

**NUCLEAR ENERGY AGENCY
NUCLEAR SCIENCE COMMITTEE**

Working Party on International Evaluation Co-operation

**31st Meeting of the Working Party on International Nuclear Data Evaluation
Co-operation (WPEC)**

SUMMARY RECORD

**27-28 June 2019
NEA Headquarters
Boulogne-Billancourt, France**

Michael Fleming
+33 1 73 21 28 22
michael.fleming@oecd-nea.org

OECD/NEA Nuclear Science Committee

WORKING PARTY ON INTERNATIONAL NUCLEAR DATA EVALUATION
CO-OPERATION 31ST MEETING

NEA Headquarters Room BB3
46 quai Alphonse Le Gallo, 92100 Boulogne-Billancourt, France

27-28 June 2019

SUMMARY RECORD

1. Welcome and membership

1.1. Welcome

The WPEC Chair, **A. Plompen**, opened the meeting and welcomed all participants (see *Appendix 1*) and the WPEC Secretariat, **M. Fleming**.

1.2. Adoption of agenda

[\[NEA/SEN/NSC/WPEC\(2019\)1\]](#)

To facilitate the participation of those presented remotely, the reports on the CENDL project and ND2019 conference were moved forward to take place immediately after item 4.1 in the agenda. The rest of the agenda was adopted without modification (see *Appendix 2*).

1.3. Review of WPEC membership and invited expert processes

The Secretariat, **M. Fleming**, reviewed the process defined in the OECD Rules of Procedure for nomination of members and invitation of experts to Working Parties of the Nuclear Science Committee, including WPEC. All official members not nominated in the period of the last WPEC mandate will be (re-)confirmed before participating in the WPEC-32 in 2020. The relevant representatives on the Nuclear Science Committee or OECD Permanent Delegations must issue these nominations. The NEA Secretariat will provide instructions to WPEC participants.

1.4. Nomination of next WPEC chairperson

The current WPEC Chair, **A. Plompen**, nominated **O. Iwamoto**, head of the JENDL project, to serve as the next Chair of the WPEC. He was unanimously confirmed by the participants and began his term at the end of the WPEC-31 meeting. This Chairmanship will continue through the WPEC-33 meeting in 2021.

2. Administrative items

2.1. Approval of WPEC-30 summary record [\[NEA/SEN/NSC/WPEC\(2018\)2\]](#)

The summary record for WPEC-30 was approved without modification.

2.2. Review of actions from previous meeting

The action items from WPEC-30, provided in *Appendix 3* of that summary record, were reviewed. All action items were completed, except actions related to the three subgroup reports that have had no demonstrable progress: 27 (**R. Jacqmin**), 36 (**P. Shillebeeckx**) and 41 (**H. Harada**). The Chair reminded all participants of the responsibility that they assume when proposing WPEC subgroups to lead the activities in fulfilling the agreed deliverables and reporting on the activity. He encouraged the future Chair to continue prioritising the reporting of subgroup activities.

2.3. Review of the status of subgroup reports

The Secretariat, **M. Fleming**, provided a report on the status of all WPEC subgroup reports. The average publication rate has been slightly higher than one report per year over the past 30 years, but no report has been published since 2014. To give a quick overview of the progress, the report drafts were classified into five states, ranging from preliminary draft (or none known to the NEA) to those finalised by the NEA Central Secretariat. Good progress has been made since WPEC-30 and three reports will be published in 2019.

2.4. Review of WPEC mandate and proposal for extension

The participants reviewed a revised mandate for the WPEC based on a streamlined copy of the previous mandate. Minor edits were made and the participants approved the revised draft provided in *Appendix 4*. Following review by the NEA Office of Legal Counsel it will be submitted via the OECD Written Procedure to the Nuclear Science Committee for approval.

