Memo CP-D/190

7 April 1989

To: Distribution

From: H.D. Lemmel

Subject: Minutes of the Technical NRDC-Meeting, 4-6 October 1988

The Minutes of the 1988 Technical NRDC Meeting had been finalized and handed out to participants already at the meeting. For the records, these are distributed herewith once more, with a few additions. According to my notes, I have added items 48., 49., 58., and 74. to 95.

The added items concern continuing actions from the 1987 meeting and discussions on non-Exfor data libraries from the last day of the meeting.

Related to the conclusions of the NRDC-Meeting is also the proposal for "reaction combinations" which became necessary for the compilation of fission-product yield data ("R-values"). This proposal was drafted in a session subsequent to the NRDC Meeting and distributed as Memo CP-D/185. As we did not receive any objection or counter proposal, we should regard this proposal as approved. Manual, Dictionaries and check programs should be updated accordingly. Centers are invited to transmit Exfor entries with fission-product yield data in the new formalism, so that we can review the workability at the next NRDC-Meeting.

Clearance: J.J. Schmidt

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3. Technical NRDC-Meeting
Vienna, 4-6 October 1988

Contents

*) Note: As most of the conclusions also involve actions, conclusions and actions are given in a merged form. Actions are marked in the left hand margin.

3. Technical NRDC-Meeting
Vienna, 4-6 October 1988

Introduction

The Third Technical Consultants' Meeting of the Nuclear Reaction Data Centers took place at the IAEA in Vienna, 4-6 October 1988. The discussions concentrated on technical matters of the jointly operated systems CINDA, EXFOR, ENDF/B and their compilation rules and data file formats.

Some of the more important topics were:

- the publication of the neutron data index CINDA will be discontinued, though all operations for having a frequently updated CINDA master file will continue. CINDA users will be referred to accessing the CINDA master file directly or, when this is not possible, to requesting specific data retrievals from one of the CINDA centers.

- various rules for the coding of the nuclear data definitions in EXFOR were reviewed and revised, with special emphasis on fission-product yield data for which a special compilation effort is undertaken. Emphasis was also given to improve the EXFOR check programs to guarantee the formal correctness of the Exfor data.

- for charged-particle reaction data emphasis is given to radioisotope production data and related monitor reactions, for which special data compilations are planned to be published.

- highlights in the field of evaluated data were the release by CJD of the USSR national nuclear data library BROND, and of the ENDF "pre-processing codes" (NNDC) resp. "pre-processing codes" (NDS), the latter both for main-frame computers and PC's.

The next meeting will be a full meeting involving center heads and technical staff. It is scheduled to take place in Vienna from 2 to 4 October 1989.*)

*) Note the change: The original date which was one week later, is superseded.

List of Participants

CJD	A. Blokhin
NEA-DB	Ms. I. Forest C. Nordborg
NNDC	Ms. V. McLane
RIKEN	A. Hashizume
NDS	D. Gandarias Cruz M. Lammer H.D. Lemmel (Scientific Secretary) P.M. McLaughlin K. Okamoto O. Schwerer Ms. M. Seits Wang Dahai
NDS trainees	V. Osorio Fernandez Tin Maung Kyi

3. Technical NRDC-Meeting, Vienna, 4-6 October 1988

AGENDA

1. Opening, adoption of agenda, announcements, etc.

2. Brief reports: oral progress reports by the Centers

3. Cinda

- 3.1 Cinda coding rules and Manual
- 3.2 Cinda exchange mechanism
  - are master files identical?
- 3.3 Cinda check programs
  - are they identical?
- 3.4 Cinda completeness
- 3.5 Cinda book
  - introductory text
  - publication schedule
  - plans for after 1990

4. Cinda/Exfor dictionaries

5. Exfor

- 5.1 Exfor coding rules and Manual
  - pending memos
  - short-living isomers
  - Exfor testfile for the testing of check programs
  - on-line services
- 5.2 TRANS tapes
  - disturbing mistakes in TRANS tapes
  - specific items to improve the check programs
  - response to requested transmissions
- 5.3 Exfor completeness
- 5.4 Fission product yield data
- 5.5 Computation formats
- 5.6 Special CPND matters
  - compilation commitments
- 5.7 Special PhotoND matters

