

Risk Analysis in Road Tunnels – Most Important Risk Indicators - DTU Orbit (09/11/2017)

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Methodologies on fire risk analysis in road tunnels consider numerous factors affecting risks (risk indicators) and express the results by risk measures. But only few comprehensive studies on effects of risk indicators on risk measures are available. For this reason, this study quantifies the effects and highlights the most important risk indicators with the aim to support further developments in risk analysis. Therefore, a system model of a road tunnel was developed to determine the risk measures. The system model can be divided into three parts: the fire part connected to the fire model Fire Dynamics Simulator (FDS); the evacuation part connected to the evacuation model FDS+Evac; and the frequency part connected to a model to calculate the frequency of fires. This study shows that the parts of the system model (and their most important risk indicators) affect the risk measures in the following order: first, fire part (maximum heat release rate); second, evacuation part (maximum pre-evacuation time); and, third, frequency part (specific frequency of fire). The plausibility of these results is discussed with view to experiences from experimental studies and past fire incidents. Conclusively, further research can focus on these most important risk indicators with the aim to optimise risk analysis.

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