3. Reports on activities from international organisations

3.1. Report on Nuclear Science activities at NEA

The Head of the NEA Nuclear Science Division, **T. Ivanova**, reviewed highlights of the Nuclear Science Committee activities, including the State-of-the-Art Report on Light Water Reactor Accident-Tolerant Fuels, the launch of an Expert Group on Reactor Core Thermal-Hydraulics, a new Technical Review Groups for SFCOMPO and SINBAD, the kick-off of the Nuclear Education, Skills and Technology Project and the international effort to create a Framework for Irradiation Experiments (FIDES) after the closure of the Halden Reactor in Norway. Various points were raised for the WPEC members to provide feedback on and these are detailed in *Section 9* of this document. She informed the participants of the new appointment of **M. Fleming** within the Nuclear Science

Division as both the Secretariat for WPEC and the Expert Group on Multi-physics Experimental Data, Benchmarks and Validation (EGMPEBV) and the appointment of **H. Hocquet** as the new assistant who will provide support to WPEC.

3.2. Report on Nuclear Data Section activities at IAEA

The Head of the IAEA Nuclear Data Section, **A. Koning**, reviewed progress made in the last year, including a renewed effort to collect fission yield data in advance of a new CRP on fission yield evaluation, a new Reference Database for Photon Strength Functions and a new Medical Isotope Browser that is available on the NDS website. Excellent progress has been made with the INDEN project, including a project on R-Matrix code comparisons and a comprehensive review of the CIELO evaluations with work in progress to address known deficiencies.

4. Reports on experimental activities

4.1. China

X. Ruan reported on experimental activities from the China Institute of Atomic Energy, including surrogate measurements at the HeSAN facility for (n,2n) and (n,f) reactions on actinides and capture measurements and light element (n, α /t) measurements at CSNS. New iron (n, α) measurements were performed at Peking University. The Institute of Modern Physics has been using its ADS superconducting LINAC to perform α -induced measurements on several materials and has now introduced ^{12}C beams in 2019. The China Academy of Engineering Physics performed experiments with the Fast Ionization Chamber for Fission Cross Section Measurement (FIXM) with preliminary results shown for the fission cross section ratio between ^{238}U and ^{235}U .

4.2. Europe

A. Plompen reported on the experimental activities that had been presented at JEFF meetings, highlighting talks that were given at ND2019 and the role of the EU CHANDA and ARIEL projects in guiding and funding work. The n_TOF programme, including numerous experiments performed by different institutions, has included measurements of $^{237}\text{Np}(n,f)$, $^{241}\text{Am}(n,f)$ and (n, γ), $^{33}\text{S}(n,\alpha)$, C(n,p/d), $^{235}\text{U}(n,f)$ up to 150 keV and from 200 MeV to 1 GeV and $^{154}\text{Gd}(n,\gamma)$. New measurements carried out with GELINA and MONNET at JRC-Geel have included transmission and capture on ^{209}Bi , ^{103}Rh , $^{154,155,157}\text{Gd}$, $^{107,109}\text{Ag}$, $^{\text{nat}}\text{Ce}$, ^{51}V , ^{139}La and ^{142}Ce . Inelastic scattering using the GAINS detector has been used for several studies including ^{54}Fe , ^{16}O and ^7Li . Various fission observables are being studied with SCINTIA at JRC-Geel and STEFF at n_TOF.

4.3. Japan

A. Kimura reported on measurements at the J-PARC ANNRI experiment at the Materials and Life Science Experimental Facility, including total and capture measurements on $^{241,243}\text{Am}$, $^{135,137}\text{Cs}$ and $^{244,246}\text{Cm}$. New surrogate measurements at the JAEA Tandem facility have included ^{239}Np and $^{239,240}\text{Pu}$ fission barriers and ^{95}Zr neutron capture. Results from (p/d,xn) measurements at 50 and 100 MeV/u were shown for several elements with

Z=42-47. Results from the PHOENIX collaboration using NewSUBARU have generated many (γ, xn) and (γ, ln) measurements that have been the subject of an updated photonuclear data library and reference data for the photon strength functions within the IAEA CRP described in **Section 3.2**. Measurements by the National Institutes for Quantum and Radiological Science and Technology (QST) include new M1 transition strength for ^{52}Cr and neutron DDX from 290 MeV/u Xe(C,xn). Deuteron- and α -induced thick-target neutron yields from Kyushu University and RIKEN were shown for materials including C, LiF, Si, Ni, Mo, Ta and Bi.

