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## Summary Report of the Technical Meeting on International Network of Nuclear Reaction Data Centres

IAEA Headquarters, Vienna, Austria

23 – 26 May 2017

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July 2017

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**Abstract**

This report summarizes the IAEA Technical Meeting on the International Network of Nuclear Reaction Data Centres held at the IAEA Headquarters in Vienna, Austria from 23 to 26 May 2017. The meeting was attended by 23 participants representing 12 cooperative Centres from eight Member States (China, Hungary, India, Japan, Korea, Russia, Ukraine and USA) and two International Organisations (NEA, IAEA) as well as two participants from the European Commission and Kazakhstan. A summary of the meeting is given in this report along with the conclusions and actions.



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## THE INTERNATIONAL NETWORK OF NUCLEAR REACTION DATA CENTRES

National, regional and specialized nuclear reaction data centres, coordinated by the International Atomic Energy Agency, cooperate in the compilation, exchange and dissemination of nuclear reaction data in order to meet the requirements of nuclear data users in all countries. At present, the following data centres participate in the network:

NNDC	US National Nuclear Data Center, Brookhaven National Laboratory, Upton, USA
NEA DB	OECD NEA Data Bank, Boulogne-Billancourt, France
NDS	IAEA Nuclear Data Section, Vienna, Austria
CJD	Russian Nuclear Data Centre, Institute of Physics and Power Engineering, Obninsk, Russia
CNDC	China Nuclear Data Centre, China Institute of Atomic Energy, Beijing, China
ATOMKI	Charged-Particle Nuclear Reaction Data Group, Institute for Nuclear Research (ATOMKI), Debrecen, Hungary
NDPCI	Nuclear Data Physics Centre of India, Bhabha Atomic Research Centre, Trombay, Mumbai, India
JAEA/NDC	Nuclear Data Center, Japan Atomic Energy Agency, Tokai-mura, Japan
JCPRG	Nuclear Reaction Data Centre, Hokkaido University, Sapporo, Japan
KNDC	Nuclear Data Center, Korea Atomic Energy Research Institute, Daejeon, Republic of Korea
CDFE	Centre for Photonuclear Experiments Data, Moscow State University, Moscow, Russia
CNPD	Centre of Nuclear Physics Data, Institute of Nuclear and Radiation Physics, Russian Federal Nuclear Center –All-Russia Research Institute of Experimental Physics, Sarov, Russia
UkrNDC	Ukrainian Nuclear Data Centre, Institute for Nuclear Research, Kyiv, Ukraine

A detailed description of the objectives of the network and the contributions of each Centre to these activities are given in INDC(NDS)-401 (Rev.6), "International Network of Nuclear Reaction Data Centres".

## PREVIOUS NRDC MEETINGS

Vienna, 23-26 May 2017	Technical	INDC(NDS)-0736
Beijing, 7-10 June 2016	Centre Heads + Technical	INDC(NDS)-0718
Vienna, 21-23 April 2015	Technical	INDC(NDS)-0686
Smolenice, 6-9 May 2014	Centre Heads + Technical	INDC(NDS)-0661
Vienna, 23-25 April 2013	Technical	INDC(NDS)-0633
Paris, 16-19 April 2012	Centre Heads + Technical	INDC(NDS)-0618
Vienna, 23-24 May 2011	Technical	INDC(NDS)-0593
Sapporo, 20-23 April 2010	Centre Heads + Technical	INDC(NDS)-0573
Vienna, 25-26 May 2009	Technical	INDC(NDS)-0558
Obninsk+Moscow 22-25 Sept. 2008	Centre Heads + Technical	INDC(NDS)-0536
Vienna, 8-10 October 2007	Technical	INDC(NDS)-0519
Vienna, 25-28 September 2006	Centre Heads + Technical	INDC(NDS)-0503
Vienna, 12-14 October 2005	Technical	INDC(NDS)-0480
Brookhaven, 4-7 October 2004	Centre Heads + Technical	INDC(NDS)-464
Vienna, 17-19 June 2003	Technical	INDC(NDS)-446
Paris, 27-30 May 2002	Centre Heads + Technical	INDC(NDS)-434
Vienna, 28-30 May 2001	Technical	INDC(NDS)-427
Obninsk, 15-19 May 2000	Centre Heads + Technical	INDC(NDS)-418
Vienna, 18-20 May 1999	Technical	INDC(NDS)-407
Vienna, 11-15 May 1998	Centre Heads + Technical	INDC(NDS)-383
Vienna, 26-28 May 1997	Technical	INDC(NDS)-374
Brookhaven, 3-7 June 1996	Center Heads + Technical	INDC(NDS)-360
Vienna, 2-4 May 1995	Technical	INDC(NDS)-343
Paris, 25-27 April 1994	Center Heads + Technical	INDC(NDS)-308
Vienna, 1-3 Sept 1992	Technical	INDC(NDS)-279
Obninsk, 7-11 Oct 1991	Center Heads + Technical	INDC(NDS)-0262
Vienna, 13-15 Nov 1990	Technical	Memo CP-D/210
Vienna, 2-4 Oct 1989	Centre Heads + Technical	Memo CP-D/200
Vienna, 4-6 Oct 1988	Technical	Memo CP-D/190
Brookhaven, 27-29 Oct 1987	Center Heads + Technical	INDC(NDS)-204
Vienna, 7-9 Oct 1986	Technical	Memo CP-D/159
Saclay, 9-11 Oct 1985	Center Heads + Technical = 8 <sup>th</sup> NRDC Meeting	INDC(NDS)-178
Vienna, 19-21 Sept 1984	Technical	Memo CP-D/131
Obninsk+Moscow, 17-21 Oct 1983	7 <sup>th</sup> NRDC Meeting	INDC(NDS)-154
Vienna, 3-7 May 1982	6 <sup>th</sup> NRDC Meeting	INDC(NDS)-141
Brookhaven, 29.9 - 2.10.1980	5 <sup>th</sup> NRDC Meeting	INDC(NDS)-125
Karlsruhe, 8-13 Oct 1979	4 <sup>th</sup> NRDC Meeting	INDC(NDS)-110
Paris, 19-23 June 1978	3 <sup>rd</sup> NRDC Meeting	INDC(NDS)-99
Kiev, 11-16 April 1977	2 <sup>nd</sup> NRDC Meeting = 3 <sup>rd</sup> CPND + 13th 4-C	INDC(NDS)-90
Vienna, 28-30 April 1976	2 <sup>nd</sup> CPND Meeting	INDC(NDS)-77
Vienna, 26-27 April 1976	12 <sup>th</sup> 4C-Meeting	INDC(NDS)-78
Vienna, 8-12 Sept 1975	CPND Meeting	INDC(NDS)-69+71
Brookhaven, 10-14 March 1975	11 <sup>th</sup> 4C-Meeting	INDC(NDS)-68
Paris, 6-10 May 1974	10 <sup>th</sup> 4C Meeting	INDC(NDS)-58
Vienna, 24-26 April 1974	CPND + PhotoND	INDC(NDS)-59+61
Moscow/Obninsk, 4-8 June 1973	9 <sup>th</sup> 4C Meeting	INDC(NDS)-54
Vienna, 16-20 Oct 1972	8 <sup>th</sup> 4C Meeting	INDC(NDS)-51
Brookhaven, 25-29 Oct 1971	7 <sup>th</sup> 4C Meeting	INDC(NDS)-41
Paris, 5-9 Oct 1970	6 <sup>th</sup> 4C Meeting	INDC(NDS)-28
Moscow, 17-21 Nov 1969	5 <sup>th</sup> 4C Meeting	INDC(NDS)-16



