Preliminary Analysis of CABRI LTX Test using SAS4A Code

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Abstract

The LTX test was performed using a SCARABIX pin in March 2000 in the framework of the CABRI RAFT Program to investigate the pin failure mechanism, in-pin fuel motion and post-failure fuel relocation behavior under a simulated TUCOP accident in LMFR. The transient of the test was initiated by a coolant flow reduction and a structured TOP was triggered when coolant average temperature at TFC reached a predefined value to keep the channel in the subcooled condition. Pin failure occurred rather early, before the initiation of any significant fuel melting. Rapid gas release upon the cladding failure led to the voiding of coolant channel, followed by a molten fuel ejection and gradual axial relocation in the test channel.

An effort was made to interpret the experimental results of the LTX test using the SAS4A code. Although the original SAS4A model was not well fitted for this type of early pin failure, the global behavior after the pin failure was reasonably simulated with time and axial location of the pin failure specified as an input to the code and judicious choice of failure criteria