# FDS Development and V&V

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## Abstract

Over the past decade, a robust process of verification and validation has been developed for FDS and CFAST. While similar in scope to that of other engineering software packages, the process has some unique features that have substantially improved the reliability of the models. These features include a simple method of quantifying model uncertainty, automated processing of the documentation to include the results of new versions, interesting examples for new users, and a compilation of some of the most useful full-scale fire experiments conducted over the past 30 years. The Verification Guides were developed mainly as a way to ensure that all the various components of the models work as new versions are released. The Validation Guides were developed in cooperation with the U.S. Nuclear Regulatory Commission as part of its transition to a performance-based, risk-informed regulatory framework. Two key features of the Validation Guides are model applicability and model uncertainty; the former clearly defining the range of parameters for which the models have been exercised, the latter quantifying the uncertainty for the various fire phenomena of interest.