6. Non-Exfor data libraries

- 6.1 News about available libraries, BROND etc.
- 6.2 News about ENDF codes
- 6.3 Miscellaneous

7. Miscellaneous

- 7.1 Wrenda
- 7.2 Other uses of the EXFOR format
- 7.3 Date of next NRDC-Meeting

GLOSSARY OF ABBREVIATIONS

CAJaD	Center for Nuclear Structure and Reaction Data, Kurchatov Institute, Moscow, USSR
CDFE	Centr Dannykh Fotojad. Eksp., Moscow State University, USSR
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, USSR
CNDC	Chinese Nuclear Data Center
CP-	Memos exchanged among the nuclear reaction data centers on technical matters
CPND	Charged-particle nuclear reaction data
ENDF	International format for evaluated nuclear data files
ENDF/B	US Evaluated Nuclear Data File
EXFOR	Format for the international exchange of nuclear reaction data
FPY	Fission-product yield
LEXFOR	Part of the EXFOR manual containing physics information for compilers
NDS	IAEA Nuclear Data Section, Vienna, Austria
NEA-DB	NEA Data Bank, Saclay, France
NNDC	National Nuclear Data Center, Brookhaven National Laboratory, USA
NRDC	the Nuclear Reaction Data Centers
RIKEN	Nuclear Data Group, RIKEN Inst. of Physical and Chemical Research, Wako-shi, Saitama, Japan
TRANS	Name of transmission tapes for data exchange in the EXFOR system
4C-	Memos exhanged among the four neutron data centers on technical matters

Technical NRDC-Meeting
Vienna, 4-6 October 1988

CONCLUSIONS AND ACTIONS

Action on	Tuesday
	Agenda item 3: CINDA
M	"M" in the left-hand margin indicates that Cinda Manual must be updated by NEA-DB accordingly, and that all centers must update their computer programs.
	1. The "cosmetic reader symbols" are dropped, because they had been used only for the production of the Supplement books which have been cancelled.
M	2. For the quantity LDL a slash "/" may be entered in the En-min field, left adjusted, in the case that no energy value is given. The numeric energy equivalent is zero. If a numeric energy is coded for LDL, then it gives the excitation energy.
	3. A blank En-min field remains forbidden.
M	4. A reference entry with a Conf-code without paper-number and without vol./page is accepted for the case that only a conference paper without paper-number is available. However, a warning message should be issued in the check-program.
NNDC M	5. The new quantity code NX for isotope production cross-sections as proposed in Memo 4C-1/197 is adopted in principle, but NNDC is requested to submit a Manual entry on the use of this quantity.
M	6. In the case of data index lines in Cinda the ref-type entry "0" may have one of the following meanings: - data unobtainable - data withdrawn or superseded - data being compiled but not yet ready (use at discretion of centers) The ref-type "0" makes that no data flag is printed in the book.
NNDC NEA-DB NDS	7. Occasional defaults in the CINDA exchange mechanisms were incidental and do not require improvements in the exchange mechanisms. However, in spring 1989 the master files should be compared against each other, possibly in time before the book deadline. NNDC and NEA-DB will send their entire master files to NDS where the comparison will be made. NDS should identify the differences encountered and all centers should analyze the reason.

