IAEA Nuclear Data Section: Progress Report for period 2016/17
Summary of Nuclear Data Activity by Staff of the IAEA Nuclear Data Section
June 2016 – April 2017

IAEA Technical Meeting, 23-26 May 2017
Vienna, Austria

Web: https://www-nds.iaea.org/
E-mail: nds.contact-point@iaea.org

1.   Staff Changes

The authorized staff level of the Nuclear Data Section (NDS) consists of a total of 16.25 professionals and support staff. The latest staff changes include:

- Kira Nathani (Team Assistant) was in a temporary reassignment in Publishing Section from 1 October 2016 to 1 May 2017.

- Stanislav Simakov (Head of Nuclear Data Services Unit) retired on 31 January 2016.

- Bas Braams (Head of Nuclear Data Services Unit) retired on 30 November 2016.

- Jean-Christophe Sublet joined on 19 March 2017 as Head of Nuclear Data Services Unit.

2.   Compilations

2.1 EXFOR transmission

During the reporting period, the following final tapes have been transmitted:

- 3 neutron final TRANS tapes (3174 - 3176) containing 18 new entries and 64 revised entries;

- 7 CPND final TRANS tapes (D104 - D108, S020 - S021) containing 107 new entries and 79 revised entries;

- 3 PhND final TRANS tapes (G035 - G037) containing 12 new entries and 19 revised entries.

These include contributions from five other centres (ATOMKI, CNDC, KNDC, NDPCI, UkrNDC) as well as two compilers (Nurzat Kenzheybayev, Myagmarjav Odsuren).

Nurzat Kenzheybayev (Kazakh National University, Almaty) is compiling of data measured in Central Asia (*e.g.*, Kazakhstan, Uzbekistan) for area 3, D and G in collaboration with Timur Zholddybayev (Institute of Nuclear Physics, Almaty).

Myagmarjav Odsuren (National Univ. of Mongolia, Ulaanbaatar) is compiling heavy-ion induced reaction data measured in area 2 countries (e.*g.*, France, Germany, Italy) for area D.

Also 62 final TRANS tapes have been received at NDS. These final TRANS tapes contain 457 neutron entries (100 new, 357 revised), 503 CPND entries (151 new, 352 revised), 72 PhND entries (15 new, 57 revised) during the reporting period.

Based on finalized TRANS tapes received at NDS, nine EXFOR Master Files have been created and distributed.

Three regular transmissions of the EXFOR/CINDA dictionaries (TRANS.9114 – 9115) were done in TRANS, DANIEL (backup) and archive format.

Number of new entries transmitted by final tapes in June2016 - April 2017
(NK: Nurzat Kenzhebayev, MO: Myagmarjav Odsuren)

	NDS	ATOMKI	CNDC	KNDC	NDPCI	UkrNDC	NK	MO	Sum
Neutron	6	-	5	2	5	-	-	-	**18**
CPND	23	31	21	-	3	12	6	11	**107**
PhND	7	-	-	4	-	1	-	-	**12**
Sum	**36**	**31**	**26**	**6**	**8**	**13**	**6**	**11**	**137**

2.2 EXFOR quality control

During the reporting period, 64 preliminary tapes (PRELIM) were received for checking by NDS and other centres. Both ZCHEX and JANIS TRANS Checker are regularly used. The finalized tapes are also checked against comments from centres before uploading to the NDS open area. NDS also registers comments on EXFOR entries from users and centres to the EXFOR Feedback List (https://www-nds.iaea.org/nrdc/error/) and monitors the correction process by checking each preliminary tape against the feedback list.

2.3   EXFOR coverage control

Under the EXFOR compilation control system, about 60 journal titles are regularly scanned and registered to the EXFOR Compilation Control System. The list of newly published articles for compilation (https://www-nds.iaea.org/exfor-master/x4compil/) is updated every week. Since the last NRDC Meeting, about 650 journal issues have been scanned and added to the database for EXFOR compilation control system.

Completeness checking of EXFOR for neutron-, proton- and alpha-induced experimental nuclear reaction data against Nuclear Science References (NSR) database will be presented at the NRDC-2017 meeting and distributed within the NRDC Network for compilation.

