

Summary report on the deficiencies removed from the FENDL-3.0 library

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Since the latest release of FENDL-3.0 nuclear data library for fusion applications several deficiencies were reported by nuclear data experts and final users (see [report by C. Konno](#)). Some problems were related with nuclear data processing and some others are a consequence of the quality of the evaluated nuclear data. With the goal to improve FENDL-3.0 data the IAEA/NDS engaged the consultant D.L. Aldama to prepare an updated version of the library labelled FENDL-3.1, removing most of the errors found in the previous release. With reference to the report by C. Konno, the work performed is summarized below.

Problem 1: O-16 data should be replaced over 20 MeV by JENDL/HE-2007 or other evaluated nuclear data (Reported by C. Konno).

Leave as it is. It is not a processing issue. The deficiency should be fixed at the level of the original evaluation. An evaluators' meeting is suggested to correct evaluated data

Problem 2: Missing angular-energy distribution over 20 MeV for several MATXS files like Fe-56. (Reported by C. Konno).

Corrected. It was due to a processing error in NJOY-99. The files were reprocessed using NJOY-2012.50 with local updates.

Problem 3: Problem with KERMA and DPA included in ACE and MATXS files (Reported by C. Konno).

i) Unexpected shape of KERMA energy dependence at low energies for Hydrogen.

H-1 Corrected: It was due to a processing error in NJOY-99. The files were reprocessed using NJOY-2012.50 with local updates.

ii) Unexpected shape at low energies.

H-2: Corrected: It was due to a processing error in NJOY-99. The files were reprocessed using NJOY-2012.50 with local updates .

N-15: Corrected. The value of Q and QI was set to 2.488890E+6 for neutron capture (MF=3, MT=102) following Mr. C. Konno's recommendations.

C-13, O-16, O-18, P-31, S-34, S-36, K-41, Sc-45, Cr-50, Cr-52, Cr-53, Cr-54, Fe-58, Ge-70, Ge-72, Ge-73, Ge-74, Ge-76, La-138, La-139, Lu-175, Lu-176, Re-185, Re-187, Pt-190, Pt-192, Pt-194, Pt-195, Pt-196, Pt-198, Pb-204, Pb-206, Pb-

207: **Corrected:** It was due to a processing error in NJOY-99. The files were reprocessed using NJOY-2012.50 with local updates

- iii) S-32, S-33, K-39, K-40, Bi-209 drastically large KERMA/DPA data due to a large helium production cross section at low energy.

Leave as it is. It should be corrected in the original evaluation. An evaluators' meeting is suggested to select the evaluated data.

Problem 4: Non-monotonically decreasing energy boundaries in matxs formatted files for some isotopes (reported by V. Sinitsa).

Corrected: It was a bug in NJOY99 and NJOY2012 when non-binary gendf formatted tapes were read using the 1p FORTRAN format descriptor. NJOY was patched and the updates made available at <https://www.oecd-nea.org/dbprog/njoy-links.html>.