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Memo CP-D/440

Date: 22 September 2005
To: Distribution
From: O. Schwerer

Subject: **Updated description of Archive Dictionaries**

Please find attached an updated description of the Archive dictionaries, describing the format used in transmission 9089. This supersedes all earlier descriptions, including those in memo CP-D/432 (for dictionary 227) and memo CP-D/405 (all other dictionaries). The corrections are highlighted in ***bold italic***.

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ARCHIVE DICTIONARIES

Victoria McLane, July 2003
1st Update by O. Schwerer, June 2004 (Draft) (Memo CP-D/405)
2nd Update by O. Schwerer, September 2005

The NRDC Dictionary Archive consists of a dictionary index file and a set of dictionary files, one for each dictionary, and contains all information necessary for the production of the DANIEL database, and the EXFOR and CINDA dictionaries.

The format and contents of the Archive Dictionary files are described on the following pages.

General Format

Dictionary Index

The dictionary index contains a list of all of the dictionary files stored, along with supplemental information.

The format of dictionary index line is:

Column(s)	1-3:	Dictionary number
	5-34:	Dictionary name
	36-37:	# of DANIEL keys
	39-78:	DANIEL record format

Dictionary Files

The dictionary files consist of two types of records: MASTER records and COMMENT records.

The general format of a MASTER record is:

Column(s)	1:	Alter flag
	2-4:	Status Code
	6-11:	Data of entry or last update
	13-42:	Key
	44-118:	Codes, expansions, *etc.* Format and contents are given under each dictionary.

The general format of a COMMENT record is (exceptions are noted under each dictionary):

Columns	1-33:	blank
	44-88:	comment

Alteration Flags

Dictionary updates are recorded on the Master Archive files by adding an alteration flag and the date of alteration. When a new transmission is run the flags are used to process the records for the output files, and are deleted from the Master Archive files.

The following flags are used to indicate an alteration to a dictionary record.

- A The record has been added
- D The record is marked for deletion
- M A modification has been made to the Code-expansion field
- S The status has been changed

Status Codes

A list of legal status codes (for all dictionaries) follows.

CIN	CINDA	used only by CINDA
EXT	extinct	no longer applies, but valid for older data sets
INT	internal	used only by DANIEL System
OBS	obsolete	not to be used on EXFOR exchange files
PRE	preliminary	do not need approval or are approved
PRO	proposed	are not yet approved
TRA	transmitted	sent to all centers on Dictionary transmission file

Contents of Dictionaries

The contents of the archive dictionaries are given on the following pages, along with the format of the MASTER records and any exceptions to the format of the COMMENT records.

For each MASTER record, the primary key is given first with the actual length of the key. (Note, however, that all primary keys are stored as 20-character strings.) Following the primary key, the secondary key (for the DANIEL database), if it exists, and the contents of the dictionary line fields are given. Note that the secondary key is also the first dictionary line field. The dictionary line is stored as an 80-character string.

Dictionary 1: SYSTEM IDENTIFIERS
MASTER RECORD:
KEY: EXFOR CODE (A10)
field 1: INTERNAL NUMERICAL EQUIVALENT (I9)
field 2: EXPANSION (A55)

Dictionary 2: INFORMATION IDENTIFIERS
MASTER RECORD:
KEY: EXFOR CODE (A10)
field 1: EXPANSION (A25)
field 2: KEYWORD REQUIRED (A1)
R - required
B - one required
X - required when relevant
field 3: INTERNAL NUMERICAL EQUIVALENT (I2)
field 4: CODE REQUIRED OR OPTIONAL (A1)
R - required code
O - optional code
field 5: DICTIONARY FOR CODE (A3)

Dictionary 3: INSTITUTE CODES
MASTER RECORD:
KEY1: EXFOR CODE (A7)
KEY2: field 1: 3-character CINDA CODE (A3)
field 2: AREA, COUNTRY CODE (A4)
field 3: EXPANSION (A53)
field 4: COUNTRY, ORG. CODE FOR CINDA (A15)
COMMENTS:
Column 44: comment flag
= CINDA comment
Columns 45-88: comment

Dictionary 4: REFERENCE TYPE
MASTER RECORD:
KEY: EXFOR CODE (A1)
field 1: SHORT EXPANSION (A4)
field 2: POINTER TO RELATED DICTIONARY (A3)
field 3: LONG EXPANSION (A35)

