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MEMO 4C-4/211

Date:	16 April 2015
To:	Distribution
From:	M.Mikhailiukova
Subject:	CJD Progress Report for NRDC2015

CJD PROGRESS REPORT for NRDC Technical Meeting
(21 - 23 April 2015, IAEA, Vienna, Austria)

Introduction

During the time passed after the previous NRDC2014 meeting the current work concerning EXFOR compilation and fulfillment of NRDC2014 Conclusions and Actions was continued. Large part of CJD activity was related to the data evaluation.

1. Staff

Now CJD is a laboratory within the theoretical physics division of “Department for perspective researches“ in the State Scientific Centre of the Russian Federation – Institute for Physics and Power Engineering named after A.I.Leypunsky – SSC RF – IPPE.

At present the number of CJD staff is 8: 5 scientists and 3 engineers.

2. EXFOR activity.

After the NRDC2014 Meeting:

- Exfor Transes 4163-4167 were transmitted as final;
- Exfor Trans 4168 was transmitted as preliminary.

EXFOR compilation statistics – area 4

Trans	Date/status	Entries total	Entries new	Entries revised	Subents total	Subents New in old+in new	Subents Revised (cor.+NOSUBENT)
4163	18.06.2014/fin	33	3	30	236	90	146
4164	21.10.2014/fin	53	12	41	403	127	276
4165	15.12.2014/fin	45	0	45	286	0	286
4166	04.03.2015/fin	24	4	20	171	25	146
4167	13.04.2015/fin	28	0	28	205	35	170
Final		183	19	164	1301	277	1024
4168	20.03.2015/pr	26	3	23	141	18	123
Total		209	22	187	1442	295	1147

- The efforts were continued to get numerical data and explanations from authors.
- The progress was achieved in contacts with the JINR (Dubna) library to get the copies of JINR reports.
- Neutron induced data Transes were checked and comments were sent:
 - 5 for area 1, 2 for area 2, 5 for area 3.
- Russian journals YF, AE, IZV, PTE, ZET, ZEP, FCY, FCY/L are scanned and information for CoCoS is sent to NDS in coordination with V.Semkova.
- Two memos (# 209-210) were prepared and sent for NRDC community for discussion:
 - Reply to memo CP-D/868- Coding rule for PTE;
 - Units of quantities with SF8=NPD

3. NRDC2014 Actions.

CJD is responsible for NRDC2014 Actions:

A1 – All articles registered (07.04.2015) in CoCoS were compiled.

At allocation site – 22 articles:

-compiled: 4–in final transes, 2 in prelim. transes,

-in compilation: 4 for new Entry, 7–Engl.translations, 3–not found yet, 2– are considered.

A4 – All very urgent and urgent corrections were made (last in preli.4168, 20.03.2015). The normal corrections will be continued.

A5 – A.Andreev was nominated, but recently he left IPPE. Nobody from CJD has been nominated yet.

A7 – Feedback was sent.

A28 – Not finished yet, will be continued.

A31 – Finished –compiled in 40644.003 in trans 4164 (final).

A32 – Not finished yet. Some new data were added in EXFOR.

A45–49, 52 – Not all the English translations of AE, YF, YK, ZEP, DOC were added. The Actions will be continued.

Added(+in prelim): AE –31, YF –35(+2), YK –7(+1) , IZV –32, FCY –1, FCY/L – 3, ZEP – 2(+1), ZET –1 , PTE –(+1) , KIEV conf. – 9, NIAR– 1 , ICD– 3, DOK –2; YFI – 12(+1), total – 139(+6) .

A53,54 – Finished – 4 Entries were corrected in trans 4164 (final)

A55 – All were corrected excluding Entry 40217 .

A56 – Not finished, will be continued.

I checked EXFOR with code UNOBT (08 April 2015):

1H – no Subents, 16O – 3(area2), 56Fe – 5(area2), 235U –27=21(area2)+6(area4), 238U – 18=7(area2)+11(area4), 239Pu – 10=1(area1)+9(area2).

