

50th Anniversary

International Network of NSDD Evaluators

Alan Nichols

Abingdon, UK

50th Anniversary

International Network of NSDD Evaluators

- 1969–1972 Mössbauer spectroscopy, University of Leeds, UK
- 1972–1974 positronium annihilation, Virginia Tech, USA
- 1974–1977 Variable Energy Cyclotron – radioisotope production:
 ^{18}F , ^{52}Fe , ^{82}Sr – ^{82}Rb , ^{127}I (p,5n) ^{123}Xe (EC) ^{123}I , and ^{201}Tl ,
evaluate/ assemble decay databases (UK), Harwell, UK
- 1977–1993 aerosol science,
physical and chemical characterisation of severe reactor
accident aerosols,
radioactive waste management,
evaluate/ assemble decay databases (UK and JEF-2.2),
management functions, Winfrith, UK
- 1991–2001 evaluate/ assemble decay databases (IAEA, DDEP, JEFF),
management functions, Culham/ Harwell, UK
- 2001–2009 Section Head, Nuclear Data Section, IAEA,
evaluations of decay data (IAEA, DDEP, JEFF)
- 2009– more evaluations of decay data (IAEA and DDEP)

50th Anniversary

International Network of NSDD Evaluators

3-7 May 1976 Grand Hotel, Ringstrasse, Vienna, Austria
("temporary" IAEA headquarters, 1957-1979)
IAEA report INDC(NDS)-79

10-14 Nov 2003 VIC, Vienna, Austria
IAEA report INDC(NDS)-456

6-10 June 2005 McMaster University, Hamilton, Canada
IAEA report INDC(NDS)-0476

11-15 June 2007 Petersburg Nuclear Physics Institute (PNPI),
St. Petersburg, Russia
IAEA report INDC(NDS)-0513

23-27 March 2009 VIC, Vienna, Austria
IAEA report INDC(NDS)-0559

50th Anniversary International Network of NSDD Evaluators

..... however, before May 1976:

IAEA report INDC(NDS)-060, September 1974

IAEA Specialists' Meeting on Nuclear Data for Applications,
29 April – 3 May 1974, Vienna, Austria,

consider expansion as recommended by the International Nuclear Data Committee in October 1973

23 scientists, of which 9 were observers, from 13 countries and 2 international bodies

Chair appointed, but not named

Scientific Secretary: Alex Lorenz (NDS, IAEA)

Delegates: B.J. Allen (Australia), W. Bambynek (CEC), G.A. Bartholomew (Canada),
J. Blachot (France), F.E. Chukreev (USSR), P.M. Endt (the Netherlands), F.H. Fröhner (NEA),
B. Grinberg (France), D.J. Horen (USA), J. Legrand (France), H. Münzel (FRG),
S. Pearlstein (USA), A. Shihab-Eldin (USA), L.L. Sokolovskij (USSR)

Observers: G. Baciú (Romania), W. Breunlich (Austria), H. Jasicek (Austria),
H. Oberhammer (Austria), G. Paic (Yugoslavia), S.N. Rapeanu (Romania), P. Riehs (Austria),
J.F. Sharpey-Schafer (University of Liverpool, UK), L.G. Stroemberg (Sweden)

+ papers and statements presented at above meeting issued as part of INDC(NDS)-061, July 1974

25th IAEA Technical Meeting of the International Network of Nuclear Structure and Decay Data Evaluators,
15–19 April 2024, IAEA Headquarters, Vienna, Austria

50th Anniversary International Network of NSDD Evaluators

3–7 May 1976 Grand Hotel, Ringstrasse, Vienna, Austria
("temporary" IAEA Headquarters, 1957–1979)
IAEA report INDC(NDS)-79

IAEA Advisory Group Meeting on Nuclear Structure and Decay Data for Applications:

26 scientists from 14 countries and 2 international bodies

Chair: Sol Pearlstein (US National Neutron Cross Section Center, BNL)

Scientific Secretary: Alex Lorenz (NDS, IAEA)

W. Bambynek (CEC), H. Behrens (FRG), D. Berényi (Hungary), F.E. Bertrand (ORNL, USA),
J. Blachot (France), L. Carlén (Sweden), F.E. Chukreev (USSR), C. Dunford (BNL, USA),
G. Erdtmann (FRG), N.E. Holden (BNL, USA), M. Ivascu (Romania), I.A. Kondurov (USSR),
J. Legrand (France), A. Marcinkowski (Poland), A.L. Nichols (Harwell, UK), H. Ohnuma (Japan),
K. Okamoto (NDS, IAEA), G. Reffo (Italy), J.J. Schmidt (NDS, IAEA), L.L. Sokolovskij (USSR),
T. Tamura (Japan), P.J. Twin (University of Liverpool, UK), C. van der Leun (the Netherlands),
H.K. Vonach (Austria)

