

EXFOR/CINDA Dictionaries used by JANIS software

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1. Dictionaries Formats

The *EXFOR/CINDA Dictionary Manual* (IAEA-NDS-213 rev. 2008) describes three formats for the distribution of dictionaries:

- Archive dictionaries
- EXFOR transmission dictionaries
- DANIEL backup dictionaries

When EXFOR support was implemented in JANIS it was decided to use the Archive format as it is described as the source of all other formats and as such contains all information (codes expansions, flags and free text explanations for compilers).

(Note: until now JANIS do not use the free text explanations for compilers)

Proposal 1: Assess the current use of various dictionary formats within NRDC and, if possible, maintain only one.

The dictionary in Archive format is the most complete one. If dictionaries in other official formats (Transmission, DANIEL) are not used, their support should be discontinued in order to simplify the updating process.

2. Dictionaries used by JANIS

X*: dictionary included in JANIS but not used

Dict.	Dict. name	Used in JANIS		Remark
		CINDA	EXFOR	
1	System Identifiers		X*	
2	Information Identifiers		X	
3	Institute Codes	X	X	
4	Reference Type	X	X	
5	Journal Codes	X	X	
6	Reports	X	X	
7	Conference Codes	X	X	
8	Elements		X	
10	Standard Reactions		X*	
11	Forbidden Reactions		X*	

Dict.	Dict. name	Used in JANIS		Remark
		CINDA	EXFOR	
12	CINDA Quantities			Obsolete?
13	Reaction Type (DICT.36)			Superseded by Dict. 213 in NDS-213
14	Reaction Dimensions (DICT.36)		X	
15	History codes		X	
16	Status codes		X	
17	Related Reference Codes		X	
18	Facility Codes		X	
19	Incident Source Codes		X	
20	Additional Result Codes		X*	
21	Method Codes		X	
22	Detector Codes		X	
23	Analysis Codes		X	
24	Data Headings		X	
25	Data Units		X	
26	Family Flags		X	
27	Nuclides, Compounds			Superseded by Dict. 227 in NDS-213
30	Processes (REACTION SF 3)		X	
31	Branch Codes (REACTION SF 5)		X	
32	Parameters (REACTION SF 6)		X	
33	Particles		X	
34	Modifiers (REACTION SF 8)		X	
35	Data Types (REACTION SF 9)		X*	
36	Quantities (REACTION SF 5-8)			Superseded by Dict. 236 in NDS-213
37	Result codes		X	
43	NLIB for evaluated libraries			List in agreement and more complete with the table of values listed in ENDF-102 (BNL-90365-2009 Rev.2)
44	Data Libraries			Obsolete? All codes INT or EXT
45	New CINDA quantities	X		
47	Old / New CINDA quantities	X		
48	Alphabetic energy values	X		
52	CINDA Reader Codes	X		
113	Web quantities	X	X	
124	Data Headings (for plotting)			"presently not used" in IAEA-NDS-213
125	Data unit (for plotting)			"presently not used" in IAEA-NDS-213
136	Quantities (for plotting)			"presently not used" in IAEA-NDS-213

Dict.	Dict. name	Used in JANIS		Remark
		CINDA	EXFOR	
144	Data Libraries for new CINDA	X	X	
207	Book Codes	X	X	
209	Compounds		X	
213	Reaction Type with CINDA quant.		X	
227	Natural isotopic mixtures and nuclides			Not up-to-date (112-Cn) Format documentation? Purpose?
235	Work Type	X		
236	Quantities (REACTION SF 5-8)		X	

X*: dictionary included in JANIS but not used

Proposal 2: Assess the current use of dictionaries within NRDC and remove the obsolete ones.

Removing obsolete dictionaries would simplify the EXFOR system and clarify for newcomers (compilers, EXFOR advanced users) how EXFOR works.

The removed dictionaries can be kept for archival but preferably in a separate location with their own documentation, again to keep actual EXFOR as simple as it should be.

3. Distribution of dictionaries

The clarification of which format should be used as exchange format for dictionaries and reduction of the list of available dictionaries would allow:

- Distribution of up-to-date dictionaries together with EXFOR Master files
- More reliable checking of PRELIM files

a) Dictionaries and Master files

As intended in EXFOR system we rely on dictionaries for displaying EXFOR to JANIS users, to provide code expansions (e.g. Institutes, Journals...) but also to organize available data in a tree structure and for plotting (variable choices, axes labels...). To do so some dictionaries are more important than others: Data Headings, Data Units and Quantities and few others, basically the ones described in *Chapter 5, RELATIONS BETWEEN QUANTITIES, HEADINGS AND UNITS of EXFOR/CINDA Dictionary Manual*.

If the latest dictionaries available do not cover all codes used in the latest Master file then we can only provide limited access to the data using the non described codes.

Proposal 3: Synchronize dictionaries and Master distribution.

b) Dictionaries and PRELIM files

We try hard to provide as many ways as possible to EXFOR compilers for checking their submitted PRELIM files but the workflow allow one compiler to submit a proposal for a new code and use it in a submitted PRELIM. As code proposals are not stored in any computer system, other than being stored on a web server a free text document files (the Memos), there is hardly no way on providing reliable checking results.

