

## Abstract

Argonne National Laboratory is providing support for a criticality safety analysis project that is being performed at Oak Ridge National Laboratory. The ANL role is to provide the covariance information needed by ORNL for this project. The ENDF/B-V evaluation is being used for this particular criticality analysis. In this evaluation, covariance information for several isotopes or elements of interest to this analysis is either not given or needs to be reconsidered. For some required materials, covariance information does not exist in ENDF/B-V:  $^{233}\text{U}$ ,  $^{236}\text{U}$ , Zr, Mg, Gd, and Hf. For others, existing covariance information may need to be re-examined in light of the newer ENDF/B-VI evaluation and recent experimental data. In this category are the following materials:  $^{235}\text{U}$ ,  $^{238}\text{U}$ ,  $^{239}\text{Pu}$ ,  $^{240}\text{Pu}$ ,  $^{241}\text{Pu}$ , Fe, H, C, N, O, Al, Si, and B. A reasonable estimation of the fractional errors for various evaluated neutron cross sections from ENDF/B-V can be based on the comparisons between the major more recent evaluations including ENDF/B-VI, JENDL3.2, BROND2.2, and JEF2.2, as well as a careful examination of experimental data. A reasonable method to construct correlation matrices is proposed here. Coupling both of these considerations suggests a method to construct covariances files in ENDF/B format that can be used to express uncertainties for specific ENDF/B-V cross sections.