## LIST OF ACRONYMS

ATOMKI	Nuclear Research Institute, Debrecen, Hungary
BARC	Bhabha Atomic Research Centre, Trombay, Mumbai, India
BNL	Brookhaven National Laboratory, Upton, New York, USA
BROND	Russian Evaluated Neutron Reaction Data Library
C4	Computational format for EXFOR data
CAJaD	Centre for Nuclear Structure and Reaction Data, Kurchatov Institute, Moscow, Russia
CDFE	Centr Dannykh Fotojad. Eksp., Moscow State University, Russia
CENDL	Chinese Evaluated Neutron reaction Data Library
CHEX	EXFOR check program (originating from NNDC)
CIAE	Chinese Institute of Atomic Energy, Beijing, China
CINDA	A specialized bibliography and data index on nuclear reaction data operated by NRDC
CJD	Russian Nuclear Data Centre, IPPE, Obninsk, Russia
CNDC	China Nuclear Data Centre, CIAE, Beijing, China
CNPD	Centre of Nuclear Physics Data at RFNC-VNIIEF, Sarov, Russia
CP...	Numbering code for memos exchanged within the NRDC
CPND	Charged-particle nuclear reaction data
CRP	Coordinated Research Project (of the IAEA Nuclear Data Section)
CSEWG	US Cross Section Evaluation Working Group
DOI	Digital Object Identifier, <i>e.g.</i> for bibliographic references
EMPIRE	A code system for nuclear reaction model calculations
ENDF-6	International format for evaluated data exchange, version 6
ENDF/B	US Evaluated Nuclear Data File/B
ENSDF	Evaluated Nuclear Structure Data File
EXFOR	Format for the international exchange of nuclear reaction data
GSYS	Data digitizing system by JCPRG
IAEA	International Atomic Energy Agency, Vienna, Austria
IBANDL	Ion Beam Analysis Nuclear Data Library, maintained at IAEA
INDC	International Nuclear Data Committee
IPPE	Institute of Physics and Power Engineering, Obninsk, Russia
IRDF	International Reactor Dosimetry and Fusion File, maintained by the IAEA-NDS
JAEA	Japan Atomic Energy Agency

JANIS	Java Nuclear Information System of NEA-DB
JCPRG	Nuclear Reaction Data Centre, Hokkaido University, Sapporo, Japan
JEFF	Joint Evaluated Fission and Fusion File, coordinated by NEA-DB
JENDL	Japanese Evaluated Nuclear Data Library
KAERI	Korea Atomic Energy Research Institute, Daejeon, Korea
KNDC	Nuclear Data Center, KAERI, Daejeon, Korea
KINR	Kyiv Institute of Nuclear Research
LEXFOR	Part of the EXFOR manual containing physics information for compilers
MBDAV	Management Board for the Development, Application and Validation of Nuclear Data and Codes
NDS	IAEA Nuclear Data Section, Vienna, Austria
NEA	OECD Nuclear Energy Agency, Boulogne-Billancourt, France
NEA-DB	OECD/NEA Data Bank, Boulogne-Billancourt, France
NEANDC	OECD/NEA Nuclear Data Committee
NNDC	National Nuclear Data Center, Brookhaven National Laboratory, USA
NRDC	International Network of Nuclear Reaction Data Centres
NRDF	Japanese Nuclear Reaction Data File
NSDD	International Network of Nuclear Structure and Decay Data Evaluators
NSC	OECD/NEA Nuclear Science Committee
NSR	Nuclear Science References, a bibliographic system
OECD	Organization for Economic Cooperation and Development, Paris, France
ORDER	EXFOR program for addition of record identification
PhND	Photonuclear data
RIKEN	Institute of Physics and Chemistry Research, Wako-Shi, Saitama, Japan
TALYS	A code system for prediction of nuclear reactions and generation of nuclear data
TRANS	Name of transmission tapes for data exchange in the EXFOR system
UKRNDC	Ukraine Nuclear Data Centre at KINR, Kyiv, Ukraine
VNIIEF	Russian Federal Nuclear Centre, Sarov, Russia
WPEC	Working Party on International Nuclear Data Evaluation Co-operation
XTRACT	EXFOR indexing program
X4TOC4	Conversion program from EXFOR to computational format "C4"
ZCHEX	Current version of CHEX, updated and maintained by NDS
4C...	Numbering code of memos exchanged among the four Neutron Data Centres

# MEETING SUMMARY

## 1. Introduction

The IAEA Technical Meeting on the International Network of Nuclear Reaction Data Centres was held at the IAEA Headquarters in Vienna, Austria from 23 to 26 May 2017. The meeting was attended by 23 participants representing 12 cooperative Centres from eight Member States (China, Hungary, India, Japan, Korea, Russia, Ukraine and USA) and two International Organisations (NEA, IAEA) as well as two participants from the European Commission and Kazakhstan (see **Appendix A**). Meetings of this network are held annually, with full meetings involving Centre Heads and technical staff every two years. (The last full meeting was held in June 2016 in the China Hall of Science and Technology in Beijing, China.)

Main topics of the present meeting were various statistics, manuals and dictionaries, compilation needs, quality control, coding rules as well as software and dissemination (see **Appendix B**). The results of the discussions were summarized in 32 conclusions and 97 actions (see **Appendix C**).

## 2. Brief Summary

### 2.1 Opening

**A. Koning**, Head of the IAEA Nuclear Data Section (NDS) welcomed the participants, and the participants introduced themselves. **O. Cabellos** was elected as the chairperson, and the agenda was adopted after addition of several items presenting web tools.

### 2.2 Progress Reports

Progress reports from all 12 attending Centres were presented by **O. Cabellos**, **O. Gritzay**, **A. Koning**, **V. Varlamov**, **S. Taova**, **S.C. Yang**, **M. Kimura**, **M. Mikhailiukova**, **S. Takács**, **Ge Zhigang**, **B. Lalremruata** and **B. Pritychenko**, who highlighted the staffing, compilation, dissemination and other nuclear data related activities of interest to the network. See also progress reports P2017-01 to P2016-10 (**Appendix D**) for further details.

### 2.3 EXFOR General

**V. Semkova** presented the statistics of transmissions, journal scanning and preliminary tape checking. She reported that 392 new entries and 956 revised entries have been newly finalized since the last NRDC meeting. She also mentioned that NDS regularly scans 61 journals since the last NRDC meeting, and CNPD, JAEA and UkrNDC also perform their responsibility for scanning of new publications regularly. Centres were reminded to check periodically the list of the outstanding articles maintained by NDS, and inform NDS necessary updates. Finally she reported that both NEA DB and NDS submit comments on almost all preliminary tapes. Centres were reminded that preliminary tapes must be finalized as soon as the required period for comments elapses.

**N. Otsuka** presented his analysis of compilation time (= time of transmission – time of publication) for seven selected journals (covering 64% of all registered articles) published in 2016. His analysis showed that the compilation time is 4.8 months on average. He also reported progress in corrections of the entries registered in the EXFOR Feedback List.

## 2.4 Manuals and Dictionaries

**N. Otsuka** presented revised EXFOR Formats Manual Chapter 7 “REFERENCE” and “STATUS” as well as revised EXFOR/CINDA Dictionary Manual “Dictionary 227”, and they were approved. He asked the participants whether EXFOR needs a new facility code for Pelletrons. He explained that two existing facility codes VDG (Van de Graaff) and VDGT (Tandem Van de Graaff) can be used as long as we distinguish single-end and tandem type Pelletron by checking the machine name (with or without D), and the participants finally concluded that a new facility code is *not* necessary for Pelletrons. He also proposed to make the analysis code RFN (R-function formalism) and the branch code MAS (total mass), and it was also approved.

## 2.5 CINDA

**V. Zerkin** reported that the CINDA automatic updates are done after every update of EXFOR and NSR since 2017, and also reported that the CINDA database was updated 12 times from June 2016 to May 2017.

## 2.6 EXFOR Compilation Needs

**V. Semkova** presented progress in compilation of data related to various applications (*e.g.*, neutron sources, radioisotope production, ion beam analysis,  $\beta$ -delayed neutron spectra, neutron dosimetry, thermal cross sections, prompt fission neutron multiplicities and its distributions). The participants confirmed that there are still many articles for compilation. She also reported that she performed EXFOR completeness checking for neutron, proton, and alpha-induced data against NSR through an extended CINDA, and found 585 journal articles (13 for neutron-induced reaction, 129 for proton-induced reaction, 443 for alpha-induced reaction) for compilation.

