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NUCLEAR ENERGY AGENCY
NUCLEAR SCIENCE COMMITTEE

Working Party on International Nuclear Data Evaluation Co-operation

Third Meeting of the Expert Group on the Recommended Definition of a General Nuclear Database Structure (EGGNDS)

SUMMARY RECORD

25 June 2019
NEA Headquarters
Boulogne-Billancourt, France

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OECD/NEA Nuclear Science Committee

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

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NEA Headquarters Room BB10

46 quai Alphonse Le Gallo, 92100 Boulogne-Billancourt, France

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SUMMARY RECORD

1. Welcome

The Chair, **D. Brown**, welcomed the participants (see ***Appendix 1***) and the WPEC Secretariat, **M. Fleming**. He reminded the participants that there was a great deal to discuss and that processes needed to be agreed to allow remote agreement on the advancement of the specifications.

2. Adoption of the agenda

The agenda (see ***Appendix 2***) was adopted without modification, although it was noted that the schedule would be more free-form depending on the requirements in the specification review.

3. Review of membership and mailing lists

The Secretariat, M. Fleming, provided the list of the current members of the Expert Group and reminded the participants of the OECD Rules of Procedure and requirement for official members to be nominated by the country representative on the WPEC, or the NSC or via the Permanent Delegation to the OECD. Any individuals not listed on the current membership list should request this nomination and contact details may be provided upon request.

4. Status of the specifications for GNDS-1.9

The participants discussed the specifications, *as they exist* within the NEA GitLab. With the release of ENDF/B-VIII.0 in 2018, a *de facto* standard was established based on the existing ENDF-6 format and data processing features within the FUDGE package. It was agreed that the current specifications based on this version were mature enough to be released as an official specification, with the intention that the various proposals for

extending the format would be considered as part of advanced versions beyond 1.9. **The participants unanimously agreed to release the GNDS-1.9 specifications** subject to the following conditions:

- All RED/TODO/FIXME text denoting areas where future development is needed will be removed
- DRAFT watermarks will be removed
- The draft following these changes will be submitted to the participants for a final review and all corrections raised will be integrated into the version before release

Notes will be re-introduced into the development draft that is defined in ***section 6*** of this document. Once the draft document has been prepared by the Chair, **D. Brown**, the Secretariat, **M. Fleming**, will liaise with NEA Publications to determine the publishing options available through the OECD. This should take into account the plan for updated version and corrected re-issued documents for each version, as described in ***Section 6***. **D. Brown** will also be responsible for determining if HTML conversion of the documentation is appropriate and **M. Fleming** will investigate hosting options for any outputs.

It was noted in discussion that the existing GNDS-1.9 specifications are a translation of ENDF-6 and are missing requested features, including TSL and FPY extensions and new content for covariances and resonances. Some content requested within the Requirements drafted within WPEC Subgroup 38, including documentation and processed data forms are not yet implemented. These will constitute feature additions and will be considered for future GNDS releases.

5. NEA GitLab and GNDS format proposal process

M. Fleming presented a draft formats proposal process that was developed based on the previous meeting at the ND2019 in Beijing, China. Each proposal under this process will be developed under a branch from the current development version of the GNDS specifications and the merge request back will constitute a formal proposal. The process to review this proposal and accept or require corrections to it is described with a view to encouraging collaboration while maintaining an opportunity for critical feedback. The participants made several corrections that were addressed during the meeting with a revised version. **This revised version was unanimously approved by the participants.** It was noted that the conflict resolution aspect of this procedure was not well-codified, but based on the extremely collegial attitude of the participants it was agreed that this will not be required. The final version agreed at the meeting is provided in ***Appendix 3***.

6. Paradigm for GNDS specification development

D. Brown presented a scheme for the future development of the GNDS specifications, inspired by well-known version control branching frameworks. This is shown schematically in ***Figure 1***. The main branch types are:

- **Master**

  The Master branch is the most recent released version of the GNDS specifications and may only be updated with hotfixes or the release of a new version

- **Release**

  The Release branch is created when the EGGNDS agrees to release a new version of the specifications. It is a branch, rather than a tag, since revisions may still be made to the version (including legacy versions) when hotfixes are identified. For example, while work may continue on GNDS-1.10, any hotfixes to GNDS-1.9 would still be accepted.

- **Development**

  The Development branch is the current working version that accepts proposals for new non-hotfix changes to the specifications. Any additions are created as branches from this branch and are merged back into this branch

- **Feature/proposal**

  Features are proposed by creating a branch off of the current development branch. Experts may change the specifications and then create a merge request. Following the procedure described in ***Section 5***, the acceptance of the feature is represented by the complete merge into the development branch.

