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I N D C **INTERNATIONAL NUCLEAR DATA COMMITTEE**

Nuclear Reaction Data Centres Network

V. G. Pronyaev and O. Schwerer (ed.)

August 2003

IAEA NUCLEAR DATA SECTION, WAGRAMER STRASSE 5, A-1400 VIENNA

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Abstract

The activities of thirteen nuclear data centres are summarized, and their cooperation under the auspices of the International Atomic Energy Agency is described. Each of the centres provides coverage for different geographical zones and/or specific types of nuclear data, thus together providing a complete service for users worldwide. The Nuclear Reaction Data Centres (NRDC) Network was established with the objective of providing nuclear physics databases that are required for nuclear technology (encompassing energy and non-energy applications) by coordinating the collection, compilation and dissemination of nuclear data on an international scale.

August 2003

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Preface

The objectives, goals and working arrangements of the Nuclear Reaction Data Centres (NRDC) Network are summarized, according to the conclusions of the IAEA Technical Meeting on Network of Nuclear Reaction Data Centres, 27-30 May 2002, OECD Nuclear Energy Agency, Issy-les-Moulineaux, France.

The purpose and mission of the Network are described in the introductory pages.

Contact addresses of the centres are given in Annex 1.

Lists of the complete activities of each centre are described in Annex 2. Note: only a part of each centre's overall work relates directly to their NRDC Network contribution.

Details of the working arrangements are given in Annex 3.

Compilation responsibilities are listed in Annex 4.

The contents of this 'living' document will be revised as necessary:

- introductory material will be reviewed biennially at each Network meeting;
- Annex 1 (Addresses) will be updated by the IAEA Nuclear Data Section (NDS) as required;
- Overall activities of each centre are described in Annex 2, and will be revised on the initiative of the data centres, after review by the Network;
- Annex 3 will be reviewed annually;
- Annex 4 will be updated by NDS after consultation with the Network.

The first version of this document was drafted at an IAEA Consultants' Meeting dedicated to this purpose from 31 October - 1 November 1994, approved at the Technical Meeting of the Nuclear Reaction Data Centres, Vienna, 2-4 May 1995, and printed as report INDC(NDS)-324 in August 1995.

NUCLEAR REACTION DATA CENTRES (NRDC) NETWORK

1. Introduction

The Nuclear Reaction Data Centres (NRDC) Network constitutes a worldwide cooperation of nuclear data centres under the auspices of the International Atomic Energy Agency. The NRDC Network was established to coordinate the world-wide collection, compilation and dissemination of nuclear reaction data. This document has been produced jointly by the Heads of the cooperating Data Centres to describe the overall activities of each Centre and their commitments to the NRDC Network. The contents will be amended as necessary by the Data Centre Heads at their regular biennial meetings.

2. Nuclear Data

Nuclear data are essential to the development and application of all nuclear sciences and technologies. These data are conventionally separated into two types, namely properties of a nucleus interacting with radiation or another nucleus called *nuclear reaction data*, and properties of single nuclei called *nuclear structure and radioactive decay data*. As defined, the term "nuclear data" includes numerical and related bibliographic data, along with descriptive documentation.

Two international nuclear data networks operate under the auspices of the IAEA: the Nuclear Reaction Data Centres (NRDC) Network, as described in the present document, and the Nuclear Structure and Decay Data (NSDD) Network, see IAEA report INDC(NDS)-421.

The scope of the Nuclear Reaction Data Centres Network includes nuclear data required for both energy and non-energy applications, as well as for basic nuclear science. Applications of these nuclear data are numerous, and include nuclear energy development (both fission and fusion), nuclear medicine, process control in manufacturing, material identification using activation analysis, accelerator design and shielding, environmental monitoring, nuclear waste management, nuclear material disposal, space radiation shielding, and design of detectors and physics experiments.

3. The NRDC Network

Nuclear data centres provide the essential link between the producers and users of nuclear data. The Nuclear Reaction Data Centres (NRDC) Network has been established to organize these important preparative and communications activities on an international scale, with the objective of providing the desired nuclear data to users in a convenient and readily-available form. Customer services represent the cornerstone of this Network, which organizes the tasks of collecting, compiling, standardizing, storing, assessing and distributing the vast amounts of nuclear data that exist already and will be produced and needed in the future. Only through the international cooperation of interested groups of scientists in different countries and organizations can the provision of recommended high-quality nuclear data be realized, avoiding duplication of effort and maximizing the use of specialized expertise at each of the cooperating centres.

The NRDC Network is coordinated through regular meetings organized by the IAEA Nuclear Data Section and through direct communications among the centres. Rules and procedures for the compilation and exchange of data files and agreements on worksharing, amongst the centres associated with data acquisition and services to customers, are determined during these Network meetings.

The centres' activities and responsibilities are described in the various annexes. Each centre has agreed to assume responsibility for one or more tasks within the Network for which they have both unique expertise and resources. Information collected or produced in any participating centre will be available without restriction to any of the other centres that are party to the agreement. This information will be available cost-free to all customers of each centre in the Network.

4. Objectives and Tasks

The primary goal of the Network is the dissemination of nuclear reaction data and associated documentation to users. The following specific tasks must be carried out in order to accomplish this important aim:

- compilation of relevant bibliographic information,
- compilation of experimental nuclear reaction data,
- collection of evaluated nuclear reaction data,
- exchange of nuclear reaction data of all types,
- promotion of the development of special purpose evaluated data files,
- development of common formats for computerized exchange of nuclear data,
- coordinated development of computer software for managing and disseminating nuclear data,
- coordination of the development and dissemination of end-user software for both on-line and local access to nuclear data,
- documentation of current and future data needs in order to be able to meet changing user demands.

5. Data Evaluations

All members of the NRDC Network recognize the importance of separately coordinated nuclear data evaluation activities. Furthermore, the availability of evaluated nuclear data files is essential in order to fulfill the responsibilities of the Network to the world-wide user community. The Network members appreciate the efforts of the Working Party on International Nuclear Data Evaluation Co-operation (WPEC), a working group - hosted by the OECD Nuclear Energy Agency - involved in the co-ordination of many national and regional evaluation projects, whose activity is complementary to the Network's tasks on evaluated data as outlined above (item 4).