**B. Lalremruata** reported that NDPCI has finalized EXFOR completeness checking for articles published in *Pramana* Vol. 1 (1973) to 63 (2004) and *Indian Journal of Pure and Applied Physics* Vol. 1 (1963) to 41 (2003). Centres were encouraged to scan the domestic journals published in their geographical areas in the past, and submit a list of the articles missing in EXFOR as performed by NDPCI for these Indian journals.

**B. Pritychenko** proposed compilation of data derived from other than the original experimentalists such as neutron-induced inelastic scattering gamma production cross sections derived by the Berkeley Group (A.M. Hurst et al.) from the corresponding gamma emission probabilities measured at the Nuclear Research Institute in Baghdad. **N. Otsuka** reminded the Conclusion 30 of the NRDC 2014 meeting “Data sets derived by other than the author are not for compilation in general, but may be compiled in another entry exceptionally when there is a strong need from EXFOR users and the derived data are well documented in a peer-reviewed journal with the derivation procedure.”, but also mentioned that we could be less strict if such data sets are compiled in a separate transmission series (*e.g.*, area V).

## 2.7 EXFOR Quality Control

**N. Otsuka** reported that Emmeric Dupont (CEA Saclay) went through the online JANIS Books (produced in March 2017) for gamma and light charged-particle (p, d, t,  $^3\text{He}$ ,  $\alpha$ ) induced reactions, and checked the source articles (when available) for the most obvious outliers. This is probably a first systematic assessment of outliers for non-neutron data, and the participants appreciated his effort. N. Otsuka also introduced a new tool checking HISTORY records of retransmitted entries

against those in the EXFOR Master File, and identifies HISTORY records disappeared during revision of the entries. He mentions this tool is useful to protect important alterations in the past (especially when two compilers revised an entry in parallel), and asked to record all important alterations under HISTORY.

**S. Takács** presented his assessment of EXFOR entries providing thick target radioisotope yields. He extracted 2204 REACITON codes with the parameter code TTY from the EXFOR Master File, and checked them against the improved coding rule and dictionaries for thick target radioisotope yields. He reported 1213 REACTION codes must be revised. He also recommended not compiling the measured yields when no proper information on the yield determination is available in the article and also from the authors.

**O. Cabellos** presented the NEA activities on verification of EXFOR performed in collaboration with Société de Calcul Mathématique (SCM). He reported that the SCM's methodology developed in 2016 (G. Breton, JEFF/DOC-1778) did not work in the resolved resonance region very well, and also reported that he plans to improve the situation by introducing a resolution function (e.g., Gaussian) for convolution of point-wise cross sections reconstructed from the evaluated resonance parameters before comparison with EXFOR cross sections.

**N. Otsuka** reported about the existence of several versions of neutron emission double differential cross sections measured at the Osaka University OKTAVIAN facility 14 MeV neutron source. He reported that they are not duplication but mainly due to three different sample geometries (ring geometry I+II and cylindrical geometry).

## 2.8 EXFOR Coding Rule

**S. Kopecky** presented derivation of resonance parameters from time-of-flight measurements. Following introductions of the observables (transmission, reaction yield), he discussed various models for experimental effects (e.g., broadening, sample inhomogeneity, multiple scattering, gamma attenuation, neutron sensitivity), and concluded that the modelling of such experimental effects are important for reliable determination of resonance parameters.

**N. Otsuka** introduced a problem for compilation of the reaction yield divided by the areal sample density (in barns). He reported that (1) this quantity has been reported by various facilities though its name depends on publication ("capture yield divided by sample thickness", "capture yield", "effective cross section", "experimental cross section"); (2) LEXFOR has asked compilers to compile this quantity as raw cross sections (,SIG,,RAW) historically; (3) SAMMY users tend to use "cross section" this is probably due to the way to specify this quantity in the SAMMY input file ("NORMALIZE AS CROSS Section rather than yield"). He demonstrated the "cross section" is not appropriate because of the strong sample thickness dependence of the quantity, and proposed to express this quantity by ,RYL,,DAD (RYL: reaction yield, DAD: divided by the areal density).

**B. Pritychenko** responded that none of the NNDC people understands such a quantity code, and it will break a few computer codes and also confuse physicists who will ignore these data sets.

**O. Schwerer** proposed a quantity code having the parameter code SIG with a modifier, and finally the participants adopted ,SIG,TTA for the quantity (TTA: thin target approximation).

**N. Otsuka** reported that the heading EN-RSL-HW has been often applied to energy spread specified by the author as half-width (HW) but not as half-width at half-maximum (HWHM) even though "HWHM" is included in the expansion of this heading. He proposed (1) to remove "HM" from the expansions of EN-RSL-HW and also EN-RSL-FW, and (2) to explain more details (e.g., at half-maximum) in free text under INC-SPECT (similar to the definition of an uncertainty heading under ERR-ANALYS). This proposal was accepted.

**O. Schwerer** introduced some problems in the current coding procedure for quantities specified with sample temperature. He proposed to introduce a new modifier TMP (at temperature other than the room temperature) replacing the existing parameter code TMP (temperature-dependent quantity). His proposal was accepted.

## 2.9 Tools for Compilation and Dissemination

**G. Pikulina** reported recent development of the EXFOR Editor. She demonstrated the improved REACTION input window and floating decimal point number processing.

**S. Taova** reported that the EXFOR booklet draft distributed in the last NRDC meeting was revised as per comments from some centres, and presented revised booklet as well as a poster.

**V. Zerkin** demonstrated a new tool for transformations of Web-ZVView outputs for validation of data digitized from distorted figure images. He also presented (1) recent development of “Exfor” web retrieval system, (2) EXFOR-NSR PDF database, and (3) web tools and software.

**B. Pritychenko** proposed to develop an EXFOR output (like the computational format) for fission yields, and the idea was supported by the participants. **O. Cabellos** stressed that the output should include not only the directly measured fission yields but also indirectly measured fission yields (e.g., by surrogate reaction). **Ge Zhigang** mentioned it would be appropriate to have an IAEA CRP for evaluation of fission yield data, and the participants agreed to recommend it to NDS.

**M. Mikhailiukova** presented a CD-ROM of BROND-3.1 for dissemination by the NRDC, and the participants appreciated the efforts made by her and Dmitry Voitenkov.

## 2.10 Other Business

**S. Ebata** reported development of a new theoretical nuclear reaction database based on microscopic models (e.g., three-dimensional Skyrme-Hartree-Fock+BCS model for description of the ground states). He presented some examples for proton and alpha elastic scattering angular differential cross sections as well as total reaction cross sections.

**B. Pritychenko** mentioned that an up-to-date Dictionary 3 (Institutes) could be useful as an extension of “Research Facilities in Nuclear Physics” (IUPAP Report 41) to provide a comprehensive list of nuclear physics institutions to the nuclear physics community. The participants were reminded that each centre is responsible to maintain institute codes belonging to their geographical areas up-to-date (i.e., change in the institute name due to reorganization).

**N. Kenzhebayev** presented progress in EXFOR compilation performed in collaboration with T. Zholdybayev (INP, Almaty) for the data measured in Kazakhstan. He reported that some numerical data sets published in 1980 on figures not suitable for digitization were discovered at INP, and compiled without digitization.

**N. Otsuka** reported major progress in compilation of time-of-flight spectra (transmissions, reaction yields) measured at n\_TOF and GELINA since the last NRDC meeting.

## 2.11 Closing

**N. Otsuka** proposed the dates and places for the next full NRDC meeting (Bahadurgarh, India, 1 to 4 May 2018) and next technical NRDC meeting (2nd quarter of 2019), and they were approved.

