

**NUCLEAR ENERGY AGENCY  
MANAGEMENT BOARD FOR THE DEVELOPMENT, APPLICATION AND VALIDATION OF  
NUCLEAR DATA AND CODES**

**The Joint Evaluated Fission and Fusion (JEFF) Nuclear Data Library Co-ordination  
Group**

**Joint Evaluation Fission and Fusion (JEFF) Co-ordination Group Meeting**

**Summary Record**

12 June 2024  
Hybrid Meeting  
NEA Headquarters, Boulogne-Billancourt and Zoom

Ms. Daniela Foligno  
+33 (0)1 73 21 28 32  
daniela.foligno@oecd-nea.org

## Opening and introduction of the participants

1. The Chair of the Co-ordination Group (CG), **Mr. Arjan Plompen**, opened the meeting and welcomed the participants. The list of participants is provided in **Appendix 1**.

## Adoption of the Agenda

2. The proposed agenda (**Appendix 2**) was approved without modifications.

## Co-ordination Group membership

3. **Mr. Bor Kos** informed the CG that he has left his position at Jožef Stefan Institut (JSI) and will be replaced by **Mr. Andrej Trkov** as temporary representative of Slovenia. The Co-ordination Group welcomed Andrej.

## Co-ordination Group (CG) Mandate

4. The current mandate runs until 30 December 2024, with the main objective being the delivery of JEFF-4.0. **Mr Arjan Plompen** will draft a preliminary document before the next MBDAV meeting and circulate it with the CG for inputs.
5. For the new mandate, it is necessary to establish new objectives and goals, which should include the following:
  - **Incorporate APRENDE deliverables** into JEFF-4.1.
  - **Create an adjusted library** starting from JEFF-4.0 with well-defined scope, methodology and quality assurance.
  - **Support radioprotection interests** emphasizing the importance of this work and exploring how the JEFF community can contribute.
  - **Address the evaluator situation in Europe.** The current shortage of evaluators needs attention, as evidenced by the inability to deliver the decay data libraries and the limited effort behind reaction evaluations. Efforts should be made to increase evaluation capabilities in Europe. The CG is tasked with raising this issue at the next MBDAV meeting to highlight the need for increased evaluation capabilities.
  - **Add an education component** to the mandate, as proposed by **Mr Oscar Cabellos**. This could involve discussing with **Mrs Tatiana Ivanova** the possibility of adding a nuclear data education branch to the NEST project.
  - **Include a point on JEFF dissemination and participation** in conferences to promote the work done by the community.

## JEFF documentation

6. Using GitLab for communication:
  - Information should be managed in GitLab to replace emails for better tracking and archival purposes. Comments should remain technical, focusing on the quality of the files rather than competition between evaluations.

*Action (all): Ensure technical discussions are traceable in GitLab.*

7. Updating file headers:

- Headers of files are not systematically updated, and the generic TENDL header causes loss of information. **Mr Dimitri Rochman** mentioned having a tool to update MF1 but noted it's time-consuming. **Mr Alexey Stankovskiy** suggested adding references to papers/documents/GitLab in headers. **Mrs Daniela Foligno** commented that referencing GitLab issues could discourage open discussions. References should be public and professional.

*Action (all): Contributors must update the header whenever a file is modified.*

*Action (Daniela Foligno): Request contributors to update headers when they modify files.*

8. Publication plans:

- **Mr Arjan Plompen** contacted the editor of EPJ/A about the future JEFF paper. **Mr Cyrille De Saint Jean** will contact another editor. There is a proposal for a JEFF overview paper and separate detailed papers, possibly in a dedicated volume. EPJ/N might be more suitable due to its focus on benchmarks and validation, despite EPJ/A's better impact factor. Regular meetings and Overleaf use at NEA will help organize the draft.

