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Impact of Monte Carlo Calculations on Design, Activation and Inventory Analysis, Safety and Radiation Protection of Nuclear Power Plants

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Monte Carlo methods have become indispensable tools in the analysis and safety assessment of nuclear power plants and nuclear facilities. Their ability to model complex particle transport processes with high spatial and energy resolution enables advanced applications across reactor neutronics, inventory and activation analysis, radiation protection, reactor safety and environmental monitoring.

This paper outlines recent applications of Monte Carlo simulations in five critical areas. The authors show, that with a basic model, once commenced in the design phase of the reactor, the whole lifespan of the reactor can be supported in its various stages from design to build through operation into decommissioning.

Technical Track

Reactor Physics

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