Comments on SG38 Activity from JENDL

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GND Merit Recognized by JENDL

- Large extensibility for future development

  for example, the capability to accommodate correlations among any isotopes, reactions, energy, and model parameters from users' viewpoint

  --> if some new good handling system (for creation, checking, processing, etc.) is established.

- Possibility to set necessary number of digits

  --> better to assure the positive definiteness of covariance, etc.

- No limit of MT numbers

  --> possible to make consistent description toward higher energy; JENDL High Energy File has a disconnection at 20 MeV on format.

- Easy readability for human being
  - elimination of redundant input such as mass, Q-value, etc.
  - unnecessary line numbers
  - reduction of the editing error and lost of consistency

Requirements Proposed by JENDL

- Manipulator
  - Creation tool of file
  - Operation tool of data (add, multiply, average, ...)
  - Plotting tools
- File Checker(s)
- Processing Code
  - Will it be open to public early? → e.g. NJOY
- Compatibility to ENDF-6 Format
  - How long is it needed?
    → It makes limitation to extend the format.
  - Compatibility to PENDF and GENDF is needed.
    → Lost, once we accept an extension.
- License
  - GPL, which is the license of the GND, is not good for some application codes. BSD or LGPL is better.

Reasonable?

- Merit
  - no limit by MTs, large extensibility, ...
- Demerit
  - Large costs will be needed to change codes to adapt the new format

    → Many tools to deal with JENDL are based on ENDF-6 format.
- Following questions arise.

  → Are the merits larger than the demerits?

  → What is the strongest motivation for a change of the format at present?

  → Is it better than to extend ENDF-6 format?

Correspondence of Merits to Problems

Just Summarized!

- **Problem 1** : Loss of significant digits in ENDF-6 format
  - Makes the positive definiteness of covariance ,etc., not assured.
  - **Merit 1** : No limit of digit numbers
- **Problem 2** : Rigorous limit of MT number in ENDF-6 format
  - Make cross section disconnection at 20 MeV in JENDL/HE file
  - **Merit 2** : consistent description toward higher energy (No limit of MT number)
- **Problem 3** : Inclusion of now unnecessary data in ENDF-6 format
  - Makes editing error and lost of consistency
  - **Merit 3** : No need of redundant inputs (e.g., mass, Q-value) and MAT, MF, MT, line numbers
- **Problem 4** : Complicated data formats in ENDF-6 format
  - Needs textbook to read ENDF-6 format
  - **Merit 4** : Good visibility for human being
- **Problem 5** : Loss of significant information (e.g., correlations among all considered elements) and less extensibility in ENDF-6 format
  - Makes inaccurate nuclear data
  - **Merit 5**: All information will be included and Large extensibility is assured for future development
    - new good handling system (for creation, checking, processing, etc.) should be established.

The listed merits 1-3 can be improved by the extension of ENDF-6 format,

but we are afraid that …

- Processing codes cannot follow a drastic format change
  - Large efforts should be made to adapt the processing code.
- No limitation of data makes nuclear data huge
  - Users cannot download the huge data from far web sites.
  - Processing codes cannot use the new nuclear data due to e.g., memory limit or delay of data reading.
- Many information makes the new format less readable.
- Merit 4 (good visibility) really needs to be improved?
  - Processing code may resolve this issue.
- We are eager to have Merit 5 (large extensibility), but is it really needed?