To illustrate this here is reported TRANS Checker result for the PRELIM area checking status as of April, 12th:

JANIS - Import Logs Summary

TRANS name	Exception(s)	Warning(s)	Timestamp
prelim.1378	1	1	2012-04-12T01:25:05.541+0200
prelim.2227	3	0	2012-04-12T01:25:06.718+0200
prelim.2228	0	3	2012-04-12T01:25:07.615+0200
prelim.2229	2	0	2012-04-12T01:25:08.826+0200
prelim.2230	1	1	2012-04-12T01:25:09.094+0200
prelim.3154	0	3	2012-04-12T01:25:09.662+0200
prelim.4155	6	0	2012-04-12T01:25:09.934+0200
prelim.4156	2	9	2012-04-12T01:25:10.388+0200
prelim.a077	0	0	2012-04-12T01:25:10.984+0200
prelim.c115	6	5	2012-04-12T01:25:11.847+0200
prelim.d082	9	3	2012-04-12T01:25:12.228+0200
prelim.e068	0	0	2012-04-12T01:25:12.710+0200
prelim.f045	1	3	2012-04-12T01:25:13.835+0200
prelim.g024	0	1	2012-04-12T01:25:14.105+0200
prelim.k011	0	0	2012-04-12T01:25:15.193+0200
prelim.l017	0	0	2012-04-12T01:25:16.246+0200
prelim.l018	8	3	2012-04-12T01:25:16.278+0200
prelim.m062	0	1	2012-04-12T01:25:16.316+0200
prelim.s015	0	0	2012-04-12T01:25:16.423+0200
prelim.t022	2	3	2012-04-12T01:25:16.456+0200
PRELIM.Y008	1	0	2012-04-12T01:25:04.457+0200
Total	42	36	

From a first sight the situation looks rather bad but going in the detail...

PRELIM	TRANS Checker		Missing codes	Rectification		Details
	Errors	Warnings		Errors	Warnings	
1378	1	1	1	0	1	DOI to correct
2227	3	0	3	≥0	≥0	Quantity ,NU/DE,,RTE
2228	0	3	3	0	0	Institute 2ITYEFR
2229	2	0	2	≥0	≥0	Quantity PRE,FY/DE,G Quantity PAR/PRE,FY,G
2230	1	1	2	≥0	≥0	Quantity PAR,KE,N Conference 2009BUDA
3154	0	3	1	0	2	DOI to correct AUTHOR to correct Conference 2009BUDA
4155	6	0	1	≥5	≥0	Format of date field 3x invalid dates Columns issue? Quantity PR,NU/DA
4156	2	9	2	≥0	≥9	5x "missing kw METHOD,FACILITY..." 4x SF4 empty Quantity TER,KEP,LCP
A077	0	0	0	0	0	
C115	6	5	4	≥4	≥3	3x AUTHOR to correct SF2 coding Quantity ,DA,,RES Detector MCP Method COIN
D082	9	3	9	≥0	≥3	DOI to correct 2x Authors Quantity CUM,TTY,,TM Quantity ,AKE,LF+HF Quantity ,FY,G
E068	0	0	0	0	0	
F045	1	3	0	1	3	3x MONIT-REF without MONITOR Missing ENDENTRY ?
G024	0	1	0	0	1	Author
K011	0	0	0	0	0	
L017	0	0	0	0	0	

PRELIM	TRANS Checker		Missing codes	Rectification		Details
	Errors	Warnings		Errors	Warnings	
L018	8	3	11	≥0	≥0	Quantity PAR,POL/DA,,ASY/PP Institute 1USAUCO Institute 1USANCC
M062	0	1	0	0	1	SF4 empty for scattering process SCT
S015	0	0	0	0	0	
T022	2	3	0	2	3	Ignore field Column issue? BIB/ENDBIB N1/N2 issues
Y008	1	0	0	≥1	0	Format
TOTAL	42	36	39	≥13	≥26	

The “rectification” columns contains figure one may expect if all missing codes were really proposed, will be accepted and are not real mistakes.

Many rectified values in these columns are lower bounds because whenever JANIS encounters an Error (Exception) it skips the remaining part of the subentry. This is due to the fact that TRANS Checker was not developed as an checking tool but is a derived used of the JANIS EXFOR parsing code which was written to display EXFOR, not to check it’s conformance with format manuals.

This situation can be improved on our side by improving this parsing code to tolerate unknown codes and do its best to continue the parsing, but:

- This would be useful only for TRANS Checker; it would not bring any real benefit for common JANIS end users.
- We think that there is a much more efficient way of solving this issue: by providing up-to-date preliminary dictionaries containing the proposed codes.

From our point of view the EXFOR system already propose this functionality with the status codes PRO and PRE:

- PRO: *proposed, are not yet approved**
- PRE : *preliminary, do not need approval or are approved*

(*: by all Data Centres)

The maintenance of up-to-date preliminary dictionaries using theses status codes, kept in sync with Memos proposing codes, will allow more reliable checking tools:

- The automatic TRANS Checker of PRELIM area already work by checking regularly the NDS server, it can easily check if more up-to-date dictionaries are provided on a given web location.
- Standalone software like JANIS or EXFOR Editor can use the user Internet connection (if any) to check with more up to date dictionaries, while keeping offline versions of dictionaries for connectionless situations.

Proposal 4: Consider maintaining up-to-date preliminary dictionaries containing the new codes and code updates proposed in Memos.