

# Severe Accident Codes Predictability: Current Status from a Historical Perspective

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The high complexity inherent to reactor severe accidents has highly conditioned the capability to reliably model these scenarios from the beginning of the nuclear age. Nonetheless, noticeable accomplishments have been made along decades: from the initial simple correlations developed for the nuclear plant siting to the current integrated engineering tools, which are capable of simulating challenging multiphysic scenarios for days. The last generation of these analytical tools is numerically robust, fairly extensive in the amount of phenomena presently considered and largely validated to the extent possible. This being said, there is still room for meaningful improvement and uncertainty and sensitivity analysis (UaSA) might play a role in it, if properly adapted to the severe accident domain. This paper briefly walks the reader along all these topics and discusses that time has come for BEPU (Best Estimate Plus Uncertainty) application into the severe accident domain, although some additional work still needs to be done to achieve a systematic methodology in which engineering judgement will be more necessary than ever.

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