



NURESA: Development and Validation of CFD Methods for Nuclear Reactor Safety Assessment

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NURESA: Development and Validation of CFD Methods for Nuclear Reactor Safety Assessment

WP 1: CFD benchmark on mixing and stratification

- OECD/NEA benchmark on erosion of stratified helium layer

WP 2: CFD modeling of stratification of pressure suppression pool

- Experiments performed at LUT with PPOOLEX and SEF-POOL facilities
- Co-operation of LUT, VTT and KTH

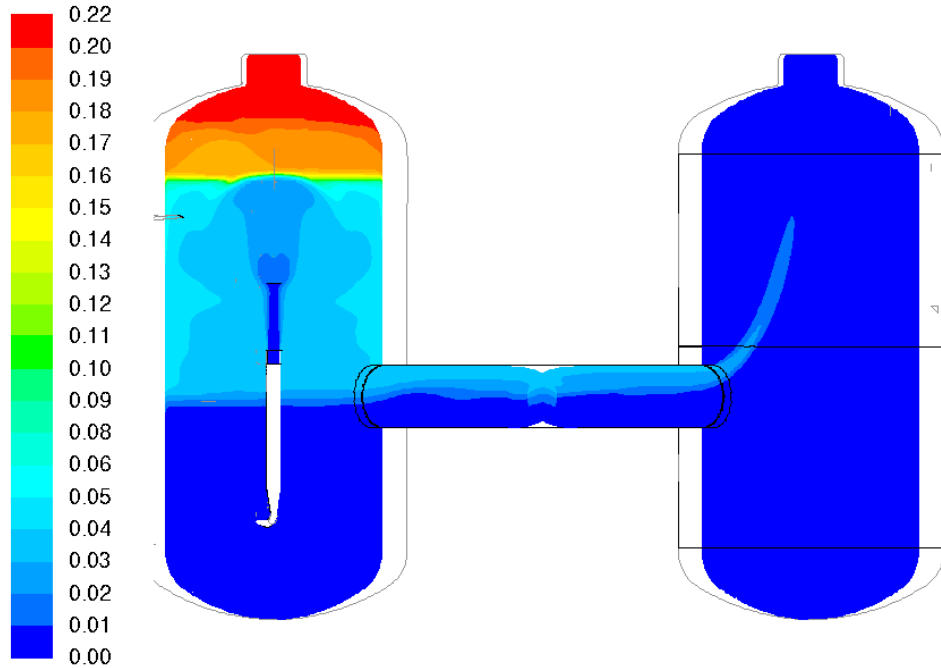
WP 3: OpenFOAM solver for nuclear reactor safety assessment

- Development and validation of boiling and condensation models
- Co-operation of VTT, LUT, Helmholtz-Zentrum Dresden-Rossendorf and CFD Direct

WP 4: Coupled CFD-Apros simulations of NPP components

- CFD model of steam generator or pressurizer coupled with generic VVER-440 plant model
- Co-operation of VTT and Fortum

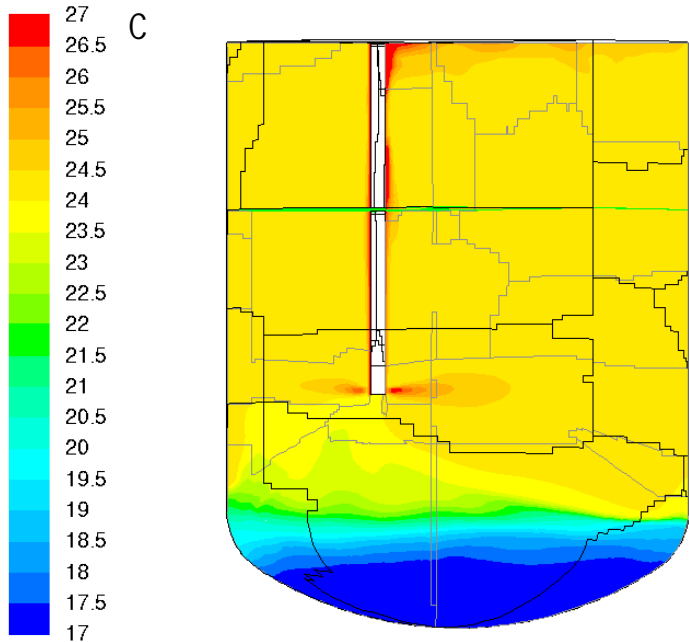
CFD benchmark on erosion of stratified layer of hydrogen