Vicky Monica M	8.	To make sure that Cinda batches are processed in their correct sequence, the first record of a Cinda transmission tape is a batch identification. Vicky and Monica will specify details.
NNDC NEA-DB	9.	Memo 4C-3/324 should be considered by NNDC and NEA-DB to update their check programs.
All CJD	10.	All centers are invited to inform each other about gaps in the literature coverage. In particular, CJD is asked to prepare Cinda entries of the abstracts of USSR literature that were provided by M. Lammer. Whereas CJD covers regularly the more important journals and report series, the regular coverage should be extended also to such series that have only little Cinda information.
All	11.	Reminder to all centers to provide input for the list of last issues covered for inclusion in the book CINDA89.
	12.	CINDA89 will be published in the same way as CINDA88.
NNDC NEA-DB NDS	13.	NNDC and NEA-DB will find out whether CINDA90 can be financed, for the last time, in the same way as CINDA88 and CINDA89 based on the cost estimate distributed earlier. If this is not possible, CINDA90 could be issued as a Supplement to CINDA89. A Cinda book in 1990 will depend also on the question whether the IAEA will at that time still has access to a Digiset machine.
NNDC NDS	14.	The centers see no means to overcome the financial difficulties of publishing a complete archival Cinda issue. NDS will inform INDC and NEANDC of this conclusion. However, centers will try to find an external publishing house. NNDC will contact Academic Press; NDS will contact the Singapore publishing house.
All	15.	If the complete archival issue of Cinda cannot be all published in book form, an issue in microfiche form should be investigated.
NDS	16.	For the period after the archival book, customers in areas 1 and 2 will be served by online services only. It is therefore up to NDS alone to think of Cinda services to those customers in areas 3 and 4 that do not have online computer lines. Possibilities are a.) "current awareness" Cinda books including only new references without blocking, which may have 200 pages per year, and b.) to provide Cinda retrievals or Cinda Supplements on floppy diskettes.
All	17.	Reminder: Cinda entries should be prepared continuously, not only at book-production deadlines. The online Cinda services make it essential to have the Cinda file as uptodate as possible at any time.

NDS	18.	Conclusion 2.5 from 1987, i.e. to include a text on covariances on page I.11 of the book, continues.
NNDC	19.	Conclusion 3.3 from 1987 about Bremstrahlung was too brief. NNDC is requested to provide a more detailed wording to be included in the Cinda Manual.
NNDC NDS CJD	20.	NEA-DB presented a new Cinda Manual that contained some updates compared to the version of Oct. 1987. All centers are invited to send comments on this Manual to I. Forest as soon as possible, but not later than end of Oct. 1988.
M	21.	Conclusion 3.6 from 1987 about resonance integrals for (n,p) and (n,α) will be included in the Manual.
NNDC	22.	NNDC will prepare data index lines for ENDF/B-6.

Agenda item 5: EXFOR

M = Manual update required
D = Dictionary update required

D — 31. The UNIT code MUB/MEV/SR2 is not accepted, neither in this form nor in another form. The data should be multiplied with E-3 such that the unit MB/SR2/MEV can be used.

M
D — 32. Memo CP-D/176 on Spin and Parity is accepted with the following modifications:

- "LVL-FLAG" is added in analogy to "DECAY-FLAG"
- a range of spin or parity values can be indicated with a slash (SPIN = 2./3.)
- if one of the fields is omitted, it does not matter whether the extra separating comma is given or omitted.

NDS — NDS will propose a Manual entry.

D — 33. The method codes proposed in CP-D/178 under item 2.1 are adopted.

Vicky Meinhart — 34. Vicky and Meinhart will agree on a formalism for fission-product R-values.

M — 35. Memo CP-A/58 item 1 is adopted. A corresponding text should be entered in the Manual.
On the one hand, the principle should be maintained that EXFOR data should be coded close to the authors' original. But on the other hand it should be avoided to introduce rare and complex UNIT codes. (Compare also item 31. above).

CAJaD — 36. It was noted that none of the centers has received Memo CP-A/52, which should be sent once more. Discussion on this item will be continued after receipt of this memo.

D — 37. The code TMP for temperature-dependent data is adopted according to Memo CP-D/179.

NDS
NNDC
D — 38. Memo CP-D/180 on the REACTION branch codes IND and CUM (independent and cumulative) is adopted. NDS will check back with CAJaD and ask for approval. NNDC will prepare a Lexfor entry based on CP-D/180. It will be entered in Dictionary 31 that the codes IND and CUM are to be used only in combination with the process codes F and X, and that IND is to be used only in cases where CUM can also occur.

All 39. O. Schwerer presented a working paper summarizing disturbing mistakes encountered in EXFOR TRANS tapes, see App. 1. Centers are asked to update their check programs accordingly.