2.4   EXFOR article collection

We are continuing collection of EXFOR article pdf files to support EXFOR compilation carried out at NDS and other centres. In order to replace text unsearchable pdf files with text searchable ones, we have started systematic upgrade of pdf files in our internal collection. During the reporting period, we have collected 12,199 pdf files from the publisher's website for 42 journals. Part of this work was done by two interns from University of Tokyo, Siyi Sun (2 November 2016 – 15 March 2017) and Ryota Hasegawa 2 November 2016 – 24 February 2017).

2.5 EXFOR workshops and meetings

- Workshop on EXFOR Compilation, 24 - 28 October 2016, Vienna, Scientific Secretary: V. Semkova). See https://ww-nds.iaea.org/nrdc/wksp_2016/ for presentations etc.

- Workshop on Asian Nuclear Reaction Database Development, 8 – 11 November 2017, China Institute of Atomic Energy, Beijing (organized by CNDC). The proceedings will be published as INDC(CPR)-62.

2.6 IBANDL transmission and inclusion in EXFOR

During the reporting period, 439 new and updated datasets from 25 publications were transmitted to IBANDL. Their numerical data relevant to area D were compiled in EXFOR by NDS, and some data relevant to area O were sent to NEA DB.

2.7 Thermal scattering law (TSL) database

Following the recommendations of the CM "EXFOR compilation of thermal neutron scattering data" a new database (https://www-nds.iaea.org/index-meeting-crp/CM-THSC-2015/) for thermal neutron scattering (TSL) evaluations was set up and about 130 datasets with experimental and calculated data were compiled by José Ignacio Márquez Damián during his consultancy visit 22 April – 6 May 2016.

2.8 CINDA

The CINDA Master File is available via the NDS compilers' Web site including all components and history. Automatic updates using the EXFOR and NSR databases have been carried out 12 times. Since 2017 CINDA automatic updates are done after every update of EXFOR and NSR. Complete MySQL CINDA database was regularly sent to NNDC (USA), BARC (India), CNDC (China) and "Atomstandart" (Russia).

2.9 Evaluated data libraries, files and programs

Various new and revised evaluated data libraries, files and programs for data checking, processing and graphical presentation were added, developed and distributed via the NDS Web site and on DVD-ROM (see below).

3. Services

3.1 Web Services

Further improvements have been implemented in the Web EXFOR-CINDA-ENDF-IBANDL database retrieval systems and Web-Tools for nuclear data compilers and evaluators since the last NRDC meeting:

- ENDF (Evaluated Nuclear Data Files):
  - new and updated evaluated libraries in the ENDF database:
    - ENDF/B-VIII.β3, U.S. Evaluated Nuclear Data Library (preliminary), 2016
    - ENDF/B-VIII.β4, U.S. Evaluated Nuclear Data Library (preliminary), 2017
    - FENDL-3.1b Fusion Evaluated Nuclear Data Library, 2016
  - software news: plotting MF23 "smooth" photon interaction cross sections
- EXFOR:
  - on-line recalculation of angular distributions to inverse kinematics
  - sending R33 datasets from EXFOR to IBANDL retrieval system for further usage
  - plotting cross section coded with SF8=DAM (CS divided by atomic mass of target) using C5
  - plotting without grouping by reaction-codes (used for calculating CS ratios between different datasets on the fly)
  - Web-ZVView plotting: interactive affine transformations (PS/EPS), distortion picture with on-line 2D-calibration (GIF)
- PDF database (now in total: 101,581 PDF files)
  - EXFOR-PDF database: 23 updates (now in total: 27,753 PDF files)
  - NSR-PDF database: 28 updates (now total: 73,828 PDF files)
  - PDF files are made accessible via EXFOR, NSR, CINDA, MyEnsdf web systems
  - news Web interface: checking mode for NSR-PDF contributions; listing of full volumes (theses, conference proceedings, reports)
- CINDA:
  - Web interface for CINDA was extended to display NSR-PDF files (for authorized users)
- IBANDL
  - added: search by first author

Development of the Web-Tools for EXFOR compilers, ENDF and ENSDF evaluators:
- MyEndf: GRUCON processing package was upgraded to the version "2016-06-20"
- MyEnsdf:
  - added programs (originated in PNPI, Russia): chk_brackets, ENSDF_to_XML, BARON, NEWGTOL
  - Web-viewers: "ensdf+" (ENSDF interpreted) and "ensdf±" (interactive tree)
  - Light ENSDF Web editor
- MyExfor: extended by links to Web PDF database and to EXFOR Reference code editor; Dictionary system updates

New NDS Mirror-site was opened in "Atomstandart" (Russia).

