V3 in Fire & Smoke Analysis

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As capabilities and features in STAR-CCM+ continuously become more numerous and sophisticated, there is an increasing demand in Verification, Validation and Visualisation. Especially in general engineering and building services, where customers do not have a distinct CFD background, the simulations have to bear more critical assessments because of targeting a more sceptical audience. Thus, it is extremely essential to validate simulation against experiment, empirical approach and literature most intelligible to a wide range of customers and show the results in a vivid and realistic way.

Still, verification of many emergency and evacuation plans, smoke discharge concepts and statutory requirements for individual safety and protection is based on warm or cold smoke tests, which are usually some kind of flow visualisation. Nevertheless, these tests provide a variety of data sets to verify and validate simulation results if they are carried out with this intention in mind. This literally leads to a DoE approach in design fires and smoke tests.

Finally, all presentations of simulation results should be prepared under consideration of the parties being involved with respect to their specific CFD knowledge and understanding. Using up-to-date presentation techniques like Virtual Reality, 3D-Visualisation and Augmented Reality is very helpful to ensure a vivid and realistic demonstration of today?s simulation capabilities.

This presentation gives an insight into the V3-Approach at Gruner by means of a project done recently on Fire & Smoke Simulation in a commuter train station with attached rail tunnels on both sides.

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