

Current Initiatives of the WPEC Nuclear Data Activities

Working Party on
International Nuclear Data
Evaluation Co-operation

Chair: Osamu Iwamoto, JAEA

**Anastasia GEORGIADOU
(NEA/SCI/DB)**

Technical Secretariat



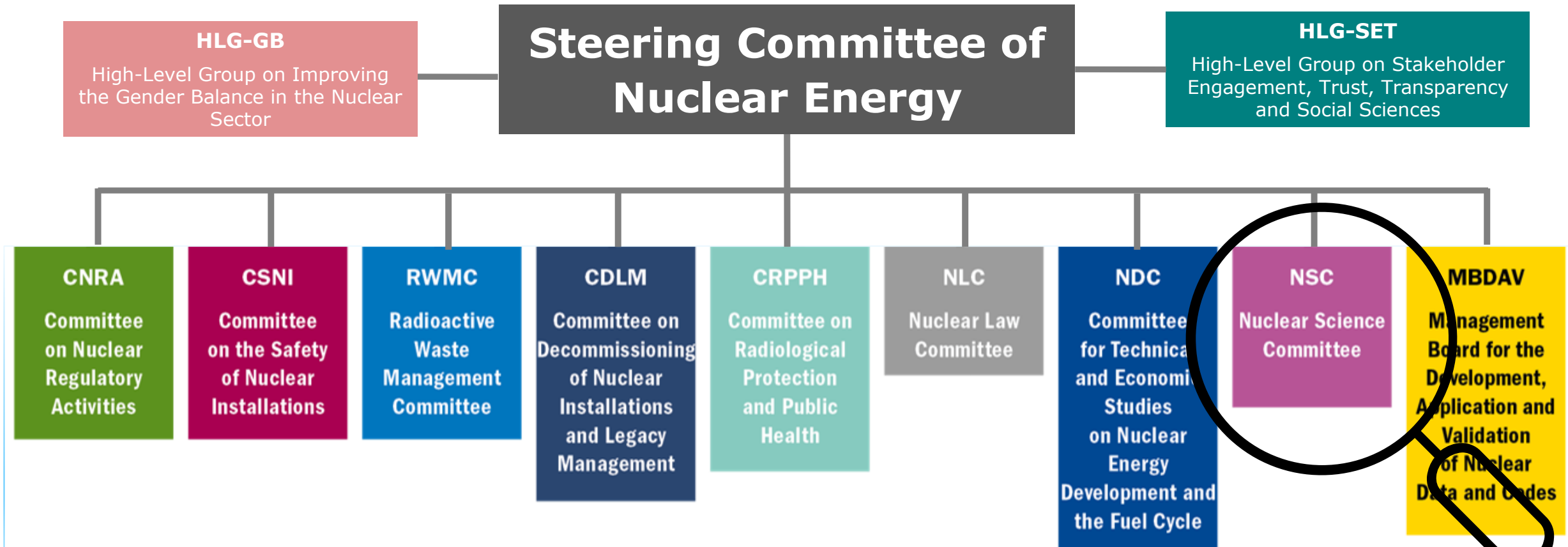
NEA member countries



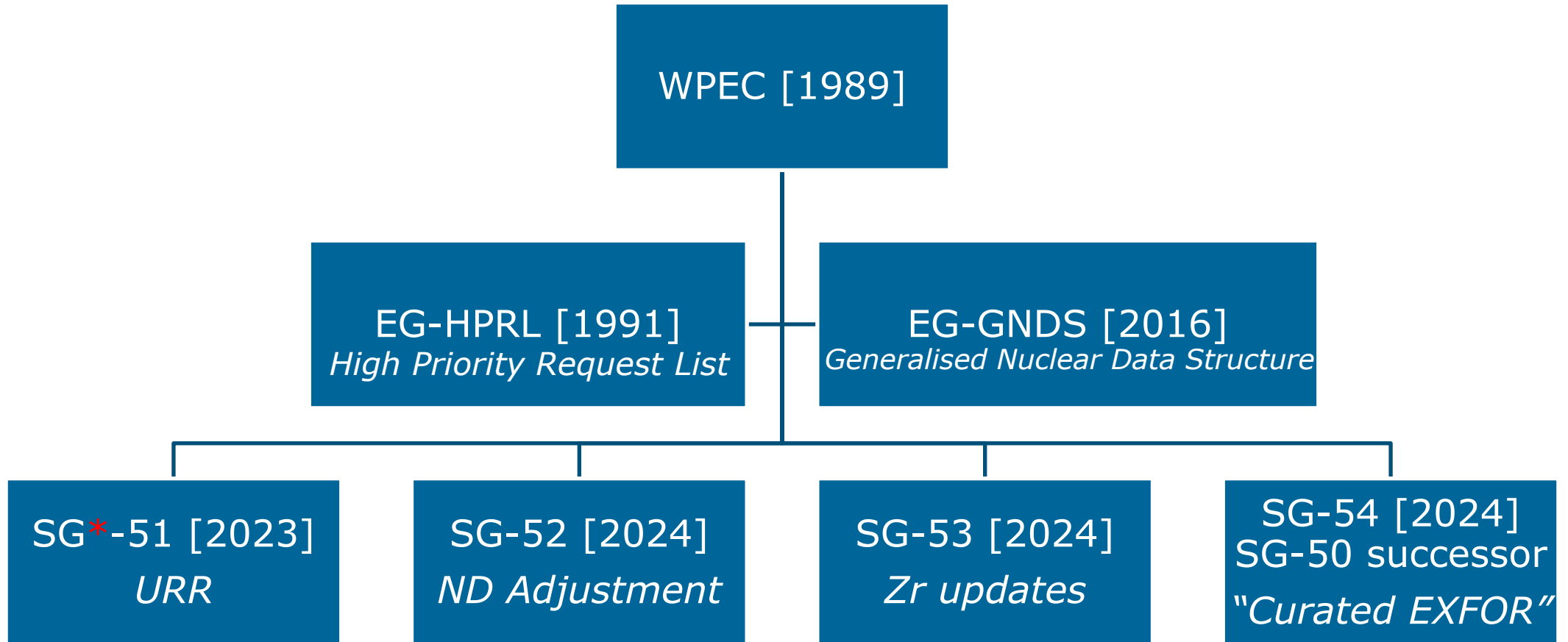
The NEA's current membership consists of 34 countries in Europe, the Americas and the Asia-Pacific region. Together they account for approximately 82% of the world's installed nuclear capacity.

NEA: International Nuclear Cooperation at Work

NEA Committee Structure



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



*SG - Subgroup

SG 51: Evaluation, Processing and Validation in the Unresolved Resonance Region *Active SGs*

Coordinators:

Vladimir Sobes, UTK
Jesse Brown, ORNL

Monitors:

Roberto Capote, IAEA