The Web EXFOR-CINDA-ENDF database retrieval system is functioning at NNDC (USA), BARC (India), CNDC (China) and "Atomstandart" (Russia). Statistics for usage of the Web retrieval system are presented in figures below.

3.2 DVD-ROM

Most of NDS CD/DVD-ROMs (19 from 26) are available via Web downloading.

New and updated "CD/DVD products":

- EXFOR-CINDA for Windows: MS-Access database and retrieval system (on Java-2). Portable.

- EXFOR-CINDA for Applications: database retrieval systems (Linux, Windows and MacOSX). Includes Endver/GUI package integrated with Prepro and full EXFOR/CINDA database. Portable.

- ENDF libraries: 35 Evaluated Data Libraries.

- GRUCON ver-2016-12-07: ENDF Data Processing Code. Distrubution: 32-bit and 64-bit executables for Linux and Windows, Manual in English and Russian, examples with scripts (by V.Sinitsa, Kurchatov Instutute, Moscow, Russia).

- Portable Empire-3.2.3 (2017) for Windows-64: does not require installation; available for downloading on NDS Web site (new)

3.3 Document Services

Nuclear Data Services Unit (NDSU) continued supporting the Member States in providing the reports published, as well as distributing data libraries on CDs and DVDs as requested. Following the introduction of the webpage (https://www-nds.iaea.org/cdroms/) for download to ensure quicker and easier service, the number of requests for physical copies decreased.

We started creation of INDC reports for unpublished documents (*e.g.,* theses, internal reports) reporting experimental works compiled in EXFOR. During the reporting period, the following three reports were published for this purpose in collaboration with the authors:

- Christophe Sage, Mesures des sections efficaces totale et (n,2n) sur ^{241}Am, INDC(FR)-73 (for EXFOR 23114).
- Cesar Domingo Pardo, New radiative neutron capture measurement of ^{207}Pb and ^{209}Bi, INDC(SPN)-3 (for EXFOR 22944+22946).
- O. Bonesso et al., Cross sections and thick target yields of alpha-induced reactions, INDC(ARG)-14 (for EXFOR D0046).

Any improvement suggestions should be sent to our contact address (nds.contact-point@iaea.org).

3.4 Nuclear Data Newsletters

The Nuclear Data Newsletter is published biannually to inform the scientific community about actual NDS work: # 61 was issued in July 2016; # 62 was issued in January 2017; #63 is in preparation and will be published in July 2017. We have currently 139 hardcopies to be distributed and 1761 electronically.
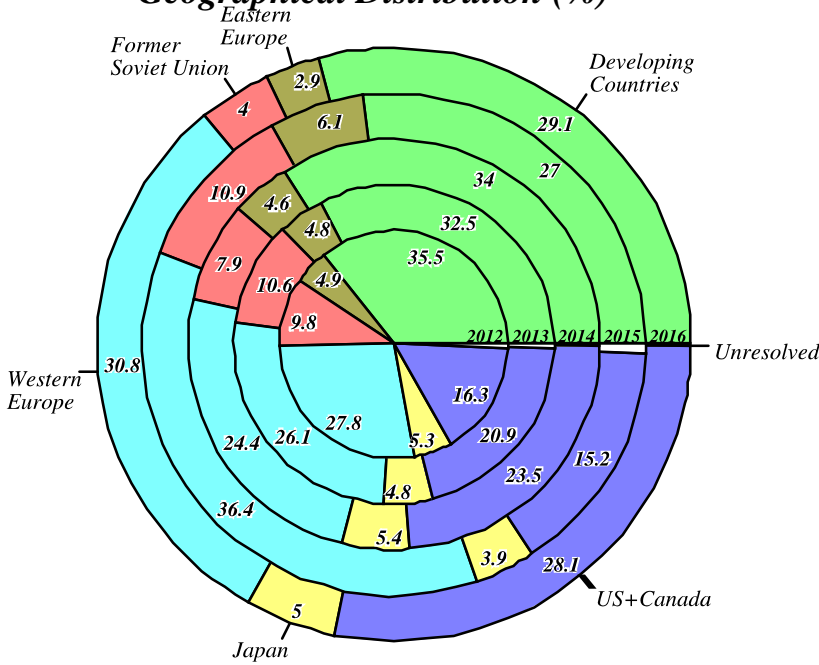
4. Visits and Inter-centre Cooperation

- M. Saito (JCPRG) visited NDS from 27 April to 26 May 2016 as an intern to compile or finalize 32 entries for Japanese experiments. (Transmitted in TRANS.E103).