Significant number of mass-chain and potential commitment statements

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50th Anniversary International Network of NSDD Evaluators

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- superb chairmanship
- subdued street lighting
- dark, empty streets in the evenings, and clanking hotel elevators
- Vienna: 'The Third Man' movie without the WWII bomb damage

Mass Chain Assignments as of 16 November 1977

<u>A-Range</u>	<u>Responsible NSDD Evaluation Groups</u>
1-4	USSR
5-20	US/UP
21-44	NED/UTRECHT
45-64	US/NDP
65-80	UK/Daresbury including KUW/ISR
81-100	FRG/ZAED
101-117	US/NDP including SWD/Lund
118-129	JAP/JAERI
130-135	USSR
136-145	US/NNDC
146-152	US/LBL
153-162	US/INEL
163-194	US/LBL
195-237	US/NDP
238, 240, 242, 244	USSR
239, 241, 243	US/NDP
245- ∞	US/NDP

Manpower Commitment of Evaluation Groups

(As of January 1978)

<u>Evaluation Group</u>	<u>Manpower Commitment</u> (given in man-years (MY) of evaluator time)
US/NNDC	2 MY plus 1 or 2 support
US/NDP	7½ MY plus 1 or 2 support
US/LBL	3 MY plus 1 support
US/INEL	1 MY plus 2 support
US/UP	½ MY plus ½ support
USSR/CAJAD	3 MY plus support staff
USSR/LIYAF	1 MY plus support staff
NED/UTRECHT	⅔ MY
UK/DARES BURY	¾ MY
FRG/ZAED	3 MY plus 1 support
JAP/JAERI	1 MY plus support staff
SWD/Lund	½ MY
KUW/ISR	1 MY

} plus contracts with other organizations

**almost
25 MY**

Table I: Mass-Chain Evaluation Status as of April 1980

Network Members	#	Completed Evaluations since end of 1977	On-Going Evaluation	Evaluations planned through 1981	Mass Range Responsibilities
US/NNDC	0	(112), 136, 140-145	138, 139	137	136-145
US/NDP + Franco-Belgian Group and Sweden	23	46, 48, 49, 51, 52, 54, 60, 62-64, 101, 103, 105, 109, 111, (112 done by US/NNDC), 117, (119), (147), (154), 195, 196, 197, 199-207, 209, 211-213, 217, 221, 225, 229, 233, 237, 241	102, 104, 106, 107, 108, 113, 114, 115, 116, (152), 208	110, 210, 215-230, 245-263 (excluding seven α -decay mass-chains 217, 221, ..., 241)	45-64, 101-117, 195-263 [Except masses 238, 240, 242, 244]
LEL	21	(147 done by US/NDP), 163, 191	(152 being done by US/NDP), 174, 188, 189, 190, 192, 193	168-171, 180-183	146-152, 163-194
INEL	2	(154 done by US/NDP), 159	153, 157, 158	155, 160, 161	153-162
UK + Kuwait	2	70, 71, 73, 77	67, 68, 72, 75, 78, 80	69, 74, 79, 76	65-75, 76-80
FIZ	4	84-87, 91, 92	93, 95, 96	81, 82, 94, 97-100	81-100
USSR/CAJaD	0		1, 3, 240, 242, 244	2, 4, 238	1-4, 238, 240, 242, 244
USSR/LIYaF	0	134	130, 133, 135	131, 132	130-135
UTRECHT	0	21-44	21-44	21-44 in 1983	21-44
US/Penn	0	5-12, 18-20	13-15	16, 17	5-20
JAPAN	1	(119 done by US/NDP), 121, 123, 125, 127	126, 128, 129	118, 120, 122, 124	118-129
Total #	53	= Number of mass-chains not being evaluated in the 4-year cycle 1978-1981			

50th Anniversary

International Network of NSDD Evaluators

Biennial meetings of the network organised and sponsored by the IAEA Nuclear Data Section in order to:

- (a) better co-ordinate the work of all centres and groups participating in the compilation, evaluation and dissemination of NSDD;**
- (b) maintain and improve the standards and rules governing NSDD evaluations;**
- (c) review the development and common use of the computerized systems and databases maintained specifically for this activity.**

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International Network of NSDD Evaluators

10–14 November 2003, VIC, Vienna, Austria
IAEA report INDC(NDS)-456

*Remember SARS? Severe Acute Respiratory Syndrome
UN in New York postponed/cancelled all UN meetings planned within
the vicinity of known SARS outbreaks in Spring, 2003 (Toronto area,
Canada, in March-April and May-June).*

*Meeting re-arranged within the same calendar year to ensure IAEA
financial coverage. Only practical alternative was close to the end of
2013 at IAEA Headquarters.*

15 → 14 data evaluation centres

23 scientists from 11 Member States

50th Anniversary

International Network of NSDD Evaluators

10–14 November 2003, VIC, Vienna, Austria

IAEA report INDC(NDS)-456

New network centres approved at ANL, USA, and ANU, Australia.

