

New fission-product decay data measurements to improve decay heat calculations

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The determination of decay heat is a major safety issue for a reactor in operation but also for the transport of burnt fuel and nuclear waste management. The calculation of decay heat through the summation method relies on the combination of reactor simulations to estimate the fuel inventory and on nuclear data: decay properties of the fission products and actinides, fission yields and cross sections. Some fission products in the decay data libraries have decay schemes which are biased by the Pandemonium effect. The Pandemonium effect arises from the low efficiency at high energy of Germanium detectors. This effect has direct consequences on decay heat calculation with an overestimation of the β - contribution and an under-estimation of the γ contribution. To overcome this effect, the Total Absorption Gamma Spectroscopy (TAGS), based on the full detection of the deexcitation gamma cascade for each populated level is used. The impact of these new decay data measurements performed with the TAGS technique on decay heat calculations will be discussed. This work is part of an IAEA coordinated paper, in preparation.

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