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Aerosol module for modeling of the fission product behavior in FR cooling circuits and NPP compartments

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This contribution presents an overview of models of an aerosol module designed to simulate the behavior of fission products in the circuits and compartments of nuclear power units with fast reactors with sodium or lead coolants. Aerosol module AEROSOL-LM is included in the thermal-hydraulic HYDRA-IBRAE/LM code. Together they represent a unified code with a common interface for calculating the processes of thermal-hydraulics and the fission products transport both in gaseous and aerosol forms. The AEROSOL-LM module allows calculating the relevant processes of aerosol dynamics: nucleation, coagulation, condensation and sedimentation. A specific feature of the module is the simulation of multicomponent and polydisperse aerosols. In particular, for sodium reactors the behavior of sodium combustion aerosols in NPP compartments is simulated. For lead cooled fast reactors the oxygen transport, the formation and behavior of corrosion particles are considered. The aerosols formation and transport between rooms of the NPP including those resulting from melt-concrete interaction are also modeled by the aerosol module.
The results of module validation are also briefly presented in the contribution.

Country/Int. organization

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