Comparison of experimental and calculated shielding factors for modular buildings in a radioactive fallout scenario

Experimentally and theoretically determined shielding factors for a common light construction dwelling type were obtained and compared. Sources of the gamma-emitting radionuclides $^{60}$Co and $^{137}$Cs were positioned around and on top of a modular building to represent homogeneous fallout. The modular building used was a standard prefabricated structure obtained from a commercial manufacturer. Four reference positions for the gamma radiation detectors were used inside the building. Theoretical dose rate calculations were performed using the Monte Carlo code MCNP6, and additional calculations were performed that compared the shielding factor for $^{137}$Cs and $^{134}$Cs. This work demonstrated the applicability of using MCNP6 for theoretical calculations of radioactive fallout scenarios. Furthermore, the work showed that the shielding effect for modular buildings is almost the same for $^{134}$Cs as for $^{137}$Cs.

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