

LSM-Webinar

Time: Oct. 08, 2020 02:00 PM Amsterdam, Berlin, Rome, Stockholm, Vienna
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Blind phase contribution to IAEA CRP “Benchmark Analysis of FFTF Loss of Flow without Scram Test” with TRACE code

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Paul Scherrer Institut participated in the coordinated research project of IAEA for FFTF LOFWOS ULOF Test #13. First phase of this benchmark has come to an end and primary analysis has been done based on test data fed back from Argonne National Laboratory. State-of-the-art thermal-hydraulics code TRACE which was treated with many modifications for application to SFRs by PSI was used. Power history was computed by point kinetics model with six types of reactivity feedback coefficients evaluated using the Monte Carlo code Serpent-2. Each assembly and each loop in primary circuit were built individually. Reactor vessel and inside plenum were simulated with characteristic 3-D module in TRACE to account for multi-dimensional effects. Flow distribution and pressure drop were successfully reproduced first in steady state to set a reasonable initial condition. The correlation between free level and introduced reactivity of Gas Expansion Module (GEM) was embedded to transient simulation directly. The trend of transient total reactivity was reproduced with largest discrepancy less than 0.2\$ which indicated applicability of the point kinetics model. Predictions of coolant flow rates and temperature in both primary and secondary loop were all in satisfactory agreement. Some directions were pointed out to improve TRACE model. This work supported future application of TRACE for safety analysis of SFRs.