*Action (Daniela Foligno, Arjan Plompen): Identify authors and organize the first meeting to set up the document structure.*

- Sections:

a. *Introduction*

b. *Evaluations*: Gilles Noguère, Dimitri Rochman, Cyrille De Saint Jean, David Bernard, Roberto Capote, Olivier Serot.

c. *Validation*: Oscar Cabellos, Raphaelle Ichou, Steven van der Marck, Tim Ware, Cédric Jouanne, Mark Gilbert., Ivan Kodeli, Alexey Stankovskiy, David Bernard, industry representatives.

d. *Impact analysis*: Alexey Stankovskiy, David Bernard, Nuria, Antonio Jiménez-Carrascosa (PSI), Patrick Carter Cortez (Cambridge), someone from Naarea.

*Action (Daniela Foligno, Arjan Plompen): Organize a meeting per section to shape the document and assign subsections to authors.*

*Action (Oscar Cabellos): Mr Oscar Cabellos will start writing the benchmarking section.*

9. Decay Data code:

- Discussion about the CEA releasing the decay data code (ENSDF to ENDF translator) to the NEA, as it is currently unmaintained. **Mr Oscar Cabellos** volunteered to review the code written in Fortran. To avoid future issues, **Mr Arjan Plompen** proposed keeping the code in the CPS archive or a GitLab-type environment.

## Next JEFF Release

10. Feedback from February release:

- **Mr Helmut Leeb's** concern about Be-9(n, tot) was due to an issue with the IAEA visualization tool. The IAEA committed to solve it in the next future. On the other hand, the AMPX processing issues are caused by the absence of MT16 (only the partials MT875-MT890 are

present). There is no easy solution, and more discussion is needed. An issue on the topic was opened on GitLab: <https://git.oecd-nea.org/databank/nds/jeff/evaluations/isotopes/4-Be-9g/-/issues/3>. **Mr Roberto Capote** noted that the Be-9 reconstructed total cross sections require further checks.

*Action (all): Follow the discussion on the Be-9 on GitLab and contribute to the solution*

*Action (Roberto Capote): compare the total cross-sections (MT1) with the reconstructed total cross-sections for Be-9.*

11. Release of two sets of files for JEFF-4T4:

Two sets of files will be released: the first set with about 600 files, and the second set with around 3000 files, which includes the 600 files from the first set plus additional files from TENDL-2023.

12. Thermal Scattering Law updates:

- **Mr José Ignacio Marquez Damian** mentioned that the TSL for H in H<sub>2</sub>O will remain unchanged. There is an issue with polyethylene that could be solved by mid-July. **Mr Tim Ware** noted potential processing issues with small values in **Mr Kemal Ramic's** files. ZrH from **Mr Andrej Trkov** and H in HF from **Mr Vaibhav Jaiwsal** (IRSN) also need consideration.

*Action (José Ignacio Marquez Damian): ask Vaibhav Jaiwsal to submit H in HF to JEFF.*

13. Starter file meeting:

- A meeting is needed to confirm JEFF-4T4 choices, including small and major changes (major actinides).

*Action (Daniela Foligno): Organize a JEFF-4T4 starterfile meeting.*

14. Validation feedback:

- Mixed feedback on validation. Improvements noted, but work remains. Issues with U-238 and its angular distribution below 1 MeV were discussed. The CEA is willing to provide new U-235 and U-238 files.

*Action (Gilles Noguère): review major actinides in June for a release in July*

15. New evaluation of thermal Fission Yields for Pu-239:

- The need to review Pu-239 fission yields was emphasized due to its effect on reactivity as a function of burnup.

*Action (Olivier Serot): release new cumulative and independent fission yields for the thermal fission of Pu-239 in July to potentially solve burnup issues*

16. JEFF-4T4 readiness:

- Targeted for July, but the final release may align with ND2025. Validation by the industry is crucial.

*Action (TBD): ensure the industry tests JEFF-4T4 and provides feedback. If files are ready in September, industry results should be presented in November.*

17. Complete library with covariances:

- Importance of including covariances in the complete library. Utilize existing data from JEFF-3.3 with adjustments noted in file headers.

*Action (TBD): ensure covariances are present in the final library.*

18. DPA Library:

- Produced from the transport library using NJOY. **Mr Alexander Konobeev's** tool with a modified NRT formula will be considered for integration into the NEA pipeline.