NNDC 40. The keyword RAD-DET should be used seldom. NNDC will prepare a Lexfor entry about the use of this keyword.

All
NNDC
NDS 41. Centers should continue to give attention to the correction and retransmission of Exfor entries as requested by the other centers. A list of requested retransmission was presented in Memo CP-D/183. This includes only the retransmissions requested by NDS. NNDC will send a similar list to NDS for inclusion in the NDS file of requested retransmissions. Thereafter NDS will maintain this list including the requested retransmissions from all centers.

42. The Exfor completenes is, in general, satisfactory. All centers, however, encounter delays due to insufficient compilation staff.
NNDC is several months behind due to transition to a new computer system whereby all manpower was absorbed by doing the required program changes.
NEA-DB does a large fraction of the EXFOR compilation with the help of consultants with resulting continuity problems and occasional increases in the number of mistakes in Exfor entries.
NDS is sufficiently uptodate with new data, but the work on errors and omissions pointed out by NNDC in connection with its barn-book production, was not yet completed.
CJD compiled all data from the 1987 Kiev Conference. A TRANS tape was brought along to the meeting.

NDS
All 43. O. Schwerer had prepared an Exfor test tape containing intentionally some of the most typical mistakes occurring in Exfor TRANS tapes. This was checked with the check programs of NNDC, NEA-DB and NDS. The output comparison indicated several failures in the 3 check programs, as given in App. 2. NDS will send the same test file also to Obninsk. All centers should update their Exfor check programs accordingly.

NDS 44. NDS will send version 30 of its check program to RIKEN and other interested centers as soon as possible. Subsequent updates should be sent automatically when they are done.

NNDC
NEA-DB 45. NNDC and NEA-DB, having now similar computer configurations, will investigate whether the NNDC EXFOR check program can be taken over by NEA-DB. A difficulty seems to be the different operation of the Dictionaries at both centers.

NDS 46. After centers have updated their Exfor check-programs, a new test file with typical mistakes will be prepared by NDS, at latest in good time before the 1989 NRDC Meeting.

NNDC 47. NNDC and NEA-DB have their files open for online use by external customers. NDS will have to arrange this in the near future. NNDC will send to NDS a writeup of their Menue-program for online services.

NEA-DB
NDS
CJD 48. To review the Exfor files 6, 7, 8 recently compiled by NNDC for missing data from areas 2, 3, 4, as soon as this has been transmitted. However, the compilation of new data should have higher priority than the conversion of the Exfor series 6, 7, 8 to the regular series 2, 3, 4.

NNDC 49. To propose a Lexfor entry for the approved spin-spin cross-section.

Agenda item 5.4 on Fission product yield data (FPY)

NDS 51. The work on FPY follows the conclusion of the 1987 Studsvik meeting. EXFOR shall be the international file for experimental FPY data. NDS will organize a co-ordinated research project (CRP) on FPY. The participants will be asked to review the EXFOR rules for FPY and to assis in the clean-up of the EXFOR entries on FPY.

NDS 52. A cleanup of the Exfor data on FPY has been started by Dr. Wang Dao in contract with NNDC and NDS. NDS will transmit Wang Dao's Exfor data after adding some final corrections.

NNDC NDS 53. NNDC will send to NDS a tape with a complete index list of Rider's FPY file, which does not contain laboratories. M. Lammer, knowing most of the author names and their affiliations, will add to this index at least area codes. Thereafter NNDC will split the file by area, and each center will clean up its part, with the help of the FPY experts. The proposed reviewers for FPY evaluation are in area 1 Ben Rider, in area 2 Mike James, in area 3 M. Lammer and Wang Dao, in area 4 A.F. Grashin in the Moscow Inst. of Phys. and Energy.

NDS 54. NDS will ask Dr. Wang Dao to make Exfor complete with respect to Chinese FPY data.

NDS CJD 55. A. Blokhin reported on the activity by A.F. Grashin on FPY evaluation and on a group at FEl under Dr. Sergachev having done FPY measurements. NDS will undertake the necessary steps to include a suitable USSR expert in the CRP.

