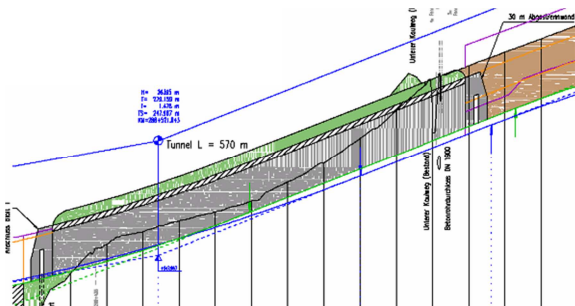
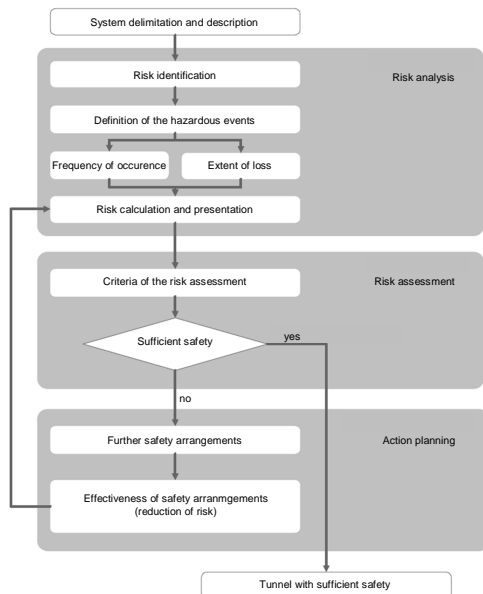




Project overview Katzenberg Tunnel near Würzburg



Longitudinal section of the Katzenberg Tunnel



Quantitative risk analysis (QRA) – methodology

Description

The Katzenberg tunnel at Würzburg will constitute part of the German autobahn A3, south of Würzburg. The two parallel tubes have a length of approximately 570 m and a gradient of 4 % from west to east. The tunnel will be used for uni-directional traffic.

According to the German guidelines for the equipment and operation of road tunnels (RABT-2006) a risk analysis is required for tunnels with length longer than 400 m and longitudinal gradient exceeding 3 %. The analysis is used to determine if additional measures and / or additional equipment is required in order to ensure the safety levels described in RABT.

Services

HBI was tasked with performing a quantitative risk analysis (QRA).

Here, the design case and a reference tunnel designed according to RABT-2006 were compared. For each case risks were evaluated taking into account the various safety factors, in particular, safety features as the traffic-related, the operational and the organizational boundary conditions.

The following services were provided:

- Detailed description of system and system boundaries to establish design case and reference case
- Definition of event scenarios and event trees for “collision” and “fire”
- Calculation of smoke propagation using the computer model SPRINT
- Setting of assumptions regarding the egress conditions, including the distance of emergency exits
- Calculation of consequences for the design case and the reference case, with variation of fire location, traffic condition, availability of ventilation or fire detection equipment and fire size
- Risk evaluation and recommendation
- Documentation