6. Nuclear Data Centres

6.1 Core Nuclear Data Centres

The resulting arrangements recognize the special status of the core Nuclear Data Centres:

- National Nuclear Data Center (NNDC), Brookhaven National Laboratory, Upton, USA (see Annex 2.1);
- OECD Nuclear Energy Agency Data Bank (NEA-DB), Paris, France (see Annex 2.2);
- International Atomic Energy Agency Nuclear Data Section (NDS), Vienna, Austria (see Annex 2.3);
- Russia Nuclear Data Center (CJD), Institute of Physics and Power Engineering, Obninsk, Russian Federation (see Annex 2.4);

that provide coordinated, world-wide customer services covering the entire range of nuclear data described herein. These core centres also provide comprehensive compilations of experimental neutron reaction data and related bibliographic information.

6.2 Other Nuclear Data Centres

Regional, national and specialized data centres (see Annexes 2.5 to 2.13) provide essential complementary functions to the core data centres by assuming particular responsibility for the collection and dissemination of data of a specialized type or application.

7. Working Arrangements

The working arrangements for the compilation and exchange of nuclear reaction data are summarized in **Annex 3** (Protocol: Nuclear Reaction Data Centres). As agreed in May 2002, the NDS assumes responsibility for the co-ordination of the NRDC Network compilation activities. Thus, the NDS will

(a) assign clear responsibilities for the creation and correction of data compilations, and drive these activities forward,
(b) ensure implementation of compilation rules,
(c) decide on all issues relating to dictionary codes,
(d) be responsible for CINDA and EXFOR distribution to the other data centres.

Annex 1

Addresses

1.1 National Nuclear Data Center

— **Contact person:** Pavel Obložinský

— **Address:** National Nuclear Data Center
Bldg. 197D
Brookhaven National Laboratory
P.O. Box 5000
Upton, NY 11973-5000

— **Telephone:** +1 631-344-2814

— **Telefax:** +1 631-344-2806

— **E-mail:** nndc@bnl.gov

— **Intercenter FTP file transfer:** ftp.nndc.bnl.gov
username: BNLNDC
(No password required)

— **World Wide Web:** http://www.nndc.bnl.gov/

1.2 OECD Nuclear Energy Agency Data Bank

— **Contact person:** Claes Nordborg

— **Address:** Le Seine Saint-Germain
12, boulevard des Iles
92130 Issy-les-Moulineaux
France

— **Telephone:** +33 (1) 45 24 10 90

— **Telefax:** +33 (1) 45 24 11 10

— **E-mail:** nea@nea.fr

— **World Wide Web:** http://www.nea.fr

1.3 International Atomic Energy Agency - Nuclear Data Section

— **Contact person:** Alan L. Nichols

— **Address:** Wagramerstrasse 5, P.O. Box 100
A-1400 Vienna
Austria

— **Telephone:** +43 (1) 2600-21709

— **Telefax:** +43 (1) 26007

— **E-mail:** A.Nichols@iaea.org

— **Intercenter FTP file transfer:** iaeand.iaea.org
username: NDSOPEN

EXFOR file transfer: username: NDSX4

— **World Wide Web** http://www-nds.iaea.org

1.4 Russia Nuclear Data Center (CJD)

— **Contact person:** Vasilij N. Manokhin

— **Address:** Leipunsky Institute of Physics and Power Engineering
Centr Jadernykh Dannykh
Ploschad Bondarenko, 1
249 033 Obninsk, Kaluga Region
Russian Federation

— **Telephone:** +7 08439-9-8982

— **Telefax:** +7 095-883-3112
+7 095-230-2326

— **E-mail:** manokhin@ippe.obninsk.ru

— **Intercenter FTP file transfer:** acjd.ippe.rssi.ru
username: CJD

— **World Wide Web** http://rndc.ippe.obninsk.ru

1.5 Russia Nuclear Structure and Reaction Data Centre (CAJAD)

— **Contact person:** Feliks .E. Chukreev

— **Address:** Russia Nuclear Structure and Reaction
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Kurchatov's Square 1
123182 Moscow
Russian Federation

— **Telephone:** +7 095-196-9968
+7 095-196-1612

— **Telefax:** +7 095-882-5804

— **E-mail:** feliks@polyn.kiae.su
chukreev@polyn.kiae.su

1.6 Centre for Photonuclear Experiments Data

(Centr Dannykh Fotoyadernykh Eksperimentov - CDFE)

— **Contact person:** Vladimir V. Varlamov

— **Address:** Skobeltsyn Institute of Nuclear Physics
Lomonosov Moscow State University
Leninskie Gory
119922 Moscow
Russian Federation

— **Telephone:** +7 095-939-3483

— **Telefax:** +7 095-939-0896

— **E-mail:** varlamov@depni.sinp.msu.ru
varlamov@depni.npi.msu.su

— **Intercenter FTP** depni.sinp.msu.ru

file transfer: username: ftp
password: varl@depni

directory: /incoming/varlamov/

— **World Wide Web** http://depni.sinp.msu.ru/cdfe/

http://depni.npi.msu.su/cdfe/

1.7 China Nuclear Data Center (CNDC)

— **Contact person:** Ge Zhigang

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China Institute of Atomic Energy
P.O. Box 275 (41)
Beijing 102413
Peoples Republic of China

— **Telephone:** +86 10-6935-7275

— **Telefax:** +86 10-6935-7008

— **E-mail:** GEZG@IRIS.CIAE.AC.CN

1.8 Japan Atomic Energy Research Institute - Nuclear Data Center

— **Contact person:** Akira Hasegawa

— **Address:** 2-4 Shirakata Shirane
Tokai-mura, Naka-gun
Ibaraki-ken 319-1195
Japan

— **Telephone:** +81 29-282-5480

— **Telefax:** +81 29-282-5766

— **E-mail:** hasegawa@ndc.tokai.jaeri.go.jp

— **World Wide Web** http://wwwndc.tokai.jaeri.go.jp/

1.9 Japan Charged-Particle Nuclear Reaction Data Group (JCPRG)

— **Contact person:** Kiyoshi Kato

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— **E-mail:** kato@nucl.sci.hokudai.ac.jp

— **World Wide Web** http://jcprg.sci.hokudai.ac.jp/

1.10 ATOMKI Charged-Particle Nuclear Reaction Data Group

— **Contact person:** Ferenc T. Tárkányi

— **Address:** Cyclotron Department
Institute of Nuclear Research
of the Hungarian Academy of Sciences
Bem tér 18/c, P.O. Box 51
H-4001 Debrecen
Hungary

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— **Telefax:** +36-52-416-181

— **E-mail:** tarkanyi@atomki.hu

1.11 Ukraine Nuclear Data Center (UKRNDC)

— **Contact person:** Olena O. Gritzay

— **Address:** Ukraine Nuclear Data Center
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Ukraine