- V. Zerkin (NDS) visited NNDC from 9 September to 14 October 2016 to deploy and further develop software for the management and the web retrieval of ENDF, EXFOR and CINDA databases.

- V. Semkova (NDS) was invited to visit CNDC from 7 to 11 November 2016. During her visit to China Institute of Atonic Energy on 7-th of November she presented seminar lecture "Measurement and EXFOR compilation of neutron-induced activation cross sections in the energy range up to 20 MeV". V. Semkova also participated in the 7th Asian Nuclear Reaction Database Development Workshop 8-11 November 2016, Beijing, China and presented talk "EXFOR database – status, compilation activates and new developments".
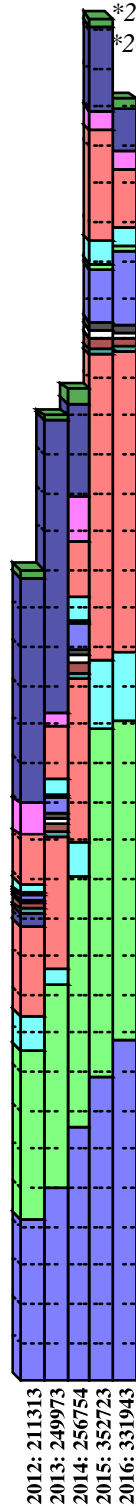
IAEA Nuclear Data Services: Web Statistics

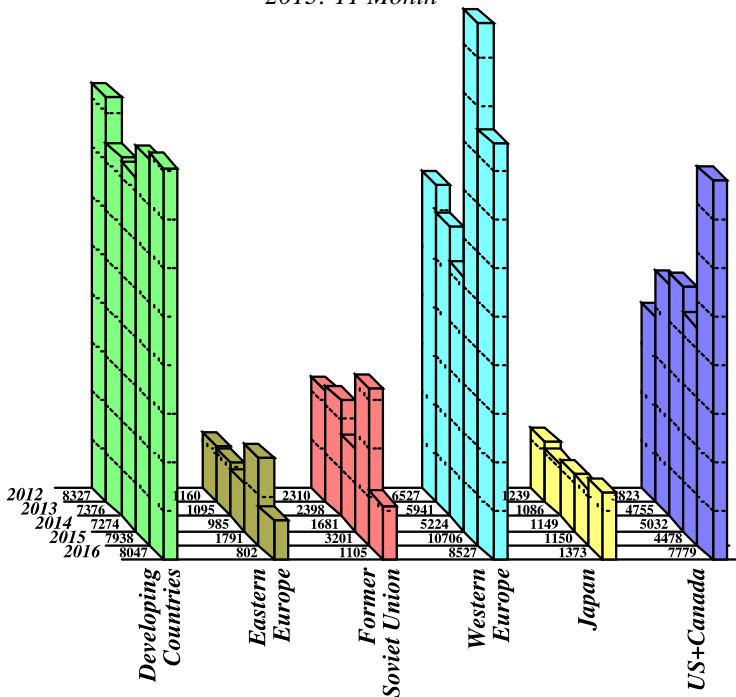## 2012-2016

Geographical Distribution (%)

Former Soviet Union

Eastern Europe

Developing Countries

Western Europe

Japan

Unresolved

US+Canada

Total per Year*
(Number of accesses + retrievals)

*2012: 9 Months
*2013: 11 Month

Service	Comment
Computer Codes	
Documents	
OtherData	
IBANDL	
PGAA	
PhotoNuclear	
RIPL	Theory
FENDL	Fusion
Masses	
IRDF	Dosimetry
Thermal Capture	
Wallet Cards	
Med.Radioisotope.Prod.	
NGAtlas	Activation
RNAL	
ENSDF	Structure
MIRD	Medical
NuDat/LiveChartNucl	
CINDA+NSR	Bibliography
EXFOR	Experimental
ENDF	Energy

