



DEHN protects.

Signalling systems for high-speed connections in Turkey

Customer



State railway company
Türkiye Cumhuriyeti
Devlet Demiryolları
(TCDD)

Project overview

Branch

Railway technology

Application

External lightning protection
for control system buildings

Coordinated lightning and surge
protection of the power supply
and control and safety systems

Hardware

HVI®Conductor

BLITZDUCTOR® XT (combined
lightning current and surge
arrester with integrated Life-
Check® monitoring)

DEHNvap

DEHNguard®

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High-speed line Ankara – Istanbul

Traffic between the Turkish metropolises Ankara (approx. 5.5 million inhabitants) and Istanbul (approx. 15 million inhabitants) is particularly heavy. Numerous other towns situated between these two hubs make this transport corridor the most heavily frequented in Turkey. In the middle of 2001, with this in mind, the Turkish government agreed to plans to build a new TCDD high-speed line between Istanbul and Ankara: providing the prerequisites for future-proof mobility with sustainable means of passenger transport.

Challenge

In a storm, the 533 km long new high-speed line is the perfect target for lightning. Damage is caused by direct strikes and the resulting electromagnetic sources of interference. Direct injections via the overhead line, the rails or masts are possible. Surges specific to railways, e.g. from switching operations or permanent interference voltage in neighbouring trackside cables, present a further threat. The highly sensitive electronics in modern control and safety systems are particularly susceptible to disturbances. If systems fail due to lightning or surges, trains are delayed and the resulting costs are often high. It is, however, possible to increase system availability even in storms by implementing a carefully planned lightning protection concept.

Solution

This concept was planned and implemented directly by our colleagues at the DEHN branch in Istanbul. It includes an isolated external lightning protection system with HVI® technology for control and safety system buildings as well as comprehensive surge protection for the power supply and control and safety systems. This guarantees the optimum protection of terminal devices whilst taking into account the actual conditions in the system.

In particular, the protection of remote-fed audio-frequency track circuits for the seamless clear and occupied indication of track sections was optimised. The high-performance surge arresters from the DEHNvap, DEHNguard® and BLITZDUCTOR® XT series make it possible to constantly monitor the condition of the arrester and to test the module quickly and easily without having to remove it first. These are the optimum requirements for predictive maintenance.



Internal Lightning Protection Solution for Audio Frequency Track Circuit inside the Technical Building



Indirect earthing of armouring and shields of cables to the technical building, to avoid disturbance by interfering voltage

Benefits of the DEHN solution

- ➔ Optimum protection in case of surges and direct lightning strikes: coordinated with the needs of the railway infrastructure
- ➔ Integrated protection concept: external lightning protection, earthing and surge protection all from one source
- ➔ Maximum system availability, low maintenance and repair time and costs: thanks to automated and permanent arrester monitoring via LifeCheck®
- ➔ Minimum wiring, simple exchange of protection module without interruption: no need to disconnect the wiring when changing the module.
- ➔ Effective, tried and tested and durable system
- ➔ Technical support and on-site training by employees at DEHN Turkey