— **Telephone:** +380-44-265-3987

— **Telefax:** +380-44-265-4463

— **E-mail:** ogritzay@kinr.kiev.ua

— **World WideWeb:** http://ukrndc.kinr.kiev.ua/

1.12 Center of Nuclear Physics Data (CNPD)

— **Contact person:** Svetlana A. Dunaeva

— **Address:** All-Russian Scientific Research Institute of
Experimental Physics
Center of Nuclear-Physics Data
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Russian Federation

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— **Telefax:** +7 831-304-5569

— **E-mail:** dunaeva@expd.vniief.ru

— **World Wide Web** http://www.vniief.ru

1.13 KAERI Nuclear Data Evaluation Laboratory (KAERI/NDEL)

— **Contact person:** Jonghwa Chang

— **Address:** Nuclear Data Evaluation Laboratory
Korea Atomic Energy Research Institute - KAERI
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Yusong, Daejon 305-600
Republic of Korea

— **Telephone:** +82 42-868-2884

— **Telefax:** +82 42-868-2636

— **E-mail:** jhchang@kaeri.re.kr

— **Intercenter FTP file transfer:** atom.kaeri.re.kr
username: anonymous

— **World Wide Web** http://atom.kaeri.re.kr/

(alternative: http://hpngp01.kaeri.re.kr/)

Annex 2

Activities

A brief description of each centre is given, including items such as background, staff, activities, responsibilities within the Network and other relevant items. Note: only a fraction of each centre's overall work relates directly to their contribution to the NRDC Network.

Annex 2.1

National Nuclear Data Center (NNDC)

- **Background**

The National Nuclear Data Center (NNDC) is the focal point for US nuclear data activities. At a national level, NNDC coordinates the United States of America Nuclear Data Program and Cross Section Evaluation Working Group. On an international level, the centre plays an important role in all major nuclear data networks, including nuclear reactions (NRDC), nuclear structure and decay data (NSDD) and evaluations (WPEC).

Nuclear data activities at BNL started in 1952 under the Brookhaven Neutron Cross Section Compilation Group, which changed to the Sigma Center in 1961, became the National Neutron Cross Section Center in 1967, and finally was defined as the National Nuclear Data Center in 1977.

- **Status**

— **Type of Institute**	National organization
— **Participating countries**	U.S.A. and Canada

Staff and Budgeting

— **Total**	7 scientists, 3 professionals, 2 support staff, 1 secretary
— **Allocated to nuclear data activities**	7 scientists, 2.75 professionals, 2 support staff, of which 1 equivalent man year is dedicated to NRDC Network activities
— **Fiscal year and budget cycle**	Yearly budget cycle: 1 October to 30 September of the next year.

- **Activities**

A. Within the Network

Services

- Provide nuclear reaction data services to users in the U.S.A. and Canada, including Web and on-line telnet access.

- Maintain and distribute documents on data compilation, evaluation and testing of nuclear data. These services cover both reaction data, and nuclear structure and decay data.

Reaction Data

- Compile experimental reaction data measured in the U.S.A. and Canada, maintain the Cross Section Information Storage and Retrieval System (CSISRS), and exchange data in the Exchange Format (EXFOR) with other data centers.

- Compile references of experimental reaction data published in the U.S.A. and Canada, and maintain the Computer Index to Neutron Data (CINDA) as index to CSISRS.

- Provide links between the Cross Section Evaluation Working Group (CSEWG) for nuclear reaction data activities in the U.S.A (as coordinated by NNDC) and the Network. Provide appropriate support services, and maintain the Evaluated Nuclear Data File (ENDF/B) for distribution to other data centers.

- Maintain computer codes used in processing, storing and retrieving nuclear reaction data and ENDF checking codes.

B. Unique responsibilities within the Network

- Compile and exchange EXFOR and CINDA entries originating from the U.S.A. and Canada.

- Maintain and distribute documentation on compilation of nuclear reaction data, particularly the EXFOR Manual.

- Provide nuclear data services to users in the U.S.A. and Canada.

C. Outside the scope of the Network

Nuclear Structure and Decay Data

- Coordinate the U.S. Nuclear Data Program, including designated activities of the Nuclear Structure and Decay Data (NSDD) network and provide appropriate support services.

- Compile and maintain the Nuclear Science References (NSR) file containing bibliographic references to nuclear physics publications.

- Carry out mass-chain evaluations for nuclear structure and decay data; NNDC is responsible for 55 mass chains.

- Process, check, correct and publish the peer-reviewed journal Nuclear Data Sheets devoted to mass-chain evaluations for A = 45-266 produced by the NSDD network.

- Maintain and distribute nuclear structure related data files (ENSDF, NUDAT, Nuclear Wallet Cards). Maintain, upgrade, and distribute ENSDF physics processing codes.

- Provision of nuclear structure and decay data services, including Web and on-line Telnet access.

- **Signature** Pavel Obložinský

Annex 2.2

NEA Data Bank

- **Background**

The coordination of nuclear data compilation within the OECD countries was initiated in 1964, with the creation of the Neutron Data Compilation Centre (CCDN) at Saclay close to Paris, France. This centre participated from the start in the 4-centre network. The NEA Data Bank was established at Saclay in 1978, by merging the CCDN and the Computer Program Library (CPL), Ispra, Italy.

NEA Data Bank activities have evolved beyond nuclear data and computer programs, and now also include projects such as the coordination of the Joint Evaluated Fission and Fusion (JEFF) library of nuclear data, the compilation and critical review of chemical thermodynamic data for waste management applications, and the compilation of information relevant to computer code validation in the areas of: integral experiments, shielding, criticality safety, fuel behaviour, reactor physics and reactor safety.

The Executive Group of the NEA Nuclear Science Committee manages the work programme of the NEA Data Bank.

- **Status**

— **Type of institute:**	International organisation. Division within the Nuclear Energy Agency (NEA) of the Organisation for Economic Cooperation and Development (OECD).
— **Participating countries:**	Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Japan, Korea, Mexico, Netherlands, Norway, Portugal, Slovak Republic, Spain, Sweden, Switzerland, Turkey, United Kingdom.

- **Staff**

— **Total:**	8 professional, 7 support staff
— **Allocated to nuclear data activities:**	2 professional, 1 support staff and external consultants, of which one equivalent man year is dedicated to NRDC Network activities
— **Fiscal year and budget cycle:**	Calendar year, with a 2-year work programme and budget cycle.

Activities

A. Within the Network:

1. Services

   - Nuclear data services to Member countries, including direct on-line computer

services, as well as data provided free of charge on CD-ROM (whether generic or user-specified).