4.4. USA

Y. Danon reported the activities presented at the 2018 CSEWG. New measurements at the LANL Chi-Nu experiment include energy-dependent PFNS for ^{235}U and ^{239}Pu with multi-chance and pre-equilibrium neutron emission separation. Work is ongoing at LENZ for $^{16}\text{O}(n, \alpha)$ and gas production cross sections in structural materials. An overview of the experiments carried out at JRC-Geel for the US Nuclear Criticality programme was provided, including a range of transmission and capture measurements for W, Cu, Ca, Ce, V, Zr and La. Results from the RPI Gaertner LINAC Center measurements of Ta were shown, including a novel set of data for the URR range from 5 keV, and lucite TSL data, with a new evaluation improving performance on integral benchmarks. Preliminary measurements taken at Gaertner on behalf of NNL for copper and hafnium show unresolved issues that will be reported on in future. Measurements at the University of Kentucky include differential elastic and inelastic scattering for ^{12}C and ^{28}Si , with preliminary data for ^{19}F and $^{\text{nat}}\text{Li}$. LBNL and UC Berkeley measurements include 2.5 MeV measurements of $^{35}\text{Cl}(n, p/\alpha)$ and $^{58}\text{Ni}(n, p)$, as well as 35-55 MeV $^{139}\text{La}(p, 6n)$ using the 88-inch cyclotron.

5. Progress reports from evaluation projects

5.1. CENDL

Z. Ge presented the progress of the CENDL project, which has a 3.2 beta version. This includes 270 files (up from 250 reported in 2018) with 77 new or updated evaluations, including ^{235}U , ^{239}Pu , ^{233}U , ^{232}Th , ^{56}Fe and ^1H . Results were shown for several evaluations, including significant focus on the revised iron evaluations. New fission product nuclei evaluations are included, based on the UNF code system. A new fission yield sub-library has been created and is complemented by a new decay sub-library that includes 1415 nuclides. A new activation sub-library is also provided, with fitting to 94 specific Chinese measurements shown in the presentation. A new photo-nuclear sub-library is included with calculations based on the GLUNF and MEND-G code packages. Various integral benchmarks have been performed and the release is expected in 2019.

5.2. ENDF

D. Brown highlighted recent advanced made in the ENDF/B-VIII.0 library that was released in 2018 and has now enjoyed a great deal of scrutiny from the user community in testing, validating and criticising the evaluations. The iron evaluations were a particular point of interest as transmission and shielding experiments have demonstrated

shortcomings that will be addressed in a revised evaluation. A new programme for the evaluation of fission product yields has begun, in parallel to the IAEA CRP and various measurements that were described in *Section 4.4* are being directly integrated into new evaluation efforts for their respective isotopes. New TSL evaluations for heavy paraffinic oil and liquid FLiBe are planned in 2019 that employ the FLASSH code and new developments specific to the GNDS formats.

5.3. JEFF

A. Plompen presented highlights from the JEFF-3.3 publication that is in an advanced draft and the state of the JEFF project after the release of the latest version in 2017. A six year plan has been agreed, including a three year period from 2018-2021 that will focus on methods improvement and be followed by a series of test files and enhanced engagement with stakeholders and users to ensure suitability of the new evaluated data. This will take advantage of new tools provided by the NEA for collaborating, version controlling and automating V&V for the test files. This is expected to benefit from the proposed subgroup in *Section 6.2*. New method developments from various JEFF participants were shown, as well as planned resonance range evaluations and fission yield codes planned to be used in the JEFF-4 evaluations.