**O. Cabellos** and **N. Otsuka** made closing addresses. **O. Cabellos** and **V. Semkova** informed that

this is the last NRDC meeting for them, and their continuous dedication to the NRDC activity were thanked by the participants.





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## AGENDA

Tuesday, 23 May 2017

9:30 – 13:00

**1. Opening Items**

1.1	Welcome address	10 min		A. Koning
1.2	Self-introduction	10 min		All
1.3	Announcement	5 min		A. Oechs
1.4	Election of chairperson, adoption of the agenda, announcements	5 min		N. Otsuka

**2. Progress Reports**

2.1	NEA DB (Paris, France)	10 min	P2017-01	O. Cabellos
2.2	UkrNDC (Kyiv, Ukraine)	10 min	P2017-02	O. Gritzay
2.3	NDS (Vienna, Austria)	10 min	P2017-03	A. Koning
2.4	CDFE (Moscow, Russia)	10 min	P2017-04	V. Varlamov
2.5	CNPD (Sarov, Russia)	10 min	P2017-05	S. Taova
2.6	KNDC (Daejeon, Korea)	10 min	P2017-06	S.C. Yang
2.7	JCPRG (Sapporo, Japan)	10 min	P2017-07	M. Kimura
2.8	CJD (Obninsk, Russia)	10 min	P2017-08	M. Mikhailiukova
2.9	ATOMKI (Debrecen, Hungary)	10 min	P2017-09	S. Takács
2.10	NDPCI (Mumbai, India)	10 min	P2017-10	B. Lalremruata
2.11	CNDC (Beijing, China)	10 min		Ge Zhigang
2.12	NNDC (Upton, USA)	10 min		B. Pritychenko

*150 min*

14:00 – 18:00

**3. EXFOR General**

3.1	Transmission statistics	10 min	WP2017-02	V. Semkova
3.2	Scanning of new publications	10 min	WP2017-03	V. Semkova
3.3	Statistics of checking and finalization of the preliminary files	10 min	WP2017-04	V. Semkova
3.4	Status of new articles for EXFOR compilation (A1)	10 min	WP2017-05	N. Otsuka
3.5	Correction of entries in Feedback List (A2)	10 min	WP2017-06	N. Otsuka
3.6	EXFOR reference paper (A4)	10 min	WP2017-07	N. Otsuka
3.7	Other actions (A3, A5)	10 min	WP2017-01	Chairperson

**4. Manuals and Dictionary**

4.1	Modification on EXFOR Formats Manual, page 7.26 (CP-C/452)	10 min	WP2017-08	O. Schwerer
4.2	Update of EXFOR Formats Manual "STATUS" (CP-D/915)	10 min	WP2017-09	N. Soppera

4.3	Update of EXFOR/CINDA Dictionary Manual for Dict.227 (CP-D/917)	10 min	WP2017-10	N. Otsuka
4.4	Possible changes in independent variable family flags for better checking (A11)	10 min	WP2017-11	N. Otsuka
4.5	Pelletron – VDG or VDG? (CP-D/922)	10 min	WP2017-12	N. Otsuka
4.6	Dictionary 23 (Analyses) – RFN (CP-D/931)	10 min	WP2017-13	N. Otsuka
4.7	Mass yield: MAS,FY and SEC,FY (CP-D/929)	10 min	WP2017-14	O. Schwerer
4.8	Other actions (A6-A10)	10 min	WP2017-01	Chairperson
<b>5</b>	<b>CINDA</b>			
5.1	Status of CINDA database (A12)	10 min	WP2017-15	V. Zerkin

*160 min*

### Wednesday, 24 May 2017

**9:00 – 13:00**

#### **6 EXFOR Compilation Needs**

6.1	Compilation of articles with priority (A13-A22, A24-A29)	10 min	WP2017-16	V. Semkova
6.2	EXFOR completeness checking for n-, p- and alpha-induced data against NSR through extended CINDA	20 min	WP2017-17	V. Semkova
6.3	EXFOR Completeness checking for articles published in PRM and IPA (CP-D/910)	10 min	WP2017-18	B. Lalremruata
6.4	Creation and revision of entries for thermal neutron constants (4C-3/405)	10 min	WP2017-19	N. Otsuka
6.5	EXFOR data sets for standard evaluations (A30, 4C-3/409)	10 min	WP2017-20	N. Otsuka
6.6	Proposal for the compilation of complementary data re-analyses (CP-C/456)	10 min	WP2017-21	B. Pritychenko
6.7	Other actions (A23, A31-A37)	10 min	WP2017-01	Chairperson

#### **7 EXFOR Quality Control**

7.1	Pending duplications (A51, A60)	10 min	WP2017-22	N. Otsuka
7.2	Pending corrections (A38-A43, A45-A46, A49-A50, A53-A55)	10 min	WP2017-23	N. Otsuka
7.3	Recommended resonance integrals in EXFOR V1001 and V1002 (A52, CP-D/924)	10 min	WP2017-24	N. Otsuka

7.4	Outliers in JANIS Books for gamma and charged particle cross sections (CP-D/926)	10 min	WP2017-25	N. Otsuka
7.5	Disappeared HISTORY records (CP-D/927)	10 min	WP2017-26	N. Otsuka
7.6	Template for reporting activation measurements at the CRP on Neutron Activation Analysis	10 min	WP2017-27	A. Trkov
7.7	Review of REACTION codes for thick target radioisotope yields (CP-D/933)	20 min	WP2017-28	S. Takács

*160 min*

**14:00 – 18:00**

**7 EXFOR Quality Control (cont.)**

7.8	Checking EXFOR data in the resolved resonance region	20 min		O. Cabellos
7.9	Other actions (A44, A47-A48, A56-A59, A61-A62)	10 min		Chairperson

**8 EXFOR Coding Rule**

8.1	Derivation of resonance parameters from time-of-flight measurements	30 min		S. Kopecky
8.2	Reaction yield divided by areal density (4C-3/406)	20 min	WP2017-29	N. Otsuka
8.3	Correction of capture data from the ORELA 40 m flight station (4C-3/407)	20 min	WP2017-30	N. Otsuka
8.4	Headings for incident projectile energy resolution (CP-D/932)	20 min	WP2017-31	N. Otsuka
8.5	PTE volume correction list (A64, 4C-4/214)	10 min	WP2017-32	M. Mikhailiukova
8.6	Update of EXFOR Formats Manual "REFERENCE" (A65, CP-D/920)	10 min	WP2017-33	N. Otsuka
8.7	Coding rules for reports: IAEA report, distribution code (CP-D/912)	10 min	WP2017-34	N. Otsuka
8.8	Indication of quantities at other than the room temperature - TMP (CP-D/928)	10 min	WP2017-35	O. Schwerer
8.9	Other actions (A63, A66-A67)	10 min	WP2017-01	Chairperson

*170 min*

**19:00 –**

Social dinner (Gigerl – der Stadtheurige, Rauhensteingasse 3/Blumenstockgasse 2, 1010 Wien)

**Thursday, 25 May 2017**  
Austrian holiday (Christi Himmelfahrt)

**9:00 – 18:00**

**9 Software and Dissemination**

9.1	Coding of nuclear reactions under the EXFOR rules	20 min	WP2017-36	G. Pikulina
9.2	Transformations of plots produced by Web-ZVView using 2D-calibration for checking result of digitization	20 min	WP2017-Z1	V. Zerkin
9.3	Improvements of EXFOR checking code ZCHEX (A70)	10 min	WP2017-Z2	V. Zerkin
9.4	Coding covariance data in EXFOR according the new format (A72-A73)	10 min	WP2017-Z3	V. Zerkin
9.5	Recent development of "Exfor" Web retrieval system, EXFOR-NSR PDF database, Web tools and software	60 min		V. Zerkin
9.6	Other actions (A68-A69, A71, A74-A88)	10 min	WP2017-01	Chairperson

**10 Other items**

10.1	Theoretical nuclear reaction database based on microscopic calculations	30 min	WP2017-37	S. Ebata
10.2	Proposal for the extended EXFOR list of nuclear physics institutions (CP-C/455)	10 min	WP2017-38	B. Pritychenko
10.3	Fission yield evaluation	10 min		B. Pritychenko
10.4	Progress in compilation of experimental data from Central Asia	10 min	WP2017-39	N. Kenzhebayev
10.5	Progress in compilation of data measured by TOF facilities	10 min		N. Otsuka

*180 min*

**Friday, 26 May 2017**

**9:00 – 13:00**

**11. Closing**

11.1	Dates and places of next meetings	10 min		N. Otsuka
11.2	Review of actions and conclusions	60 min		Chairperson
11.3	Closing address	10 min		



## CONCLUSIONS AND ACTIONS

### Conclusions

#### General

- C1 The next full NRDC meeting will be held in Bahadurgarh, India from 1 to 4 May 2018. (N.B. the 2018 WPEC meeting will be from 14 to 18 May.)
- C2 The next technical NRDC meeting will be held in Vienna, Austria in the 2nd quarter of 2019.
- C3 The NRDC congratulates on CNPD's 20 years of dedication to the NRDC activity through compilation of charged-particle induced reaction data as well as compilation software development.