2. Reaction data

- Compilation of numerical data and summary abstracts (EXFOR) for almost all neutron-induced reaction measurements performed in Member countries.
- Compilation of bibliographic references (CINDA) to measurements, calculations, reviews and evaluations of neutron reaction and other microscopic data, as published in Member countries.
- Coordination of the Joint Evaluated Fission and Fusion (JEFF) project for the production of a complete evaluated neutron data library for use in neutronics calculations covering many different applications.

B. Unique responsibilities within the Network

Compilation and exchange of EXFOR and CINDA entries originating from the Member countries of the NEA Data Bank.

Maintenance of CINDA coding manual.

Provide nuclear data services to Member countries of the NEA Data Bank.

Production of CD-CINDA on an annual basis to coincide with the publication of the CINDA book, which will also be printed by the NEA Data Bank.

C. Outside the scope of the Network

Coordination of the Working Party on International Nuclear Data Evaluation Cooperation (WPEC), established to promote exchange of information concerning nuclear data evaluations, validations, and related topics, and with the aim to assess and improve the quality and completeness of evaluated data.

Collection, verification and validation of computer programs used in all areas of nuclear power production. Dissemination of these computer codes to all countries, apart from the U.S.A. and Canada.

Collection and critical review of Chemical Thermodynamic Data for key elements required for geo-chemical modelling in waste management applications, and on-line computer services for these data.

Compilation of information relevant for computer code validation in the areas of: integral experiments, shielding, criticality safety, fuel behaviour, reactor physics and reactor safety.

- **Signature** Claes Nordborg

Annex 2.3

IAEA Nuclear Data Section (NDS)

- **Background**

The Nuclear Data Section (NDS) of the International Atomic Energy Agency was formed in 1964 to provide nuclear data to IAEA Member States. NDS along with three other neutron reaction data centres formed the 4-centre network in 1964. This network was designed to coordinate the compilation and distribution of neutron reaction data on a world-wide basis in order to provide high-quality customer services at lower cost by avoiding duplication and adopting common compilation formats and procedures for easier data exchange.

NDS initiated a network of charged-particle and photonuclear data centres in 1975 to compile nuclear reaction data types not covered by the existing 4-centre network. These two networks were merged in 1979 to form the Nuclear Reaction Data Centres Network which covers all nuclear reaction data.

Separately, the NDS established the Nuclear Structure and Decay Data Network in 1975 to coordinate internationally the evaluation and dissemination of nuclear structure and radioactive decay data. The Atomic and Molecular (A+M) Data Unit was also constituted within the Nuclear Data Section in 1975 to coordinate the evaluation and dissemination of atomic and molecular data.

The nuclear data programme of the IAEA is guided by the International Nuclear Data Committee, while the A+M Subcommittee of the International Fusion Research Council advises on the atomic and molecular data programme.

- **Status**

— **Type of institute:** International organization.
Section within the Division of Physical and Chemical Sciences, Department of Nuclear Sciences and Applications, International Atomic Energy Agency

— **Participating countries:** 134

- **Staff and Programmes**

— **Total staff:** 10 professional, 8 general service staff members

— **Thereof allocated to nuclear data activities:** 8 professional, 7 general service staff members, of which 4 equivalent man years per annum are dedicated to NRDC Network activities (provision and development of relevant databases, plus support service functions)

— **Fiscal year:** Calendar year

— **Budget cycle:** Two-year budget cycle (for example, 2004/2005)

- **Activities**

A. Within the Network:

1. Services:
   - Nuclear data services to those Member countries that are not directly served by one of the other service centres, including direct on-line computer services.
   - Documentation of data libraries in the IAEA-NDS series, and announcements in the IAEA Nuclear Data Newsletter.

2. Reaction Data:
   - Coordination of the nuclear reaction data centres network, including
     - neutron-induced reactions,
     - charged-particle and heavy-ion induced reactions,
     - photonuclear reactions.
   - Compilation of numerical data and related information (EXFOR) for nuclear reaction data measurements performed in those Member countries that are not directly served by one of the other compilation centres.
   - Compilation of bibliographic references for microscopic neutron reaction data and related data (CINDA), published in those Member countries that are not directly served by one of the other compilation centres. Publication of CINDA handbooks.
   - Assign responsibilities for the creation and correction of data compilations as coordinator of these activities, and drive this work forward.
   - Maintain and distribute EXFOR dictionaries and EXFOR (and CINDA) master file to other network data centres.

B. Unique responsibilities within the Network

Data centre coordination by organizing Network meetings, and reporting resulting activities.

Publication of reports and technical documents - Network meeting reports and relevant technical data (also made available through the Internet and on CD-ROM).

C. Outside the main scope of the Network

Coordination of nuclear data generation activities, including experiments, theory, evaluations and validations, primarily through the mechanism of IAEA Coordinated Research Projects (CRPs).

Participation in activities organized by the NEA Nuclear Science Committee to coordinate major nuclear data evaluation projects.

Coordination of the Nuclear Structure and Decay Data Evaluators Network.

Coordination of the production of specialized evaluated data libraries such as FENDL.

Secretariat of the International Nuclear Data Committee and A+M Subcommittee of the International Fusion Research Council; establish and oversee recommended IAEA nuclear data programmes.

Support nuclear data activities in developing countries by appropriate means, such as training, research contracts, Technical Cooperation projects, *etc.*

Data centre and research coordination activities in the field of atomic and molecular data for fusion.

- **Signature** Alan Nichols

Annex 2.4

RUSSIA NUCLEAR DATA CENTER (CJD)
(Leipunsky Institute of Physics and Power Engineering, Obninsk, Russian Federation)

- **Background**

CJD was formed in 1963, participated from the start in the 4-centre network and was responsible for the compilation of neutron data within the former USSR. The CJD works under the Nuclear Data Commission of the Russian Federation Ministry of Atomic Energy, and compiles neutron data published in Russia and the states of the CIS.

- **Status**

— **Type of institute:** Laboratory within the Department of Nuclear Physics of the Leipunsky Institute of Physics and Power Engineering.

— **Member countries:** Russian Federation

- **Staff and Programmes**

— **Total staff:** 10 professional, 2 supporting staff

— **Allocated to nuclear data activities:** 8 professional, 1 supporting staff, of which 4 equivalent man years are dedicated to NRDC Network activities.

— **Fiscal year:** Calendar year

— **Budget cycle:** One year

- **Activities**

A. Within the Network:

1. Services

   - Providing neutron data services to institutes and other organizations in the Russian Federation.