Kenichi Tada, JAEA

Meetings 2025:

WPEC Annual meeting
3 June 2025
Brussels, Belgium

Goals

- Quantification of application response differences for various definitions of beginning and end of the URR for fissile and non-fissile materials.
- Coordinated work planned across formats, processing codes, and transport applications based on SG32 recommendations.
- Next steps include defining sensitive benchmarks and establishing URR probability table validation exercises along with URR uncertainty quantification.

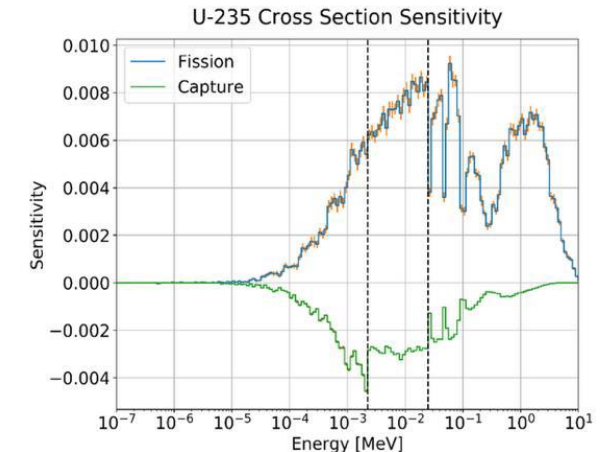


Figure 5: Optimized Teflon Sensitivity Profile, 2.276 cm Teflon Plates.

HEU-MET-INTER-011

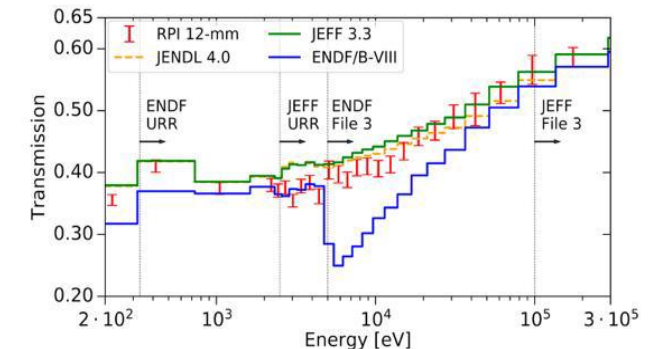


Figure 5.13: The grouped thick-sample transmission measurement in red, along with the MCNP calculated transmission using various evaluated cross section libraries.