CJD 56. CJD will be requested to do in cooperation with USSR experts the cleanup of area 4 FPY Exfor entries, after receipt of the area 4 part of the Rider file.

NNDC 57. A computation format for FPY data has been developed at NNDC. The original version, which was presented at the 1987 Studsvik meeting, has been updated since then. NNDC will send examples of the FPY computation format together with the same data in original Exfor format to FPY evaluators for review. The distribution will include the other neutron reaction data centers and evaluators for review.

CJD 58. CJD will inform the network on the availability on tape of the fission-product yield data calculated from thermodynamic principles by the Moscow Institute of Physics and Engineering.

Agenda item 5.7 Photonuclear Data

CDFE

61. CDFE had transmitted a voluminous Exfor tape M006, which was acknowledged. However, it contains various items that do not agree with the Exfor rules, and in several cases new quantity codes will have to be introduced in Dict. 36, together with the necessary Lexfor entries on these quantities. For details see Memo CP-D/184. CDFE is requested to make the necessary revisions and retransmissions.

CDFE and others

62. A. Blokhin reported that CDFE had difficulties in obtaining data from Japan. CDFE, and other centers with similar difficulties, are advised to request assistance from NDS.

Agenda item 5.6 on CPND

All CPND Centers

71. At the 1987 NRDC Meeting, a program on compilation and evaluation

- on monitor reactions, and
- on radioisotope production reactions

NDS

for medical applications had been agreed. The relevant actions continue, i.e. actions 6.15 to 6.25 on pages 55/56 of INDC(NDS)-204. Several actions had not been fulfilled, and NDS will contact centers to stimulate the program.

72. K. Okamoto reported on two reports which are being finalised, containing inventories of existing EXFOR data in graphical form

- for ca 12 monitor reactions by Okamoto and Schwerer, and

- for radioisotope production reactions by Okamoto and Gandarias-Cruz.

NDS

NDS will distribute these reports as soon as possible. The latter also includes some isotope production data from Jülich which are not yet in Exfor. These should be sent to RIKEN and CAJaD for compilation in Exfor.

RIKEN NDS

73. RIKEN has nearly finished the work on I-123. The manuscript will be sent to NDS by end of October 1988 for publication by NDS as the first part of the new series on radioisotope production data.

NNDC

74. Send to all centers an example of CPND coded in ENDF-6 format along with documentation.

CAJaD

75. Prepare a memo on their proposal to code stopping power information within CPND Exfor entries.

CNDC

76. Provide comments on any potential problems in the compilation of stopping power data in Exfor format.

NDS

77. Prepare a list of monitor reactios and all CP reactions for medical radioisotope production identified by the Tokyo Meeting on Radioisotope Production Data and send it to the other centers.

NNDC

78. Send to CAJaD, CNDC, NDS and RIKEN monthly excerpts from the NSR file for all CP reactions listed by NDS (see preceding action).

NDS

79. Send a CP Exfor Index to RIKEN.

NDS

80. Organize an intercomparison of nuclear model calculations for the reactions I-127(p,xn) and As-75(p,xn) and inform the other data centers about the results.

Agenda item 6: non-EXFOR data libraries

CJD

91. The release of the BROND library was highly appreciated, however, in two or three files mistakes were encountered. CJD is requested to send as soon as possible corrected versions of these files. - BROND2 is in preparation; it will include gamma-production data and double-differential data.

92. V. Goulo reported on his work on the nuclear data file for fusion. Various files for structural materials have been received.

93. C. Nordborg reported on a co-operation planned for selected topics of neutron data evaluation. There will be working groups for specific problems among participants from the evaluators' communities of JEF/EFF, ENDF/B-6 and JENDL.

94. The libraries JEF-2, JENDL-3 and ENDF/B-6 are in progress.

95. The ENDF-6 processing codes are available from NNDC. NDS has the ENDF-6 pre-processing codes by D.E. Cullen in two versions: for mainframe, and for a PC-AT. Comments on the ENDF-6 codes should be addressed to D.E. Cullen and C.L. Dunford.

