

**Nuclear Data Section
International Atomic Energy Agency
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Memo CP-D/369

Date: 30 June 2003

To: Distribution

From: O. Schwerer

Subject: Actions and Conclusions of the 2003 NRDC Meeting

Please find attached:

- the list of Actions and Conclusions of the 2003 Technical NRDC Meeting in Vienna;
- the revised NRDC Protocol;
- the new CINDA Protocol (WP 2003-25 as revised at the meeting);
- the revised agreement on Future NRDC Co-operation on CINDA (WP 2003-26).

The main modifications in the list of Actions and Conclusions, compared to the version distributed at the meeting, are the following:

- Conclusions C5 and C8 were combined
- Conclusions C13 and C15 were combined
- Actions A34 and A39 were combined
- Conclusions C17 and C23 were changed to Actions
- Actions and Conclusions of the last meeting day were added and all items resorted and renumbered accordingly.

The revision of the NRDC Protocol consists of an additional paragraph approved at the meeting and minor editorial improvements which were drafted and distributed earlier this year for the revised NRDC network document INDC(NDS)-401.

Please check the attachments for any mistakes or important omissions and report them to me no later than 20 July 2003.

As usual, the meeting report will be published in the INDC(NDS) series and will include also the progress reports and a selection of working papers.

Though the final list of Actions and Conclusions will be the one in the above-mentioned meeting report, work on the Actions can start immediately.

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Actions and Conclusions of the 2003 NRDC Meeting

CONCLUSIONS

General

- C1 The NRDC Protocol (approved at the 2002 NRDC Meeting) is amended by adding item 9 on "Problematic entries":
NDS will create a new subdirectory of the open area NDSX4.TRANS for those problematic entries which were removed from a PRELIM transmission. These entries will be reviewed by the other centers and can be finalized at the next NRDC meeting.
- C2 The next (full) NRDC meeting (4 days) is planned for the week following the Santa Fe Conference (i.e. starting 4 October 2004) in Brookhaven.

EXFOR/CINDA Dictionaries

- C3 Dictionary 7 will be split into two: new dictionary 7 (conferences only) and dictionary 207 for books. The format will be unchanged.
- C4 The particle dictionaries (EXFOR dictionaries 13, 28, 29, 33) will be unified also in EXFOR dictionaries (combined particle dictionary 33, as used already in archive dictionary).
- C5 A new dictionary 236 will be created by V. McLane which will provide more space for code expansions and no longer contain the numerical equivalents for the REACTION subfields.
- C6 A new dictionary 235 will be added containing work types for EXFOR and CINDA. (Note: present dictionary 35 contains similar information for REACTION SF9).
- C7 The proposed dictionary 46 (not mentioned in WP2003-6), containing the correspondence between EXFOR quantities and (new) CINDA quantities, will be replaced by an additional column in the new dictionary 236.
- C8 Numbering of dictionaries: The correspondence dictionary for old and new CINDA quantities will be dictionary 47, while the dictionary for CINDA Reader codes will be dictionary 52. The numbers of the other new dictionaries will be as indicated in WP2003-6.
- C9 The dictionaries, including all new CINDA dictionaries, will be provided in all formats (Archive, TRANS, Daniel-backup). The backup dictionaries should be provided also in zipped form.
- C10 The new nuclides dictionary 227 is approved in the format provided by McLane (Addition to WP2003-4) and a new Compounds dictionary 209 will be introduced.

CINDA and common CINDA/EXFOR items

- C11 All Japanese CINDA entries (including CPND) will go to NEA-DB (by e-mail).
- C12 The CINDA Protocol (**Revision** of WP 2003-25) is approved.
- C13 The NEA-DB will print the CINDA2003 book (cumulative issue). NDS will send them the CINDA file for book production. The deadline for transmissions to be included is end of August 2003. NDS will inform the NEA-DB of the number of copies normally sold by IAEA.
- C14 The following changes of the CINDA2001 format were approved:
- The quantity field will be in columns 24-26 (1 character less than before)
 - The institute code will start with the area code in column 27
 - The date of last update will be included on each record in columns 125-132.
 - Comments will be shortened (from 40 in original proposal) to 38 characters
- C15 The following new Reference types are introduced for both CINDA and EXFOR:
- A Abstract of Conference
 - K Abstract of Journal
 - X Preprint
- A and K will replace * for Abstract (was used in CINDA only).
The "Content" code proposed in WP 2003-5 is not introduced.
Reference types P (Progress report) and S (Conference report) are kept.
- C16 Reminder: All reference codes in CINDA will be as in EXFOR, even in cases where there were differences in the past (some long journal, report and conference codes had shorter versions in CINDA).
- C17 The proposal of WP 2003-5 for the conversion of MANY and FPROD, using Z=999 for both, is adopted.
- C18 When converting from old CINDA, centers should be aware that spontaneous fission data must be in separate blocks from neutron fission data.
The energy field must be checked for SPON so that the reaction will correctly be specified as (0,F).
- C19 The revised schedule for the cooperation on CINDA as summarized in WP 2003-26 is agreed.
- C20 The meeting notes that, since NSR will take over the compilation of theoretical works from CINDA, the inclusion of NSR into the network should be considered.