Plots by J. Brown SG51 review WPEC meeting 03/06/2025

Secretariat: Antonio JIMENEZ-CARRASCOSA

SG 52: Development and Application of Advanced Methodologies to Produce Application Specific Nuclear Data *Active SGs*

Coordinators:

Mathieu Hursin, EPFL
Jesson Hutchinson, LANL
Denise Neudecker, LANL


Monitors:

Roberto Capote, IAEA
Oscar Cabellos, UPM

Meetings 2025:

WPEC Annual meeting
2 June 2025
Brussels, Belgium
Co-ordinators meetings
(online)

Context

SG refined its scope to achievable, well-defined nuclear data adjustment exercise. 

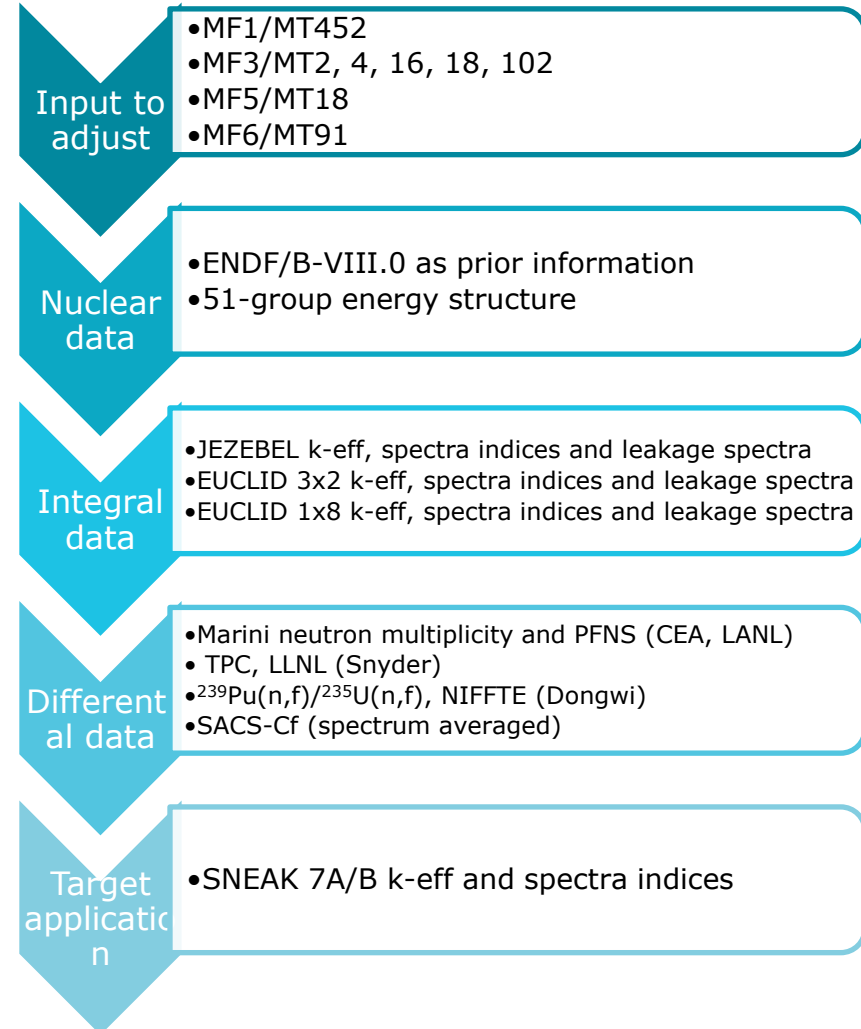
A SG's participant survey was carried out after WPEC meeting, receiving 16 inputs.

Fast-range Pu-239 adjustment

1. Application sensitive to Pu-239.
2. Extra benchmarks to test adjusted data.
3. 8-stages gradual exercise (integral and differential data)
4. Several adjustment methods will be involved.

Adjustment Exercise Goal

Reproduce ENDF/VIII.1 starting from ENDF/VIII.0 using the same experimental data as the evaluators.



