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Thermal-hydraulic experiments supporting the MYRRHA fuel assembly

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The development of the LBE-cooled MYRRHA fuel assemblies is supported by an extensive thermal-hydraulic experimental program, as well as numerical studies. For the safety assessment of the reactor, several experimental campaigns considering fuel assembly mockups in representative operating conditions have been completed, and others are ongoing and planned at KIT (Germany) and SCK•CEN (Belgium). These are individually focused on specific issues, such as the heat transfer and pressure drop in nominal conditions, effects of local blockages and their formation, and influences of inter-wrapper flow between neighboring fuel assemblies. Heated tests using LBE, as well as isothermal studied with water as a model fluid, are considered. This article summarizes the main results of completed projects, highlighting the accuracy of existing correlations, and the relevance of hot spots based on local temperature distribution both at the wall and in the fluid. Moreover, the status of ongoing work is presented and the main open thermal-hydraulic issues for supporting the development of the MYRRHA fuel assembly are identified.

Country/Int. Organization

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