Safety and waste management of materials for ITER, IFMIF and future power plants require detailed knowledge of the activation caused by irradiation with neutrons, or in the case of IFMIF, deuterons. The European Activation System (EASY) has been developed for such calculations and a new version (EASY-2007) was released earlier this year. This contains a large amount of nuclear data in the European Activation File (EAF-2007) covering neutron-, deuteron- and proton-induced cross sections (about 200,000 reactions have data extending up to 60 MeV), decay data (2,231 nuclides) and subsidiary data on e.g. biological hazards. These data are input to the FISPACT inventory code used to calculate the activation.

Recent work has concentrated on the validation of EASY-2007 using integral and differential measurements; these studies are summarised showing examples of reactions agreeing with the experimental results and cases where the library data require further improvement. Integral data above 20 MeV are especially important in improving the library for IFMIF calculations. Using a previous version of EASY a study of the activation of all the elements enabled the identification of the reactions important in producing activation below 20 MeV. The list of 1,340 neutron-reactions producing the dominant radionuclides enables further studies to be focused on the important data. This study made extensive use of importance diagrams. This work has been extended to cover the energy region up to 60 MeV, and the new important radionuclides and reactions in this energy range are reported.

Although the data above 20 MeV are important for IFMIF and are of interest because of their novelty, the traditional energy region below 20 MeV remains of great importance for most fusion applications. The testing of such large data libraries for reactions with no experimental data is necessary and results from the use of the recently developed method of Statistical Analysis of Cross Sections (SACS) to EAF-2007 is discussed.

In addition to neutron-induced reactions, EASY-2007 contains data for deuterons and protons important for IFMIF. Proton data are required for calculation of activation in the testing phase of IFMIF when H\(^+\) will probably be used instead of D\(^+\).