*Action (Dieter Leichtle): ask Alexander Konobeev to provide the code to the NEA.*

#### 19. Inclusion of Activation data:

- Proposal to include activation data in the transport library for simultaneous processing.

*Action (Alexey Stankovskiy, Dieter Leichtle): organize virtual discussions to determine the feasibility of including activation data in the transport library.*

#### 20. Adjustments for JEFF-4.0:

- No adjustments will be made for JEFF-4.0; these will be included in JEFF-4.1 and in the next mandate.

*Action (evaluators): ensure adjustments are well-documented and communicated clearly.*

#### 21. General strategy:

- The aim is to have JEFF-4T4 in July with partial testing and JEFF-4T5 in September, focusing on major actinides. Incremental changes and thorough validation are necessary.

*Action (all): maintain momentum and ensure thorough validation before final release.*

## Validation

#### 22. Streamlining the validation process:

- The paper will help streamline the validation process. **Mr Arjan Plompen** praised **Mr Tim Ware's** method of ordering chi-squared values, which places the bad cases at the end. **Mr. Tim Ware** noted the need to carefully select the library for this ordering, as differences between libraries can be informative.

#### 23. Need for a validation coordinator:

- Mr Dimitri Rochman** emphasized the influx of validation data and the challenge of extracting and interpreting relevant information. A coordinator who understands validation and can link results to nuclear data improvements is needed. **Mrs Raphaele Ichou**, previously leading validation activities, will be unavailable due to maternity leave. **Mr Oscar Cabellos** agreed to coordinate validation and benchmarking but requested support from IRSN (**Mr Vivian Salino**) or CEA (**Mr David Bernard**). **Mr Tim Ware** also offered his support.

*Action (Daniela Foligno, Oscar Cabellos): organize a meeting to discuss coordination and use the validation plan drafted with Mrs Raphaele Ichou and Nicolas Leclaire.*

#### 24. Consistency in validation results:

- Mr Arjan Plompen** stressed the importance of obtaining consistent results when using the same libraries. **Mr Oscar Cabellos** noted the main disagreement is with OpenMC, while VESTA, Dragon, Serpent, and WIMS show consistent results. **Mr Mathieu Hursin's** comparison using the TMI benchmark was highlighted. **Mr Andrej Trkov** suggested ensuring consistent definitions for energy released per fission to avoid discrepancies in reactivity loss with burnup and recommended comparing delta\_rho rather than delta\_k.

*Action (all): adopt and maintain consistent definitions and presentation methods across code comparisons.*

*Action(all): follow the action of the JEFF November meeting on using at least a common set of benchmarks to allow comparing code systems of different participants (all should run UAM pin cell, for example; see Action 26.).*

25. Criteria for library quality:

- Good performance is needed in depletion calculations, the Mosteller suite, shielding benchmarks, and decay heat, ideally outperforming previous JEFF versions. **Mr Michael Fleming** mentioned CERN's interest in contributing to JEFF validation with FLUKA, requiring file processing for Geant4, which only a few people can do.

*Action (Arjan Plompen, Michael Fleming, Daniela Foligno): identify individuals capable of processing files for Geant4 and ensure collaboration with CERN for JEFF validation.*

26. General agreements:

- There is consensus on the importance of presenting validation results in a consistent manner and maintaining discipline in methodological choices.

*Action (all): ensure all participants adopt the same methodological choices and maintain consistency throughout the validation process.*

## Miscellaneous

27. APRENDE Project:

- APRENDE was approved in November, and a grant agreement is being processed. APRENDE has several deliverables intended for JEFF-4.1, which need to be included in the next JEFF CG mandate. **Mr Daniel Cano Ott** should be invited to the next JEFF meeting to describe the project.

