

## Austrian Risk Analysis for Road Tunnels

### Development of a new Method for the Risk Assessment of Road Tunnels

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#### ABSTRACT

In Austria, in the past the assessment of road tunnel safety was based on experience and prescriptive guidelines. In the course of updating the Austrian design code for road tunnel ventilation (RVS 09.02.31 2006, in prep.), it was decided to develop a methodology for an integrated quantitative risk analysis which is in line with the requirements of the EC Directive on minimum safety requirements for road tunnels.

For the Austrian Risk Analysis for Road Tunnels (TuRisMo) a set of different methodical tools are used to analyse the whole system of safety relevant influencing factors; the method consists of two main elements:

- Quantitative frequency analysis: event tree approach for calculating the frequencies of defined accident scenarios
- Quantitative consequence analysis:
  - mechanical accidents: estimation of consequences based on tunnel accident data
  - fire accidents: modelling of consequences by combining a ventilation model with an evacuation simulation model

The risk model covers the personal risks of tunnel users. The result of the risk analysis is the expected value of the societal risk of the tunnel investigated. The respective shares of risk due to mechanical effects, fires and hazardous goods are shown.

Risk evaluation is done by relative comparison

- of risk reducing effects of different safety measures
- of the risk of the tunnel investigated to the risk of a reference tunnel

A tunnel of the same length, type and traffic characteristic, fully complying with the minimum safety requirements as per EC Directive is used as reference case.

*Key words: tunnel safety, quantitative risk analysis, risk reducing effects, safety measures*

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