

ANL/NDM-148 (supplement)

Covariance Files in ENDF/B Format for Criticality Safety Applications¹

Dimitri G. Naberejnev²

July 2000

Technology Development Division
Argonne National Laboratory
9700, South Cass Avenue
Argonne, Illinois 60439
U.S.A.

Argonne National Laboratory is providing support for a criticality safety analysis project that is being performed at Oak Ridge National Laboratory. For this project the ENDF/B-V evaluation files are being used. The ENDF/B-V library does not contain the covariance files for all isotopes of interest to this project. Argonne National Laboratory therefore provides the missing information for these isotopes. In the previous report we described the method used to construct the correlation matrices and to estimate fractional errors. This method is ad-hoc and is based on the comparison between different existing evaluations (ENDF/B-VI, JENDL3.2, BROND2.2, and JEF2.2) with the ENDF/B-V evaluations. The results on covariance matrices for several isotopes were presented in the previous report. These included isotopes/elements: Gd¹⁵⁵, Gd¹⁵⁶, Gd¹⁵⁷, Hf, Mg, U²³³, U²³⁶, U²³⁸, Zr.

The present work completes the list of the isotopes for which covariance matrices are needed for ORNL criticality safety project. These isotopes/elements are: Cu, Cd, Ca, K, U²³⁴, Pu²³⁸, Am²⁴³, Nd¹⁴³, Sm¹⁴⁹, Rh¹⁰³, Sm¹⁵¹, Cs¹³³, Tc⁹⁹, Sm¹⁵², Gd¹⁵⁴, Eu¹⁵³, Nd¹⁴⁵, Sm¹⁴⁷, Sm¹⁵⁰, Mo⁹⁵, Ag¹⁰⁹, Ru¹⁰¹, Eu¹⁵⁴, and Eu¹⁵⁵.

The complete ENDF/B-V tapes for all above listed isotopes can be downloaded from the Technology Development Division Internet site at

<http://www.td.anl.gov/reports/ANLNDMReports.html>.

The report **ANL/NDM-148** contains the description of the method used to calculate the covariances files. The document **ANL/NDM148.memo** is this memo. All the ENDF/B-V tapes are compressed in the attached file **DE5COV.zip**. The graphical representation of correlation matrices and fractional errors for all above listed isotopes (postscript format) are in the file **DE5COV_GRA.zip**.

¹ This work was supported by the U.S. Department of Energy under contract W-31-109-Eng-38

² Contact: Tel. +1 (630) 252-7402, Fax +1 (630) 252-1885, E-mail: dimitri@anl.gov