2. Reaction Data

   - Compilation of bibliographic references for measurements, calculations, reviews

and evaluations of microscopic neutron reactions (CINDA) in Russia and the states of the CIS.

- Compilation of numerical data and related information for neutron reaction data measurements (EXFOR) in Russia and the states of the CIS.
-
- Make evaluations from the BROND project available to the Network.

B. Unique responsibilities within the Network

Compilation and exchange of CINDA and neutron EXFOR entries originating from Russia and the states of the CIS.

C. Outside the scope of the Network

Determination of nuclear data requirements for various applications in the Russian Federation.

Coordination of neutron data evaluations, and development of national evaluated neutron data libraries for general purposes and special applications.

Publication of the journal “VANT, Ser. Yadernye Konstanty”.

Selected nuclear reactor calculations for nuclear data testing.

- **Signature** Vasilij N. Manokhin

Annex 2.5

Russia Nuclear Structure and Reaction Data Centre (CAJAD)

(National Scientific Research Center "Kurchatov Institute", Moscow, Russian Federation)

- **Background**

CAJAD was formed in 1973, and was initially responsible for the compilation of integral charged-particle data and for preparing bibliographic entries (according to NSR file rules) for Russian nuclear physics papers. The centre has also participated in the ENSDF activity from the beginning. CAJAD works under the auspices of the Nuclear Data Commission of the Russian Federation Ministry of Atomic Energy.

- **Status**

— **Type of institute:** Laboratory within the General and Nuclear Physics Institute of the Russian Research Centre "Kurchatov Institute".

— **Participating countries:** Russian Federation

- **Staff**

— **Total staff:** 4 professionals, 1 supporting staff

— **Allocated to nuclear data activities:** 4 professionals, 1 supporting staff, of which 1.5 equivalent man years are dedicated to NRDC Network activities.

- **Activities**

A. Relevant to the Network:

1. Services

   - Provision of charged-particle reaction data.

2. Reaction Data

   - Compilation of numerical data and related information for charged-particle induced reactions (integral and differential). Scope of publications is international, and is based on the various on-going tasks of CAJAD.
   - Evaluation of some charged-particle reactions (mainly monitor reactions).

- CAJAD will continue to develop the EXFOR checking code for PCs.

B. Outside the scope of the Network

Nuclear Structure and Decay Data

- Responsible for specific mass chains in ENSDF.
- Develop methods of experimental data analysis in case of contradictions and ambiguous interpretations.
- Develop computer codes to aid in the evaluation of quantum data.

Computer codes for specific applications: alpha- and neutron-induced reactions, identification of nuclides, electromagnetic radiation penetration, and stopping power of charged particles.

Determine non-neutron nuclear data requests for applications.

- **Signature** Feliks E. Chukreev

Annex 2.6

MSU SINP Centre for Photonuclear Experiments Data (CDFE)

(Centr Dannykh Fotoyadernykh Eksperimentov - CDFE)

- **Background**

The Centre for Photonuclear Experiments Data (Centr Dannykh Fotoyadernykh Eksperimentov - CDFE) of the Skobeltsyn Institute of Nuclear Physics, Moscow State University, was formed to provide photonuclear data for scientific and educational institutes and for organizations working under the auspices of the Russian (former USSR) Nuclear Data Commission.

CDFE became a member of the IAEA Nuclear Reaction Data Centres Network in 1980, with the tasks of compilation and international exchange of experimental nuclear data (primarily photonuclear) using the EXFOR system, evaluation of photonuclear data and compilation of relevant bibliographic information. The centre was the lead organization of the Russia Committee of Education (RCE) Nuclear Data Centres Network from 1983 to 1991, dedicated to the compilation, evaluation and dissemination of nuclear data (primarily to universities and institutes of RCE).

- **Status**

— **Type of organization:** Laboratory of the Skobeltsyn Institute of Nuclear Physics of the Lomonosov Moscow State University.

— **Participating countries:** Russian Federation

- **Staff**

— **Total staff:** 4 professional, 1 general service

— **Allocated to nuclear data activities:** 3 professional, 1 general service, of which 2 equivalent man years are dedicated to NRDC Network activities.

— **Fiscal year:** Calendar year

— **Budget cycle:** One year

- **Activities**

A. Within the Network

1. Services

   - Photonuclear data services to IAEA Member countries.

Web-site maintenance of nuclear reaction and nuclear structure databases.

2. Reaction Data

- Compilation of numerical data and related information (EXFOR) for photon-induced reaction measurements. International exchange of nuclear data as EXFOR entries.
- Compilation of bibliographic references to measurements, reviews and evaluations of photonuclear reactions. Publication of annual bibliographic bulletins and indices, such as the "Photonuclear Data" series.
- Development of methods for evaluation of photonuclear data obtained in various kinds of experiments.
- Production and maintenance of an evaluated photonuclear reaction cross section library.
- Development of various charged-particle reaction data catalogues (in co-operation with CAJAD).

B. Unique responsibilities within the Network

CDFE is the main centre for photonuclear data within the Network.

Compilation of experimental photonuclear data using EXFOR.

Evaluation of photonuclear data.

C. Outside the scope of the Network

1. Related to Photonuclear Data
   - Experimental measurements of photonuclear data using various facilities (betatron and race-track microtron).
   - Theoretical calculations of photonuclear data, and development of models for the description of photonuclear data.

2. Nuclear Structure and Decay Data

   - Development of computer software for managing nuclear data from ENSDF using IBM/PC and compatible computers (e.g., "NESSY" - New ENSDF Search System).

3. Web-site

   - Development and maintenance of Web-site (http://depni.sinp.msu.ru/cdfe) in terms of the various nuclear structure relational databases.

Support of nuclear (primarily photonuclear) data activities in Russian Federation.

Nuclear data services to Russian organizations: primarily to universities and other educational institutes, and to the Academy of Science and Minatom organizations.

