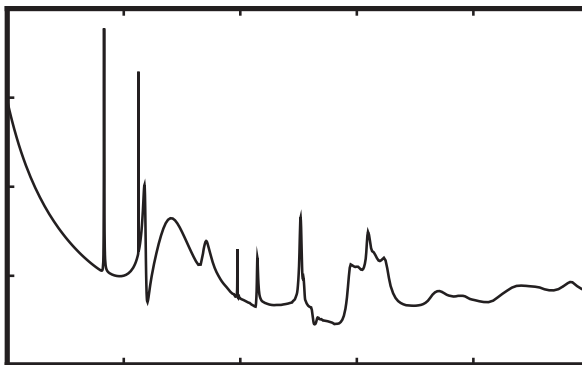# NUCLEAR DATA NEWSLETTER

Nuclear Data Section (NDS)

International Atomic Energy Agency
Vienna

CONTENTS

Issue No. 26   **October 1998**

New Telephone and Fax Numbers

Personal Item

Online News

Offline News

New Data Libraries

IAEA Nuclear Data Development Activity

Computer Codes Development

Selected Reports and Documents on Nuclear Data

Co-operating nuclear data service centres

All services provided to users are free of charge.

Please contact us on the following addresses:

ISSN 0257-6376

New Telephone and Fax Numbers

With effect from Sunday, 4 October 1998, the Agency's main telephone number is changed to **2600** and the fax number to **26007**.

Personal Item

Dr. Nikolai Kocherov left NDS after many years of service. He was responsible for NDS projects related with nuclear data development for industrial, medical and other applications. His present address is: Dr. Nikolai Kocherov, V.G. Khlopin Radium Institute, 2nd Murinski Ave. 28, 194021 St. Petersburg, Russia.
Fax: +7 812-247-5781,
e-mail: kocherov@infopro.spb.su.

Online News

IAEA-NDS-0 Report "Index to the IAEA-NDS-Documentation Series" is available online from our Web site (http://www-nds.iaea.or.at). It contains an up-to-date reference list of all IAEA-NDS reports. Each IAEA-NDS report briefly describes one product which can be a data base, data library or data file, computer codes or package, manual or document.

A few reports are available online now through hyperlinks in reference list. Two of them present a new computer package and data library available from NDS:

IAEA-NDS-195, Rev. 0, XMuDat: Photon attenuation data on PC by R. Nowotny, August 1998 presents computer programme and data to be used with Windows 95 or Windows NT for the presentation and calculation of mass attenuation-, mass energy transfer- and mass energy absorption coefficients in a photon energy range of 1 keV to 50 MeV for materials, their mixture and compounds. The XMuDat.zip file can be downloaded via a hyperlink in IAEA-NDS-195 report.

IAEA-NDS-196, EPDL97: the Evaluated Photon Data Library, '97 Version, by D.E. Cullen, J.H. Hubbel and L. Kissel, supersedes the earlier 1989 version of EPDL (see IAEA-NDS-158). The library includes photon interaction data for all elements with atomic numbers between 1 and 100 over the energy range 1 eV to 100 GeV. The Evaluated Atomic Data Library (EADL), Evaluated

Electronic Data Library (EEDL) and Evaluated Excitation Data Library (EXDL) are included to allow consistent coupled photon-electron calculations.

Six reports describe data libraries for different fusion applications. Previously they were available only as hard copies.

IAEA-NDS-173, FENDL/A-2.0, Neutron Activation Cross Section Data Library for Fusion Applications, version of March 1996. Contains cross section data for 13006 activation reactions for 739 target nuclides from H-1 to Cm-248. Summary documentation by A.B. Pashchenko, H. Wienke, J. Kopecky, J.- Ch. Sublet and R.A. Forrest.

IAEA-NDS-174, FENDL2/A-MCNP, FENDL2/A-VITJ_E and FENDL2/A-VITJ_FLAT. The processed FENDL-2 neutron activation cross-section data files. Summary documentation by A.B. Pashchenko, H. Wienke.

IAEA-NDS-175, FENDL/E-2.0. Evaluated nuclear data library of neutron-nucleus interaction cross sections, photon production cross sections and photon-atom interaction cross sections for fusion applications. Summary documentation by A.B. Pashchenko, H. Wienke.

IAEA-NDS-176, FENDL/MG-2.0 and FENDL/MC-2.0. The processed cross-section libraries for neutron-photon transport calculations. Summary documentation by M. Herman and H. Wienke.