*Action (Arjan Plompen): Include APRENDE deliverables in the next JEFF CG mandate and invite Daniel Cano Ott to the next JEFF meeting.*

28. New WPEC Subgroup proposal:

- A new WPEC subgroup proposed by **Mr David Brown** and **Mr Vladimir Sobes** will focus on the unresolved resonance range of actinides. **Mr Gilles Noguère** and someone from CEA/BRC should participate, with **Mr Oscar Cabellos** also involved for benchmarking and testing.

*Action (Gilles Noguère, Oscar Cabellos): participate to the new WPEC subgroup on behalf of JEFF.*

29. Continuation of WPEC SG-46:

- **Mr Oscar Cabellos** mentioned another WPEC group to continue SG-46, coordinated by **Mr Mathieu Hursin** and **Mrs Denise Neudecker**. This group will focus on adjustments, machine learning techniques, and the impact of integral correlation of experiments in the adjustments. **Mr Oscar Cabellos** will be a monitor. **Mr Arjan Plompen** welcomed the renewed energy around these themes.

*Action (all): support and monitor the continuation of WPEC SG-46.*

30. ND2025 conference:

- ND2025 is not JEFF's responsibility. **Mr Daniel Cano Ott** will provide more information at the WPEC meeting. The tentative date is May 26-30, 2025. WPEC should consider organizing

around these dates in Madrid, with **Mr Oscar Cabellos** assisting with organization at CIEMAT university.

*Action (NEA): plan WPEC events around the ND2025 conference dates with Oscar Cabellos's assistance.*

31. ICRM 2024 (International Conference Radionuclide Metrology):

- Scheduled for May 19-22 in Paris (<https://physics.nist.gov/ICRM/conference.html>).

*Action (Mark Kellett): verify the dates for the ICRM2025 conference in Paris.*

32. Centralized event listing:

- **Mr Arjan Plompen** suggested creating a webpage listing all upcoming nuclear data events to help in scheduling future events.

*Action (NEA): develop a webpage to list all upcoming nuclear data events.*

## Closing Remarks

33. **Mr Michael Fleming** expressed gratitude for the progress made by the JEFF community, noting it has been seven years since the last JEFF release. He highlighted the increasing interest in documentation and mentioned new NEA methods to incentivize publications. The NEA can assist in publishing various technical documents that may not require peer review but are valuable for recording the information in JEFF-4.

34. A new member is expected to join the Data Bank, with the MBDAV meeting on May 30 continuing the process for the USA to join within the year. This addition will positively impact nuclear data work, computer programs, benchmarks, and training courses for all member countries.

35. **Mr Arjan Plompen** acknowledged **Mrs Daniela Foligno's** effective work as a meeting organizer and JEFF coordinator, praising her innovative approach, including the use of modern tools for centralized and accessible discussion tracking. He also appreciated the support from **Mrs Claude-Annie Manga** and **Mrs Hedvig Nahon** in organizing the meeting.

**Appendix 1: List of participants in alphabetical order**

SURNAME	NAME	COUNTRY
ALGORA	Alejandro	SPN
CABELLOS DE FRANCISCO	Oscar	SPN
CAPOTE	Roberto	IAEA
DE SAINT JEAN	Cyrille	FR
FOLIGNO	Daniela	NEA
GILBERT	Mark	UK
HILAIRE	Stéphane	FR
HOLCOMB	Andrew	NEA
JACQMIN	Robert	FR
KELLETT	Mark A.	FR
KIM	Do Heon	KOR
LEEB	Helmut	AUT
LEICHTLE	Dieter	GER
MANGA	Claude Annie	NEA
MARQUEZ DAMIAN	José Ignacio	ARG
MILLS	Robert	UK
NAHON	Hedvig	NEA
NAHON	Hedvig	NEA
NOGUERE	Gilles	FR
PLOMPEN	Arjan	EU
ROCHMAN	Dimitri	SWT

## Appendix 2: Agenda

1. Opening and introduction of the participants
2. Adoption of the agenda
3. Co-ordination Group membership
4. Co-ordination Group (CG) Mandate
5. JEFF Documentation
6. Next JEFF Release
7. Validation
8. Miscellaneous
9. Closing Remarks