	13	84	37	8
Japan	131	0	1	115	15	0
Germany	128	0	2	97	29	0
Brazil	121	1	12	66	40	2
Poland	116	0	14	71	27	4
Czechoslovakia	108	0	7	62	34	5
Romania	87	0	7	56	23	1
Argentina	60	0	10	35	14	1
Austria	57	1	2	29	11	14
United Kingdom	57	1	2	46	7	1
German Dem.Rep.	56	0	3	41	12	0
Egypt	54	0	7	33	13	1
Yugoslavia	53	0	8	30	14	1
Pakistan	50	2	9	27	7	5
Korea	40	0	7	26	7	0
Algeria	39	0	2	26	9	2
Bulgaria	36	0	3	20	11	2
South Africa	36	0	2	22	12	0
Indonesia	35	1	1	23	8	2
Iran	35	0	1	22	11	1
Italy	34	0	1	28	5	0
Vietnam	32	1	3	15	13	0
Israel	31	0	1	20	10	0
Cuba	28	0	7	8	9	4
Thailand	27	0	3	16	8	0
Bangladesh	25	0	4	13	7	1
France	25	0	1	21	3	0
Mexico	25	0	3	13	9	0
Saudi Arabia	25	0	5	15	5	0
Australia	24	1	1	9	13	0
Belgium	24	0	0	23	1	0
Nigeria	24	0	3	16	5	0
Libya	23	0	1	14	8	0
Malaysia	22	0	2	17	3	0
Canada	20	0	1	19	0	0
Taiwan	19	0	4	9	6	0
Netherlands	16	0	0	9	7	0
Burma	17	0	1	13	3	0
Albania	14	0	2	8	4	0
Morocco	14	0	1	8	2	3
Sweden	14	0	1	12	1	0
Peru	13	0	0	6	7	0
Zaire	12	0	2	10	0	0
Kenya	11	0	1	9	1	0
Switzerland	11	0	1	4	5	1
Turkey	11	0	0	9	1	1
Finland	9	0	3	3	3	0
Sri Lanka	9	0	1	1	5	2
Zambia	9	0	2	5	2	0
Iraq	8	0	1	7	0	0
Venezuela	8	0	2	4	2	0
Bolivia	7	0	0	7	0	0
Philippines	7	0	1	5	1	0
Russia	6	0	1	3	2	0
Spain	5	0	0	5	0	0
Syria	5	0	0	4	1	0
Ghana	4	0	0	2	2	0
Portugal	4	0	0	2	2	0
Sudan	4	0	0	3	1	0
Chile	3	0	0	3	0	0
Denmark	3	0	0	3	0	0
Uruguay	3	0	1	1	1	0
Ecuador	2	0	0	2	0	0
Jordan	2	0	0	2	0	0
New Zealand	2	0	0	0	2	0
Costa Rica	1	0	0	1	0	0
Cyprus	1	0	1	0	0	0
Ivory Coast	1	0	0	1	0	0
Kuwait	1	0	0	1	0	0
Madagascar	1	0	0	1	0	0
Norway	1	0	0	1	0	0
Senegal	1	0	0	1	0	0
Swaziland	1	0	0	1	0	0
Tunisia	1	0	0	1	0	0
Uganda	1	0	0	1	0	0
United Arab Emirates	1	0	0	1	0	0
Zimbabwe	1	0	0	1	0	0

81 countries served between 1989 and 1992

Tape/Diskette Media sent out

Number of Tapes/Diskettes