5.4. JENDL

O. Iwamoto presented the JENDL/PD-2016 activation and JENDL/AD-2017 photonuclear data library, showing several examples of improvement with differential experimental data. A new special-purpose JENDL/ImPACT-2018 library was released, covering 163 nuclides up to 200 MeV that are produced as part of transmutation of fission products. A new JENDL-5 α 1 library has been created with new evaluations for Re, Pt and Tl and updated evaluations for 16 other elements including U, Pu and Am, which have benefitted from the new measurements carried out at ANNRI. A new R-matrix code, AMUR, has been created and used in the evaluation of ^{15}N , ^{16}O and ^{19}F , including covariances over the full incident energy range. New deuteron-induced evaluations have been created using a combination of CCONE and DEURACS to account for breakup processes. Results for 102 MeV DDX and 18 MeV TTY were shown to be in relatively excellent agreement. Plans for JENDL-5 include a new fission product yield sub-library, new decay data sub-library and a new TSL sub-library.

K. Yokoyama presented benchmarking and testing activities, where selections of criticality benchmarks were utilised to demonstrate issues with over-prediction of k_{eff} in several benchmarks. Evidence suggests that re-evaluation of TSL data will play a major role in balancing other changes made in major isotope evaluations.

5.5. TENDL

D. Rochman presented the TENDL evaluation methodology and progress made in the development of the TENDL-2019 library. This has been done in parallel to developments in the so-called T6 code package, including a new TALYS-1.95 and TARES-1.4 with various improvements, including new gamma strength functions, corrections to isomeric branching ratios, input parameter optimisation for several isotopes and corrections to TEFAL routines that generate the final ENDF-6 files. Considerable effort has been spent

preparing T6 as a portable and platform-independent package, which will be one of the first code packages considered in the new subgroup proposal described in *Section 6.2*.

6. Proposals for new subgroups

6.1. Subgroup on Advances in Thermal Scattering Law Analysis

A. Hawari presented a proposal for a new subgroup following on the successful completion of the WPEC subgroup 42 on *Thermal Scattering Kernel $S(\alpha, \beta)$: Measurement, Evaluation and Application*, which saw over 30 new TSL evaluations in a field that has historically generated few new evaluations in the past several decades. Subgroup 42 has already completely drafted its summary report and raised several points that should be addressed in follow-up activities. The proposed subgroup will carry on with the recommendations of subgroup 42 and is expected to make new and enhanced TSL evaluations. **WPEC unanimously approved the creation of this subgroup.**

6.2. Subgroup on Reproducibility in Nuclear Data Evaluation

D. Rochman presented a proposal for a new subgroup that will address reproducibility in nuclear data evaluations. While considerable improvements have been made in the reporting and documentation of evaluations, many evaluations, including the most essential for many applications, are not practically reproducible. This subgroup will use the NEA GitLab to prototype the systems required to make evaluations fully documented and reproducible. As part of this effort, model/code developers will be engaged in workshops to be held in 2019 to version control and containerise their tools. The NEA Databank Computer Program Service will be engaged to provide assistance in streamlining the program submission process for these codes. The Chair of the US CSEWG and the Head of the IAEA NDS remarked that this should have been WPEC subgroup 1. **WPEC unanimously approved the creation of this subgroup.**

7. Status of active subgroups

7.1. Expert Group on the High Priority Request List

E. Dupont reported on the progress with the High Priority Request List, including the implementation of new features to the list following the requests in the previous WPEC-30 meeting. This includes a new ‘feedback table’, entry status fields and archiving of completed entries. As the NEA begins the development of, and migration to, a new website with a Java Content Management System, users have been encouraged to share any feedback on the current system in order to provide enhancements on what will otherwise be as close as possible to a like-for-like replacement. Updates to the entries were shown, as well as the inclusion of new requests for $^{209}\text{Bi}(n, \gamma)$ and $^{239}\text{Pu}(n, \text{tot})$. An ND2019 paper will summarise the progress made since 2016.