2012: 211313
2013: 249973
2014: 256754
2015: 352723
2016: 331943

Average per Month
(Number of accesses + retrievals)
*2012: 9 Months
*2013: 11 Month

	Developing Countries	Eastern Europe	Former Soviet Union	Western Europe	Japan	US+Canada
2012	8327	160	2310	6527	239	3823
2013	7376	1095	5941	10706	1086	4755
2014	7274	985	1681	5224	1149	5032
2015	7938	1791	3201	10706	1150	4478
2016	8047	802	1105	8527	1373	7779

5. Nuclear Data Developments

The Nuclear Data Section undertakes long term nuclear data development by implementing Coordinate Research Projects (CRP) and Data Development Projects (DDP). The staff members of NDS who manage NRDC also follow the currently running CRPs and DDPs to observe the actual trends and needs for nuclear reaction data.

5.1. Coordinated Research Projects (CRP)

- Nuclear data for charged-particle monitor reactions and medical isotope production (2012-2017)

- Testing and improving the IAEA International Dosimetry Library for Fission and Fusion IRDFF (2013-2017)

- Primary radiation damage cross sections (2013-2017)

- Reference database for beta-delayed neutron emission (2013-2018)

- Updating photonuclear data library and generating a reference database for photon strength functions (2016-2019)

- Recommended Input Parameter Library (RIPL) for fission cross section calculations (2017-2021)

5.2 Data Development Project (DDP)

- Maintain the international neutron cross section standards file and evaluation techniques

- CIELO collaboration: coordination and technical work

- Development of evaluation methodology and nuclear reaction modelling systems

- Evaluation of charged-particle-induced reaction data in the resolved-resonance region for applications

- Improvement of analysis codes for nuclear structure and decay data evaluations

- Stopping power database

- Different data processing routes (NJOY, PREPRO and other methods)

- Total absorption gamma-ray spectroscopy (TAGS): Decay data for decay heat calculations and other applications

- Data for Safeguards

- Nuclear Data Libraries for Advanced Systems: Fusion Devices (FENDL-3)

- Thermal scattering law data

5.3. Training Activities (Schools, Workshops)

- Joint ICTP-IAEA Workshop on "Nuclear Structure and Decay Data: Experiment, Theory and Evaluation", 22 August - 2 September 2016, Trieste

- Joint ICTP-IAEA Workshop on "Monte Carlo Radiation Transport and Associated Data Needs for Medical Applications", 18 - 29 September, 2017, Trieste

- Joint ICTP-IAEA Workshop on "Evaluation of Nuclear Reaction Data for Applications", 2 - 13 October 2017, Trieste

6. Nuclear Data Journal Publications (2016-2017)

Excitation functions of alpha particles induced nuclear reactions on natural titanium in the energy range of 10.4-50.2 MeV
A.R. Usman, M.U. Khandaker, H. Haba, N. Otuka, M. Murakami, *Nucl. Instrum. Meth. B* **399** (2017) pp. 34-47.

Measurements of neutron capture cross sections on ^{70}Zn at 0.96 and 1.69 MeV
L.R.M. Punte, B. Lalremruata, N. Otuka, S.V. Suryanarayana, Y. Iwamoto, R. Pachuau, B. Satheesh, H.H. Thanga, L.S. Danu, V.V. Desai, L.R. Hlondo, S. Kailas, S. Ganesan, B.K. Nayak, A. Saxena, *Phys. Rev. C* **95** (2017) p.024619.

Update of the α - n Yields for Reactor Fuel Materials for the Interest of Nuclear Safeguards
S.P. Simakov, Q.Y. van den Berg *Nucl. Data Sheets* **139** (2017) pp. 190-203.

Production cross-sections of radionuclides from α-induced reactions on natural copper up to 50 MeV
A.R. Usman, M.U. Khandaker, H. Haba, N. Otuka, M. Murakami, Y. Komori, *Appl. Radiat. Isot.* **114** (2016) pp. 104-113.

Neutron-induced fission cross section of ^{237}Np in the keV to MeV range at the CERN n TOF facility
M. Diakaki, P. Dimitriou, R. Capote, et al. (n_TOF Collaboration) *Phys. Rev. C* **93** (2016) 034614.

Effects of Fission Yield Data in the Calculation of Antineutrino Spectra for ^{235}U(n,fission) at Thermal and Fast Neutron Energies
A.A. Sonzogni, E.A. McCutchan, T.D. Johnson and P. Dimitriou, *Phys. Rev. Lett.* **116** (2016) 132502.

