

International Conference on Fast Reactors and Related Fuel Cycles: Next Generation Nuclear Systems for Sustainable Development (FR17)



Contribution ID: 529

Type: POSTER

Advanced Coupling Methodology for Thermal-hydraulic calculations

Wednesday, June 28, 2017 5:50 PM (1h 10m)

The purpose of this paper is to describe in a first part a coupling methodology between two codes in order to describe global thermalhydraulic behavior inside a sodium-cooled fast reactor. A CFD code (STAR-CCM+) is used for the modelling of primary circuit, while a system code (CATHARE) is used for the modeling of specifics area in primary circuit (core structures and primary pumps) and the modeling of secondary circuits.

The main advantage of this method is the computation of the whole primary loop while representing accurately complex 3D phenomena like thermal stratification onset or unsymmetrical thermal mixture in plena.

The second part of the paper presents thermalhydraulics results obtained with this coupling tool in case of two reactor design sizing transients:

- a station blackout transient in which primary and secondary circuits are in natural circulation.
- a loss of one secondary loop in which there are thermal mixed phenomena in primary pools.

Country/Int. Organization

FRANCE - AREVA NP

Primary author: Mr SAGEAUX, Thomas (AREVA NP)

Co-author: Mr BERNARD, Olivier (AREVA NP)

Presenter: Mr HAMY, JEAN-MARIE (AREVA NP)

Session Classification: Poster Session 2

Track Classification: Track 6. Test Reactors, Experiments and Modeling and Simulations