

Title	CFD and FEM modeling of PPOOLEX experiments
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Abstract	<p>Large-break LOCA experiment performed with the PPOOLEX experimental facility is analysed with CFD calculations. Simulation of the first 100 seconds of the experiment is performed by using the Euler-Euler two-phase model of FLUENT 6.3. In wall condensation, the condensing water forms a film layer on the wall surface, which is modelled by mass transfer from the gas phase to the liquid water phase in the near-wall grid cell. The direct-contact condensation in the wetwell is modelled with simple correlations. The wall condensation and direct-contact condensation models are implemented with user-defined functions in FLUENT.</p> <p>Fluid-Structure Interaction (FSI) calculations of the PPOOLEX experiments and of a realistic BWR containment are also presented. Two-way coupled FSI calculations of the experiments have been numerically unstable with explicit coupling. A linear perturbation method is therefore used for preventing the numerical instability. The method is first validated against numerical data and against the PPOOLEX experiments. Preliminary FSI calculations are then performed for a realistic BWR containment by modeling a sector of the containment and one blowdown pipe. For the BWR containment, one- and two-way coupled calculations as well as calculations with LPM are carried out.</p>
Key words	Large-break LOCA, Condensation pool, pressure suppression pool, BWR, CFD, fluid-structure interactions, FSI