Benchmark experiment for the cross section of the ^{100}Mo(p,2n)^{99m}Tc and ^{100}Mo(p,pn)^{99}Mo reactions
S. Takács, F. Ditrói, M. Aikawa, H. Haba, N. Otuka, *Nucl. Instrum. Meth. B* **375** (2016) pp. 60-66.

Development of a Reference Database for Particle-Induced Gamma-ray Emission spectroscopy

P. Dimitriou, H.-W. Becker, I. Bogdanović-Radović, M. Chiari, A. Goncharov, A.P. Jesus, O. Kakuee, A.Z. Kiss, A. Lagoyannis, J. Räisänen, D. Strivay, A. Zucchiatti, *Nucl. Instrum. Meth. B* **371**(2016) pp. 33-36.

Validation of IRDFF in ^{252}Cf Standard and IRDF-2002 Reference Neutron Fields
Stanislav Simakov, Roberto Capote, Lawrence Greenwood, Patrick Griffin, Albert Kahler, Vladimir Pronyaev, Andrej Trkov and Konstantin Zolotarev, *EPJ Web of Conferences* **106** (2016) 04011.

Toward a New Evaluation of Neutron Standards
A.D. Carlson, V.G. Pronyaev, R. Capote, G.M. Hale, F.-J. Hambsch, T. Kawano, S. Kunieda, W. Mannhart, R.O. Nelson, D. Neudecker, P. Schillebeeckx, S. Simakov, D.L. Smith, P. Talou, X. Tao, A. Wallner and W. Wang, *EPJ Web of Conferences* **106** (2016) 04002.

Systematic study of proton capture reactions in medium-mass nuclei relevant to the *p* process: The case of ^{103}Rh and ^{113,115}In
S. Harissopulos, A. Spyrou, V. Foteinou, M. Axiotis, G. Provatas, P. Demetriou, *Phys. Rev. C* **93** (2016) 025804.

Nuclear Data Sheets for A = 227
B. Singh, F. Kondev, E. McCutchan, J. Tuli, et al. *Nucl. Data Sheets* **132** (2016) 257.

Measurements of deuteron-induced reaction cross-sections on natural nickel up to 24 MeV
A.R. Usman, M.U. Khandaker, H. Haba, M. Murakami, N. Otuka, *Nucl. Instrum. Meth. B* **368** (2016) pp. 112-119.

7. Nuclear Data INDC Reports (2016-2017)

INDC(IND)-0049 INDC-2711	**Measurements of neutron capture cross sections on ^{70}Zn at 0.96 and 1.69 MeV** B. Lalremruata, L.R.M. Punte, N. Otuka, Rebecca Pachuau, Y. Iwamoto, S.V. Suryanarayana, B.K. Nayak, B. Satheesh, H.H. Thanga, L.S. Danu, V.V. Desai, L.R. Hlondo, S. Kailas, S. Ganesan, A. Saxena	Mar 2017
INDC(NDS)-0729 LA-UR-17-21103 INDC-2710	**Testing the Goodness of Gaussian and Lognormal Emulators via Their Statistically Converged Probability Distribution Moments** Donald L. Smith, Denise Neudecker and Roberto Capote Noy	Mar 2017
INDC(FR)-73 INDC-2709	**Mesures des sections efficaces totale et (n,2n) sur ^{241}Am** Christophe Sage	Mar 2017
INDC(SPN)-3 INDC-2707	**New radiative neutron capture measurement of ^{207}Pb and ^{209}Bi**	Feb 2017