IAEA-NDS-177, FENDL/C-2.0. Charged-particle reaction data library for fusion applications. Version of March 1997. Data extracted from ENDF/B-6 evaluations by R.M. White and D.A. Resler, LLNL, and G.M. Hale, LANL. Summary documentation by A.B. Pashchenko, H. Wienke.

IAEA-NDS-178, FENDL/D-2.0. Decay data library for fusion applications. Version of June 1996. Prepared by R.A. Forrest and processed by F.M. Mann. Summary documentation by A.B. Pashchenko, H. Wienke.

Benchmark data on neutron and gamma leakage spectra from various spheres obtained with 14 MeV neutrons at OKTAVIAN (Osaka) are available for on-line retrieval from IAEA-NDS Web site (http://ripcnt01.iaea.org/nds/databases/fendl/fen-bench.htm).

Offline News

The complete **FENDL-2** Library, which includes general and application oriented purpose files and files processed for fusion reactor activation and transport calculations (see IAEA-NDS Reports above) is available on CD-ROM.

Databases now available on CD-ROM include:

IAEA-NDS-CD-01, EXFOR, database of experimental nuclear reaction cross sections (January 1998)

IAEA-NDS-CD-02, RIPL, Reference Input Parameter Library for nuclear model calculations (15 May 1998)

IAEA-NDS-CD-03, FENDL-2, Fusion Evaluated Nuclear Data Library (15 May 1998)

IAEA-NDS-CD-04, ENDF, contains all comprehensive evaluated data library (ENDF/B-VI, Rev. 4, JENDL-3.2, JEF-2.2, BROND-2 and CENDL-2) retrieval and merger system for MS Windows, Manuals and Documentation in PostScript format, Utilities and Preprocessing codes (May 1998)

New Data Libraries

XMuDat: Photon attenuation data on PC by R. Nowotny, August 1998 XMuDat is a package from computer programme and data library to be used with Windows 95 or Windows NT for the calculation and presentation of mass attenuation-, mass energy transfer-, and mass energy absorption coefficients in a photon energy range of 1 keV to 50 MeV for materials, their mixture and compounds. The package is available on request on PC diskette or online (see under Online News, report IAEA-NDS-195).

EPDL97: the Evaluated Photon Data Library, '97 Version, by D.E. Cullen, J.H. Hubbel and L. Kissel supersedes the earlier 1989 version of EPDL. The library includes photon interaction data for all elements with atomic numbers between 1 and 100 over energy range1 eV to 100 GeV. The Evaluated Atomic Data Library (EADL), Evaluated Electronic Data Library (EEDL) and Evaluated Excitation Data Library (EXDL) are included to allow consistent coupled photon-electron calculations. Available on CD-ROM (79.4 MB) on request.

IAEA Nuclear Data Development Activity

Information about all current or planned NDS Data Development Activity such as about programmes, workshops and meetings is available online from http://www.iaea.or.at/programmes/ripc/nd/ index.html.

Computer Codes Development

NJOY 97.0. This nuclear data processing system is available from RSICC (see http://epicws.cped.ornl.gov/codes/psr3/psr-368.html). It is a cleaned up version of NJOY 94.105 that features compatibility with a wider variety of compilers and machines, explicit double precision for 32-bit systems (including PC platforms), a larger test-problem suite, a new revision control system, and some changes to the users input. Documentation and exercises for NJOY 97.0 are available on http://t2.lanl.gov/njoy/title.html. Although all requests on NJOY 97.0 system should be sent to the RSICC (it is possible to do so electronically using forms on http://www-rsicc.ornl.gov/ ORDER.html) and decision about supplying of the package will be taken by RSICC, the Nuclear Data Section of IAEA may be able to provide financial support for payment of license fees to scientists from developing countries.

Selected Reports and Documents on Nuclear Data

Nuclear Reaction Data and Nuclear Reactors. Physics, Design and Safety, Proceedings of the Workshop, ICTP, Trieste, Italy, 15 April - 17 May 1996, Vol. 1 and 2, Eds. A. Gandini and G. Reffo, (1998). All requests on the Proceedings (price of 2 volumes is US$187) should be sent to World Scientific Publishing Co. Pte. Ltd., PO Box 128, Farrer Road, Singapore 912805 (http://www.wspc.com). The Proceedings include papers on the following topics: optical model, level density, resonance theory, compound nucleus theory, pre-equilibrium reaction theory, intermediate energy reaction mechanisms, basic nuclear data processing, data processing for applications, examples of nuclear data needs, use of nuclear data with the example of reactor physics calculations.

