Short Guide for EXFOR compilers

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A. Main steps in compilation of new Entries and correction of old ones:

1. **Avoidance of duplications in input of data:** first retrieve from the latest EXFOR database by author(s) name(s) and reactions, and compare numerical data in existing subentries with data in the paper. If the data are similar, you need to understand if the latest data are the result of new measurements, or a new analysis of the results of old measurements.

2. Find and read **all References**.

   Under REFERENCE give only publications to pertain data for this ENTRY , taking in mind, that all REFERENCEs will be automatically included in the bibliographical data base CINDA as the reference for all data of this Entry.

   Other references (containing common details of experiment, method of analysis, etc.) should be compiled under REL-REF.

   If the name of the **first author** of the second reference (or any subsequent references) differs from the name of the first author in the first (main) reference, this difference can be mentioned in the free text of these references.

3. Request and compile the **original measured data** if they are available (e.g. ratio of the cross sections, transmissions, etc.). It is obligatory to send experimental data request to the author. Digitized data can be put in Entry only if it is impossible to find tabulated data or get numerical data from authors. After compilation of the data received from authors, the digitized data should be deleted from the Entry.

4. Check data given in the **tables** and in the **text,** and compare them (in case of corrections) with data in **all Subentries** of Entry.

5. Check data given in **figures of publications** against their **correspondence to** the data in the **tables**, to the **data received from authors** and (in case of corrections) to the **data previously entered**. If data from figures are absent in EXFOR, they **can be digitized** and tabulated. The compiler should attempt to obtain the data from the corresponding author.

6. Check the **physical meaning** of data. There are only a few reactions types that can be measured directly (in some approximation) as absolute (no further normalization is needed). Most data are obtained as a ratio to a known standard or even from shape or shape of ratio measurements type. The questions should be answered:

   What was measured (primarily **measured quantity**)?

   If relevant, how was the **normalization** of the cross sections carried out, which **standard cross section(s)** or **monitor reaction(s)** were used?

   It is useful to communicate on these problems with evaluators and physicists, and make a plot to compare with other data for the same reaction. These plots can be sent to authors for comments if their data differ too much from other data in the EXFOR database.

7. Check if the **REACTION code used is correct**. It is very useful to produce a plot from the EXFOR database and the evaluated data libraries for data comparison. Large differences compared with data from other entries or evaluations may also show that the reaction code is incorrect (e.g., "inelastic collision" used by authors does not mean inelastic scattering cross section, but non-elastic cross section, etc.).

8. **Ask authors** (if possible) any questions **about observed disagreements and possible misprints**. Give compiler comments under CRITIQUE (about data quality) or COMMENT. Make sure they are labeled as "Comment by Compiler".

9. Old data (published before 1976) can also be checked by comparison with data in the figures and tables given in **UCRL-50400** report (several volumes). Experimental data from many journals, reports and private communications were analyzed by a group of evaluators from the LLNL (USA) and clear mistakes (misprints in publications) were also corrected. Corrected data are presented in the figures and tables, and can be found on the basis of reaction, author's name and reference.

10. **Use Nuclear Wallet Cards, Table of Isotopes, and NuDat** for retrievals to understand **decay properties** and compile decay radiation characteristics used by authors. Compile only decay data as given in the article. If decay data are not given in article, request decay data from author. This approach may help to renormalize the results using modern values of the decay radiation characteristics.

11. **Monitor** reaction cross section used in the measurements should be compiled if given, or direct and full reference on the standards or monitor reaction used should be provided to help renormalize the measured values to new standard or monitor reaction cross section.

12. **Uncertainties** have to be given in ERR-ANALYS including the partial components of the total uncertainty with a free text explanation of the source of the uncertainty component. The partial components of the uncertainties should be compiled according to the existing compilation rules. This information will help the evaluators to build the covariance matrix of the uncertainty for this data set.

13. **Source of data** should be clarified as much as possible (including free text) under **STATUS.**

14. **HISTORY** should be given as a detailed free text description of any corrections introduced in the ENTRY/SUBENT.

