RESULTS OF OECD PROGRAMME SERENA ON FUEL-COOLANT INTERACTION

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ABSTRACT

The overall objective of OECD programme SERENA (Steam Explosion Resolution for Nuclear Applications) is to consolidate understanding on FCI phenomenology and assess method(s) for reliable estimate of the magnitude of loadings for realistic reactor conditions, in order to bring understanding and predictability of FCI energetics to desirable levels for risk management. The programme is divided into two phases. Phase 1, purely analytical, has the scope of identifying those areas where large uncertainties/discrepancies still subsist and are important for predicting loads in reactors with a sufficient level of confidence. If required, a second phase may be undertaken, with the scope of carrying out the confirmatory analytical and experimental research possibly needed to reach the objective. Phase 1 consisted of comparative calculations by available tools of selected existing experiments and reactor cases. Calculations have been performed by using ESPROSE-m, IDEMO, IFCI, IKEMIX, JASMINE, MATTINA, MC3D, PM-ALPHA, TEXAS-V, TRACER and VESUVIUS codes. The paper presents and discusses the results of Phase 1.

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