

Verification and Validation

In this video, I will answer the question, why is verification and validation important in fire safety engineering? The goal of Verification and Validation, or V&V, is to establish the predictive capability of calculation methods. V&V is needed for a range of fire scenarios encountered in practical applications. V&V is essential for quality assurance of a fire safety design. It is also important to establish the range of applicability of the specific calculation method. - Slide 2

So how is validation done? Tests are done to simulate fires that can occur in real life situations. Considerable care has to be given to the type of measurements to be made and the variable fire conditions. The properties of the compartment that will be simulated are also important. – Slide 3

Real fires are then simulated and measurements are made of important parameters that computer fire models predict, such as the hot gas layer development. - Slide 4

In some situations, the fire may become under-ventilated and behave in an erratic manner moving away from the source of the fire. – Slide 5

There are two methods by which validation exercises may be conducted. In blind validation exercises, the modeler has no access to measurements of the predicted parameters. In open exercises, the modeler has access to all the measurements of predicted parameters. Certain natural biases may exist in open predictions. – Slide 6

The ISO standard for fire model validation is ISO 16730-1. It was published in Aug. 2015. This revision includes the two options for validating models, open and blind. The blind option will provide a higher degree of quality assurance for the computer model being tested. ISO 16730-1 also specifies procedures for use in audits and subsequent certifications of the computer models – Slide 7

An important caution is included in the standard that “Significant errors in the fire protection measures implemented will result if the calculation method is used outside the range of its established capabilities.” This is important because the fire simulations are only valid if they have been tested for the conditions being simulated – Slide 8

For a preview of ISO 16730-1, please see the ISO website for the standard. For other reference materials on V&V, please visit the Reference Materials section at www.deytecinc.com – Slide 9

The founding principal, Monideep Dey, is the Chair (Convenor) of the working group in ISO that developed ISO 16730-1. Deytec, Inc. USA provides training on ISO 16730-1. It can also audit a validation exercise using the standard. This audit can eventually be used for certification. – Slide 10

Sign up for the informative newsletter on fire safety engineering at the website, and you will receive a free copy of the script and slides of this video. Also, there are two other videos I have prepared on related topics you may wish to view – Slide 11

Please contact us if you have any questions about the content of this video, or fire safety engineering in general. Thank you for listening. – Slide 12