General EXFOR matters

- C21 Both check programs CHEX and TEST-EXF are useful to the network. CAJAD is recommended to consider publicizing the source code (and the code to update the dictionaries) to the network, to make sure that TEST-EXF will continue to be available and be maintained in the future.

Technical EXFOR matters

- C22 When new codes in REACTION SF5 or SF 8 are introduced, the sequence of codes within a subfield should maintain consistency with other similar codes in dictionary 36.
- C23 The dictionary 27 codes for fundamental particles are approved as given in the 3rd and 4th column of WP 2003-10 with the following modifications:
- 0-K0-0 will be used for neutral kaons, and
 - -1 will be replaced by 1 in the Z field.
- C24 The decision about a new lepton dictionary (memo CP-A/135, WP 2003-10) is postponed until it is needed for compilation.
- C25 The process code TCC (Total charge changing, WP 2003-11) is approved.
- C26 The proposal on Total Spin Transfer (WP 2003-13) is approved.
- C27 The new formalism for correlated particles for REACTION SF7 (WP 2003-14) is approved using + as separator. This may be used also in EN-SEC.
- C28 The proposal on Longitudinal Momentum (WP 2003-15, CP-C/313) is approved.
- C29 The proposal of WP 2003-16 (Partial cross section for production of specified number of product particles) is approved. In addition, the definition of DN is changed to “differential with number of outgoing particles”.
- C30 As a consequence of the above, the coding of the quantity "Probability of emission of 'n' prompt fission neutrons" is changed to (...F)NPART,PR/NUM,NU
This replaces the coding proposed in WP 2003-17.
- C31 The new quantities for secondary particle spectra are agreed as proposed in WP 2003-18.
- C32 New formalism for DECAY-MON is agreed as proposed in WP 2003-19.
- C33 The clarification on DIS and CON (WP 2003-20, CP-C/324) is agreed.
- C34 The new coding for Transmission (WP2003-21) is agreed.

ACTIONS

General

- A1 All (Continuing) Support the joint project of Russia, Ukraine (UkrNDC) and Belarus (Minsk-Sosny) on development of Internet site structure and web pages for nuclear databases and related software. This support will include establishment of contacts of project initiators with European, US and other centers and organisations interested in collaboration, cooperation or partnership.
- A2 Dunaeva (Continuing) Keep other centers informed on the status of the proposed project.
- A3 All (Continuing) All recognized policy papers for consideration by the NRDC members need to be prepared and distributed four weeks before the Annual NRDC meeting. This will ensure adequate thought and discussion prior to the meeting.
- A4 Zerkin Discuss with Slavutytsch Nuclear Data Bank joining the migration project rather than pursuing VMS upgrades
- A5 NDS Put new draft of "Citation Guidelines" on NDS open area.
- A6 All (Standing Action) Send any changes or updates of the "Citation Guidelines" to NDS
- A7 CAJAD, CNDC, JAERI, JCPRG, ATOMKI, CNPD, KAERI:
Send to NDS the information about manpower dedicated to activities for the network (for Annex 2 of the network document INDC(NDS)-401) by 31 July
- A8 All As soon as possible propose potential participants of compilation workshop (Vienna, December 2003) to NDS.
- A9 NDS Take lead in preparing a common paper of the core centres for the Nuclear Data Conference in Santa Fe, 26 Sept. – 1 Oct. 2004
- A10 All Provide names of participants of next year's NRDC meeting by the end of December to both NNDC and NDS.

EXFOR/CINDA Dictionaries

- A11 McLane, Schwerer: Decide on a procedure for updating the new Nuclides Dictionary 227
- A12 McLane Provide file of new Nuclides Dictionary 227 to NDS.
- A13 NDS (Continuing) Remove the restrictions "for photonuclear data (only)" from all dictionaries at their earliest convenience.