- **Signature** Vladimir V. Varlamov

Annex 2.7

China Nuclear Data Center

- **Background**

  The China Nuclear Data Center (CNDC) was founded in 1975 as the national centre for the generation, collection, processing and dissemination of nuclear data, and provision of services to all nuclear data users in China. The China Nuclear Data Coordination Network (CNDCN) is composed of specific institutes and universities in China that undertake nuclear data measurements and evaluation. At present, the network has about 20 members, and is coordinated by the CNDC

- **Status**

  — **Type of institute:** Within the Nuclear Physics Division of the China Institute of Atomic Energy

  — **Members of CNDCN:** About 19 institutes and universities in China

- **Staff and Programmes**

  — **Total staff:** 16 professional, 3 general service

  — **Thereof allocated to nuclear data activities:** 14 professional, 3 general service, of which na
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  - **A activitind**

Network concerning:

- nuclear data measurements;
- nuclear data evaluations;
- model program development and computation;
- group constant generation and benchmark testing;
- charged-particle nuclear reaction data;
- fission product yield data;

Network concerning:- chargons;
- charged-par Tc D -iD -0n;

Annex 2.8

JAERI Nuclear Data Center

- **Background**

JAERI Nuclear Data Center (JAERI/NDC) was established in 1968, with the support of Japanese Nuclear Data Committee (JNDC) which was formed in 1963 within the Atomic Energy Society of Japan. Main efforts of JAERI/NDC have been devoted to the development of the Japanese Evaluated Nuclear Data Library (JENDL) in cooperation with JNDC. JENDL-1 was completed in 1977, JENDL-2 in 1984, JENDL-3 in 1989, and the latest version of JENDL-3 (JENDL-3.3) was released in 2002. Efforts have also focused on the development of the JENDL special purpose files: latest version of JENDL Fission Product Decay Data File was released in 2000, and JENDL Dosimetry File 99 in 2001. JAERI/NDC has published a Chart of the Nuclides every 4 years since 1976, and joined the international mass chain evaluation for ENSDF in 1977.

As the national nuclear data centre, JAERI/NDC disseminates both experimental and evaluated nuclear data to users in Japan, and functions as the communications channel to foreign and international nuclear data centres. JAERI/NDC also serves as the secretariat of JNDC.

Besides nuclear data activities, JAERI/NDC began evaluating atomic and molecular data in 1976. However, due to restructuring of Tokai Research Establishment of JAERI, this activity was transferred to Plasma Analysis Division, Department of Fusion Plasma Research, Naka Fusion Research Establishment in October 2000.

- **Status**

— **Type of institute:** Laboratory in the Department of Nuclear Energy System, Tokai Research Establishment, JAERI

— **Member countries:** Japan

- **Staff and Programmes**

— **Total staff:** 7 physicists, 2 secretaries

— **Thereof allocated to nuclear data activities:** 7 physicists, 2 secretaries, of which equivalent man year is dedicated to NRDC Network activities.

— **Fiscal year and budget cycle:** Yearly from 1 April to 31 March

- **Activities**

A. Within the Network:

1. Services:

   - Nuclear data services to domestic users.

   - Communications channel to foreign and international centres for data and information exchange.

2. Reaction Data:

   - Evaluation, validation and dissemination of JENDL General Purpose File (JENDL-1, 2, 3) and JENDL Special Purpose Files (Dosimetry, Activation, Gas-Production, (α,n), Fusion, Actinides, Covariance, Photo-reaction, PKA/KERMA, High Energy etc.).

   - Contribute CINDA entries from Japanese journals and reports through NEA Data Bank.

B. Unique responsibilities within the Network

Provide large-scale nuclear data library produced in Japan to all centres (e.g., JENDL).

C. Outside the scope of the Network

Nuclear Structure and Decay Data:

- Publish Chart of the Nuclides every 4 years (latest version, 2000).

- Evaluation, validation and dissemination of JNDC Nuclear Data Library for Fission Products (for decay heat calculations).

- Contribute mass chain evaluations of ENSDF (A = 118 to 129).

Member of NEA/NSC Working Party on International Nuclear Data Evaluation Cooperation (WPEC), and various IAEA Coordinated Research Programmes.

- **Signature** Akira Hasegawa

Annex 2.9

Japan Charged-Particle Nuclear Reaction Data Group (JCPRG)

- **Background**

A research project to compile Charged-Particle Nuclear Reaction Data was initiated in 1974, which was approved by the Theoretical Nuclear Physics Society and the Experimental Nuclear Physics Society in Japan. When this project started, a work-sharing programme was agreed with the JAERI Nuclear Data Centre that the resulting study group would be responsible for Charged-Particle Nuclear Reaction Data while JAERI would be in charge of Nuclear Neutron Data.

The original database (NRDF, Nuclear Reaction Data File) was devised by the study group under the sponsorship of the Japanese Ministry of Education, Science and Culture through the Grant-in-Aid for Scientific Research. With data storage and retrieval functions added to the original NRDF system, the project developed from research and testing to the practical working stage of data compilation and data dissemination in 1987. Subsequently, the study group was reorganized to become the Japan Charged-Particle Nuclear Reaction Data Group (JCPRG), and was assigned an annual budget through the Nuclear Physics Laboratory, Department of Physics, Hokkaido University by the Ministry of Education, Science and Culture. This regular JCPRG budget ended in 2001, and was replaced by a yearly competitive process.

The primary aims of JCPRG are to construct and provide an academic-oriented database according to an original and unique format by compiling and storing all charged-particle nuclear reaction data produced with Japanese accelerators. JCPRG is also responsible for transforming NRDF to EXFOR format, and sending these files to IAEA-NDS.

JCPRG comprises an Advisory Committee and an Executive Committee. The Advisory Committee has a membership of 17, consisting of representatives from the main nuclear laboratories and institutes in Japan. Activities carried out by JCPRG are the responsibility of the Executive Committee, under the advice and guidance of the Advisory Committee.

- **Status**

— **Type of institute:** Nuclear Physics Laboratory, Division of Physics, Graduate School of Science, Hokkaido University (Office of Executive Committee).

— **Member countries:** Japan

- **Staff and Programmes**

  — **Members of Executive Committee:** 7 nuclear physicists, 1 information scientist
  — **Allocated to JCPRG Office:** 2 nuclear physicists, 1 secretary
  — **Part-time:** 12 nuclear physicists (in 2002)

  of which equivalent man year is dedicated to NRDC Network activities.

  — **Fiscal year:** Yearly from 1 April to 31 March
  — **Budget cycle:** One year

- **Activities**

A. Within the Network:

Reaction Data:

- Compilation of Charged-Particle Nuclear Reaction Data produced in Japan (NRDF format).
- Conversion of NRDF data into EXFOR format.
- Contribute to the development of common formats for the computerized exchange of nuclear data

B. Unique responsibilities within the Network

Compilation of all charged-particle nuclear reaction data produced in Japan, and conversion into EXFOR

Provide charged-particle nuclear reaction data service to Japanese users

C. Outside the scope of the Network

On-line computer services of NRDF to Japanese users.

Publication of "NRDF Annual Report" to coordinate and promote nuclear data.