Cesar Domingo Pardo

INDC(ARG)-14 INDC-2706	**Cross Sections and Thick Target Yields of Alpha-Induced Reactions** O. Bonesso, O.A. Capurro, M.J. Ozafrán, M.J. Tavelli, M. de la Vega Vedoya, C. Wasilevsky, S.J. Nassiff	Feb	2017
INDC(NDS)-0726 INDC-2703	**R-matrix codes for charged-particle induced reactions in the resolved-resonance region** H. Leeb, P. Dimitriou and I. Thompson	Jan	2017
INDC(NDS)-0717 INDC-2691	**Nuclear Data for Charged-particle Monitor Reactions and Medical Isotope Production** A.L. Nichols, F.M. Nortier, R. Capote Noy	Jan	2017
INDC(SLO)-0003 INDC-2704	**MCNP modelling of the LMT–006 integral criticality benchmark experiment** Bor Kos, Peter Schillebeeckx, Gašper Žerovnik and Ivo Kodeli	Dec	2016
INDC(CCP)-0460 REV. INDC-2679	**Neutron activation cross sections measured at KRI in neutron energy region 13.4 – 14.9 MeV** A.A. Filatenkov	Dec	2016
INDC(AUS)-20 INDC-2702	**Cross sections of n-^{3}He between 3.5 and 30 MeV. An evaluation using results of an ab-initio calculation** M. Drosg and A. Deltuva	Oct	2016
INDC(CZR)-3 INDC-2701	**Validation of ^{nat}Fe and ^{nat}Cr activation cross sections in quasi-mono energetic neutron spectra (<35 MeV), irradiation, measurement and computational analysis** M. Majerle, P. Bém, J. Novák, E. Šimečková, M. Štefánik	Oct	2016
INDC(NDS)-0713 INDC-2687	**Fission Yields: current status & perspective in measurements, theory and evaluations** P. Dimitriou, F.-J. Hambsch, S. Pomp	Oct	2016
INDC(NED)-013; INDC-2700	**Present Status of Experimental Gamma-ray Strength Functions Derived from Neutron Capture** J. Kopecky	Sep	2016
INDC(JPN)-202 INDC-2686 JAEA-CONF 2016-004	**Proceedings of the 2015 Symposium on Nuclear Data** O. Iwamoto, T. Sanami, S. Kunieda, H. Koura, S. Nakamura	Sep	2016
INDC(NDS)-0724 INDC-2698	**The Fusion Evaluated Nuclear Data Library (FENDL)** M. Fleming, A. Trkov	Aug	2016

INDC(NDS)-0719 INDC-2693	**Nuclear Reaction Data and Uncertainties for Radiation Damage** P.J. Griffin, H. Sjostrand, S.P. Simakov	Aug	2016
INDC(NDS)-0716 INDC-2690	**Current Status and Open Issues of the U-235 Evaluation** G. Noguere and A. Trkov	Aug	2016
INDC(SEC)-0111 REV. 2 INDC-2666	**Updating of data for the neutron yields in reactor fuels for the interest of Nuclear Safeguards** Quincy van den Berg and Stanislav Simakov	Aug	2016
INDC(NDS)-0725 INDC-2696	**Report of the IAEA Nuclear Data Section to the International Nuclear Data Committee for the period January 2014 - December 2015** Arjan J. Koning and Roberto Capote Noy	Jul	2016
INDC(NDS)-0718 INDC-2692	**International Network of Nuclear Reaction Data Centres** N. Otuka and M. Herman	Jul	2016
INDC(NDS)-0712 INDC-2685	**Updating the Photonuclear Data Library and Generating a Reference Database for Photon Strength Functions** S. Goriely, P. Dimitriou	Jul	2016
INDC(NDS)-0711 REV. 1 INDC-2683	**URR-PACK: Calculating Self-Shielding in the Unresolved Resonance Energy Range** D.E. Cullen and A. Trkov	Jul	2016
INDC(NDS)-0704 INDC-2672	**Development of a dedicated online database for nuclear moments data** T. Mertzimekis	Jun	2016
INDC(NDS)-0690 INDC-2653	**Benchmarking Experiments for Ion Beam Analysis** M. Chiari, P. Dimitriou	May	2016
INDC(CZR)-2 INDC-2684	**Validation of ^{59}Co and ^{93}Nb activation cross sections in a quasi-mono energetic neutron spectrum (<35 MeV) including irradiation, measurement and computational analysis** M. Majerle, P. Bém, J. Novák, E. Šimečková, S. P. Simakov, U. Fischer	Apr	2016
INDC(NDS)-0697 INDC-2663	**Compilation of Thermal Neutron Scattering Data for Experimental Nuclear Reaction Data Library (EXFOR)** J.I. Marquez Damian, V. Semkova	Apr	2016
INDC(JPN)-201 INDC-2682 JAEA-CONF 2015-	**Proceedings of the 2014 Symposium on Nuclear Data** M. Aikawa, O. Iwamoto, S. Ebata, S. Kunieda, S. Nakamura,	Mar	2016