Dictionary 5: JOURNAL CODES

MASTER RECORD

KEY1: EXFOR CODE (A6)

KEY2: field 1: CINDA CODE (A4)

field 2: AREA-COUNTRY CODE (A4)

field 3: ADDITIONAL AREA-COUNTRY OR ORGANIZATION CODE (A4)

1st character area code: 2nd country of origin

T: country of original publication

blank: organization code (1st code = *n*ZZZ)

field 4: SHORT EXPANSION (A20)

field 5: EXPANSION (A48)

COMMENTS:

Column 44: comment flag

\+ addition to title

* full title

. translation of title

= CINDA comment

Columns 45-88: comment

Dictionary 6: REPORT CODES

MASTER RECORD:

KEY: EXFOR CODE (A11) (CINDA key is 8-character truncation of code)

field 1: INSTITUTE CODE (A7)

field 2: EXPANSION (A48)

field 3: CINDA FLAG (A1)

* Expansion not entered in CINDA book dictionary

COMMENTS:

Column 44: comment flag

= CINDA comment

Columns 45-88: comment

Note: This dictionary contains CINDA codes flagged with the status code CIN, which are not simply truncations of the 10-character EXFOR code.

Dictionary 7: CONFERENCE CODES

MASTER RECORD:

KEY: EXFOR CODE (A10) (CINDA key is 8-character truncation of code)

field 1: EXPANSION (A53)

field 2: AREA-COUNTRY CODE (A4)

field 3: 2ND AREA-COUNTRY OR ORGANIZATION CODE (A4)

1st character area code: 2nd country of origin

T: country of original publication

blank: organization code (1st code = *n*ZZZ)

field 4: CINDA SHORT CODE (A10)

COMMENTS:

Column 44: comment flag

(EXFOR long expansion

= CINDA comment

Columns 45-88: comment

Dictionary 8: ELEMENTS
MASTER RECORD:
KEY1: Z-NUMBER OF ELEMENT (I3)
KEY2: field 1: ELEMENT SYMBOL (A2)
field 2: ELEMENT NAME (A20)

Dictionary 10: STANDARD REACTIONS (CSISRS)
MASTER RECORD:
KEY: CSISRS CODE line format output (A2)
field 1: EXPANSION (A24)
field 2: INTERNAL NUMERICAL EQUIVALENT (A56)

Dictionary 11: FORBIDDEN REACTIONS (CINDA)
MASTER RECORD:
KEY: EXFOR CODE (A8)
field 1: EXFOR CODE (A50)

Dictionary 12: CINDA QUANTITIES
MASTER RECORD:
KEY: CINDA CODE (A3)
field 1: FISSION FLAG (A1)
field 2: INTERNAL NUMERICAL EQUIVALENT (I4)
field 3: CINDA SHORT EXPANSION (A14)
field 3: EXPANSION (A50)

Dictionary 13: REACTION TYPE (for Dictionary 36)
MASTER RECORD:
KEY: EXFOR CODE (A3)
field 1: COMPUTATION FORMAT (A5)
field 2: ONLINE SYSTEM CODE (A4)
field 3: INDEPENDENT VARIABLE FAMILY CODE (I10)
field 4: EXPANSION (A65)

Dictionary 14: REACTION DIMENSIONS (for Dictionary 36)
MASTER RECORD:
KEY: EXFOR CODE (A1)
field 1: EXPANSION (A55)

Dictionary 15: HISTORY CODES
MASTER RECORD:
KEY: EXFOR CODE (A1)
field 1: SHORT EXPANSION (A15)
field 2: LONG EXPANSION (A45)

Dictionary 16: STATUS CODES
MASTER RECORD:
KEY: EXFOR CODE (A5)
field 1: INTERNAL NUMERICAL EQUIVALENT (I5)
field 2: EXPANSION (A55)
field 3: SUBACCESSION # FIELD FLAG (A1):

Dictionary 17: RELATED REFERENCE CODES
MASTER RECORD:
KEY: EXFOR CODE (A1)
field 1: EXPANSION (A53)

Dictionary 18: FACILITY
MASTER RECORD:
KEY: EXFOR CODE (A5)
field 1: EXPANSION (A53)
field 2: SPECIAL USE CODE (A4)
NEUT, PHOT

