

Topic of Discussion for Model-Assisted Probability of Detection

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Premise:

There is a need for an umbrella document that is generic with respect to the field of nondestructive evaluation, but is more comprehensive with respect to issues that need to be addressed in the development of model assisted probability of detection quantification.

A list of major issues that need to be considered in such a document follows. (This list is not necessarily complete.)

- The capability to assess and quantify the confidence in the use of models
 - Quantification of the margins and the uncertainties surrounding factors included in models
 - Identification of major factors not incorporated into the model
 - Characterization of all factors having potential to affect POD
 - Theoretical or science based
 - Implementation or process based (possibly including component age effects, human elements, etc.)
- The integration of simulation and experimental activities to increase predictive capabilities and to provide qualitative confidence in applications
 - Baseline simulation codes
 - Calibrating models
 - Integration of theory with archival data
 - Interpolation versus extrapolation with respect to experimental design
- A common glossary for discussing model quantification of POD and the assessment and reporting of uncertainties

The development of model assisted or model based quantification of probability of detection will likely include theories, experiments, and simulations (or other forms of computer modeling). These activities should be included in a framework that includes a detailed quantification of uncertainties and one in which meaningful confidence metrics have been developed and are routinely reported.