7.2. Expert Group on the Recommended Definition of a General Nuclear Database Structure

D. Brown reported on the progress made in the development of the GNDS specifications. Since the launch of the NEA GitLab in 2018, the GNDS specifications have been ported over and actively developed with new over 1000 commits and a nearly 400 page document. The Expert Group agreed to formally release the GNDS-1.9 specifications based on the version that reflects the translation of ENDF-6. The NEA Secretariat will engage the Publications Division to identify the best method for releasing this document as an OECD publication. Several additions have been proposed and will go through a well-defined, collegial system for proposal acceptance utilising the GitLab merge request functionality. The procedure for this was drafted and agreed in the 2019 June meeting. A complete paradigm for development, proposals, hotfixes and releases was agreed at the meeting and work is ongoing for the next release, expected following the 2020 meeting.

7.3. Subgroup 43: Code infrastructure to support a modern general nuclear database (GND) structure

C. Mattoon reported on the progress of subgroup 43, where multiple partial or complete implementations of a GNDS API have been developed with the Fudge, GIDiplus and AMPX code packages. Additional work has started or is planned at LANL, CEA and JAEA. The progress of each will be included in a summary report that the subgroup coordinators have begun organising, and which will also include descriptions of the physics checking and verifications performed as part of the subgroup's activities.

7.4. Subgroup 44: Investigation of Covariance Data in General Purpose Nuclear Data Libraries

V. Sobes reviewed the presentations shown in the subgroup 44, covering a range of domains including cross section evaluations, assimilation-based correlations, fission yield covariances and the handling of model defects. The subgroup is working now to prepare a summary report and has agreed participants for various sections, although more contributions are welcome. A final inter-comparison will be performed with the cross-correlation of fission and nu uncertainties.

7.5. Subgroup 45: Validation of Nuclear Data Libraries (VaNDaL) Project

M. White reported on renewed activities in subgroup 45 with the launch of the NEA GitLab in 2018 and porting of input decks onto a private contribution space. More are expected in 2019 as users become more familiar and in the 2019 meeting several participants agreed to do so. An output JSON format has been specified for parsed simulation outputs and will be collaboratively developed through the NEA GitLab so that participants may identify discrepancies in their results and ultimately their inputs. A QA procedure document will be drafted, with **N. Leclaire** as the lead, based on the lessons learnt from different labs. Enhanced engagement with the ICSBEP community will take place to engage on any data dissemination issues and ensure a healthy dialogue.

7.6. Subgroup 46: Efficient and Effective Use of Integral Experiments for Nuclear Data Validation

G. Palmiotti reported on the progress of subgroup 46, which has begun a target accuracy requirements capture exercise from participants from different advanced applications to identify the operational parameters and accuracies required. These will then be translated, using feedback methodologies developed in the previous subgroups, into nuclear data requirements that can be posed to the HPRL (as was done with subgroup 26) and will help guide the next generation of evaluation efforts. Advances in assimilation methods were also presented, with enhancements of existing tools and the introduction of new methods that were presented in the subgroup meeting.

7.7. Subgroup 47: Use of Shielding Integral Benchmark Archive and Database for Nuclear Data Validation

A. Plompen, on behalf of **I. Kodeli**, reported on the kick-off meeting for subgroup 47, which attracted a large number of participants and presentations. Results from several SINBAD cases and new experiments that may be included in future SINBAD versions were shown. The NEA GitLab space for subgroup 47 has already been used to collect information related to new, proposed experiments and additional supplementary information related to existing SINBAD entries may be included in future, subject to outstanding permissions issues. These are expected to aid nuclear data evaluators and provide resources for the SINBAD Technical Review Group to review.

8. Conferences and meetings of interest

8.1. Report on the ND2019 Conference in Beijing, China

Z. Ge provided a summary of the ND2019 conference, which was attended by over 500 participants from 32 countries. He reminded participants that the conference papers will be published as an EPJ web conference and that full-paper submissions are due by 1 August 2019.

8.2. ND2022 in California, USA

C. Mattoon presented the plans for the ND2022 conference that will take place in Autumn 2022 in the San Francisco Bay Area, California, USA. Following the NSC-30 meeting earlier in June 2019 this conference has been approved. The local organising committee, including five national laboratories in the US, has been selected. The exact dates and venue will be selected in the near future.