- A14 Zerk,McLane: Agree on format for the new quantities dictionary 236 and submit to Schwerer
- A15 NDS Finalize and transmit the new CINDA dictionaries (including Dictionary 52 / Reader codes).

CINDA and common CINDA/EXFOR items

- A16 NEA-DB Send final list of area 2 CINDA reader codes to NDS
- A17 NEA-DB (Continuing) Submit the area 2 CINDA neutron master file in the new format to NDS and NNDC.
- A18 NEA-DB (Continuing) Send to NNDC the area 2 CINDA master file in exchange format for conversion to the new format.
- A19 NNDC (Continuing) Compare the two versions of area 2 master file as outlined above.
- A20 CNDC Compile all Chinese experimental works (journals and conference proceedings) for CINDA and send to NDS in Reader format. The first entries will be sent in July 2003.
- A21 McLane Produce revised CINDA 2001 Manual
- A22 CINDA centers (WP 2003-8, Section 2): When coming across report codes in dictionary 6 which differ significantly from what is shown on the cover, submit additional explanation to NDS for inclusion in dictionary 6
- A23 McLane, NEA-DB, CJD: Check and confirm/clarify report codes given in WP 2003-8, Sections 4 and 5
- A24 CINDA centers: Correct errors in report coding, as listed in Sections 6 and 7 of WP 2003-8
- A25 All CINDA centers: Search for illegal experimental entries for MANY and replace them with individual entries, and for the many illegal entries for FPROD which may be used only for lumped fission products.

General EXFOR matters

- A26 All (Continuing) Check/retransmit those entries from the list of pending retransmissions (distributed by McLane at the 2001 NRDC meeting) which still need correction
- A27 CPND centers (Continuing) Check the list of references identified as missing in EXFOR during the CRP on Medical Radioisotope Production, and distributed by Tarkanyi; communicate with Tarkanyi and NDS concerning which items they will compile from their area of responsibility.

References not covered in this way will then be available for compilation by others.

- A28 McLane Check whether conversion of EXFOR 60000 series was finished and communicate result to NEA-DB
- A29 NEA-DB, NDS (Continuing) Convert any remaining 60000 and 70000 series entries to proper EXFOR entries of area 2 and 3.
- A30 All All centers should give high priority to compiling new publications.
- A31 McLane (Continuing) Send to all participating centers a memorandum of understanding that defines compilation responsibilities resulting from the agreement with Phys.Rev.C (on EXFOR archiving of experimental data published in Phys.Rev.C).
- A32 Dunaeva, Chukreev (Continuing) Once the agreement between NNDC and the publishers of Phys.Rev.C has been put into operation, try to establish a similar agreement with the publisher of Yadernaya Fizika.
- A33 NDS (Continuing) Compare EXFOR master files received from other centres with the NDS file, and as far as possible correct them (with help of other centers).
- A34 NDS (Continuing) Make available to all centres the “final” EXFOR master file, together with a matching set of dictionaries.
- A35 JCPRG (Continuing) After upgrading, send HENDEL (Web-based EXFOR editor) to the other centres for testing and comments.
- A36 All Give priority to data sets that NNDC requests regarding the compilation of alpha-induced reactions on “alpha-nuclei” (O-16 through Ti-44).
- A37 All Compile with priority data related to the new Co-ordinated Research Project on "Nuclear Data for Production of Therapeutic Radionuclides" (see WP 2003-28).
- A38 McLane Make available a platform independent version of the ORDER program.
- A39 All The following centers volunteer to participate in a test of EXFOR coverage completeness for a few main journals for one “test” year, 1998. Included will be neutron data and CPND up to 1 GeV, excluding projectiles heavier than alpha. Results will be sent to NNDC and NDS before the next meeting.
NNDC: PR/C
ATOMKI: NIM/B
CAJAD: ARI, RCA
VNIIEF: YF (=PAN)

NEA-DB: EPJ/A
NDS: NP/A
JCPRG: PR/B, PRL

Technical EXFOR matters

- A40 McLane/Schwerer (Continuing) Improve the LEXFOR entry on 'Correlations' with respect to the clarifications requested in WP 2002-5.
- A41 McLane (Continuing) Correct the LEXFOR entry for the proposed coding of 4-momentum transfer (WP 2002-6).
- A42 McLane (Continuing) Check whether there is a LEXFOR entry on the process code FUS (total fusion, Dictionary 30); if not, provide such an entry.
- A43 McLane (Continuing) Try to resolve the problems in order to define the various polarization quantities for LEXFOR and dictionary 36 consistently.
- A44 Schwerer (Continuing) Delete RCL from dictionary 33.
- A45 McLane Produce a list of quantities related to Product Yields and Thick Target Yields with a detailed explanation and including reference to an appropriate paper as an example, and produce revised LEXFOR entries on them.