Secretariat: Antonio JIMENEZ-CARRASCOSA

SG 53: Stable Zr evaluation and validation *Active SGs*

Coordinator:
Gustavo Nobre, BNL

Monitor:
Yaron Danon, RPI

Meetings 2025:
Kick-off meeting (online),
20 Feb 2025
WPEC Annual meeting,
2 June 2025, Brussels,
Belgium
SG53 meeting (online),
14 Oct 2025

Goals

Evaluate the neutron-induced reaction data for all stable Zr isotopes



Available for adoption by nuclear data libraries

Impact

Zr is present in cladding alloys. The project is expected to reduce ND uncertainties in criticality experiments sensitive to Zr

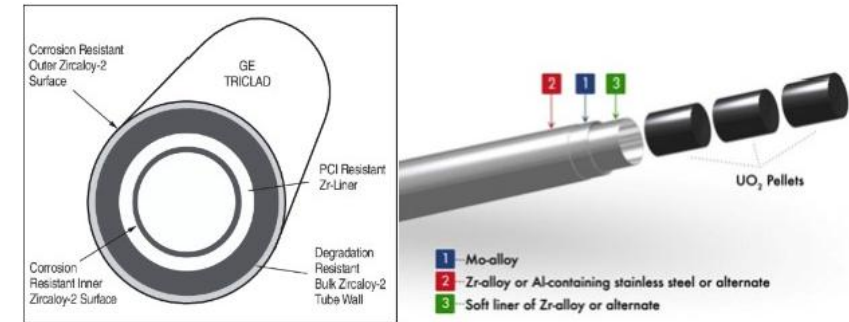
New measurements

- R-Matrix fits of resonances
- Model calculations
- Adjustments to data, and
- Validation of evaluated files against integral benchmarks

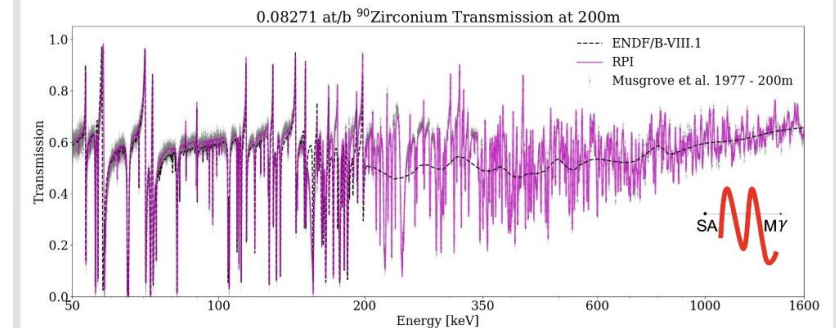


Validation

The evaluations will be validated by ICSBEP and other available benchmarks



Resonance parameters fit to ^{90}Zr transmission data up to first excited state, 1764 keV. Limit of current ENDF/B-VIII.1 RRR is 200 keV.



Plots by G. Siemers, G. Nobre presentation SG53 meeting 14/10/2025

Secretariat: Anastasia GEORGIADOU

SG 54: Curated EXFOR: developing an automatically readable, comprehensive, and curated by evaluators, experimental reaction database *Active SGs*

Coordinator:

Boris Pritychenko, BNL

Monitor:

Georg Schnabel, IAEA

Meetings 2025:

Kick-off meeting (online),

17 March 2025

WPEC Annual meeting,

3 June 2025, Brussels,

Belgium

SG54 meeting (online),


06 Oct 2025


Based on the work of SG50 MEDUSAL COLLABORATION

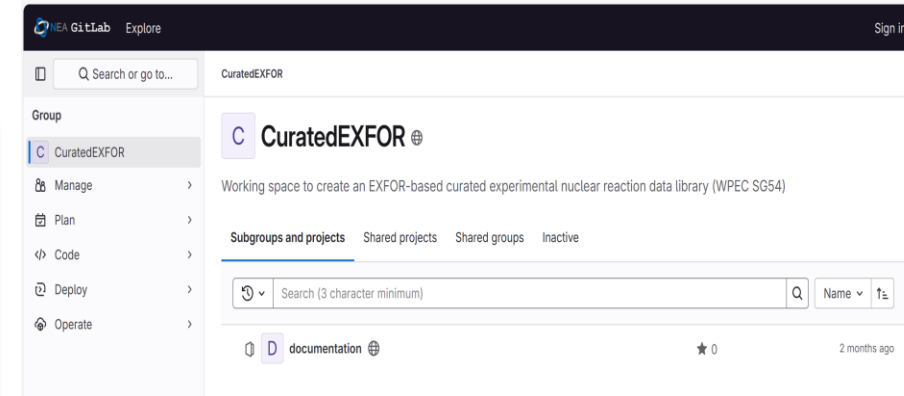
Specified new database structures and requirements so that valuable experimental data can be retained for future use