IAEA-TECDOC-1034, Handbook for Calculations of Nuclear Reaction Data. Reference Input Parameter Library. Final report of co-ordinated research project, IAEA, August 1998 is published. It contains detailed description of all components of RIPL library with a Starter File available online (http://www-nds.iaea.or.at/ripl/) or on CD-ROM (IAEA-NDS-CD-02, RIPL, 15 May 1998).

INDC(BLR)-012. Evaluation of Average Neutron Resonance Parameters of Actinides with the Account of Experimental Resolution and Discrimination Threshold. Final Report on Research Contract 9503/RB. Yu.V. Porodzinskij, E. Sukhovitskij, V.M. Maslov (1998).

INDC(CCP)-412. Comparison of Threshold Reaction Cross Sections for the Ti, V, Cr, Fe, Ni, Cu and Zn Isotopes from Evaluated Data Library. By A.I. Blokhin et al. (1998).

INDC(JPN)-180/U. Proceedings of the 1997 Symposium on Nuclear Data . November 27-28, 1997, JAERI, Tokai, Japan. Ed. T. Yoshida and T. Fukahori (1998).

INDC(NDS)-381. The CENDL21 Library - Neutron Data Library for MCNP. Liu Ping (1998)

INDC(NDS)-382. WIMSLIB Library - Neutron Data Library for WIMS-D. Liu Ping. (1998). Ed. note: *WIMSLIB is based on CENDL-2.1.*

INDC(NDS)-383. Co-ordination of the Nuclear Reaction Data Centers. Report of an IAEA Advisory Group Meeting, held at IAEA Headquarters, Vienna, 11 - 15 May 1998, Ed. by V.G. Pronyaev, O. Schwerer, July 1998, IAEA, Vienna. The report summarizes the nuclear data centers activity in international exchange of bibliographic, experimental and evaluated nuclear reaction data and improvement of online and offline user access to the data. Copies of the report are available from NDS.

INDC(NDS)-387. Nuclear Data Libraries and Online Services. P. Obložinský and O. Schwerer. The report summarizes the various nuclear data types and libraries available from the IAEA Nuclear Data Sectiion with particular emphasis to online services via the Internet.

Yadernye Konstanty ("Nuclear Constants") Moscow, Russia. The papers in Voprosy Atomnoj Nauki i Tekhniki ("Problems of Atomic Science and Technique") appear in Russian with abstracts in English or in English. Copies are available, free of charge, from the IAEA Nuclear Data Section. Content are listed below. Subject to available funds, selected articles are translated by IAEA and published as INDC(CCP) reports.

Yad. Konst. 1998 (1). Stages of development of nuclear data in Russia (B.D. Kuzminov, V.N. Manokhin). Investigation of neutron cross section for ^{232}Th and ^{237}Np in the energy range 2 eV-100 keV (Yu. V. Grigor'ev, V.V. Sinitsa, G.N. Gundorin, Yu.P. Popov, Ch. Faikov-Stanchik). Measurements of the energy dependence of the relative delayed neutron yields related to individual precursors from neutron induced fission of ^{237}Np (S.G. Isaev, V.M. Piksaikin, L.E. Kazakov, M.Z. Tarasko, in English). Delayed neutron data for ABBN-93 set of constants (S.V. Zabrodskaya, M.N. Nikolaev, A.M.Tsibulya). Neutron spectrum covariances and their influence on results of pressure vessel neutron spectrum adjustment (B. Boehmer, G.N. Manturov, in English). Evaluated cross sections of p, d, α-particle interaction with ^{11}B (B.M. Dzyuba, A.G. Zvenigorodskij, L.M. Lazarev, S.G. Skidan). ^{232}Th,^{233,235,238}U, ^{237}Np and ^{243}Am nuclei fission by tritons (M.F. Andreev, V.V. Gladkov, V.A. Zavgorodni, V.I. Serov, in English).

Computer code descriptions

ANL/NDM-145, ABAREX- a Neutron Spherical Optical-Statistical Model Code - a User Manual, by R.D. Lawson, edited and updated by A.B. Smith. Report contains full description of ABAREX code (including formulae used, typical inputs and outputs), code which was distributed between IAEA Workshop participants.

