

Memo 4C-3/93

To: Distribution

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From: C.L. Dunford *c/l*

- I. Recapitulation of Actions from the Ninth Four Center Meeting
- II. Consensus "Common Statistics" Proposal
- III. Generalized EXFOR Isoquants

Distributions:

S. Pearlstein, NNCSC (5)
F. Fröhner, NDCC (5)
V. Manokhin, CJD (5)

NDS: P. Attree
A. Calamand
C. Dunford
J. Lemley
H. Lemmel
J. Schmidt
file ✓

Clearance: J.J. Schmidt

W. Schmidt

I. Recapitulation of Actions from the Ninth Four Center Meeting

Reference: 4C-3/81 or INDC(NDS)-54/G Appendix S

Action	On	Comment
1	CJD	Done
2	CJD	Not Done
3	NDS	Depends on action 2
4	ALL	Done
5	ALL	CCDN only
6	NNCSC	Not Done
7	Schmidt	Depends on action 6
8	ALL	Not Done
9	NDS	Depends on action 8
10	ALL	Continuing
11	ALL	"
12	ALL	"
13	ALL	"
14	ALL	Done
15	ALL	Done
16	NDS	See item II attached
17	NDS	Done
18	CCDN	Done
19	ALL	Continuing
20	ALL	CCDN only
21	NDS	Not done due to incomplete action 20
22	NDS	On agenda
23	Pearlstein	Done
24	Schmidt	Not done
25	Pearlstein	Done
26	ALL	Continuing
27	CJD	Not Done
28	NNCSC	Not Done
29	NNCSC	Not Done
30	NDS	Not Done
31	CCDN	Continuing
32	ALL	Not Done
33	NDS	See item III attached
34	NDS + CCDN	Continuing
35	CCDN	Done
36	Lemmel, Tubbs	Not done at NDS, CCDN(?)
37	Pearlstein	Done
38	NDS	Done
39	NDS	Done
40	Schmidt	Not discussed
41	CCDN	Continuing
42	NNCSC	Not yet released
43	CJD	Not Done
44	CCDN	Of course

II. Consensus "Common Statistics" Proposal

Action 16 of Ninth Four Center Meeting on NDS
References: Memo 4C-2/44, 4C-4/22 and
INDC(NDS)-54/G, Appendices M and N.

We are proposing that the Four Centers provide the following basic information and use the following format for reporting operational statistics for the annual Four Center Meetings. This proposal follows very closely the suggestions of Memo 4C-2/44.

The statistics should cover a common annual cycle from 1 April to 31 March. Common definitions for quantities reported are as follows:

Request - a single written or oral communication in which a customer or data center requests either experimental, evaluated, or bibliographic data, or codes or documents. A single communication which requests more than one category of information (for example both experimental and evaluated data are requested) should be counted as a multiple request, one request for each type of information.

Data set - data from one experiment for a given nuclide (or element) and quantity. This corresponds typically to one EXFOR subentry or one Z,A,Q,REF combination but if current multiple isoquant proposals are adopted then there could be more than one data set per subentry. In the case of evaluated data, a data set shall mean any complete or partial data file. A data file normally corresponds to one DFN for the UKNDL, one MAT NO for ENDF/B, etc.

A. Request Statistics (Table I)

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Table I should be presented in three parts as attached. The first table (Ia) is a breakdown of request types by country of origin. This breakdown would be useful for NDS and the INDC and we think also for CCDN. Current and previous year's totals should be included for comparison. The second table (Ib) gives a breakdown of requests as a function of the requestor's organization type. This breakdown is particularly useful for NNCSC and CCDN. As discussed at the last Four Center Meeting, it will be difficult for NDS and CJD to provide any meaningful breakdown using these categories. At least for the next Four Center Meeting NDS will probably have to enter all data under OTHER. The third table (Ic) is a breakdown of request disposition by request type.

The suggestion using a single table contained in Memo 4C-2/44 is more concise but was changed for the following reasons:

- 1) An additional request type and summary totals seemed to be needed.
- 2) Two centers (NDS and CJD) would probably only fill in one of the four lines.
- 3) A useful "country" breakdown could not be easily included.
- 4) The breakdown of request disposition by requestor organization does not seem to be useful for all centers.

B. Data Dissemination (Table II)

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The proposed format and contents for this table are attached. We are proposing the adoption of the suggestion from Memo 4C-2/44 with the following modifications:

- 1) Addition of a codes and documents category.
- 2) Deletion of the transmission mode (CARRIER). It seems that NNCSC once provided this breakdown but it has not been generally used in the past. Furthermore many of NDS requests are answered by listings so would require all evaluated files to be listed under OTHER or cause the addition of an entry for LISTING for each library type under evaluated data.
- 3) Dissemination of evaluated data need only be counted by data sets as defined in the introduction. Since the size of a library varies between centers due to availability and new evaluations, the unit "complete library" does not seem too meaningful.

C. ZAQ Request Statistics (Table III)

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We recommend that the proposal (Table 3) in Memo 4C-2/44 be adopted. We suggest however that associated quantities be counted together. For example

n_{γ} replaces $\sigma_{n_{\gamma}}$ and means $\sigma_{n_{\gamma}}$ + gamma spectra

$n_{\bar{\nu}}$ replaces $\sigma_{n_{\bar{\nu}}}$ and means $\sigma_{n_{\bar{\nu}}}$ + $\bar{\nu}$ + ETA + ALPHA

n_x replaces σ_{n_x} and means only charged particle emission such as n, α and n, p .

"Other" to mean quantities like neutron production and gamma emission.