OUTCOMES

Finalise the JSON format for EXFOR 

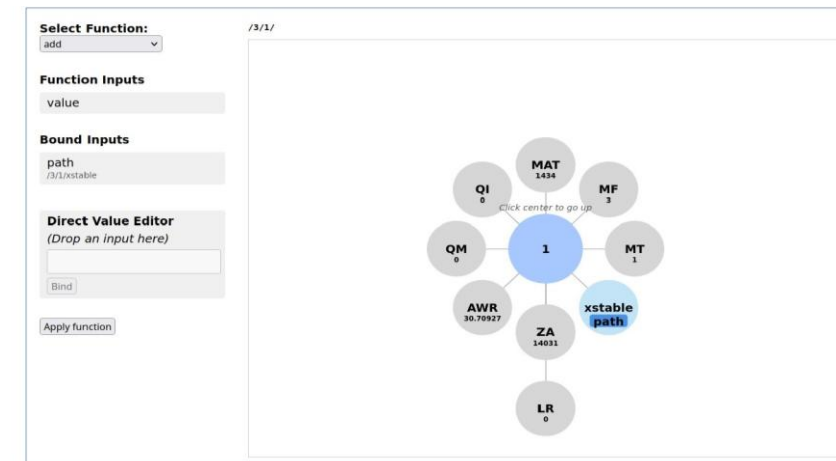
Publicly available curated database and repository with permissive open-source and data licenses 