#### EXFOR General

- C4 Centres must check periodically the list of the outstanding articles maintained by NDS ("Article Allocation List"), and inform NDS necessary updates (e.g., assignment of an entry number, article not for compilation, article for compilation by another centre).
- C5 CNPD, JAEA NDS and UkrNDC perform their responsibility for scanning of new publications regularly (WP2017-03).
- C6 Centres must finalize preliminary tapes as soon as the required period for comments elapses (one month). In case of disagreement with the proposed corrections the centres shall try to clarify the situation and resolve the issues (WP2017-04).

#### Manuals and Dictionary

- C7 Revisions of the EXFOR Formats Manual Chapter 7 "REFERENCE" proposed in CP-C/452=WP2017-08 and CP-D/920=WP2017-33 were approved.
- C8 Revision of the EXFOR Formats Manual Chapter 7 "STATUS" proposed in CP-D/915 =WP2017-09 was approved.
- C9 Revision of the EXFOR/CINDA Dictionary Manual "Dictionary 227" proposed in CP-D/917 =WP2017-10 was approved.
- C10 A new facility code is not necessary for Pelletrons. Single ended and tandem types of Pelletrons will be coded by VDG and VDG<sub>T</sub>, respectively, as proposed in CP-D/922 = WP2017-12.

- C11 The analysis code RFN (R-function formalism) will be obsolete. The R-function formalism is a special case of the Reich-Moore formalism as summarized in CP-D/931 = WP2017-13, and the resonance parameters derived from this formalism must be coded with RM (Reich-Moore formalism) in REACTION SF8.
- C12 The branch code MAS (total mass) and the quantity codes having this branch code will be obsolete. The mass fission yield (MAS,FY) and secondary fission yield (SEC,FY) are the same quantity as discussed in CP-D/929=WP2017-14.
- C13 An up-to-date Dictionary 3 (Institutes) could be useful to provide a list of nuclear physics institutions to the nuclear physics community (CP-C/455=WP2017-38).
- C14 Centres are responsible to maintain the explanations of the institute codes belonging to their geographical areas up-to-date.

### **EXFOR Compilation Needs**

- C15 Centres are encouraged to scan the domestic journals published in their geographical areas in the past, and to submit a list of the articles missing in EXFOR as done by NDPCI for Indian journals (CP-D/910=WP2017-18).
- C16 Compilation of data derived by other than the author (REACTION SF9=DEROT) could be useful as long as they are kept under a specialized area (e.g., area V) and the data are published with the procedure to obtain them.

### **EXFOR Quality Control**

- C17 The NRDC appreciates Emmeric Dupont for his systematic assessments of the outliers observed in the JANIS Book for photon and light charged-particle induced reaction cross sections in EXFOR presented in CP-D/926 (=WP2017-25).
- C18 Compilers are reminded to keep all important alterations (History code A) under the HISTORY records of the affected data subentries.

### **EXFOR Coding Rule**

- C19 The reaction yield divided by areal density (4C-3/406=WP2017-29) will be coded by the quantity code ,SIG,,TTA.
- C20 HM (half-maximum) will be deleted from the expansions of EN-RSL-HW and EN-RSL-FW and their derivatives, and their details will be explained in free text under INC-SPECT as proposed in CP-D/932 = WP2017-31.

- C21 (1) If there is an INDC report number for a report coded under REFERENCE, it must be always coded. (2) When a report has two or more report numbers, the primary report number must be always coded. (3) Compilers should keep a uniform style within a series. Compilers are recommended to omit insignificant symbols such as distribution codes if these are not needed to identify a report (e.g., INDC reports).
- C22 The parameter code TMP (temperature-dependent quantity) will be obsolete. Temperature dependent quantities will be indicated by the modifier TMP as proposed in CP-D/928=WP2017-35.

### **Evaluated Data Libraries**

- C23 The NRDC recommends NDS a future CRP for evaluation of fission yield data.
- C24 The NRDC has received BROND-3.1 from CJD for dissemination. NRDC appreciate efforts of Marina Mikhailukova and Dmitry Voitenkov.

### **Tools for Compilation and Dissemination**

- C25 An improved REACTION input window and updated floating decimal point number processing are implemented in the EXFOR-Editor Ver.3.1.
- C26 A new tool for transformations of Web-ZVView outputs was developed for validation of data digitized from distorted figure images (WP2017-Z1).
- C27 Centres should cooperate in EXFOR web dissemination and development (e.g., the EXFOR web system developed by NDS in close cooperation with NNDC.)
- C28 The NRDC supports further collection of EXFOR pdf files.
- C29 Centres are encouraged to make their library resources (e.g., laboratory reports) public. NDS will draft corresponding letters, if necessary.
- C30 Centres are encouraged to publish numerical data received from the authors as an INDC report so that EXFOR users have access the materials provided by the authors.
- C31 Submission of EXFOR promotion materials (booklet and poster) prepared by CNPD was appreciated by the NRDC.
- C32 An EXFOR output (like the computational format) for directly measured and indirectly measured (e.g., by a surrogate reaction) fission yields could be useful.

## Actions

### EXFOR General

- A1 All (Standing action) Give the highest priority to compilation of new articles.
- A2 All (Standing action) Correct erroneous entries listed on the EXFOR Feedback List according to the indicated priorities. All urgent corrections must be done by the next meeting.
- A3 Otsuka Revise the initial draft of the table of contents for the EXFOR reference paper (WP2017-07) as per the comments from the centres.
- A4 All Propose Otsuka by the end of 2017 (1) corrections and additions to the initial draft of the table of contents for the EXFOR reference paper (WP2017-07), and also (2) topics to which the centre will be responsible.

### Manuals and Dictionaries

- A5 Otsuka (Continuing action) Update Dictionaries every four months.
- A6 Otsuka (Continuing action) Revise the EXFOR Formats Manual for (1) "DECAY-DATA" and "RAD-DET" (CP-D/874=WP2016-28), (2) "Reaction specification" (CP-D/880 Rev.=WP2016-29, CP-D/896=WP2016-33), (3) "LEVEL-PROP" (CP-D/882=WP2016-30), (4) "ERR-ANALYS" (CP-D/894 Rev.=WP2016-32), (5) "FACILITY" (CP-D/899=WP2016-34), (6) "REFERENCE" (CP-C/452=WP2017-08, CP-D/920=WP2017-33), (7) "STATUS" (CP-D/915=WP2017-09), (8) "INC-SPECT" (CP-D/932=WP2017-31).
- A7 Otsuka (Continuing action) Revise LEXFOR for (1) "Thermal Neutron Scattering" (4C-3/403 =WP2016-08), (2) "Fission Yields" (CP-D/895=WP2016-09), (3) "Thick- and thin-target yields" (CP-D/893=WP2016-31), (4) "Isomeric flags" (CP-D/896=WP2016-33), (5) "Status" (CP-D/904=WP2016-35, CP-C/443=WP2016-36), (6) "Sample" (CP-D/928=WP2017-35).
- A8 Otsuka Revise the EXFOR/CINDA Dictionary Manual for the contents of the dictionary 227 (CP-D/917=WP2017-10).
- A9 Otsuka Submit a revision of LEXFOR "Multilevel Resonance Parameters" to clarify the relation of the R-function formalism and Reich-Moore formalism (CP-D/931=WP2017-13).