Russian Nuclear Structure and Reaction Data Centre (CAJaD) withdrawn from network.

Endorsement of sponsorship of regular two-week NSDD evaluation workshops (ICTP, Trieste, November 2003, July 2005 and Feb/March 2006).

Replace Hager and Seltzer internal conversion coefficients with equivalent Band et al. data – all related programs to be also modified.

13 → 14 data evaluation centres

23 scientists from 11 Member States

50th Anniversary International Network of NSDD Evaluator

6–10 June 2005, McMaster University, Hamilton, Canada



25th IAEA Technical Meeting of the International Network of Nuclear Structure and Decay Data Evaluators,
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International Network of NSDD Evaluators

6–10 June 2005, McMaster University, Hamilton, Canada
IAEA report INDC(NDS)-0476

New network centre approved at Indian Institute of Technology, Roorkee, India.

Endorsement of IAEA sponsorship of two-week NSDD evaluators' workshops, ICTP, Trieste.

IAEA-NDS to organise 1-day meeting of Directors/Heads from appropriate European institutes with the aim of developing a coherent approach towards possible EU funding.

IAEA-NDS urged to extend their expertise in nuclear structure and decay data through the recruitment of staff to undertake mass-chain evaluations as part of their regular work.

Mass-chain evaluations for ENSDF require reputable reviews by appropriate volunteers within the evaluators' network.

Significant number of technical recommendations, including the adoption of Band et al. ICCs (BrIcc) based on “frozen orbital approximation”.

15 data evaluation centres

33 scientists from 12 Member States

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International Network of NSDD Evaluators

11-15 June 2007, PNPI, St. Petersburg, Russia
IAEA report INDC(NDS)-0513

Network endorsed sponsorship of further NSDD evaluators' workshops at ICTP, Trieste (further 2-week workshop scheduled for April/May 2008).

IAEA NDS staff to pursue initiatives to improve non-North American input to ENSDF, and invite relevant specialists/managers related to such expertise to the next NSDD Evaluators' network meeting (April/May 2009).

Various technical recommendations.

15 data evaluation centres

27 scientists from 13 Member States

50th Anniversary International Network of NSDD Evaluators

23–27 March 2009, VIC, Vienna, Austria

IAEA report INDC(NDS)-0559

Dominated by the persistent need for new ENSDF evaluators.

Efforts continue to increase overall and particularly European participation, with NSDD workshops organized at ICTP and an ENSDF-2009 workshop in Bucharest.

Recommendations include the need to develop stronger links and understanding between key financial organizations and research facilities.

Stressed that the main NSDD centres play crucial roles in the mentoring of all new groups.

Technical improvements were discussed to facilitate the work of the evaluators, along with tools to disseminate the results.

Various technical recommendations.

15 data evaluation centres

22 scientists from 14 Member States

50th Anniversary International Network of NSDD Evaluators

Initiatives from 2002 onwards to explain the need for and accrue 'new blood':

- 1. Establishment and development of ICTP-IAEA NSDD workshops;**
- 2. Contact with the European Union – various in Brussels;**
- 3. Letters to various European laboratories, 2008;**
- 4. Contact with European Expert Committee, NuPECC (Nuclear Physics European Collaboration Committee), Chair: Brian Fulton, University of York, 2008;**
- 5. Joint (Nichols, Kondev, Tuli) NSDD awareness article in the NuPECC journal *Nuclear Physics News*, 17, no. 4 (2007) 19-23;**
- 6. IAEA meeting in Vienna to discuss on-going issues, 10-11 November 2008 (see editorial, *Nuclear Physics News*, 19, no. 1 (2009) 3-4);**
- 7. Tuli talk at a European Town Meeting in Helsinki, Finland.**

IAEA Technical Meeting on Reference Data Libraries for Nuclear Applications – ENSDF, 10-11 November 2008, IAEA Headquarters, IAEA report INDC(NDS)-0543, November 2008

Europe and ENSDF

D. Balabanski	INRNE, Bulgarian Academy of Science, Bulgaria
K. Gladnishki	University of Sofia, Bulgaria
S. Lalkovski	University of Sofia, Bulgaria
T. Venkova	INRNE, Bulgarian Academy of Sciences, Bulgaria
H. Penttilä	University of Jyväskylä, Finland
S. Galès	GANIL, France
C. Scheidenberger	GSI, Germany
Y. Litvinov	GSI, Germany
J. Timár	ATOMKI, Hungary
Z. Elekes	ATOMKI, Hungary
A. Maj	IFJ-PAN, Poland
J.W. Jastrzębski	Warsaw University, Poland
V. Zamfir	IFIN-HH, Romania
D. Bucurescu	IFIN-HH, Romania
A. Luca	IFIN-HH, Romania
A.L. Negret	IFIN-HH, Romania