Demonstrate the use by producing test cases useful for ENDF/JEFF evaluators 



<https://git.oecd-nea.org/curatedexfor>

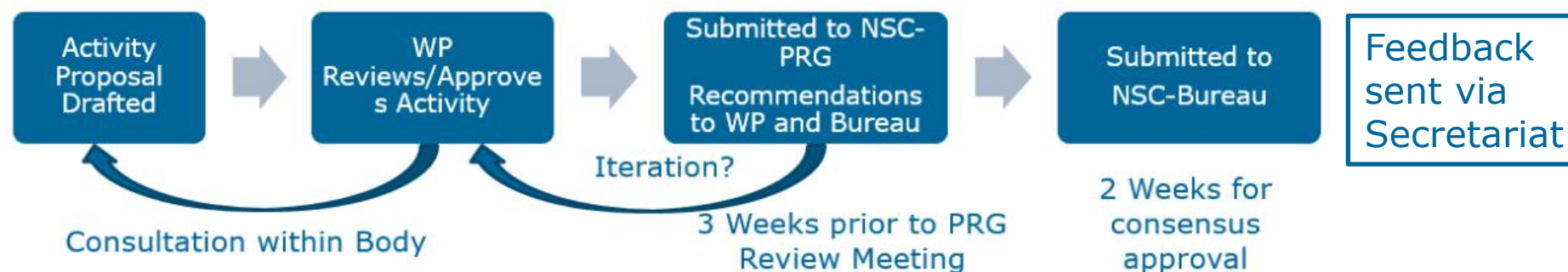
Prototype Graphical Editor



<http://github.com/CodeVisionaries/json-patch-editor>

Secretariat: Anastasia GEORGIADOU

Proposals for WPEC

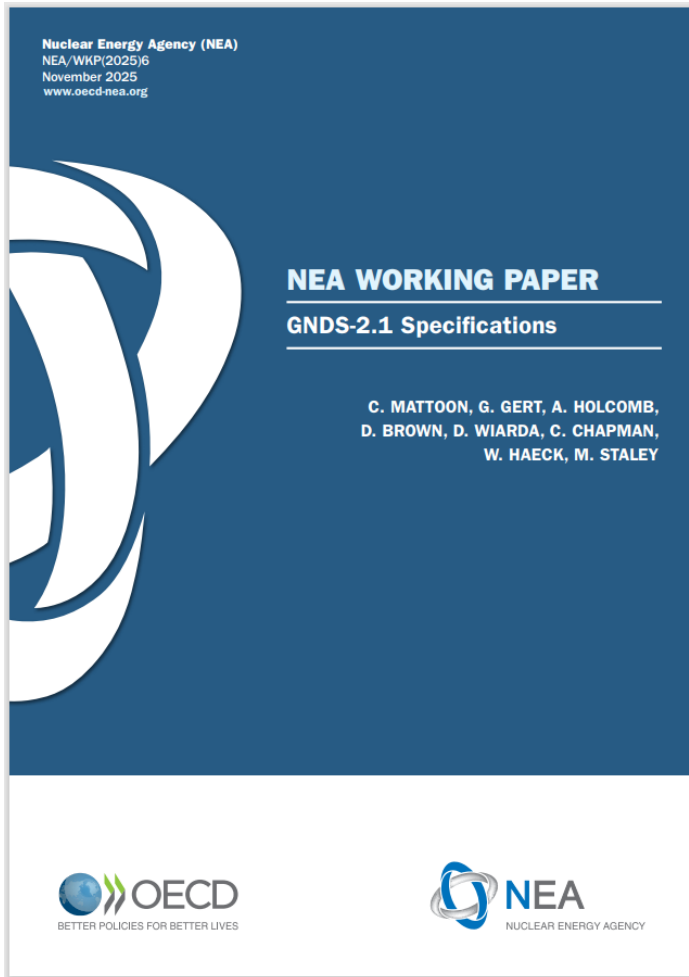


- PRG provides comments within 1 month, with recent efforts **lowering the time to 1 week**, PRG is working to minimize delays.
- Activity **proposal sheet updated in 2024** to improve clarity and PRG appreciates feedback to improve the template.
- Various steps in the review process can be followed in a '**StatusTracking**' sheet, accessible to the NEA Secretariat
- In cases PRG suggests a revised version, a **PRG single point of contact** is nominated



Typical requests from PRG: Clarify objective and how it fits WP priorities, Interactions between bodies, contributions of participants; meeting frequency ; suggestions to integrate outputs into education initiatives or Data Bank products to facilitate knowledge management.

Expert Groups Highlights of 2025



NEW HPRL WEBPAGE: https://www.oecd-nea.org/jcms/pl_68746/hprlapp

NEA Nuclear Data High Priority Request List - HPRL

The NEA Nuclear Data High Priority Request List (HPRL) is the most important nuclear data that have been rigorously reviewed by the NEA Working Party on International Nuclear Data Evaluation Co-operation (WPEC). The purpose of the list is to provide a guide for those planning measurement, nuclear theory and evaluation.

Use the links below to display corresponding lists:

- All requests
- High priority requests (HPR)
- General requests (GR)
- Special purpose quantities (SPQ)
- Standard (STD)
- Dosimetry (DOS)

ID	Type	Target	Reaction	Quantity	Energy		Accuracy (%)	Status	Last update
					Min	Max			
1	G	14-Sr-28	(n,np)	SIG	Threshold	20 MeV	20	Archived	2007-Mar-23
2	H	8-O-16	(n,a), (n,abs)	SIG	2 MeV	20 MeV	5-12	Work in progress	2008-Sep-12
3	H	94-Pu-239	(n,f)	prompt g	Thermal	Fast	7.5	Archived	2006-May-12
4	H	92-U-235	(n,f)	prompt g	Thermal	Fast	7.5	Archived	2006-May-12
5	H	72-Hf-0	(n,g)	SIG	0.5 eV	5.0 keV	4	Archived	2007-Apr-16
6	G	92-U-233	(n,g)	SIG	10 keV	1.0 MeV	9	Work in progress	2007-Mar-13
7	G	26-Fe-56	(n,xm)	SIG DA/DE	7 MeV	20 MeV	30	Archived	2007-Apr-16
8	H	1-H-2	(n,e)	DA/DE	0.1 MeV	1 MeV	5	Work in progress	2007-Apr-16
9	G	92-U-233	(n,g)	nubar SIG	Thermal	10 keV	5	Work in progress	2007-Apr-19
10	G	79-Au-197	(n,tot)	SIG	5 keV	200 keV	5	Archived	2007-Jun-06
11	G	94-Pu-239	(n,f), (n,g)	SIG	1 meV	1 eV	1	Work in progress	2007-Jun-06

GNDS-2.1 Specifications, NEA Working paper, Dec 2025
 DOI: <https://doi.org/10.82155/vx7d-az61>

Expert Groups Highlights of 2025

GitLab Repository: <https://git.oecd-nea.org/science/wpec/hprl/requestForm>

Transparent and Traceable requests

New requests can be proposed for inclusion via opening an Issue

Request Prioritization

- Fast-tracking by up voting 👍

Advanced features

- Milestones & assignments for transparent work planning
- Labels for article categorization:

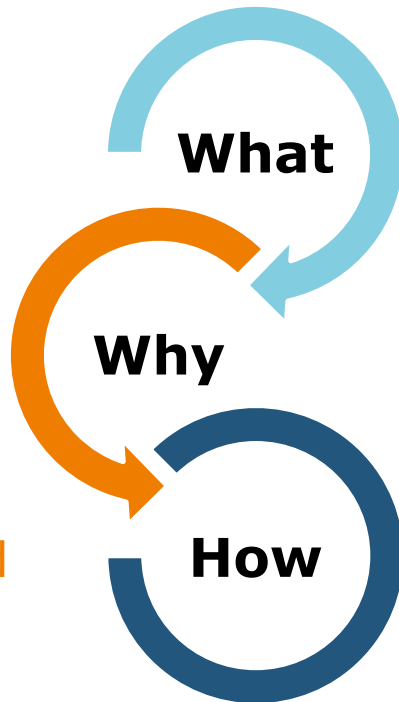
DOS Nuclear Science / WPEC / Expert Group HPRL / requestForm	Dosimetry	SPQ Nuclear Science / WPEC / Expert Group HPRL / requestForm	Special purpose quantities
GR Nuclear Science / WPEC / Expert Group HPRL / requestForm	General Requests	STD Nuclear Science / WPEC / Expert Group HPRL / requestForm	Standard
HPR Nuclear Science / WPEC / Expert Group HPRL / requestForm	High Priority Request		

The screenshot shows the 'New issue' form in GitLab. The 'Type' dropdown is set to 'Issue'. The 'Title (required)' field is empty. The 'Description' field contains 'submitHPRLrequest'. The 'Assignee' is set to 'None - assign yourself'. The 'Labels' field is empty. The 'Milestone' is set to 'None'. The 'Dates' field shows 'Start: None' and 'Due: None'. The 'Contacts' field is empty. The 'Requester Details' section includes fields for Name, Email, Organisation, and Country or International Organisation. The 'Request Details' section includes fields for Target Z, Target A, Reaction / Process, Quantity, Incident Energy Range (eV), Secondary Energy (eV) or Angle, and Covariance Information. The 'Issues' menu item in the left sidebar is highlighted.

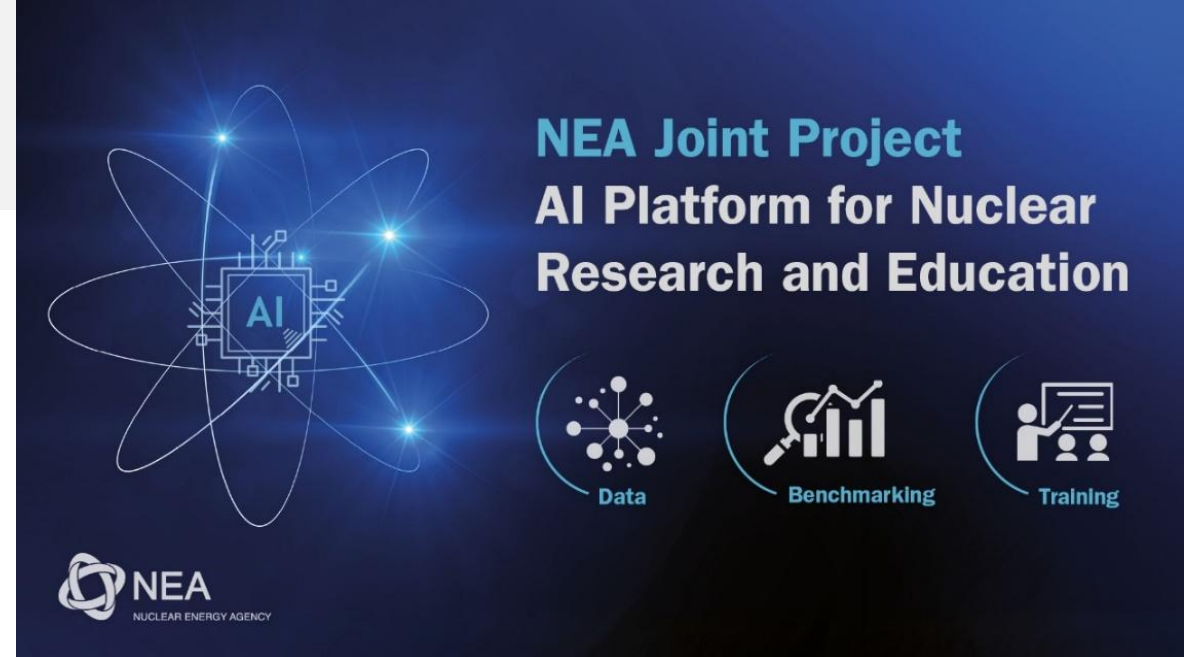
AIxpertise Project Objective

Establish a Joint Project within the Nuclear Energy Agency (NEA) to **harness the transformative potential of Artificial Intelligence (AI) and Machine Learning (ML)**