9. Any other business

The participants discussed several items raised by the Head of the Nuclear Science Division, **T. Ivanova**, in the presentation of *Section 3.1*. All Working Parties of the NSC have been invited to provide metrics quantifying their impact as the NSC launches a Task Force to review and prioritise the activities of the NSC. All subgroups will send lists of related publications or other outputs that have been related to or directly created as a consequence of the subgroup's activities. All subgroups must additionally provide an *impact statement* to be used in high-level meetings. All projects are invited to propose

speakers for the upcoming NEA Radioactive Waste Management joint workshop in February, with a focus on multi-factor optimisation of pre-disposal.

Following the very engaging discussions that took place during the subgroup status updates, it was proposed that they be placed earlier in the agenda for WPEC-32 and that the Chair and Secretariat introduce in-depth discussions similar to those included in the NSC meetings.

10. Date and place of next meeting

The next meeting of the WPEC will take place on the week of 11-15 May 2020, with the Working Party meeting on the 14-15 May 2020.

Appendix 1

OECD NEA Nuclear Science Committee

31st meeting of the WPEC Working Party on International Nuclear Data Evaluation Co-operation

June 27-28, 2019
OECD-NEA Headquarters, Room BB3
46, quai Alphonse Le Gallo, 92100 Boulogne-Billancourt, France

More information for the schedule of subgroup meetings during the week at:
<https://www.oecd-nea.org/science/wpec/meeting2019>

PROPOSED AGENDA

1. Welcome and membership

- | | |
|--|-------------|
| • Welcome | Chair |
| • Review of WPEC membership and invited expert processes | Secretariat |
| • Nomination of next WPEC chairperson | All |

2. Administrative items

- | | |
|---|-------------|
| • Adoption of agenda
[NEA/SEN/NSC/WPEC(2019)1] | All |
| • Approval of summary record of the past meeting
[NEA/SEN/NSC/WPEC(2018)2] | All |
| • Review of actions from previous meeting | Chair |
| • Review of the status of subgroup reports | Secretariat |
| • Review of WPEC mandate and proposal for extension | Secretariat |

3. Reports on activities from international organisations

- | | |
|---|------------|
| • Report on Nuclear Science activities at NEA | T. Ivanova |
| • Report on Nuclear Data Section activities at IAEA | A. Koning |

4. Reports on experimental activities

- | | | |
|----------|-----------------------------------|------------|
| • China | Report on experimental activities | X. Ruan |
| • Europe | Report on experimental activities | A. Plompen |

- Japan Report on experimental activities A. Kimura
- USA Report on experimental activities Y. Danon

5. Progress reports from evaluation projects, discussion of future plans

- CENDL Status and updates Z. Ge
- ENDF Status and updates D. Brown
- JEFF Status and updates A. Plompen
- JENDL Status and updates O. Iwamoto / K. Yokoyama
- TENDL Status and updates D. Rochman

6. Proposals for new subgroups

- Subgroup on Advances in Thermal Scattering Law Analysis A. Hawari / G. Noguère
- Subgroup on Reproducibility in Nuclear Data Evaluation D. Rochman / M. Herman

7. Status of active subgroups

- Expert Group High Priority Request List for Nuclear Data E. Dupont (JEFF)
- Expert Group Recommended Definition of General Nuclear Database Structure D. Brown (ENDF)
- Subgroup 43 Code infrastructure to support a modern general nuclear database (GND) structure J. Conlin (JEFF)
- Subgroup 44 Investigation of Covariance Data in General Purpose Nuclear Data Libraries V. Sobes (ENDF)
- Subgroup 45 Validation of Nuclear Data Libraries (VaNDaL) Project M. White (ENDF)
- Subgroup 46 Efficient and Effective Use of Integral Experiments for Nuclear Data Validation M. Salvatores (JEFF)
- Subgroup 47 Use of Shielding Integral Benchmark Archive and Database for Nuclear Data Validation I. Kodeli (JEFF)

8. Conferences and meetings of interest

- ND2019 conference Beijing, China May 2019 Z. Ge (CENDL)
- ND2022 conference California, USA TBD 2022 C. Mattoon (ENDF)