INDC(BLR)-012/G+NM. Evaluation of Average Neutron Resonance Parameters of Actinides wit the Account of Experimental Resolution and Discrimination Threshold. Final Report on Research Contract 9503/RB. Yu.V. Porodzinskij, E. Sukhovitskij, V.M. Maslov (1998).

Progress Reports

INDC(NDS)-379/G,P. Progress in Fission Product Nuclear Data. Information about Activities and Requirements in the Field of Measurements and Compilations/Evaluations of Fission Product Nuclear Data (FPND), No. 15. Collected by M. Lammer (1998)

INDC(GER)-044. Progress Report on Nuclear Data Research in the Federal Republic of Germany for the period April 1, 1997 to March 31, 1998. Ed. by S.M. Qaim (1998)

INDC(UK)-054/LN. UK Nuclear Science Forum Progress Report: Data Studies during 1997. Ed. A.L. Nichols (1998).

<u>**Co-operating nuclear data service centers**</u>

<u>For services to customers in USA and Canada</u>:
US National Nuclear Data Center, Bldg. 197D, Brookhaven National Laboratory, P.O. Box 5000, Upton, NY 11973-5000, USA. Tel. +1 516-344-2902; Fax +1 516-344-2806; e-mail: nndc@bnl.gov; Worldwide Web: http//www.nndc.bnl.gov/. For information on online services and requests contact: V. McLane

<u>For services to customers in OECD countries in Western Europe and Japan</u>:
NEA Data Bank: OECD Nuclear Energy Agency, Le Seine Saint-Germain, 12 blvd des Iles, F-92130 Issy-les-Moulineaux, France. Tel. +33 (1) 4524 (plus extension); Fax +33 (1) 45241110; e-mail: (name)@nea.fr or nea@nea.fr; Worldwide Web: http://www.nea.fr, username: NEADB. Contact: C. Nordborg, ext. 1090

<u>For services to the countries of the former USSR</u>:
<u>Neutron data</u>: Russia Nuclear Data Center, Centr Jadernykh Dannykh (CJD), Fiziko-Energeticheskij Institut, Ploschad Bondarenko, 249020 Obninsk, Kaluga Region, Russia. Tel. +7 08439-9-8982; Fax +7 095-230-2326; e-mail: manokhin@ippe.rssi.ru. Contact: V.N. Manokhin

<u>Charged-particle data</u>: Russia Nuclear Structure and Reaction Data Center (CAJAD), Kurchatov Institute, 46 Ulitsa Kurchatova, 123 182 Moscow, Russia. Tel. +7 095-196-1612, 9968; Fax +7 095-882-5804; e-mail: chukreev@polyn.kiae.su or feliks@polyn.kiae.su. Contact: F.E. Chukreev

<u>Photonuclear data</u>: Centre for Photonuclear Experiments Data, Centr Dannykh Fotoyadernykh Eksperimentov (CDFE), Moscow State University, Vorob'evy Gory, 119 899 Moscow, Russia. Tel. +7 095-939-3483; Fax +7 095-939-0896; e-mail: varlamov@cdfe.npi.msu.su or varlamov@depni.npi.msu.su Contact: V.V. Varlamov

<u>For services to customers in China</u>:
China Nuclear Data Center, China Institute of Atomic Energy, P.O. Box 275(41), Beijing 102413, China. Tel. +86 10-6935-7830; Fax +86 10-6935-7008; e-mail: tong@mipsa.ciae.ac.cn. Contact: Liu Tong

<u>Computer codes of US origin to all countries</u>:
Radiation Safety Information Computational Center (RSICC), Oak Ridge National Laboratory, P.O. Box 2008, Oak Ridge, TN 37831-6362, USA. Tel. +1 615-574-6176; Fax +1 615-574-6182; e-mail: pdc@ornl.gov. (There may be charges and release restrictions.)

<u>Computer codes of non-US origin to all countries</u>:
NEA Data Bank, see above, contact: E. Sartori, ext. 1072. (There may be release restrictions.)

<u>The IAEA Nuclear Data Section</u> offers data center services primarily to non-OECD countries (except Russia and China, see above). However, most products advertised in this Newsletter, specifically INDC reports, IAEA-NDS-documents, etc., are provided, upon request to customers in all countries. For online services see the first page of this Newsletter.