- A10 Otsuka Submit a revised EXFOR Formats “Reference” according to Conclusion 10 (Coding of INDC report number and primary report number etc. See also CP-D/912=WP2017-34).
- A11 Otsuka Check if all typical combinations of the fields and subfields are provided as examples in the EXFOR Formats Manual “REFERENCE”.
- A12 Zerkin (Continuing action) Summarize the role of family flags (also known as family codes, c.f. EXFOR Formats Manual Chapter 6) in systems (c.f. WP2017-11).
- A13 Soppera Check if there is a field or subfield which cannot be uniquely identified within the current coding rule described in the revised EXFOR Formats Manual “REFERENCE” (CP-D/920=WP2017-33).

## **CINDA**

- A14 Zerkin (Continuing action) Export EXFOR and NSR to CINDA, and distribute it to other Centres every month.

## **EXFOR Compilation Needs**

(Underlined items are registered in the Article Allocation List.)

- A15 Cabellos (Continuing action) Compile articles published in JINR Rapid Communication (KSO) and Phys. Part. Nucl. Lett. (PPN/L) and listed in CP-D/858.
- A16 Mikhailiukova (Continuing action) Compile the thermal neutron-induced reaction data cited in Mughabghab’s “Atlas of Neutron Resonances” and listed in 4C-4/212=WP2016-15.
- A17 Pritychenko (Continuing action) Compile with priority articles related to the neutron dosimetry cross sections listed in the second table of CP-D/838.
- A18 Pritychenko (Continuing action) Assess the articles reporting keV neutron capture cross section entries listed in CP-D/740, and add these articles with necessary revisions with priority.
- A19 Pritychenko Compile articles for thermal neutron constants listed in 4C-3/405=WP2017-19.
- A20 Chen  
Ebata  
Pritychenko (Continuing action) Compile with priority the neutron source spectra listed in CP-D/700 (Rev.3).

<u>A21</u>	Cabellos Ebata Pritychenko Taova	(Continuing action) Compile with priority the proton-induced isotope production cross sections listed in CP-D/725 Rev. (~WP2012-19). Notify Semkova if the assigned centre does not compile the high energy ( $E > 1$ GeV) data in the list.
<u>A22</u>	Ebata Pritychenko Taova	(Continuing action) Compile with priority the light charged-particle induced isotope production cross sections listed in CP-D/757. Notify Semkova if the assigned centre does not compile the high energy ( $E > 1$ GeV) data in the list.
<u>A23</u>	Cabellos Chen	(Continuing action) Compile with priority the articles cited in the NACRE II (an update and extension of European Compilation of Reaction Rates for Astrophysics) listed in Tables 1 and 2 of CP-D/833.
<u>A24</u>	Cabellos Chen Taova	(Continuing action) Compile with priority the articles related to ion beam analysis application listed in CP-D/832 Rev.
<u>A25</u>	Cabellos Mikhailiukova Pritychenko	(Continuing action) Compile the thermal neutron-induced reaction data cited in Mughabghab's "Atlas of Neutron Resonances" and listed in 4C-3/395.
<u>A26</u>	Chen Pritychenko	(Continuing action) Compile with priority prompt fission neutron multiplicity distributions listed in CP-D/867.
<u>A27</u>	Cabellos Mikhailiukova Pritychenko	(Continuing action) Compile with priority prompt fission neutron multiplicities listed in CP-D/871.
<u>A28</u>	Cabellos Ebata Gritzay Pritychenko	(Continuing action) Compile articles presented in Reactor Dosimetry Symposia listed in 4C-3/400=WP2016-16.
<u>A29</u>	Cabellos Pritychenko	(Continuing action) Compile thermal neutron data cited by Axton and listed in 4C-3/402 =WP2016-18.
<u>A30</u>	Cabellos Mikhailiukova Pritychenko	(Continuing action) Compile thermal neutron scattering data listed in 4C-3/404= WP2016-19.
A31	Lalremruata	Compile old Indian articles published in Pramana and Ind. J. Pure and Applied Phys. listed in Memo CP-D/910=WP2017-18.
A32	Pritychenko	Compile Tables 1 and 2 of J.W. Meadows, C, 70ANL., 129, 1970 which supersedes EXFOR 10148.002 and 003 (4C-3/409=WP2017-20).

- A33 Pritychenko (Continuing action) Monitor availability of P.E. Koehler's time-of-flight spectra on DVDs received from ORELA in 2015 for EXFOR compilation.
- A34 Pritychenko Monitor availability of the  $^{235}\text{U}(n,f)$  prompt fission neutron spectra in EXFOR 13982.002 (P. Staples) corrected for the sample size effect.
- A35 Pritychenko Compile  $^{238}\text{U}(n,f)$  cross sections in Table 4.6 of Zchariah W. Miller's thesis (Univ. of Kentucky, 2015) once they are published.
- A36 Semkova Finalize the list of the journal articles for proton and alpha-induced reactions in NSR but not in EXFOR (WP2017-17). N.B. It was done for neutron induced reactions in Memo 4C-3/412.
- A37 Cabellos  
Otsuka Receive the experimental fission product yield data collected by Robert Mills. Identify the numerical data sets missing in EXFOR once they are received.
- A38 Cabellos  
Pritychenko (Continuing action) Perform EXFOR completeness checking for the list of articles (4C-3/401, articles cited in S. Mughabghab's "Atlas of Neutron Resonances") to identify articles missing in EXFOR, and assign responsibility of compilation of the identified articles to centres by a memo.
- A39 Cabellos  
Mikhailiukova  
Pritychenko (Continuing action) Summarize typographical mistakes of bibliography in Mughabghab's atlas, and send it to S. Mughabghab.
- A40 Cabellos  
Otsuka (Continuing action) Monitor communications among evaluators (e.g., CIELO mailing lists), and try to receive tabulated experimental data from evaluators who have their own internal database.
- A41 Kenzebayev (Continuing action) Scan domestic publications (e.g., journals, laboratory reports) to identify articles for EXFOR compilation.
- A42 Gritzay (Continuing action) Consider compilation of neutron spectra for filtered neutrons published in the last 10 years.

### **EXFOR Quality Control**

(Underlined items are registered in the EXFOR Feedback List.)

- A43 Mikhailiukova (Continuing action) Add English translation information of Atomnaya Energiya under the keyword REFERENCE as listed in WP2011-26.