Dictionary 19: INCIDENT SOURCE
MASTER RECORD:
KEY: EXFOR CODE (A5)
field 1: EXPANSION (A53)
field 2: SPECIAL USE CODE (A4)
NEUT, PHOT
field 3: DELIMITER CODE (A1)

Dictionary 20: ADDITIONAL INFORMATION
MASTER RECORD:
KEY: EXFOR CODE (A5)
field 1: EXPANSION (A53)

Dictionary 21: METHOD
MASTER RECORD:
KEY: EXFOR CODE (A5)
field 1: EXPANSION (A53)
field 2: SPECIAL USE CODE (A4)
FY, NEUT, PHOT

Dictionary 22: DETECTOR
MASTER RECORD:
KEY: EXFOR CODE (A5)
field 1: EXPANSION (A53)
field 2: SPECIAL USE CODE (A3)
FY, NEU, GAM

Dictionary 23: ANALYSIS

MASTER RECORD:

KEY: EXFOR CODE (A5)

field 1: EXPANSION (A53)

field 2: SPECIAL USE CODE (A4)

PHOT, RP

Dictionary 24: DATA HEADINGS

MASTER RECORD:

KEY: EXFOR CODE (A10)

field 1: DATA TYPE (2I1)

1st integer 0: flags, *etc.*

2nd integer 1:flag
2: decay flag
3:level flag
4: miscellaneous data

1: assumed values

2nd integer 1: monitor
5:assumed

2: data

2nd integer 1:data
3: ratio

3: resonance parameter

2nd integer 1: quantum number
2: energy

4: incident energy

2nd integer 1: energy
2: momentum
3: spectrum energy
4: spectrum temperature

5: secondary energy

2nd integer 1: particle energy
2: level energy
3: excitation energy
4: Q value
5: energy degradation
6: energy gain
7: level number
8:linear momentum
9:polarity

6: angle

2nd integer 1: angle
2: cosine
7: q (momentum transfer)
8: wave number

7: number

2nd integer 5: coefficient number
6: kq

Dictionary 24: DATA HEADINGS (continued)

8: other variable
- 2nd integer
  - 2: sample temperature
  - 3: sample thickness
  - 4: polarization
  - 5: half-life
  - 6: group number
  - 7: decay constant

9: isotope/particle identification
- 2nd integer
  - 1: element
  - 2: mass
  - 3: isomer
  - 4: monitor element
  - 5: monitor mass
  - 9: emitted nucleons

field 2: FAMILY CODE (A1)

field 3: PLOTTING FLAGS (I7)
- col 1-3 - independent variable
- col 4-6 - dependent variable
  - col 1 & 4: variable
    - 1 - value
    - 2 - minimum
    - 3 - maximum
    - 4 - approximate
    - 5 - one of multiple variables
    - 9 - uncertainty or resolution
  - if col 1 = 1-5:
    - col 2: 1 - numerator
    - 2 - denominator
  - if col 1 or 4 = 9:
    - col 2 & 5: +error; col 3 & 6: -error
    - 1 - error
    - 2 - resolution
    - 3 - half resolution
    - 4 - statistical error
    - 5 - partial error
- col 7 - reference frame flag
  - 1 - c.m. system

field 4: UNIT CODE (A4)

field 5: SPECIAL USE FLAG (A1)
- H = for relativistic heavy-ion data

field 6: EXPANSION (A55)

Dictionary 25: DATA UNITS
MASTER RECORD:
KEY: EXFOR CODE (A10)
field 1: EXPANSION (A35)
field 2: FAMILY CODE (A4)
field 3: CONVERSION FACTOR (E11)
field 4: SORTING CODE (A3)

Dictionary 26: UNIT FAMILY CODES
MASTER RECORD
KEY: UNIT FAMILY CODE (A4)
field 1: DICTIONARY 24 USE (I2)
field 2: DICTIONARY 25 USE (I2)
field 3: DICTIONARY 36 USE (I2)
field 4: EXPLANATION (A50)