- **Signature** Kiyoshi Kato

Annex 2.10

ATOMKI Charged-Particle Nuclear Reaction Data Group

- **Background**

The ATOMKI Charged-Particle Nuclear Reaction Data Project started in 1992 within the Institute of Nuclear Research of the Hungarian Academy of Sciences (ATOMKI), Debrecen, following an invitation from IAEA-NDS to join the international network for the compilation and evaluation of integral data from charged-particle induced nuclear reactions.

Compilation work was initially based on cross section measurements and practical applications. The existing database of charged-particle nuclear reactions was found to be inadequate, with increasing demands for more precise data. Therefore, a comprehensive charged-particle data programme has started, covering the establishment of a computerized database, the (re)measurement of the most important reaction data, and a critical evaluation of the compiled data. Integral reaction data were also measured and used in medical isotope production, activation analysis, thin-layer activation technique and other fields using cyclotrons, in collaborative studies with a number of foreign institutes.

Establishment of the computerized charged-particle reaction database was supported by the National Committee for Technical Development, Hungary.

- **Status**

— **Type of institute:** Team within the Cyclotron Department of the Institute of Nuclear Research, Hungarian Academy of Sciences.

— **Participating country:** Hungary

- **Staff and Programmes**

— **Total:** 6 nuclear physicists (all part time), of which 0.25 equivalent man years are dedicated to NRDC Network activities.

— **Fiscal year:** Calendar year

— **Budget cycle:** One year

- **Activities**

A. Within the Network:

1. Services:

   - Charged-particle reaction data for Hungarian users. International services also include the provision of compiled and recommended data for monitor reactions, reactions for the production of medical radioisotopes, and reactions for thin-layer activation analysis.

2. Reaction Data:

   - Compilation of new cross-section data for nuclear reactions induced by charged particles, as performed at Forschungszentrum Jülich (Germany) and in Hungary.
   - Compilation of older data when required
   - Review and evaluation of low- and intermediate-energy charged-particle data used in various applications.

B. Unique responsibilities within the Network

Compilation of all charged-particle nuclear data produced, as specified above.

C. Outside the scope of the Network

Provision of charged-particle reaction data to Hungarian users.

Measurement of the most important reaction data used for monitoring beam parameters, for medical radioisotope production, and for thin-layer activation analysis.

- **Signature** Ferenc Tárkányi

Annex 2.11

Ukraine Nuclear Data Center (UKRNDC)

(Institute for Nuclear Research, Kyiv, Ukraine)

- **Background**

UKRNDC was formed in 1996, with initial responsibility for the compilation of neutron data published in the Ukraine. Both the products and services have expanded over the years, and current activities are listed below.

- **Status**

— **Type of institute:** Subdivision within the Department of Neutron Physics, Institute for Nuclear Research.

— **Participating country:** Ukraine

- **Staff and Programmes**

— **Total:** 6 professionals

— **Allocated to nuclear data activities:** 6 professionals, of which 2 equivalent man years are dedicated to NRDC Network activities.

— **Fiscal year:** Calendar year

— **Budget cycle:** 3 years

- **Activities**

A. Within the Network:

1. Services:

   - Nuclear data services for users in Ukraine, including Web service.

2. Reaction Data:

   - Compilation of numerical data and related information for neutron and charged-particle reaction data measurements (EXFOR) in Ukraine.
   - Compilation of bibliographic references to measurements, calculations, reviews and evaluations of microscopic neutron and charged-particle reaction data (CINDA) published in Ukrainian scientific journals and reports.

3. Web-site

   - Development of Web-site with various nuclear reaction data and computer codes to facilitate customer work with nuclear data in the Ukraine.

B. Unique responsibilities within the Network

Responsibilities mentioned above.

C. Outside the scope of the Network

Experimental measurements of neutron data using the neutron filter beam technique.

Creation of task-oriented databases and preparation of multigroup cross-section libraries for nuclear technology needs in the Ukraine.

Dissemination of free world-wide computer codes for basic and applied calculations.

Development of computer codes for specific applications.

Nuclear data support to meet requirements connected with Chernobyl (decommissioning of RBMK units, 4^{th} block nuclear safety, etc.).

Educational support of senior course students at Kyiv University and Slavutych Nuclear Data Bank staff (provision of lecturers for teaching course on "Nuclear Data for Science and Technology").

- **Signature** Olena O. Gritzay

Annex 2.12

Center of Nuclear-Physics Data (CNPD)

(RFNC-VNIIEF, Sarov, Russian Federation)

- **Background**

CNPD evolved from compilation activities dedicated to charged-particle reaction data, which started at RFNC-VNIIEF in 1977. Officially, the data centre was formed in 1997 to provide nuclear services to users.

- **Status**

— **Type of institute:** Research Group within the Institute of Nuclear and Radiative Physics, Russian Federal Nuclear Centre.

— **Member countries:** Russian Federation

- **Staff and Programmes**

— **Total staff:** 5 professional, 2 support staff

— **Allocated to nuclear nuclear data activities:** 5 professional, 1 support staff, of which 1 equivalent man year is dedicated to NRDC Network activities.

— **Fiscal year:** Calendar year

— **Budget cycle:** One year

- **Activities**

A. Within the Network:

1. Services

   - Provide nuclear data services to users in Russia and the republics of the former USSR.

2. Reaction Data

   - Compilation of numerical data and related information for charged-particle reaction data on light nuclei. International exchange of data as EXFOR entries.

   - Compilation of numerical data and related information for various nuclear reaction

data measurements performed in RFNC-VNIIEF with the co-operation of CJD, CAJAD and CDFE.

- Development of methods for the evaluation of charged-particle reaction data.

- Production of an evaluated reaction cross-section library.

B. Unique responsibilities within the Network

Responsibilities mentioned above.

C. Outside the scope of the Network

Research and development of measurements, calculations and compilations of nuclear data.

Determination of nuclear requirements for applications at RFNC-VNIIEF.

- Provision of computer codes for specific applications, for example:

  Maxwellian and non-Maxwellian velocity calculations of main thermonuclear reactions;

  cross-section evaluations of charged-particle reactions on light nuclei;

  development of algorithms for extrapolation of nuclear data into the lower energy region (of interest in astrophysics);

  creation of task-oriented databases.

- Experimental measurements of neutrons, charged particles and photonuclear data using various facilities (linear accelerator, tandem Van de Graaf, neutron generator, *etc*).

• **Signature** Svetlana A. Dunaeva

Annex 2.13

KAERI Nuclear Data Evaluation Laboratory (KAERI-NDEL)

(KAERI, Yusong, Republic of Korea)

- **Background**

The Nuclear Data Evaluation Laboratory (KAERI-NDEL) of the Korea Atomic Energy Research Institute was established in 1996. KAERI-NDEL has devoted considerable effort to ensure the supply of processed and evaluated nuclear data for national nuclear research and development projects.

