Memo 4C-3/340

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To: Distribution

From: O. Schwerer and M. Lammer

Subject: Comments on TRANS-1233 and 4075

Please find enclosed our comments on TRANS-1233 and 4075 including an appendix on some unusual fission yield data of entry 40965.

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#3067N

Comments on TRANS 1233

Entry	Subent	Line(s)	Comment
12788	2-5		ANG-CM = 16.4 always repeated, check input
12846	2-5		ANG-CM = 16.3 " " " "
12911	2*)		E-EXC repeated; I don't understand the meaning of the second E-EXC column (0.95 MeV repeated throughout the DATA section)
13066*)	3,4		Headings ELEM 1,2,3 and MASS1,2,3 are illegal. We doubt that they should be introduced for this case because it is not easy to see where each one belongs. If these very old average R-values are to be compiled at all (which we are not sure), a legal way could be replacing both numerators of the double-ratio by sum REACTIONs (with explicit SF4) for the 2 (or 3) fission products, using 4 levels of parentheses.
13073	2*)		DECAY-DATA: half-life of SN-133 is 1.4 sec as opposed to 55 sec given here. Also the values for SN-131 and 132 deviate strongly from recent data. Is there a compilation mistake, or are the original data in error?
13079	3	15,21	ISOMER should be blank (no metastable state exists).
13085	2	23	Exponent in wrong position
13090	2	3	Delete ELEM from SF4 (chain yield needs MASS only)
	3	11	ISOMER should be blank
	7	10-14	ISOMER should be blank, delete this column
13091	16	17,18,20,21, 23,27-33	ISOMER should be blank
13092*)	2,3		See comment on entry 13066, (also for heading ISOMER2)
13094	2	9	3rd heading should read DATA 2
13095	5	14-17,19,22, 26-28	ISOMER should be blank
13097	2	19	ISOMER should be blank
	7	21	ISOMER should be blank

*) Retransmission requested

Entry	Subent	Line(s)	Comment
13146	4		Many angles repeated between lines 83-146
	7		" " " " " 78-141
	10		" " " " " 60-123
	13		" " " " " 60-123, 170-185
13236	2*)	3	Wrong nuclide in SF4. Should 55-I-135 be 55-CS-135?
13238	2	9	Decimal point missing
13252	2	6	51-TE-131 should read 52-TE-131

Comments on TRANS 4075

Entry	Subent	Line(s)	Comment
40965*)			Except for subentry 3, 2 angles are given in the COMMON sections which is illegal. The data in this entry are of very complex nature and we are not sure what quantities were measured nor whether they can be compiled in Exfor in accordance with the present coding rules. See Appendix by M. Lammer for details. Discussion at the forthcoming NRDC mmeting suggested.
40972	2)		REACTION: delete 'N' from SF7. For differential inelastic data the 'particle considered' should be coded only when it is different from incident particle, i.e. when SF7 = 'G'.
40973	2-7)		
40974*)	3		Subentry 3 missing? 'sample is the same as in subentry 2': if a retrieval just for thermal cross sections is made, subentry 2 will not be included. Therefore the SAMPLE information should be repeated in subentry 4.
	4		
40975	1	17	DECAY-DATA should be DECAY-MON. It is not necessary to repeat the nuclide when several γ-rays are given. The radiation field may be repeated (see examples in Manual).
		18	

*) Retransmission requested

Appendix (M. Lammer): Comments on Exfor 40965

1) General comments on BIB, SAN001

MONITOR: not required (ratio measurements)

METHOD: add (BSPEC) β-spectrometer of separated fission products

add keyword:

DETECTOR (PROPC) Methane-flow counter

2) Angles of measurement (SAN 2, 4, 6):

The actual angle of measurement is not clear:
Throughout the paper, angles of 0 and 90° are mentioned, except for one sentence, saying "The angular resolution ..... corresponded to effective fragment-registration angles 30 and 75° for collection of fragments ..."

- Either it is assumed that the registration angles were 0 and 90°,
  then: REACTION: SF8 = RSD is correct, and
  COMMON should have: ANG = 0. ADEG

- or it is assumed that the registration angles were 30 and 75°,
  then: REACTION : SF8 = RSD is wrong;
  it should be coded as ratio 30°/75°
  (how, remains to be discussed)

In either case, the present coding of angles is wrong.

3) Comments on ASSUMED (SAN 2, 4, 6)

a) The values given under "ASSUM" in the DATA table were not assumed, but measured values.

b) The coding under the keyword "ASSUMED" does not correspond to the measurement result and needs discussion.

c) The reference to "ASSUMED" in the free text comment to the reaction is irrelevant in SAN's 3, 5 and 7 (no ASSUMED given).

Discussion:

The values given under the column heading "ASSUM" correspond to the values called A^{mp}_{*} in the paper and presented in column 4 of Table 1. According to the paper, these values were obtained as a result of a measurement of the "integrated angular anisotropy A^{mp}_{*} of the fragments (the ratio of the yields at 0 and 90° with the neutron beam, obtained in measurements with good energy resolution)".

⟹ This would require a reaction coding as "result integrated over all fragments".

On the other hand, it is also stated in the paper: "The anisotropy referred to here was integrated over all fragments and is practically equal to the anisotropy of the most-probable-fission fragments."; and, elsewhere: ".... yield Y^{mp} and anisotropy A^{mp} of the most-probable-fission fragments. The latter were the yields and anisotropies of the fragments ^{140}Ba and ^{99}Mo" (see note below).

⟹ This interpretation suggest a coding as "anisotropy corresponding to the most probable fragments", which are, however, <u>both</u> Ba-140 and Mo-99 in this case (and coding with <u>just Ba-140</u> is <u>wrong</u> in any case!).

In principle, these results should be given in separate subentries. However, with the present rules, both ways of coding are not possible. We wonder, if, in the second case, coding as

((...(N,F)MO-99,...,RSD/FCT)+
+(...(N,F)BA-140,...,RSD/FCT)) would be acceptable?

(with FCT = 0.5 to indicate "average")

Note: Y^{mp} and A^{mp} are the actually measured yields and anisotropies of Ba-140 and Mo-99, whereas A^{mp}_{*} is the measured integrated value "corresponding" to these fission products. In both cases it is not stated, how the values were obtained (average?).

4) REACTION and DATA in all subentries:

All values given under DATA are <u>ratios</u> of the fission products given (ELEM/MASS) to those of the most probable fission products Mo-99 and Ba-140 (to which one, or whether relative to the average of both, is not stated; see "Note" above).

Therefore the reactions should be coded as <u>ratios</u>, (which seems not to be possible with present coding rules; but; see our proposal under 3) above), or with the REL modifier.