

**Insights from the Preliminary Uncertainty Analysis for ICARE2 Late Core
Degradation Models : TMI2 and FPT4S Cases**

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Abstract

Using a coupled system of the severe accident analysis code ICARE2 and the statistical uncertainty quantification code SUNSET, a preliminary uncertainty analysis has been performed (1) to verify an applicability of the most recent ICARE2 301 version to TMI2 late phase and PHEBUS experiment FPT4S and (2) to provide a framework for final uncertainty analysis. The results show that the ICARE2 301 version is well suited to the FPT4S case through the wide-ranges of uncertainty parameters while the code results in crashes of a few calculations for the TMI2 case. Based on this study, some additional tasks are recommended: (1) identify and resolve the crashes of calculations due to any combination of uncertainty parameters (TMI2 only), (2) increase the number of uncertainty samples (TMI2 and FPT4S) to get more reliable results for uncertainties, (3) consider a longer transient time to identify the impact of some uncertainty parameters on the final results (TMI2 only), and (4) utilize more refined uncertainty ranges and distribution types, in the final stage of the uncertainty analysis.