

Source term determination of containment by-pass accidents using results of thermal-hydraulic system codes

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Determination of a source term is an essential part in the chain of nuclear safety analyses and serves as a cornerstone to following analyses of radiological consequences. Aside the design basis accidents like large break LOCA, events where primary coolant bypasses the containment may be of high importance. Such accidents are steam generator tube ruptures, where a flow of activities from primary to the secondary circuit and consequently through SDA directly into the environment surrounding the power plant may cause non negligible radiological consequences. Within EU R2CA project, UJV developed a methodology and computational tool, which uses existing or new results of relevant transients from thermal hydraulic codes such as RELAP5 or ATHLET and with application of balance equations calculates the source term. The methodology incorporates several typical physical phenomena occurring during the transport of activities between the primary and secondary circuit such as partitioning and flashing. In this paper, basics of the methodology will be presented, including sample application on a steam generator tube rupture of a VVER-1000/V-320 unit calculated with RELAP5.

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