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Simulation of the Chernobyl Accident

The physical and structural drawbacks of RBMK reactors that led to the accident at Chernobyl unit 4 are analyzed. They are as follows: positive void reactivity coefficient and defects in the design of the reactor core protection system. Contribution of each drawback to the accident development is assessed. It is shown that the drawback in the design of control rods triggered the accident.

Keywords: nuclear reactor, neutron flux density, reactivity, neutron power, control rods, void reactivity coefficient, graphite cladding, xenon poisoning, transient, operative reactivity margin, control rod effectiveness, positive reactivity, effective fraction of delayed neutrons, credit of void reactivity coefficient.