15. Check **ERRATA** or **CORRIGENDUM** lists that are usually published in the last issue of the journal volume for possible corrections of the data.

16. **Use CHEX code** to detect format and coding errors.

17. **Use Spellcheckers** to correct free text language errors and misprints.

18. **Corrected Entries: Use FLAG C or I in column 11** in ENTRY/SUBENT lines. **Optional:** use **FLAG in column 80** in EXFOR Entry by marking lines with I (line inserted) or C (line corrected) even if this requirement is optional (as at present).

C. Check list for compilation of new or correction of old entries:

□ – Check duplication.

□ – Search for all related references.

□ – Check for ERRATA or CORRIGENDUM to the original references.

□ – Selection of all data (physical quantities) appropriate for compilation (primarily measured data – type of ratios, data normalized using monitor reactions or standards, derived quantities, etc.).

□ – Determination of the reaction string coding for data as defined in the Manuals, Dictionaries and "good" examples compiled in EXFOR.

□ – Data check on consistency (between figures and tables in publications, authors' data and figures and against data retrieved from EXFOR database using Quick Plot).

□ – If data deviate significantly (outliers) check if correct codes used for REACTION or appropriate units are used. Contact authors when clear problems exist.

□ – Compile data with as much information as possible given under ERR-ANALYS, STATUS and HISTORY; produce compiler comments needed under CRITIQUE or COMMENTS, especially if some problems were not resolved.

□ – Check by CHEX and Spellchecker and send to the authors for approval.

D. Manuals to be used:

1. **LEXFOR –** Quantity definitions and detailed compilation guidelines
2. **EXFOR** Exchange Formats Manual
3. **NRDC Protocol** - Procedures for EXFOR exchange and compilation scope
4. **EXFOR/CINDA Dictionary Manual**
5. **Present guide**

E. Main Web-sites with information for compilers' access:

1. http://www-nds.iaea.org/nrdc/ - International Network of Nuclear Reaction Data Centres (NRDC).
2. http://www-nds.iaea.org/ - EXFOR, CINDA, ENDF, NSR, NuDat and other data libraries.
3. http://www-nds.iaea.org/exfor-master/x4compil/ - EXFOR status compilation Webpage.
4. http://nds121.iaea.org/ndsx4/trans/ - dictionaries, manuals, preliminary and final TRANSES, codes for EXFOR compilation.
5. http://www-nds.iaea.org/nrdc/error/exfor_err1.html - collection of mistakes found by EXFOR users and NRDC members.
6. http://www-nds.iaea.org/nrdc/error/exfor_err2.html - format errors in EXFOR found by database administrators in NEA-DB, NDS and JCPRG.
7. http://www-nds.iaea.org/nrdc/error/exfor_err3.html - suspicious entries submitted from WPEC SG-30 members after NRDC 2007 meeting.

F. Main codes to be used:

1. Retrieval systems:
   a) software developed by V. Zerkin, adopted on web-sites of NDS, NNDC, mirror web-sites;
   b) JANIS –developed and adopted in NEA Data Bank.
2. Special editors for compilation in EXFOR:
   a) EXFOR-editor (ExfData.exe) developed in NPDC, VNIIEF, Sarov, Russia, http://cnpd.vniief.ru/load;
   b) HENDEL, developed in JCPRG, Sapporo, Japan, http://www.jcprg.org/hendel/
3. Digitizing codes:
   a) InpGraf.exe, developed in NPDC, VNIIEF, Sarov, Russia;
   b) GSYS, developed in JCPRG, Sapporo, Japan, http://www.jcprg.org/gsys/.
4. Checking codes: CHEX – to check TRANSes.
5. Tool of web-service for compilers: http://nds121.iaea.org/exfor2/x4up1.htm

to check and compare the data of preliminary trans and the data from EXFOR data base and evaluated libraries on plots, using Quick plot and Advanced plot, to avoid duplications, disagreements and misprints in compiled data.

New, under improvement.

6. JANIS-TRANS Checker code to check preliminary transes - www.nea.fr/janis/trans-checker
7. SpellCheckers – standalone or built in text editors and redactors.
8. Additional code: ORDER – to run before sending to NDS.