Working Paper: Summary of disturbing mistakes in TRANS tapes and related improvement of the check programs

O. Schwerer

This is a summary of important and/or frequently occurring mistakes in TRANS tapes as found at NDS in Exfor tapes from areas 1, 2, 4, A and C since the last NRDC meeting. Complete error reports were distributed as memos CP-D/170, 173, 175, 177, 181 and 4C-3/320, 321, 322, 323, 326. (Areas E, M and R are not included in this summary because of special problems not typical for the other centres.)

	Check programs to be improved
- Pointers for multiple REACTIONs missing altogether/ missing in DATA section/inconsistent	*
- Incident energy missing or over-specified, e.g. - both EN and EN-MIN/MAX given - EN given both in subentry 1 and other subentries - EN given for REACTION SF2=0 or if resonance energy is given under REACTION (already mentioned at last NRDC meeting)	*
- Use of COMMENT where more specific keywords should be applied	
- Wrong use of heading ANG for data which, according to the code given under REACTION, should not be angle-dependent (already mentioned at last NRDC meeting)	*
- Codes given under ERR-ANALYS not consistent with DATA section (already mentioned at last NRDC meeting)	*
- incorrect or missing alter flags in col. 80 (already mentioned at last NRDC meeting)	*
- Confusion of modifiers in SF8: - SPA and AV - SPA and MXW (SPA wrongly used for both)	
- ASSUMED and MONITOR not properly distinguished	

Check programs to be improved

- Incorrect coding of isomeric cross sections and ratios. Correctly,

  - total isomeric sums have no extension
  - ratios are coded implicitly, e.g. -G/M or -G/T
  - isomeric cross sections have no PAR in SF5.

- Missing keyword DECAY-DATA when RAD-DET is used. (Very often DECAY-DATA alone or PART-DET alone would do the job.)

- The sequence of outgoing particles in SF3 must be by ascending Z,A (= sequence of dictionary 29) unless SF5 contains SEQ. (For example, (N,P+N) is incorrect unless SF5 = SEQ.) (*)

- It should be remembered that ISOMER is an independent variable to be placed before DATA. ISOMER = 0. for the ground state may be used only if there is a metastable state. Otherwise ISOMER = blank. (*)

- STATUS keyword missing. (Among other things, dependent data must be identified under STATUS.) *

- Do not use EN-NRM if it is = EN.

- Author's name must not be split betweeen 2 AUTHOR lines. *

- If several lab codes are given under INSTITUTE, or if the lab of the facility is different from the one given under INSTITUTE, the relevant lab code should be given under FACILITY.

- Missing decimal points, misspelled codes and units should be detected by check programs prior to transmission. *

Appendix 2

Exfor Check Program Comparison between NNDC, NEA-DB and NDS based on a Test File: Required Check Program Enhancements

Centers concerned	New check to be introduced
NDS) NEA-DB)	REFERENCE: no parentheses within volume field allowed
NEA-DB	Consistency of REACTION SF4 with SF1-3
NEA-DB	Consistency of REACTION vs. DATA headings
NDS) NEA-DB)	Consistency of REACTION vs. DATA units
NEA-DB	Missing REACTION SF4 for scattering quantities
NEA-DB	Duplicate EN
NDS	STATUS (DEP,...) requires subaccession number
NNDC) NEA-DB)	If ANG is repeated, the units must be different (ADEG,AMIN)
NEA-DB	Illegal code combinations in REACTION SF3 (e.g. EL+INL)
NNDC) NEA-DB)	Isomer extensions vs. dictionary 27 (col. 25)
NDS) NEA-DB)	BIB keywords without any information (no code, no free text)
NEA-DB	Headings in BIB section under ERR-ANALYS vs. headings used in COMMON or DATA section
NEA-DB	Matching of pointers between BIB and DATA sections
NEA-DB	Illegal nuclide codes in REACTION SF4 (e.g. 49-IN-0 for quantities other than scattering)
NEA-DB	EN given if SF2 = 0