9. Any other business

10. Date and place of next meeting

Appendix 2

List of participants to the 31st meeting of the WPEC Working Party on International Nuclear Data Evaluation Co-operation

	Given Name	Surname	Representing	Notes
1	David	BROWN	UNITED STATES	<i>EG-GNDS</i>
2	Roberto	CAPOTE	IAEA	<i>Remote</i>
3	Jeremy Lloyd	CONLIN	UNITED STATES	<i>SG-43</i>
4	Yaron	DANON	UNITED STATES	
5	Marie-Anne	DESCALLE	UNITED STATES	
6	Emmeric	DUPONT	FRANCE	<i>EG-HPRL</i>
7	Michael	FLEMING	NEA	<i>Secretariat</i>
8	Zhigang	GE	CHINA	<i>Remote</i>
9	Ayman	HAWARI	UNITED STATES	<i>SG-42</i>
10	Michal	HERMAN	UNITED STATES	
11	Jesse	HOLMES	UNITED STATES	
12	Tatiana	IVANOVA	NEA	
13	Osamu	IWAMOTO	JAPAN	
14	Nobuyuki	IWAMOTO	JAPAN	
15	Robert	JACQMIN	FRANCE	
16	Atsushi	KIMURA	JAPAN	
17	Arjan	KONING	IAEA	<i>Remote</i>
18	Luiz Carlos	LEAL	FRANCE	
19	Fausto	MALVAGI	FRANCE	<i>SG-43</i>
20	Caleb	MATTOON	UNITED STATES	<i>SG-43</i>
21	Gilles	NOGUERE	FRANCE	<i>SG-42</i>
22	Giuseppe	PALMIOTTI	UNITED STATES	<i>SG-46</i>
23	Arjan	PLOMPEN	EUROPEAN COMMISSION	<i>Chair</i>
24	Dimitri	ROCHMAN	SWITZERLAND	
25	Evgeny	ROZHIKHIN	RUSSIA	
26	Xichao	RUAN	CHINA	<i>Remote</i>
27	Vladimir	SOBES	UNITED STATES	<i>SG-44</i>
28	Alejandro	SONZOGNI	UNITED STATES	
29	Andrej	TRKOV	IAEA	
30	Morgan	WHITE	UNITED STATES	<i>SG-45</i>
31	Kenji	YOKOYAMA	JAPAN	
32	Michael	ZERKLE	UNITED STATES	

Appendix 3

List of Actions from the 31st meeting of the WPEC Working Party on International Nuclear Data Evaluation Co-operation

	Action	Responsible	Date
1	Provide NEA with any draft materials for the SG27 summary report	R. Jacqmin	November 2019
2	Provide NEA with any draft materials for the SG35 summary report	A. Plompen	November 2019
3	Provide NEA with any draft materials for the SG41 summary report	O. Iwamoto	November 2019
4	Prepare the final copy of the GNDS-1.9 specifications for NEA publication	D. Brown	September 2019
5	Identify a solution with NEA Publications for serial publication of GNDS specifications with citable identification numbers and public distribution	M. Fleming	January 2020
6	Submit WPEC mandate for approval of NSC and inform WPEC of status	M. Fleming	September 2019
7	Agree place and date of ND2022 conference and inform WPEC participants	C. Mattoon	May 2020
8	Liaise with representatives on the Nuclear Science Committee to (re-)confirm members of WPEC that will be given access to future meetings	All	April 2020
9	Identify in-depth discussion topics and organise presentations for WPEC-32	M. Fleming and O. Iwamoto	February 2020

Appendix 4

Revised Mandate

Working Party on International Nuclear Data Evaluation Co-operation (WPEC)

Members:	All NEA member countries
Full Participant:	European Commission <i>Under the NEA Statute</i>
Observer (International Organisation):	International Atomic Energy Agency (IAEA) <i>By agreement</i>
Date of creation:	30 October 1989
Start of current mandate:	1 July 2019
Duration:	30 June 2022

Mandate (Document reference):