- **Hotfix**

  A Hotfix branch is created when a bug is found that *does not change an existing file*. Examples would include typos or formula errors that do not affect the contents of a file. However, *interpretation* of the contents of a file may be altered with the correction of an error within a hotfix.

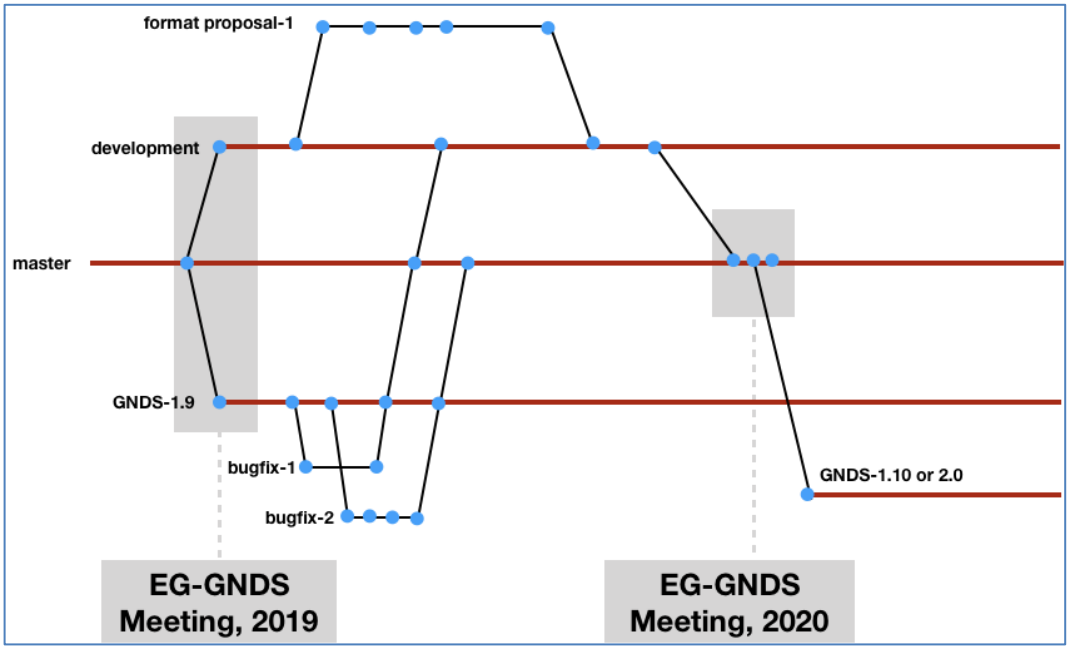

Figure 1. Schematic of the branching system proposed and agreed for the development of GNDS specifications, including annual meetings that will be used to discuss and potentially agree the release of new versions.

The participants generally agreed on this method for developing the specifications and it was noted that several candidate merge requests already were in the pipeline. Following the release of the GNDS-1.9, the creation of this scheme of branches will be performed by the Chair and feature proposals may be made.

The requirements for a format proposal were agreed to be, at a minimum, the LaTeX descriptive text, additions in JSON that encode the format and a successfully building commit to the central repository. In future, the requirements may be extended to include reference implementation, examples files and/or code or a stylesheet to perform translation.

7. Nuclear data structure and format: applications or science driven?

J-.Ch. Sublet, presented many of the finding from the TENDL processing and nuclear data file generation steps that have demonstrated some limitations of the ENDF-6 format and can help guide the direction of the specifications for future formats. Of the many lessons, it was noted that different levels of detail may be required by different applications. While certain nuclear engineering applications require only general reaction channels, some applications require a detailed break-down, complete multi-differential data (potentially with correlations), or various other complex datasets that may be obfuscated within ENDF-6. Isomeric data (including detailed level information), full covariances (without limitations) and processed/derived data should all be catered to in an extensible format that can address the needs of the nuclear industry, as well as astrophysics, medical physics, homeland security and any other user.

8. Any other business

None

APPENDIX 1

List of participants to the Third Meeting of the WPEC Expert Group on the Recommended Definition of a General Nuclear Database Structure (EGGNDS)

	First Name	Last Name	Country	Notes
1	David	BROWN	UNITED STATES	*Chair*
2	Mireille	COSTEDELCLAUX	FRANCE	
3	Michael	FLEMING	NEA	*Secretariat*
4	Zhigang	GE	CHINA	*Remote*
5	Wim	HAECK	UNITED STATES	
6	Michal	HERMAN	UNITED STATES	
7	Jesse	HOLMES	UNITED STATES	
8	Osamu	IWAMOTO	JAPAN	
9	Alexis	JINAPHANH	FRANCE	
10	Cedric	JOUANNE	FRANCE	
11	Skip	KAHLER	UNITED STATES	*Remote*
12	Fausto	MALVAGI	FRANCE	
13	Caleb	MATTOON	UNITED STATES	
14	Alexandru	NEGRET	ROMANIA	
15	Xichao	RUAN	CHINA	*Remote*
16	Vladimir	SOBES	UNITED STATES	
17	Alejandro	SONZOGNI	UNITED STATES	
18	Nicolas	SOPPERA	NEA	
19	Jean-Christophe	SUBLET	IAEA	
20	Ian	THOMPSON	UNITED STATES	*Remote*
21	Alex	VALENTINE	UNITED KINGDOM	
22	Thierry	VISONNEAU	FRANCE	
23	Morgan	WHITE	UNITED STATES	
24	Dorothea	WIARDA	UNITED STATES	

