

## Cold Leg Large Break LOCA Analysis for KNGR using TRAC-M Code

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### Abstract

The KNGR is the evolutionary PWR which is enhanced the safety and economics drastically compared to existing PWRs. For this purpose, safety injection water is injected into the reactor vessel downcomer directly (Direct Vessel Injection, DVI). In cold leg LBLOCA, it is assumed that the water injected through broken cold leg is spilled out the break in current PWR, which the water is injected to the cold legs. By the adoption of DVI, it is not necessary to assume the spillage of the injection water. Due to this effectiveness, Low Pressure Safety Injection Pumps (LPSIPs) are removed in the KNGR.

According to the Phenomena Identification and Ranking Table (PIRT), ECC Bypass, Multi-dimensional flow, Steam jet impingement, and Condensation are important to LBLOCA. The general approach to verify the conservatism of the EM code is to use Best Estimate (BE) code, which simulates DVI related phenomena well. We can get the picture for the conservatism of EM code from the analysis results of a BE code. And we can understand the phenomenological behavior during LBLOCA in the KNGR. These are the main purpose of this paper.

In this analysis, TRAC-M code is used. The PCT is much lower than the acceptance criteria (=2,200°F). And cladding temperature behavior during late reflood phase is similar to those of the experimental results.