- Status of the NEA Nuclear Science Committee Projects and their Evolution in 2007
[\[NEA/SEN/NSC\(2006\)2\]](#)
- Summary Record of the 17th Meeting of the Nuclear Science Committee (NSC)
[\[NEA/SEN/NSC\(2006\)3\]](#)
- Approved at the 20th Meeting of the Nuclear Science Committee [\[NEA/SEN/NSC\(2009\)3\]](#)
- Extended at the 21st Meeting of the Nuclear Science Committee [\[NEA/SEN/NSC\(2010\)3\]](#)
- Revised and extended at the NEA Nuclear Science Committee Bureau in December 2010
[\[NEA/NSC/DOC\(2010\)14\]](#)
- Revised and extended at the 24th Meeting of the Nuclear Science Committee in June 2013
[\[NEA/NSC/DOC\(2013\)2\]](#)
- Revised and extended at the 27th Meeting of the Nuclear Science Committee in June 2016
[\[NEA/SEN/NSC\(2016\)2\]](#)

Background and scope

The goal of the Working Party is to improve the quality and completeness of evaluated nuclear data available for use in science and technology and to promote the efficient use of available resources through international collaboration. The topics of the Working Party span the full range of nuclear data activities, including basic experimental measurements, theoretical developments, modelling/simulation of nuclear physics, formats and data structures, data processing, experimental data assimilation, verification and validation.

Objectives

The Working Party will promote the exchange of information on all nuclear data related topics and foster the adoption of best practices. The Working Party will provide a framework for co-operative activities between the participants and the nuclear data programmes that they represent. The Working Party will assess the needs for nuclear data improvements and address those needs by initiating joint evaluation, methods development or measurement efforts. The outcomes that the Working Party facilitates will be reflected in major evaluated data files.

In the three-year period, the Working Party will set out to complete the following tasks:

- Recommend improvements in evaluated nuclear data (including covariance data) for nuclear technology applications, in response to indications from stakeholders, new experimental data, theoretical and modelling advances, sensitivity and uncertainty analysis and integral validation/assimilation activities.
- Recommend updates in codes, formats, methods and practices for further improving the nuclear data evaluation process and streamlining their processing and use.
- Monitor and update the “High Priority Request List for Nuclear Data” (HPRL) to stimulate specific nuclear data measurement and evaluation activities.

The Working Party will liaise closely with other Nuclear Science Committee activities to ensure that data needs of nuclear science applications are properly addressed.

Deliverables

The deliverables of the WPEC during this mandate are the following:

- A continuously updated version of the “High Priority Request List for Nuclear Data”, accessible through the NEA web pages, which reflects the annual reviews of all progress made to satisfy these requests and new entries.
- A continuously updated specifications document for Generalised Nuclear Database Structures and repositories of the version-controlled documentation source code on the NEA GitLab.
- A report on prompt photon production from fission products.
- A report on processing of covariance data in the resonance region.
- A report on scattering angular distribution in the fast range.
- A report on evaluation of experimental data in the resolved resonance region.
- A report on fission yield evaluation methodologies and recommended improvements.
- A report on the development of a modern nuclear database structure beyond the current ENDF format.
- A report on methods and approaches to provide feedback from nuclear and covariance data adjustments to evaluators and experimentalists.
- An extended summary report on a joint assessment of six key isotopes, ^1H , ^{16}O , ^{56}Fe , $^{235,238}\text{U}$ and ^{239}Pu , in the framework of the Collaborative International Evaluated Library Organization (CIELO) Project.
- A report on improving nuclear data accuracy of ^{241}Am and ^{237}Np capture cross-sections.
- A report on thermal scattering kernel $S(a,b)$ measurements, evaluations and applications.
- A report on code infrastructure to support a modern general nuclear database (GND) structure.
- A report on covariance data in general purpose nuclear data libraries
- A report on the Validation of Nuclear Data Libraries (VaNDaL) Project, including a suite of inter-comparison benchmark inputs and outputs.
- A report on the efficient and effective use of integral experiments for nuclear data validation.