

bayerl-consult

Your Partner for Tunnel Safety

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Tunnel Safety means Fire Prevention and Fire Protection

Risk Analysis for a Tunnel

With mathematical models and physical simulation based upon:

- Geometrical and geographical data of the tunnel
- Micrometeorological conditions in and about the tunnel
- Data of the traffic, of transport, of frequency
- Fire loads of the means of traffic
- Fire loads of the system itself

Risk Analysis for a Tunnel

Leads to

- Definition of scenarios and worst cases
- Definition of requirements for safety system

Risk Factors in a Tunnel

- Human error
- Conditions in the tunnel
- Conditions of the means of transport
- Conditions of the transported goods



Tunnel Safety as an Integrated System

Dr. Manfred Bayerl, bayerl-consult 2005



Integrated Fire Protection and Safety Systems have to cope with all sorts of risk factors and include

- Technical measures
- Organisational measures
- Efficient fire fighting
- Minimisation of external risk factors

Our Scope of Services for Tunnel Safety I

Pre-project analysis ==>

Necessities of the safety system according to

- Micrometeorological conditions and natural air flow
- Geographical situation of the tunnel
- Expected frequency of use
- Expected fire loads
- Risk analysis

Our Scope of Services for Tunnel Safety II

Definition of risks

Definition of necessary performance

Our Scope of Services for Tunnel Safety III

Conception of integrated
fire protection and prevention system

Physical design of emergency ventilation system

Our Scope of Services for Tunnel Safety IV

Recalculation and proof of already
designed systems
(Design and Build Projects)

Optimisation of Design according to
accompanying measurements and physical
simulation

Our Scope of Services for Tunnel Safety V

Final inspection of emergency ventilation system.

Final inspection of integrated fire prevention
system

Our Scope of Services for Tunnel Safety VI

Proof of efficiency and final report
based upon

- Measurements
and
- Physical Simulation

References

Ankara – Light Rail System Ankaray – Audit and Optimisation of Emergency Ventilation System

Bursa – Light Rail System Bursaray – Consultancy on Tunnel Safety

Vienna – Underground System – Tunnel Safety and Emergency Ventilation System – Design and Proof

References

Istanbul – Marmaray Crossing – Verification of Tunnel Ventilation and Emergency Ventilation Design

Greece – Egnatia Odos Highway-Tunnels – Consultancy on Elements of Tunnel Safety

Netherlands - Infrasppeed Highspeed System – Consultancy on Tunnel Safety

etc.