A65 – Not finished, will be continued.

A66 – No such transes in CJD.

A75 – Comments of ZCHEX were sent.

A80 – Feedback was not sent.

A83 – No new aliases were found.

A86 – No feedback was sent.

A89 – Some comments were sent to G.Pikulina.

4. Computer and software matters. WEB-site service.

- The information from web-site of users' feedback is helpful for correction of the old Entries.
- EXFOR status compilation web-page CoCoS and allocation web-page are used for information about the articles registered for the compilation.
- CJD web-site (Russian/English) is still under reconstruction as also IPPE web-site.
- New site of journal YK is in preparation as a part of IPPE web-site.

5. Journal YK.

The journal “Yadernye Konstanty”-2013, issue 1-2 is the last published one.

The journal will be continued to be published as “Yadernye and reactornye konstanty” (Nuclear and Reactor’s Constants).

YK 1999 – 2007 issues are available to read from the old CJD web-site <http://www.ippe.obninsk.ru/podr/cjd/> . Some translations are available at NDS web-site as INDC(CCP) reports.

6. Nuclear data evaluation activity.

The main activity of CJD in 2014 was connected with a completion of the BROND-3.1 library formation. The ROSFOND-2010 library was taken as the basis one, but for many nuclides the neutron inelastic scattering and capture cross sections, as well as the secondary gamma-production cross-sections were revised. The fission cross sections and the delayed neutron yields were also updated for some minor actinides.

The special attention in the new library was devoted to the cross-section uncertainty matrixes, which were absent in the previous Russian libraries. The analysis of uncertainties for the most cases was performed on the basis of the unrecognized-error estimation method, developed at IPPE in the last years [1]. Along with a consistent consideration of statistical uncertainties of experimental data this method allows to determine some systematic uncertainties, usually underestimated by the authors of data, and to establish also some implicit correlations of data. An account of the systematic uncertainties is an important feature of the new BROND evaluations.

The compiled version of the BROND-3.1 library includes 372 files of isotopes from hydrogen to curium for the neutron energy range from thermal to 20 MeV. All files were checked for the ENDF-6 format correspondence and were transformed with the NJOY code to the “ace” format widely used at the various benchmark calculations.

The full-scale verification of the BROND-3.1 library was carried out on the basis of the ICSBEP compilation [2]. It was shown that the uncertainties of the integral experiments modeling with BROND-3.1 do not exceed the benchmark uncertainties in the most cases and the deviations for some benchmarks are comparable with similar ones for the last versions of national libraries.

CJD plans to transmit the BROND-3.1 library into IAEA Nuclear Data Section during the summer of 2015.

[1] Е.В.Гай, Некоторые алгоритмы оценки ядерных данных и построения ковариационных погрешностей. Вопросы атомной науки и техники, сер. Ядерные константы, 2007, вып. 1-2, С. 56-65 (E.V.Gay, VANT, ser.YK, is.1-2,p.56-65,2007)

[2] International Handbook of Critically Safety Benchmark Experiments, OECD – Nuclear Energy Agency, September 2014.

7. Acknowledgments.

Great thanks to:

- N.Otsuka, E.Dupont, O.Cabellos, S.Simakov, R.Capote for their comments and productive discussions;
- V.Semkova for collaboration concerning CoCoS;
- V.Zerkin for developed option of automatic access to Entry in old transes;
- S.Dunaeva, K.Nathani, L.Vrapcjenjak for sent pdf-copies of articles;
- A.Oechs for assistance;
- JINR (Dubna) library staff E.Ivanova, K.Astvatsaturova for sending of JINR report copies;
- experimentalists V.Dement’ev, A.Vorobiev, V.Piksaykin for sent authors’ data and very useful explanations;
- EXFOR users for their comments collected in the feedback list web-site.