IAEA Technical Meeting on Reference Data Libraries for Nuclear Applications – ENSDF, 10-11 November 2008, IAEA Headquarters
IAEA report INDC(NDS)-0543, November 2008
Europe and ENSDF

J.M. Los Arcos	CIEMAT, Spain
M. Bostan	Istanbul University, Turkey
M.N. Erduran	Istanbul University, Turkey
S. Erturk	Nigde University, Turkey
J. Billowes	University of Manchester, UK
Z. Podolyak	University of Surrey, UK
J.K. Tuli	NNDC, BNL, USA
F.G. Kondev	Argonne National Laboratory, USA
Balraj Singh	McMaster University, Canada
A.L. Nichols	IAEA, Nuclear Data Section, Austria
D. Abriola	IAEA, Nuclear Data Section, Austria
M.A. Kellett	IAEA, Nuclear Data Section, Austria

**IAEA Technical Meeting on Reference Data Libraries for Nuclear Applications – ENSDF,
10-11 November 2008, IAEA Headquarters, Vienna, Austria**



**25th IAEA Technical Meeting of the International Network of Nuclear Structure and Decay Data Evaluators,
15-19 April 2024, IAEA Headquarters, Vienna, Austria**

Conclusions, 11 November 2008

- 1. Nuclear structure and decay data specialists within Europe assembled for two days at IAEA Headquarters in Vienna to determine interest and willingness to undertake mass-chain evaluations for ENSDF.**
- 2. Much interest and commitment was expressed in such work.**
- 3. Inevitably, financial support is the major issue – NuPNET is seen as an appropriate vehicle for aligning and generating national support for this type of evaluation effort.**
- 4. The International Network of Nuclear Structure and Decay Data Evaluators is scheduled to meet at IAEA Headquarters from 23 to 27 March 2009 for its biennial meeting, and arrangements have been made for committed European nuclear structure experts to attend.**
- 5. A one-week training course in ENSDF evaluation procedures needs to be held in the near future, and preparative discussion should begin immediately.**

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International Network of NSDD Evaluators

Workshops on Nuclear Structure and Decay Data: Theory and Evaluation

Sponsored by the Nuclear Data Section, IAEA, Vienna, Austria, and hosted regularly by ICTP, Trieste, Italy:

- a). further development of scientists in their study and understanding of all features of nuclear structure and decay data;**
- b). potential candidates for future mass-chain evaluations identified with ENSDF.**

**Workshop on Nuclear Structure and Decay Data Evaluation,
18-22 November 2002 as a trial run, IAEA Headquarters
IAEA report INDC(NDS)-439, January 2003**



Left to right: Eddie Browne-Moreno, Tom Burrows, Filip Kondev, Dimiter Balabanski, Jag Tuli, Vito Vanin, Ivan Mitropolsky, Vladimir Pronyaev, Guillermo Marti, Ashok Jain, Tibor Kibédi, Huang Xiaolong, (Alan Nichols missing)

25th IAEA Technical Meeting of the International Network of Nuclear Structure and Decay Data Evaluators,
15-19 April 2024, IAEA Headquarters, Vienna, Austria

**Workshop on Nuclear Structure and Decay Data: Theory
and Evaluation, 17-28 November 2003, ICTP, Trieste, Italy
INDC(NDS)-452, January 2004**



24 participants and 9 lecturers

25th IAEA Technical Meeting of the International Network of Nuclear Structure and Decay Data Evaluators,
15-19 April 2024, IAEA Headquarters, Vienna, Austria

Workshop on Nuclear Structure and Decay Data: Theory and Evaluation, Addendum - 2005, 4-15 April 2005, ICTP, Trieste, Italy, INDC(NDS)-0473, July 2005



27 participants and 9 lecturers

**Workshop on Nuclear Structure and Decay Data: Theory
and Evaluation, Addendum - 2006, 20 Feb - 3 March 2006,
ICTP, Trieste, Italy, INDC(NDS)-0496, July 2006**



23 participants and 9 lecturers

25th IAEA Technical Meeting of the International Network of Nuclear Structure and Decay Data Evaluators,
15-19 April 2024, IAEA Headquarters, Vienna, Austria

**Workshop on Nuclear Structure and Decay Data: Theory
and Evaluation - 2008, 28 April - 9 May 2008,
ICTP, Trieste, Italy, INDC(NDS)-0533, June 2008**



32 participants and 9 lecturers
- have undertaken a total of 10 such ICTP workshops

50th Anniversary International Network of NSDD Evaluators

Regards to all NSDD evaluators:

exciting new formats, new codes and
new innovative ideas to develop and explore