

Safety in the Lopper Road Tunnel



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The Lopper Road Tunnel is a section of the A8 Autobahn (Thun – Lucerne) between Alpnach and Hergiswil. It links to the A2 Autobahn, one of the main and most heavily used Autobahns in Switzerland, connecting Basel to Lugano.

The Lopper Road Tunnel cuts the journey time by four minutes as it crosses a peninsula which means that cars no longer have to drive around the coast.

Details of the Lopper Tunnel:

- Location: Canton of Obwalden, Switzerland
- Length: 1.56 km
- Design: 10.0 T (one main tube with two-way traffic, one lane in each direction)
- Opened: April 2006 (following modernization)
- Constructor: Civil Engineering Department of Obwalden, Switzerland
- Volume of traffic: approximately 25,000 vehicles/day



Lopper Tunnel in Switzerland

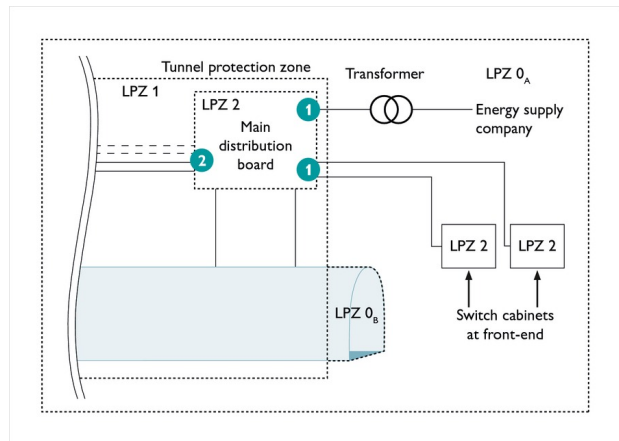
Application

All cables are combined together in the main distribution located in the protection zone of the tunnel. Cables that connect the main distribution to the access areas or the transformer pass the unprotected LPZ 0_A or 0_B zone (see figure).

Lightning current arresters from Phoenix Contact are used in the Lopper Road Tunnel to prevent lightning currents from damaging the distribution.

Technical equipment in the tunnel:

- Video cameras
- Radiating cable for radio and wireless
- Lighting, fire emergency lighting
- Fire alarm system
- Low visibility measuring equipment, wind measurement
- Light signals, fire doors



Schematic view of the main distribution in the Lopper Tunnel

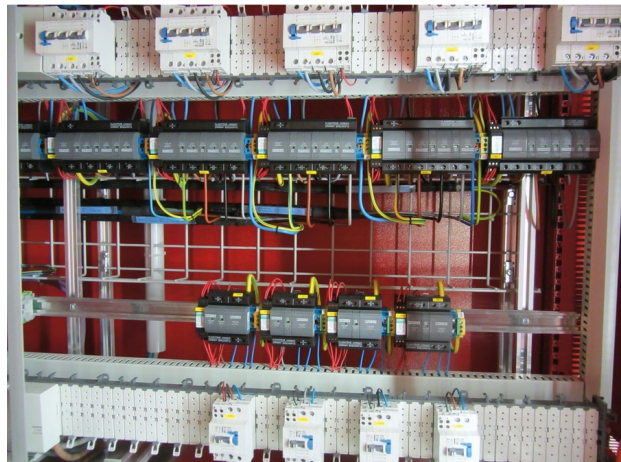
Solution

One FLASHTRAB compact arrester (FLT-CP) is used for each cable. As several cables for the power supply in the Lopper Road Tunnel are routed into the access areas, the equivalent number of arresters are installed in the control cabinet.

In the event of lightning discharge in or around the cable, the arresters generate a brief (< 1 ms) short circuit between all conductors. The lightning current is therefore discharged directly at the main distribution input and cannot harm the system.

Signal and energy supply lines in the tunnel are exposed to electromagnetic radiation which is strong enough to cause interference or damage to connected devices. Surge protective devices are therefore used in the distribution on both cable types in the Lopper Road Tunnel.

- The signal lines in the Lopper Road Tunnel are protected by surge protective devices from the PLUGTRAB PT series, combining lightning and surge protection in a single device.
- VALVETRAB compact surge protective devices protect the devices in the control cabinet that are connected to the supply lines of the tunnel tubes.



Protection of supply lines with FLASHTRAB compact

Summary

The availability of the tunnel is increased significantly through the use of surge protection. The traffic on the A2 Autobahn is therefore not disrupted, the tunnel infrastructure remains operational even in an emergency, and costs are reduced.