- A44 Mikhailiukova (Continuing action) Add English translation information of Yadernaya Fizika under the keyword REFERENCE as listed in WP2012-24.
- A45 Mikhailiukova (Continuing action) Add English translation information of Yadernye Konstanty under the keyword REFERENCE as listed in Tables 1 and 2 of CP-D/777.
- A46 Mikhailiukova (Continuing action) Add English translation information of Zhurnal Eksp. Teoret. Fiziki (incl. Pis'ma v Redaktsiyu) under the keyword REFERENCE as listed in CP-D/809.
- A47 Mikhailiukova (Continuing action) Add English translation information of Izvestiya Rossiiskoi Akademii Nauk, Seriya Fizicheskaya under the keyword REFERENCE as listed in CP-D/847.
- A48 Mikhailiukova Supersede 41013.003 by 41013.004. Also supersede 41013.004 by 22304.002 and 006 (4C-3/409=WP2017-20).
- A49 Semkova Supersede 30558.002 by 22304.002, and 30559.002 by 22304.006 (4C-3/409=WP2017-20).
- A50 Pritychenko Look for the original value corresponding 12576.003 which provides a value renormalized by NNDC. If the original value is available, compile it and link it with 12576.003 by STATUS=OUTDT and RNORM. If the original value is no longer available, consider using free text instead of RNORM. (CP-D/841 Rev.=WP2014-45).
- A51 Pritychenko Add three values in Table XII of P,WASH-1018,63,1959 to EXFOR 12185 which must be linked with 12185.004, 006 and 007 (values renormalized at NNDC) by STATUS=OUTDT and RNORM (CP-D/841 Rev.=WP2014-45).
- A52 Pritychenko (Continuing action) Explain availability of the neutron spectra of the ISNF facility compiled in the IRDF-2002 library under the keyword COMMENT of 13153.001 as compiler's comments.
- A53 Pritychenko Replace the data type code DERIV with DEROT in 14329.163 to 165. Move these subentries to an area Ventry, and submit its draft to NDS (see the coding sample in LEXFOR "Data Type").
- A54 Cabellos Correct data sets compiling neutron production cross sections measured at OKTAVIAN as summarized in Table 2 of 4C-3/408.
- A55 Cabellos (Continuing action) Add target thickness as coded information in the data sets listed in CP-D/878=WP2016-07.  
Mikhailiukova  
Pritychenko



<u>A56</u>	Ebata Mikhailiukova Pritychenko Semkova	(Continuing action) Correct half-lives and isomeric flags listed in Memo CP-D/888 =WP2016-25.
<u>A57</u>	Pritychenko Semkova Takács Taova	Correct data sets identified as outliers on JANIS Books for gamma and charged particle cross sections (CP-D/926=WP2017-25).
<u>A58</u>	Taova	(Continuing action) Delete EXFOR A0320 (all) and F0160 (all) which are duplicated entries summarized in WP2016-20.
A59	Pritychenko Semkova	Revise EXFOR entries compiling data sets from ORELA 40 m flight station listed in the Appendix of 4C-3/407=WP2017-30 by (1) addition of the corrigendum under REFERENCE of the common subentry, (2) addition of STATUS=OUTDT to each data subentry with the correction factor in free text.
A60	Cabellos Mikhailiukova	(Continuing action) Try to add numerical data which are not superseded (SPSDD) but still unobtainable (UNOBT) for neutron-induced reaction data published in old literature for $^1\text{H}$ , $^{16}\text{O}$ , $^{56}\text{Fe}$ , $^{235}\text{U}$ , $^{238}\text{U}$ and $^{239}\text{Pu}$ .
A61	Cabellos	(Continuing action) Assess if REACTION of 22077.014, 029 and 044 can be improved as proposed in the table of CP-D/813 (Rev.2).
A62	Cabellos Soppera	(Continuing action) Provide a list of erroneous and suspicious outliers by using various statistical approaches (c.f. WP2011-17, WP2013-19).
A63	Otsuka	Submit a revised Memo CP-D/933=WP2017-28 by addition of the remark to each subentry from Takács.
A64	All	Revise the REACTION codes of the thick target considering the changes proposed in Appendix of CP-D/933=WP2017-28 once the subentries for revisions are registered in the EXFOR Feedback List. Consult the proposed change with Takács when necessary. A draft of the revised entry is available from Otsuka.
A65	Cabellos	Check the p-n scattering data set in EXFOR 22207.002 (G. Fink) against G. Fink's thesis (e.g., reference frame – lab or c.m.).
A66	Cabellos	(Continuing action) Provide JANIS–TRANS Checker Log list on every preliminary TRANS-file. (+ bibliography checking and typo)

- A67 Soppera (Continuing action) Provide JANIS Import Log created from the EXFOR Master File to Otsuka on a regular basis.
- A68 Otsuka (Continuing action) Assess the JANIS Import Log provided by Soppera as above, and register important errors to the EXFOR Feedback System.
- A69 Cabellos (Continuing action) Inform Division of Nuclear Science of NEA the mistake in SINBAD NEA-1552/14 (CP-D/883=WP2016-24).

### EXFOR Coding Rule

- A70 Mikhailiukova (Continuing action) Submit a memo summarizing entries where the year of publication coded in the volume field must be deleted due to absence of the volume number in the journal other than PTE.
- A71 Cabellos  
Mikhailiukova (Continuing action) Check whether the current description of the eta value in LEXFOR defines the quantities compiled in entries listed in CP-D/789 (Rev.) (*e.g.*, whether the denominator is absorption cross section or non-elastic scattering cross section) in cooperation with Lee and Otsuka.
- A72 Otsuka (Continuing action) Assess if coding rule of resonance parameters of reaction product is technically possible (CP-D/632=WP2016-27).
- A73 Otsuka Propose a revised rule for compilation of the data derived by other than the author not published in peer-reviewed journals.

### Tools for Compilation and Dissemination

- A74 Otsuka (Continuing action) Provide EXFOR News for every EXFOR Master File.
- A75 Soppera (Continuing action) Continue development and testing of the JANIS –TRANS Checker in cooperation with NDS and the other centres.
- A76 Zerkin (Continuing action) Update ZCHEX based on comments from compilers (*e.g.*, WP2011-36).
- A77 All (Continuing action) Provide feedback to NDS on the existing ZCHEX version (on bugs as well as desired additions.). Bugs must be reported with sample entries which are checked and not checked properly by ZCHEX.

- A78 Zerkin (Continuing action) Prepare examples of coding of covariance data for all EXFOR Entries having authors' covariances, and offer them to Data Centres according to Areas for finalizing and submitting to the database.
- A79 All (Continuing action) Finalize and submit EXFOR entries including covariance data provided by Zerkin (WP2017-Z3).
- A80 Zerkin (Continuing action) Continue development of the EXFOR upload web tool.
- A81 Zerkin (Continuing action) Every four months produce an EXFOR distribution with (a) full Dictionary distribution; (b) EXFOR in C4 and XC4 format; (c) Dictionaries in MS Access; (d) X4Map.
- A82 Zerkin (Continuing action) Distribute the program package including a standalone platform independent program to generate X4+ from a standalone EXFOR entry.
- A83 All (Continuing action) Consider to use the X4+ format for author approval, and also send feedback to Zerkin.
- A84 Zerkin (Continuing action) Continue development of a new database encompassing correction factors and relevant comments for suspect/erroneous data (X4-evaluated) presented in WP2010-19; keep NRDC informed about conclusions of discussions on new database.
- A85 Zerkin Pritychenko (Continuing action) Continue translation from EXFOR to NSR.
- A86 All (Continuing action) Provide Zerkin a list of name aliases to improve the search of EXFOR entries by the author name (WP2014-53).
- A87 Zerkin (Continuing action) Introduce flags to indicate articles published in conference proceedings and the data are not available from the authors on the EXFOR Compilation Control System web page.
- A88 Zerkin Consider translation of fission yields in EXFOR to a C4-like format in consultation with A. Trkov and B. Pritychenko.
- A89 JCPRG (Continuing Action) Continue development and testing of GSYS in cooperation with NDS and other centres, taking into account compilers' remarks.
- A90 All (Continuing Action) Provide JCPRG feedback on GSYS.