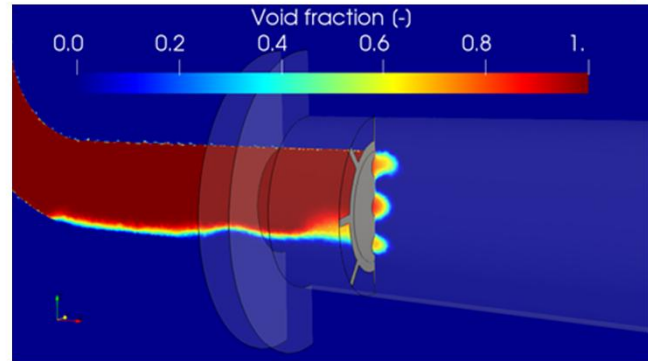
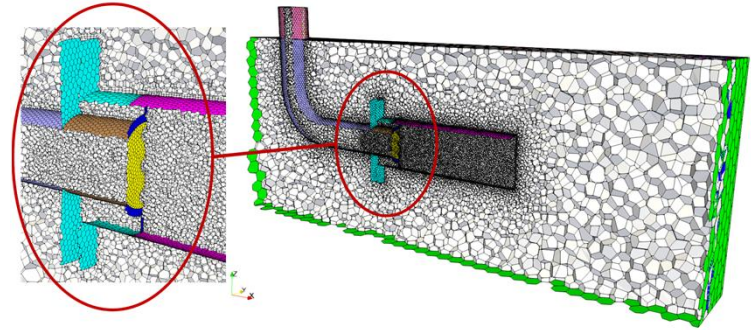
§ Erosion of stratified helium layer by vertical steam jet.

Volume fraction of helium in two vessels of the PANDA facility.
CFD calculation of the OECD/NEA HYMERES benchmark HP1_6_2.

Thermal stratification of pressure suppression pool



Thermal stratification of pressure suppression pool. (PPOOLEX test facility of LUT).

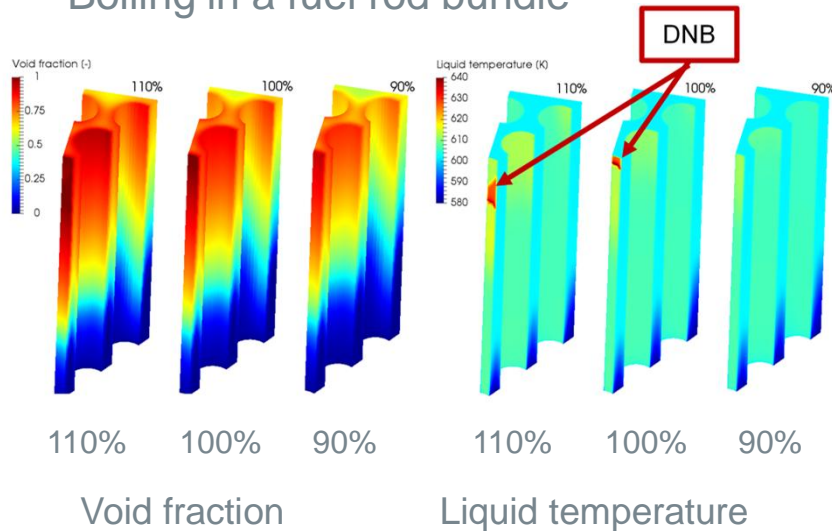


Blowdown of steam into pool through sparger (SEF-POOL separate effect facility of LUT).

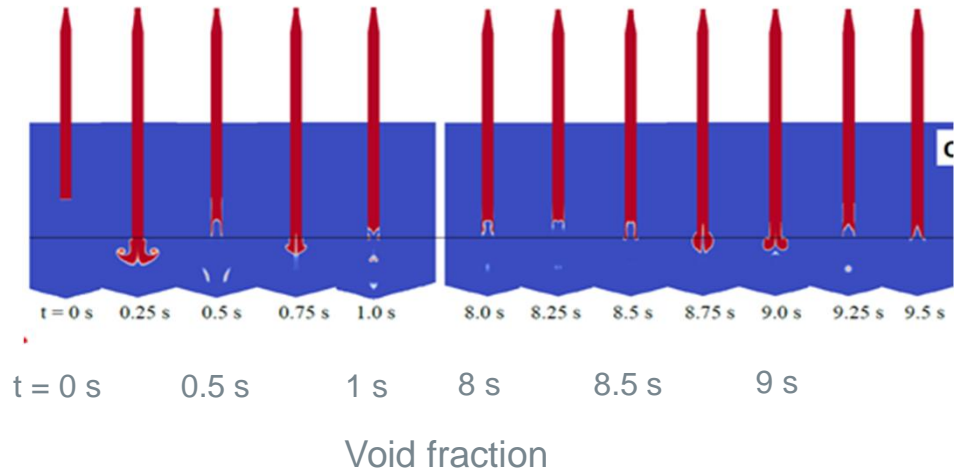
OpenFOAM solver for nuclear reactor safety assessment

§ Development and validation of boiling and condensation models in co-operation with international partners.

Boiling in a fuel rod bundle



Blowdown of steam into pressure suppression pool of BWR.



Coupled CFD-Apros simulations of NPP components

- § Generic VVER-440 power plant modeled with Apros.
- § Pressurizer or steam generator modeled with CFD.
- § Loss-of-feedwater transient and main steam line break were calculated.