Dictionary 27: NATURAL ISOTOPIC MIXTURES, NUCLIDES AND COMPOUNDS
MASTER RECORD:
KEY1: EXFOR CODE (A10)
KEY2: field 1: CINDA CODE (A5)
field 2: INTERNAL NUMERICAL EQUIVALENT (I6)
field 3: NUCLIDE USES (A13)
(See EXFOR Chapter 7 for field contents)
field 4: SPIN (E5)
field 5: for isotopes, ISOTOPIC ABUNDANCE (E11)
for natural element, ATOMIC WEIGHT (E11)
field 6: EXPANSION (A25)
filed 7: COMPOUND FLAG (A1) = '*'
COMMENT RECORD
Columns 44-45: OUTPUT DICTIONARY NUMBER FOR DANIEL (I2)
(blank after 1st MASTER Record).
Columns 46-98: COMMENT

Dictionary 30: PROCESS CODES
MASTER RECORD:
KEY: EXFOR CODE (A3)
field 1: INTERNAL NUMERICAL EQUIVALENT (I10)
field 2: EXPANSION (A55)

Dictionary 31: BRANCH CODES
MASTER RECORD:
KEY: EXFOR CODE (A3)
field 1: INTERNAL NUMERICAL EQUIVALENT (I10)
field 2: EXPANSION (A55)

Dictionary 32: PARAMETER CODES
MASTER RECORD:
KEY: EXFOR CODE (A3)
field 1: INTERNAL NUMERICAL EQUIVALENT (I10)
field 2: EXPANSION (A55)
field 3: SPECIAL USE CODE (A4)

Dictionary 33: PARTICLES
MASTER RECORD:
KEY: EXFOR CODE (A3)
field 1: INTERNAL NUMERICAL EQUIV: Reaction SF2,3 (I6)
field 2: INTERNAL NUMERICAL EQUIV: Reaction SF7 (I5)
field 3: ALLOWED SUBFIELD FLAG (A4)
field 4: EXPANSION (A40)
COMMENT RECORD
Columns 44-45: OUTPUT DICTIONARY NUMBER FOR DANIEL (I2)
Columns 46-98: COMMENT

Dictionary 34: MODIFIERS
MASTER RECORD:
KEY: EXFOR CODE (A3)
field 1: INTERNAL NUMERICAL EQUIVALENT (I10)
field 2: GENERAL QUANTITY MODIFIER FLAG (A5)
field 3: EXPANSION (A55)
COMMENT RECORD
Column 1: Flag
* replaces EXFOR expansion
Columns 45-99: Comment

Dictionary 35: DATA TYPE
MASTER RECORD:
KEY: EXFOR CODE (A5)
field 1: INTERNAL NUMERICAL EQUIVALENT (I10)
field 2: EXPANSION (A40)

Dictionary 36: QUANTITIES
MASTER RECORD:
KEY: EXFOR CODE (A30)
field 1: INTERNAL NUMERICAL EQUIV. Reaction SF5 (I6)
field 2: INTERNAL NUMERICAL EQUIV. Reaction SF6 (I6)
field 3: INTERNAL NUMERICAL EQUIV. Reaction SF7 (I6)
field 4: INTERNAL NUMERICAL EQUIV. Reaction SF8 (I6)
field 5: REACTION TYPE (A3)
field 6: REACTION DIMENSION (A1)
field 7: FAMILY CODE (A4)
field 8: EXPANSION (A48)
COMMENT RECORD
Columns 44-87: COMMENT

Dictionary 37: RESULT
MASTER RECORD:
KEY: EXFOR CODE (A5)
field 1: EXPANSION (A53)

Dictionary 43: NLIB for Evaluated Libraries
MASTER RECORD:
KEY: NLIB NUMBER (A2)
field 1: LIBRARY NAME (A40)

Dictionary 44: Data Libraries
MASTER RECORD:
KEY: LIBRARY NAME (A20)
field 1: AREA-COUNTRY CODE (A4)
field 2: AREA-COUNTRY, ORGANIZATION CODE (A4)
1st character: area code; 2nd country of origin
blank; organization code (1st code = *n*ZZZ)
field 3: EXPANSION (A55)

Dictionary 45: New CINDA Quantities *(new)*
MASTER RECORD:
KEY: NEW CINDA QUANTITY (A15)
field 1: WEB QUANTITY (A7)
field 2: EXPANSION (A53)

Dictionary 47: Old / New CINDA Quantities *(new)*
MASTER RECORD:
KEY: OLD CINDA QUANTITY (A15)
field 1: REACTION (A10)
field 2: NEW CINDA QUANTITY (A4)