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|-----|-------------------------------------|---|
| A91 | Otsuka                              | (Continuing Action) Support update of the Japanese editor (HENDEL) as time permits.   |
| A92 | CNPD                                | (Continuing Action) Continue development and testing of the EXFOR-Editor and InpGraph in cooperation with NDS and other data Centres, taking into account compilers' remarks. |
| A93 | All                                 | (Continuing Action) Provide CNPD feedback on EXFOR-Editor and InpGraph.   |
| A94 | Zerkin<br>Pikulina<br>Chen<br>JCPRG | Study problems in 2D calibration of original pictures, and process of approval of results of digitizing using plotting facilities.  |
| A95 | All                                 | Provide Taova feedback on the booklet for promotion of EXFOR prepared by CNPD by the end of 2017.   |
| A96 | Bhattacharyya                       | Demonstrate the EXFOR-I editor in the NRDC 2018 meeting.  |
| A97 | Cabellos                            | Make available on the NEA Data Bank web site the EANDC and NEANDC reports compiled in EXFOR and not available as INDC reports.  |

## LIST OF PROGRESS REPORTS

<b>Number</b>	<b>Title</b>	<b>Presented by</b>
P2017-01	NEA Data Bank progress report 2016-2017	O. Cabellos
P2017-02	Ukrainian Nuclear Data Centre progress report, 2016/17	O. Gritzay
P2017-03	IAEA Nuclear Data Section: Progress report for period 2016/17	A. Koning
P2017-04	The CDFE photonuclear data compilation and evaluation activity. 2016/2017 progress Report	V. Varlamov
P2017-05	Center of Nuclear Physics Data (CNPd), RFNC-VNIIEF	S. Taova
P2017-06	Nuclear Data Center (NDC) of KAERI	S.C. Yang
P2017-07	Japan Nuclear Reaction Data Centre (JCPRG) progress report	S. Ebata
P2017-08	CJD progress report for NRDC 2017 Technical Meeting	M. Mikhailiukova
P2017-09	Progress report 2017	S. Takács
P2017-10	NDPCI Progress report: Nuclear data activities in India 2016-2017	B. Lalremruata

Note: These progress reports are available online: [http://www-nds.iaea.org/nrdc/nrdc\\_2017/](http://www-nds.iaea.org/nrdc/nrdc_2017/).



## LIST OF WORKING PAPERS

Number	Title	From
WP2017-01	Conclusions and action of the 2016 NRDC Meeting	
WP2017-02	Transmission statistics	V. Semkova
WP2017-03	Scanning of new publications	V. Semkova
WP2017-04	Statistics of checking and finalization of the preliminary files	V. Semkova
WP2017-05	Status of new articles for EXFOR compilation (A1)	N. Otsuka
WP2017-06	Correction of entries in Feedback List (A2)	N. Otsuka
WP2017-07	EXFOR reference paper (A4)	N. Otsuka
WP2017-08	Update of EXFOR Formats Manual, Page 7.26 (CP-C/452)	O. Schwerer
WP2017-09	Update of EXFOR Formats Manual "STATUS" (CP-D/915)	N. Soppera
WP2017-10	Update of EXFOR/CINDA Dictionary Manual - Dict.227 (CP-D/917)	N. Otsuka
WP2017-11	Possible changes in independent variable family flags for better checking (A11)	N. Otsuka
WP2017-12	Pelletron - VDG or VDGT? (CP-D/922)	N. Otsuka
WP2017-13	Dictionary 23 (Analyses) - RFN (CP-D/931)	N. Otsuka
WP2017-14	Mass yield: MAS,FY and SEC,FY (CP-D/929)	O. Schwerer
WP2017-15	Status of CINDA database (A12)	V. Zerkin
WP2017-16	Compilation of articles with priority (A13-A22,A24-A29)	V. Semkova
WP2017-17	EXFOR completeness checking for n-, p- and alpha-induced data against NSR through extended CINDA	V. Semkova
WP2017-18	Completeness checking for articles published in PRM and IPA (CP-D/910)	B. Lalremruata
WP2017-19	Creation and revision of entries for thermal neutron constants (4C-3/405)	N. Otsuka
WP2017-20	EXFOR data sets for neutron standard evaluation (A30;4C-3/409)	N. Otsuka

WP2017-21	Proposal for the compilation of complementary data re-analyses (CP-C/456)	B. Pritychenko
WP2017-22	Pending duplication (A51,A60)	N. Otsuka
WP2017-23	Pending corrections (A38-A43,A49,A53-A55)	N. Otsuka
WP2017-24	Recommended resonance integrals in EXFOR V1001 and V1002 (A52;CP-D/924)	N. Otsuka
WP2017-25	Outliers in JANIS Books for gamma and charged particle cross sections (CP-D/926)	N. Otsuka
WP2017-26	Disappeared HISTORY records (CP-D/927)	N. Otsuka
WP2017-27	Template for reporting activation measurements at the CRP on Neutron Activation Analysis	A. Trkov
WP2017-28	Review of REACTION codes for thick target radioisotope yields (CP-D/933)	S. Takacs
WP2017-29	Reaction yield divided by areal density (14324 in PRELIM.1420) (4C-3/406)	N. Otsuka
WP2017-30	Correction of capture data from the ORELA 40 m flight station (4C-3/407)	N. Otsuka
WP2017-31	Headings for incident projectile energy resolution (EN-RSL etc.) (CP-D/932)	N. Otsuka
WP2017-32	PTE volume correction list (A64;4C-4/214)	M. Mikhailiukova
WP2017-33	Update of EXFOR Formats Manual "REFERENCE" (A65;CP-D/920)	N. Otsuka
WP2017-34	Coding rules for reports: IAEA report, distribution code (CP-D/912)	N. Otsuka
WP2017-35	Indication of quantities at other than the room temperature (TMP) (CP-D/928)	O. Schwerer
WP2017-36	Quick-start tutorials for EXFOR-EDITOR and INPGRAPH	G. Pikulina
WP2017-37	Theoretical nuclear reaction database based on microscopic calculations	S. Ebata
WP2017-38	Proposal for the extended EXFOR list of nuclear physics institutions (CP-C/455)	B. Pritychenko
WP2017-39	Progress in compilation of experimental data from Central Asia	N. Kenzhebayev
WP2017-Z1	Transformations of plots produced by Web-ZVView using 2D-calibration for checking result of digitization (See also WP2017-Z1a)	V. Zerkin
WP2017-Z2	Improvements of EXFOR checking code ZCHEX	V. Zerkin
WP2017-Z3	Coding covariance data in EXFOR according the new format	V. Zerkin

Note: These working papers are available online: [http://www-nds.iaea.org/nrdc/nrdc\\_2017/](http://www-nds.iaea.org/nrdc/nrdc_2017/)



## LIST OF PRESENTATIONS

<b>TITLE</b>	<b>Presented by</b>
NEA Data Bank progress report 2016-2017	O. Cabellos
Ukrainian Nuclear Data Centre progress report 2016/17	O. Gritzay
IAEA Nuclear Data Section: Progress report 2016/2017	A. Koning
The CDFE photonuclear data compilations and evaluation activity - 2016/2017 Progress Report	V. Varlamov
Center of Nuclear Physics Data: Status report to the NRDC Meeting	S. Taova
KNDC progress report	S.C. Yang
JCPRG progress report	M. Kimura
Progress report of Nuclear Reaction Data Group at ATOMKI 2017	S. Takács
2016/17 Status report of China Nuclear Data Center	Ge Zhigang
NDPCI Progress report: Nuclear Data Activities in India 2016-2017	B. Lalremruata
Nuclear reaction compilation and web dissemination efforts in the area #1	B. Pritychenko
A few words on EXFOR publications	B. Pritychenko
Checking RRR in EXFOR	O. Cabellos
Derivation of resonance parameters from time-of-flight measurements	S. Kopecky
Reaction yield divided by areal density	N. Otsuka
Prelim 1420, Entry 14324	B. Pritychenko
Heading for incident projectile energy resolution	N. Otsuka
Review of REACTION codes for thick target radioisotope yields	S. Takács
Coding of nuclear reactions under the EXFOR rules	G. Pikulina
Recent development of "Exfor" Web retrieval system, EXFOR-NSR PDF database, Web tools and software	V. Zerkin

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Theoretical nuclear reaction database based on the microscopic calculations	S. Ebata
A few words on EXFOR fission yields	B. Prityhcnko
Progress in compilation of experimental data from Central Asia	N. Kenzhebayev
Progress in TOF spectra compilation	N. Otsuka

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Note: These presentations are available online: [http://www-nds.iaea.org/nrdc/nrdc\\_2017/](http://www-nds.iaea.org/nrdc/nrdc_2017/).



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