Miscellaneous

- A46 Lammer/NDS (Continuing) Include the PC program package for calculation of Fission Yield distributions by A. C. Wahl in the NDS data collection.

Nuclear Reaction Data Center Protocol

Reviewed and amended at the 2003 NRDC Meeting, 17 June 2003

(Original drafted by O. Schwerer and V. McLane and approved at the 2002 NRDC Meeting)

The Nuclear Data Section (NDS) will assume a more pro-active role co-ordinating all Nuclear Reaction Data Centres (NRDC). NDS staff will be responsible in this extended role for ensuring that data compilations are undertaken and completed in an efficient, productive and timely manner. Thus, the role of NDS will be as follows:

- (a) assign clear responsibilities for the creation and correction of data compilations, and drive these activities forward,
- (b) ensure implementation of compilation rules,
- (c) decide on all issues relating to dictionary codes,
- (d) be responsible for CINDA and EXFOR distribution to the other data centres.

1. Compilation Responsibilities

NDS will assign areas of responsibility for data compilation. If a centre assigned a particular area of compilation (e.g., neutron data from a country or countries)¹ does not carrying out their responsibilities (i.e., compile all new data for that area in a timely manner), the NDS co-ordinator will re-assign all or part of those responsibilities to another volunteer centre.

A centre responsible for an area of compilation may agree with another network centre to share the compilation work for that area on a regular basis. However, the responsibility for coverage and quality of the compilation remains with the responsible centre.

2. Decisions Concerning Compilation Rules and New Quantities

Final decisions on proposals concerning compilation rules and new quantities can be made with Core Centre² agreement after discussions among all centres. NDS will be the final arbiter in case the Core Centres are unable to reach a decision.

3. Decisions Concerning Dictionary Codes

NDS will be the final arbiter for all decisions concerning dictionary codes (see also Section 2, above).

4. EXFOR/CINDA Transmissions

All preliminary and final EXFOR and CINDA transmissions will be sent to NDS, who will be responsible for distributing all final transmissions.

5. Corrections to EXFOR/CINDA Entries

NDS may correct or assign volunteers to correct preliminary transmissions, that have not been corrected and resubmitted as final transmissions in a timely manner.

¹ An area may be defined in terms of a given projectile or set of projectiles, for a given country or group of countries, for a given data type or data types, or for any combination of these.

² Core centres will be defined by NDS, based on contributions to the network and user service capabilities.

6. Urgent Compilation Needs

If a centre requires a particular data set to be compiled immediately, the centre should send a request to the responsible centre with a copy to NDS. If the responsible centre cannot compile the data to the timetable requested, the requesting centre may compile the data as an area Z entry. This entry will be sent to both the original responsible centre and NDS. If the responsible centre does not intend entering the data in a timely fashion, the NDS may transmit the new Z entry to all centres. The responsible centre can subsequently delete the Z entry, if they are able to replace the earlier compilation with their own entry for their area.

7. Corrections to Entries Compiled at Another Centre

Notification of errors found in entries originating from another centre should be communicated to all centres. The NDS should make sure corrections are undertaken in a timely manner. If they are not, the co-ordinator will request one of the other centres to submit the corrected entries.

8. Maintenance of the Masterfile

NDS will maintain and distribute the EXFOR (and CINDA) Masterfile.

9. Problematic entries

NDS will create a new subdirectory of the open area NDSX4.TRANS for those problematic entries which were removed from a PRELIM transmission. These entries will be reviewed by the other centers and can be finalized at the next NRDC meeting.

10. NDS staff

Otto Schwerer (NDS) has been appointed co-ordinator of the NRDC Network.

Notes

a). As a consequence of the above, the link between the geographical area of the Institute and the accession number, which has been in place for all neutron data, is no longer obligatory and may be lifted in certain cases. Similarly, for corrections to entries of another centre according to Section 7 above, entries of different accession number areas can be transmitted on the same TRANS file.

b). This protocol will be reviewed at each NRDC meeting.