- **Status**

- **Type of institute:** Within Department of Advanced Reactor Technology, Korea Atomic Energy Research Institute
- **Member country:** Republic of Korea

- **Staff**

- **Total Staff:** 8 scientists, 1 technician, of which equivalent man year are dedicated to NRDC network activities
- **Fiscal year:** Calendar year
- **Budget cycle:** One year

- **Activities**

A. Within the Network:

1. Services:

   - Nuclear data services to domestic users

   - Communications channel to foreign and international centres for data and information exchange.

2. Reaction Data:

   - Compilation of numerical data and related information for nuclear reaction data measurements published in Korea.

   - Compilation of bibliographic references to microscopic nuclear reaction data and related data, as published in Korea.

C. Unique responsibilities with in the Network

Provision of nuclear data services to Korean users

B. Outside the scope of the Network:

Research and development in the evaluation of nuclear data.

Preparation of multigroup libraries for neutron transport codes.

- **Signature** Jonghwa Chang

Annex 3

2003 Protocol: Nuclear Reaction Data Centres

Approved at NRDC Meeting held at NEA DB, Paris, 27-30 May 2002
Reviewed and amended at the 2003 NRDC Meeting, 17 June 2003

The Nuclear Data Section (NDS) will assume a more pro-active role co-ordinating all Nuclear Reaction Data Centres (NRDC). NDS staff will be responsible in this extended role for ensuring that data compilations are undertaken and completed in an efficient, productive and timely manner. Thus, the role of NDS will be as follows:

(a) assign clear responsibilities for the creation and correction of data compilations, and drive these activities forward,
(b) ensure implementation of compilation rules,
(c) decide on all issues relating to dictionary codes,
(d) be responsible for CINDA and EXFOR distribution to the other data centres.

1. Compilation Responsibilities

NDS will assign areas of responsibility for data compilation. If a centre assigned a particular area of compilation (e.g., neutron data from a country or countries)[1] does not carrying out their responsibilities (i.e., compile all new data for that area in a timely manner), the NDS co-ordinator will re-assign all or part of those responsibilities to another volunteer centre.

A centre responsible for an area of compilation may agree with another network centre to share the compilation work for that area on a regular basis. However, the responsibility for coverage and quality of the compilation remains with the responsible centre.

Compilation responsibilities as assigned by NDS are given in **Annex 4** (December 2002).

2. Decisions Concerning Compilation Rules and New Quantities

Final decisions on proposals concerning compilation rules and new quantities can be made with Core Centre[2] agreement after discussions among all centres. NDS will be the final arbiter in case the Core Centres are unable to reach a decision.

3. Decisions Concerning Dictionary Codes

NDS will be the final arbiter for all decisions concerning dictionary codes (see also Section 2, above).

[1] An area may be defined in terms of a given projectile or set of projectiles, for a given country or group of countries, for a given data type or data types, or for any combination of these.
[2] Core centres will be defined by NDS, based on contributions to the network and user service capabilities.

4. EXFOR/CINDA Transmissions

All preliminary and final EXFOR and CINDA transmissions will be sent to NDS, who will be responsible for distributing all final transmissions.

5. Corrections to EXFOR/CINDA Entries

NDS may correct or assign volunteers to correct preliminary transmissions, that have not been corrected and resubmitted as final transmissions in a timely manner.

6. Urgent Compilation Needs

If a centre requires a particular data set to be compiled immediately, the centre should send a request to the responsible centre with a copy to NDS. If the responsible centre cannot compile the data to the timetable requested, the requesting centre may compile the data as an area Z entry. This entry will be sent to both the original responsible centre and NDS. If the responsible centre does not intend entering the data in a timely fashion, the NDS may transmit the new Z entry to all centres. The responsible centre can subsequently delete the Z entry, if they are able to replace the earlier compilation with their own entry for their area.

7. Corrections to Entries Compiled at Another Centre

Notification of errors found in entries originating from another centre should be communicated to all centres. The NDS should make sure corrections are undertaken in a timely manner. If they are not, the co-ordinator will request one of the other centres to submit the corrected entries.

8. Maintenance of the Masterfile

NDS will maintain and distribute the EXFOR (and CINDA) Masterfile.

9. Problematic entries

NDS will create a new subdirectory of the open area NDSX4.TRANS for those problematic entries which were removed from a PRELIM transmission. These entries will be reviewed by the other centers and can be finalized at the next NRDC meeting.

10. NDS staff

Otto Schwerer (NDS) has been appointed co-ordinator of the NRDC Network.

Notes

a). As a consequence of the above, the link between the geographical area of the Institute and the accession number, which has been in place for all neutron data, is no longer obligatory and may be lifted in certain cases. Similarly, for corrections to entries of another centre according to Section 7 above, entries of different accession number areas can be transmitted on the same TRANS file.

b). This protocol will be reviewed at each NRDC meeting.

Annex 4

Responsibilities for EXFOR Compilations

Centre	Basic Responsibility	Additional Compilation
NNDC	Neutron data and CPND* from USA and Canada	
NEA Data Bank	Neutron data from NEA Data Bank member countries (see Annex 2.2)	CPND (co-ordinated by NDS)
NDS	Neutron data and CPND from Rest of the World (areas not covered otherwise)	
CJD	Neutron data from former Soviet Union (except Ukraine)	
CAJAD	CPND from former Soviet Union (except Ukraine)	CPND from Rest of the World (co-ordinated by NDS)
CDFE	Photonuclear data	
China Nuclear Data Centre	Neutron data and CPND from China (entries submitted through NDS)	
Japan Charged-Particle Nuclear Reaction Data Group (JCPRG)	CPND from Japan (entries submitted through NDS)	
ATOMKI Charged-Particle Nuclear Reaction Data Group	CPND from Jülich and ATOMKI (entries submitted through NDS)	
Ukraine Nuclear Data Centre (UKRNDC)	Neutron data and CPND from Ukraine (entries submitted through NDS)	
CNPD-VNIIEF	CPND for light nuclei, co-ordinated with other centres	

* CPND - Charged-particle induced nuclear reaction data.

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usernames: ANONYMOUS for FTP file transfer;
FENDL2 for FTP file transfer of FENDL-2.0;
RIPL for FTP file transfer of RIPL;
NDSONL for FTP access to files sent to NDIS “open” area.
Web: http://www-nds.iaea.org