- Keep pace with **fast-advancing innovations in AI/ML**
- Ensure **readiness for regulatory review** of AI approaches
- Support innovation in reactor **operation** and **SMR deployment**



- **Demystify AI** solutions and **expand capacity**
- **Harness AI/ML** in a clear and defensible way
- Establish a **community-of-practice** ready to **learn by doing**
- Develop specific, structured deliverables



Contact: Oliver.BUSS@oecd-nea.org

AIxpertise - AI Platform for Nuclear Research and Education



Adapting/developing datasets for AI applications



Building bridges between nuclear and AI domains to advance expertise



Disseminating knowledge and training nuclear experts

AIxpertise Project Activities and Outputs

AI-friendly internationally peer-reviewed, aggregated, and accessible datasets (FAIR data).

- **Extend the datasets** by including supplementary data.
- **Define hierarchical, machine readable data and meta data formats.**
- **Design APIs.**
- **Considered data: Halden legacy data, NSC datasets (e.g. ICSBEP, SFCOMPO, IFPE), time series data from research reactors, Subchannel and bundle test data.**

International benchmarks for assessing and training AI algorithms.

- **Data mining and knowledge management** (e.g. data mining for HRP, Nuclear Science Chatbot) .
- **Scientific computing** (e.g. ML-enhanced CFD, Physics-informed neural networks, Multi-scale AI/ML integration for nuclear fuel materials).
- **Health monitoring and reactor operation** (e.g., reactor time series analysis, optimisation of nuclear power plant core reloading patterns).

Hands-on trainings on the use of AI algorithm for nuclear research and education.

- **Workshops**
 - **Data management for AI**
 - **Secure usage of AI**
 - **Deploying AI to the Cloud**
 - **Explainable AI for safety**
 - **Machine Learning Hackathon**
- **Hands-on Training, e.g. “AI for Nuclear Asset Management”**

Online platform for collaboration of nuclear and AI experts for aggregated data, benchmark specifications, software, AI models, and interactive discussions and issue boards.

AIxpertise - Project Development Timeline

Contact: Oliver.BUSS@oecd-nea.org

11 Feb 2025:
Announced during
World Governments
Summit

15-16 Oct 2025:
AIxpertise Workshop,
Remote
(45 organisations, 17
countries)

21 January 2026:
AIxpertise 2nd virtual
Workshop – Review
Programme of Work
(45 organisations,
16 countries,
presentations by
CNSC, GRS, NRC,
RegLab)

01 March 2026:
Feedback on legal
agreement

30 March 2026:
Final version of legal
agreement & start of
signing process

End of May 2026:
AIxpertise
Kick-Off Meeting (in-
person)

**Early 2025: Surveys
among NSC stakeholders
including national
laboratories, regulators,
to define AIxpertise
programme of work**

**Q4 2025: Development of
the detailed program of
work through bilateral
discussion**

**Q1 2026: Prioritization and review of
legal agreement**

Now

In a nutshell

- **The WP continues the strong engagement with the international nuclear data community**
- **Our goals are:**
 - Recommend nuclear data improvements (including covariance data) based on stakeholder input, new data, and advances in theory and modeling.
 - Suggest updates in codes, formats, methods, and practices for better evaluation processes.
 - Monitor and update the HPRC to stimulate measurement and evaluation activities.
- **Upcoming WPEC meeting:** 26 to 29 May 2026; BB10 OECD, Boulogne-Billancourt, France
- Data Bank contribution to the WPEC the **successful 2025 Release of JEFF-4.0**.
- **Open Call for WPEC Subgroup Proposals:** Reach-out to the secretariat we can always guide and assist!
- **Increased focus on usability of the research data:** Modern tools and approaches allow for easier use of data and utilisation of novel tools
- Joint Projects and Frameworks also represent possibility of getting international funding to support the research activities and use of infrastructure
- We invite you to **Join the new Aixpertise joint project** to shape the future of AI in nuclear research through hands-on collaborative work.



**Thank you for
your attention**

Anastasia.Georgiadou@oecd-nea.org