APPENDIX 2

OECD/NEA Nuclear Science Committee

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

Third Meeting of the Expert Group on the Recommended Definition of a General Nuclear Database Structure (EGGNDS)

NEA Headquarters Room BB10

46 quai Alphonse Le Gallo, 92100 Boulogne-Billancourt, France

25 June 2019

AGENDA

1.	**Welcome and introductions**	**Chair**
2.	**Adoption of the agenda**	**All**
3.	**Review of mailing list and membership**	**Secretariat**
4.	**Status of the specifications for GNDS-1.9**	**Chair**
5.	**NEA GitLab and GNDS format proposal process**	**Secretariat**
6.	**Paradigm for GNDS specification development**	**Chair**
7.	**Nuclear data structure and format: applications or science driven?**	**JC Sublet**
8.	**Any other business**	**All**

APPENDIX 3

OECD/NEA Nuclear Science Committee

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

Expert Group on the Recommended Definition of a General Nuclear Database Structure (EG-GNDS)

Procedure for the Proposal and Approval of Changes to the Generalised Nuclear Data Structure Specifications

Introduction

With the growing complexity of the Generalised Nuclear Database Structure (GNDS) specifications, it was proposed that the proposal of new specification, as well as the review, editing, approval and adoption of the changes, should be done through a remote process.

The NEA GitLab system (https://git.oecd-nea.org/) offers a solution to these issues, where proposals may be naturally created, developed, revised and approved via standard branch and merge request processes. The process for submitted and reviewing proposals is described in this document.

Guidelines of the procedure

1. Proposals are identified by individual branches which are stand-alone modifications of the formats repository
    a. Pre-proposal tracking of topics may be done via the repository issue board, ensuring material is central stored and available for review
    b. Issue board content does not constitute a proposal for a change to the specifications
2. Proposals are approved through merge requests into the development branch
3. Merge requests must pass the continuous integration system before being considered by Expert Group members
4. Merge request approval should be done remotely if at all possible, due to the significant time required to review proposals and potential for multiple revisions before acceptance
5. Proposals are treated as unapproved until the merge request is completed

6. The approval of a merge request proposal takes two phases:
    a. Approval of reviewers
        i. The Chair of the Expert Group proposes one or more reviewers
        ii. The Expert Group participants are contacted using the NEA Expert Group mailing list to propose reviewers
        iii. All members of the Expert Group have 30 days to propose reviewers
        iv. All proposed reviewers must accept the responsibility of reviewing the proposal within 10 days and record acceptance within the merge request discussion board
    b. Approval of proposal
        i. Reviewers must either provide critical feedback, indicate that they will abstain from giving an opinion, or accept the merge request within 90 days of accepting the responsibility of reviewing the proposal
        ii. No proposal may be accepted without at least one approval from one reviewer
        iii. The proposer of the merge request must accept any changes made to the proposal before it can be accepted
        iv. The approval or requested changes must be communicated through the discussion board of the merge request within the repository
        v. The Chair is responsible for performing the branch merge once approved
7. The Chair of the Expert Group reserves the right to review any proposal and provide critical feedback that must be addressed before acceptance of any proposal

APPENDIX 4

List of actions agreed at the Third Meeting of the WPEC Expert Group on the Recommended Definition of a General Nuclear Database Structure (EGGNDS)

1. **D. Brown** to investigate "latexdiff" for use in comparing specification versions
2. **D. Brown** to perform the clean-up operations described in ***Section 4*** and submit the specification document for review by the EG members
3. **M. Fleming** to review OECD Rules of Procedure and Publication copyright rules to determine requirements for EG to agree final GNDS document for publication
4. **C. Mattoon, D. Brown** to perform a refactoring of the git repository to streamline the technical aspects of the process for feature proposal
5. **C. Mattoon, D. Brown, M. Fleming** setup git branching scheme as described and agreed in ***Section 6***, including required permission rules for different participants
6. **D. Brown** to report on the options for LaTeX to HTML conversion and provide options for NEA to consider for alternative, parallel online publishing
7. **B. Beck** to spearhead outreach efforts and plan an ANS workshop