CINDA Protocol

V. McLane, M. Lammer, V. Zerkin

1. The CINDA2001 format shall be the method of exchange between the Nuclear Reaction Data Centers. The CINDA Format Manual shall contain the coding rules for CINDA exchanges.
2. A subset of the original “core” centers will be responsible for all CINDA transmissions. That is, the NNDC will be responsible for the US and Canada, the NEA Data Bank will be responsible for the NEA member countries, and the NDS will be responsible for the rest of the world. All other centers compiling new references will transmit the data through one of these three centers.
3. Updates sent by a center that contain corrections to their own entries shall be transmitted in a separate file from updates to entries that are the responsibility of another center. The latter shall be sent in update files, separated by coordinating center.
4. The EXFOR Accession Number will, in general, be used as the CINDA block number.
5. The sequence number within a block shall be unique, *i.e.*, if a line is deleted, the sequence number should not be reassigned.
6. New blocks that are the responsibility of another center (to be transmitted on UPDATE files) shall have block numbers beginning with zero (0) and sequence numbers equal to zero.
7. CINDA Transmissions shall be deposited on the NDS open area, NDSX4, subdirectory CINDA.
8. In the case where there is problem with updates to files of a given center, the Nuclear Data Section shall have the authority to produce transmission files for that center and release them to all data centers.

Future NRDC Cooperation on CINDA

Nuclear Reaction Data Center Meeting
June 2003

V. McLane, M. Lammer, O. Schwerer

General

This document contains several proposals, which are meant as a starting point for further discussions. The three main points addressed are: 1) the transmitting of CINDA entries needs to be reorganised, 2) transmission of CINDA entries in the new formats should be initiated before the end of the year, and 3) the new CINDA database should be considered as an index to the experimental and evaluated data files. Detailed proposals follow.

Creation of a CINDA database in the new format

In order to allow time for the centers to work on the creation of their new CINDA databases, there will be a moratorium on new transmissions for some period of time before the changeover. The database creation project consists of four parts: 1) the conversion of the existing library, 2) the production of a starter library for charged particle and photonuclear data, 3) the addition of new entries, and 4) the addition of entries from other existing bibliographies, and the merging of these entries with the existing database.

1. Conversion of the existing CINDA library:

Each neutron center, or its designated center, will:

- Convert its CINDA master file to the new format,
- Retrieve the data for their area in the old exchange format, and
- Send both files to NDS.

These files will be distributed by NDS to those centers that want them.

Completion: October 2003 (moratorium on new transmissions initiated 1 Sept. 2003).

2. Production of a starter library for charged particle and photonuclear data

A starter library of charged-particle and photonuclear data references will be produced by NDS/NNDC from the existing EXFOR database after the EXFOR master file comparison is completed and the libraries are updated.

This library will then be distributed to those centers who want it.

Completion: December 2003

3. Addition of new entries

For new CINDA entries, an agreement will be reached with the center responsible for co-ordination of coverage as to who will compile which references. After the entries are compiled, they will be sent through the co-ordinating center to NDS. NDS will check and distribute the entries.

Implementation: January 2004 (moratorium lifted).

4. Addition of entries from other existing bibliographies

There exist several other bibliographies that contain nuclear reaction references in a form useful for conversion and entry into the CINDA database. Among these are the CPBIB at NNDC and Photonuclear Data at CDFE. The conversion of these files to the CINDA format will greatly add to the coverage of the literature in the database. However, each reference must be checked against the contents of the CINDA database a) to see if it already exists in the database, and b) if it does not exist, to see if it should be loaded into an already existing block. This checking and blocking may take a considerable amount of time to complete.

Completion: to be decided for each database to be converted.

Contents of CINDA

From 2004 forward, CINDA will be considered to be an index to the experimental and evaluated data, that is, entries for theory (except those given in EXFOR entries), compilations, and reviews will not be entered in CINDA. Such references are now entered in Nuclear Science References (NSR), and present coverage seems to be complete; 98% of all new theory references given in CINDA are already in NSR; a comparison of CINDA theory entries for 2000-2002 to NSR found only 4 missing references in NSR: 3 from laboratory reports and one from a conference. The savings in duplicated effort will allow more time to be devoted to data compilation. Existing CINDA entries will remain in the database until such time as they are documented to exist in the NSR database.

For older references, the coverage in NSR is not as good. The NNDC will provide a program to be used in checking which CINDA theory entries exist in NSR and will ask for help in entering those which are not in NSR.

Those documents which exist or are entered in NSR will then be deleted from the CINDA database.