Dictionary 48: Alphabetic energy values for CINDA *(new)*
MASTER RECORD:
KEY: ENERGY CODE (A15)
field 1: BOOK EXPANSION(A10)
field 2: DESCRIPTION (A44)

Dictionary 52: CINDA Reader Codes *(new)*
MASTER RECORD:
KEY: READER CODE (A15)
field 1: CINDA READER(A60)
field 2: COUNTRY (A15)

Dictionary 113: Web Quantities *(new)*
MASTER RECORD:
KEY: WEB QUANTITY (A15)
field 1: EXPANSION (A53)

Dictionary 144: Data Libraries for new CINDA *(new)*
MASTER RECORD:
KEY: REF-TYPE, LIBRARY NAME (A20)
field 1: AREA-COUNTRY CODE (A4)
field 2: AREA-COUNTRY, ORGANIZATION CODE (A4)
1st character: area code; 2nd country of origin
blank; organization code (1st code = *n*ZZZ)
field 3: EXPANSION (A55)

Dictionary 207: BOOK CODES *(new)*

MASTER RECORD:

KEY: EXFOR CODE (A10) (CINDA key is 8-character truncation of code)

field 1: EXPANSION (A53)

field 2: AREA-COUNTRY CODE (A4)

field 3: 2ND AREA-COUNTRY OR ORGANIZATION CODE (A4)

1st character area code: 2nd country of origin

T: country of original publication

blank: organization code (1st code = *n*ZZZ)

field 4: CINDA SHORT CODE (A10)

Dictionary 209: COMPOUNDS *(new)*

MASTER RECORD:

KEY1: EXFOR CODE (A10)

KEY2: field 1: CINDA CODE (A5)

field 2: INTERNAL NUMERICAL EQUIVALENT (I6)

field 3: NUCLIDE USES (A13)

(See EXFOR Chapter 7 for field contents)

[field 4: SPIN (E5)] not used

[field 5: for isotopes, ISOTOPIC ABUNDANCE (E11)

for natural element, ATOMIC WEIGHT (E11)] not used

field 6: EXPANSION (A25)

[field 7: COMPOUND FLAG (A1) = ''] not needed*

COMMENT RECORD

Columns 44-35: OUTPUT DICTIONARY NUMBER FOR DANIEL (I2)

(blank after 1st MASTER Record).

Columns 46-98: COMMENT

Dictionary 213: REACTION TYPE WITH NEW CINDA QUANTITY *(new)*

MASTER RECORD:

KEY: EXFOR CODE (A3)

field 1: NEW CINDA QUANTITY (A5)

field 2: WEB QUANTITY (A4)

field 3: INDEPENDENT VARIABLE FAMILY CODE (I13)

field 4: EXPANSION (A65)

Dictionary 227: NATURAL ISOTOPIC MIXTURES, AND NUCLIDES

KEY1: EXFOR CODE (A12)

KEY2: field 1: A-SYMBOL (A6)

field 2: INTERNAL NUMERICAL EQUIVALENT (I7)

field 3: USE FLAG (A1):

Z = not to be used in REACTION SF2,3,7, and in keywords DECAY-DATA, DECAY-MON, EN-SEC, HALF-LIFE, MOM-SEC, PART-DET, RAD-DET

(where the appropriate particle codes are to be used)

field 4: SPIN/PARITY (A6)

field 5: HALF-LIFE FLAG (A1)

field 6: HALF-LIFE (E11)

field 7: HALF-LIFE UNITS (A3)

field 8: ISOTOPIC ABUNDANCE (E11)

field 9: ATOMIC WEIGHT (E12)

field 10: EXPLANATION (A21)

Dictionary 235: WORK TYPE *(new)*

MASTER RECORD:

KEY: CINDA CODE (A1)

field 1: SHORT EXPANSION (A6)

field 2: LONG EXPANSION (A20)

Dictionary 236: QUANTITIES *(new)*

MASTER RECORD:

KEY: EXFOR CODE (A30)

field 1: REACTION TYPE (A3)

field 2: REACTION DIMENSION (A1)

field 3: FAMILY CODE (A4)

field 4: EXPANSION (A72)

COMMENT RECORD

Columns 44-87: COMMENT (LONG EXPANSION)