D. EXFOR Compilation Statistics (Table IV)
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We also recommend that the proposal (Table 4) in Memo 4C-2/44 be adopted.

E. EXFOR Exchange Statistics
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CCDN will provide a single table for all four centers as previously agreed.

Request Statistics

TABLE Ia

1 April 19__ to 31 March 19__

Area __

Country Origin	Number of requests for data				Total	Total Previous Year
	Experimental	Evaluated	Bibliographic	Codes Documents		
Total						
Total Previous Year						

Request Statistics

TABLE Ib

1 April 19__ to 31 March 19__

Area __

Originating Organization	Number of requests for data				Total	Total Previous Year
	Experimental	Evaluated	Bibliographic	Codes Documents		
Government Lab.						
University						
Industry						
Other						
Total						

Request Statistics

TABLE I

1 April 19__ to 31 March 19__

Area __

Request Disposition	Number of requests for data		Bibliographic	Codes Documents	Total	Total Previous Year
	Experimental	Evaluated				
Fulfilled						
Partially Fulfilled						
Unfulfilled						
Standing						
Total						

Data Dissemination

Table II

1 April 19__ to 31 March 19__

Area ___

Data Type	Amount	
Experimental	Data Sets	containing _____ Data Points
Evaluated (Total)	Data Files	
KEDAK	Data Files	
UKNDL	Data Files	
ENDF	Data Files	
OTHER	Data Files	
Bibliographic	Cinda Entries	
Codes and Documents		

III. Generalized EXFOR Isoquants

Action 33 on NDS from Ninth Four Center Meeting

There have been no detailed comments on generalized isoquants as requested in action 32. A comment on possible structure can be found in Memo 4C-2/41, page 12. Therefore we do not consider this discussion as a proposal. We think that the alternative solutions presented here are capable of handling all types of reaction data. NDS definitely favors "Solution II". We would like comments from the other centers on the various methods and on implementation, so that we may prepare a final proposal by March 1.

The key problem to be faced is the method whereby information about the incident particle is provided in the isoquant construction. In the past this has been "neutron" by default or "no particle" in a few cases like spontaneous fission. We will examine two possible solutions.

Solution I. Construct additional mnemonics for the quant-field which includes the incident particle.

Examples T \bar{O} T — PTOT, DTOT, GTOT etc.
 NF — PF, GF, DF etc.
 N2N — P2N, G2N, D2N etc.

Advantage 1) No change is required in the present EXFOR system.

Disadvantage 1) Works nicely only if incident particle has a simple representation like neutron (N), proton (P) etc. What happens with LI-6 incident particles ?

 2) Dictionaries 10 and 14 will become long, repetitious and difficult to work with.

 3) Inconsistency of nomenclature in that some quantities will remain which have an assumed but not explicit first character N like TOT instead of NTOT.

 4) Related to the first disadvantage is the fact that quantities representing multiple outgoing particles will be extremely complicated.

Solution II. Separate field for incident particle and reconstructed quant-field. (Currently used in WRENDA.)

Examples

Z-S-A,N,TØT Z-S-A,P,TØT etc.
Z-S-A,N,F Z-S-A,P,F
Z-S-A,N,2N Z-S-A,P,2N

Advantage

- 1) Incident particle separated and clearly identified with a field. Instead of the particle (N or P) a full (Z-S-A) could be given thus handling heavy particles automatically.
- 2) No more than normal increase in Dictionaries 10 and 14.
- 3) Disadvantage four of the previous solution remains but could be fixed as discussed below.

Disadvantage

- 1) Basic incompatibility of modifications with all previously compiled EXFOR entries. This leads to complications in processing programs allowing them to handle both versions simultaneously.

Adoption of this solution would seem to require the violation of one of the cardinal rules of EXFOR, namely "no changes to previously compiled entries can be required". Hans Potters mentioned at the Four-Center Meeting that an automatic machine modification of the isoquant field of old EXFOR files could probably be done with reasonable effort. Pamela Attree is not so sure of the "reasonable effort", she thinks there are complications, perhaps unforeseen by Hans Potters, at centres where the internal files are kept in an EXFOR-like format, complete with the ID-field.

Finally, there is the point that was suggested in Hans Potters' memo to separate the final particles in the quant-field with a slash as

Z-S-A,N,P/N to mean $\sigma(N,PN)$

and thus generalized to

Z-S-A,N,Z₁-S₁-A₁ /Z₂-S₂-A₂/

It should be noted that a slash is currently used with a different meaning in the isoquant fields. Perhaps a different character from the permitted character set should be used instead. This proposal seems reasonable if we ever plan to compile data representing heavy particles in the exit channels and should be implemented simultaneously with Solution II if that option is selected so that major perturbations are made only once.

One minor detail which would improve visual readability is the suggestion to set off the incident particle and quantity fields with parentheses as

Z-S-A(N,T)T
Z-S-A(P,2N)DA etc.

This would seem to provide additional complication to the system for little return.

Implementation Procedure

Non-neutron induced data will anyway be stored in libraries separate from the neutron induced (plus spontaneous fission) library. There is no advantage of merging both into the same library, even if they have identical format.

Thus, let us start the non-neutron induced data with the new quantity scheme, without touching the present neutron-induced EXFOR. Later on one can decide what is more economical:

- a) to continue to keep two different quantity-dictionaries, or
- b) to convert the neutron-induced EXFOR library in a one-off program automatically to the new quantity scheme.

This can be decided only after the non-neutron induced EXFOR library is in successful operation for some period. Until that time no change in EXFOR should be made !