SUESSCO SENSORS

Case Study - Tunnel Monitoring

Rastatt Tunnel

Deutsche Bahn

Germany

Background

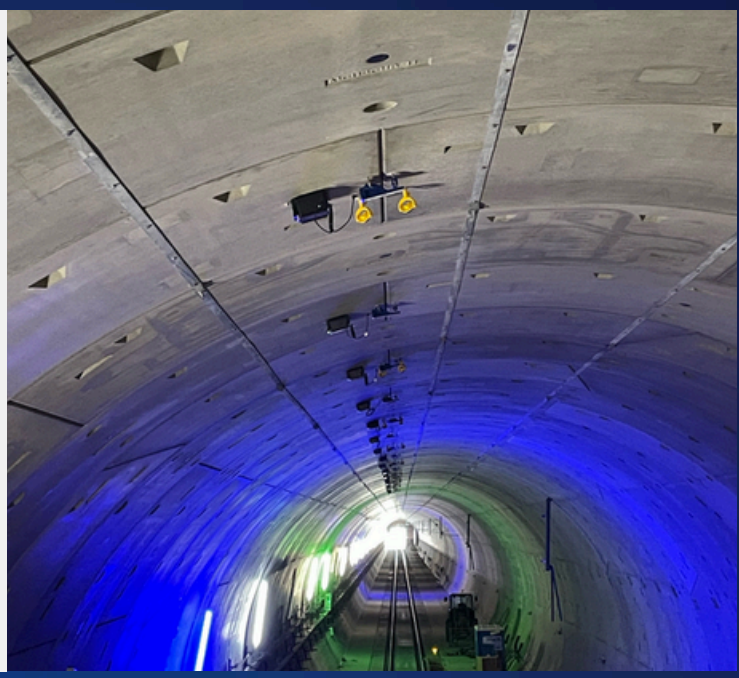
The Rastatt Railway Tunnel is a major infrastructure project for the expansion of the Karlsruhe–Basel high-speed line operated by Deutsche Bahn AG.
As the structure is located in the geologically active Upper Rhine Graben, the construction phase requires seamless monitoring. This protects the surrounding buildings and safeguards the structural integrity of the tunnel.

Requirements

This demanding project required an efficient monitoring system capable of measuring three-dimensional deformations and relative movements between the concrete tunnel segments at micrometre-level precision. The system had to ensure continuous, high-density real-time monitoring and provide immediate alerts, particularly during ground stabilisation works. Furthermore, the project managers required automated data transmission, minimal installation effort, and extended battery life for the deployed hardware.

Solution

To meet the specified requirements, the client deployed SuessCo 3D-Sensors XT units at the joints between the tunnel segments. Installed directly at these critical locations, the sensors continuously captured even the smallest relative movements with high precision. The recorded data were automatically transmitted via the mobile network to the digital SuessCo Datahub, where the three-dimensional deformation behaviour of the tunnel structure was visualised and analysed in real time.



Result

The deployment of SuessCo Sensors' technology ensured the long-term quality and integrity of the tunnel construction project while providing the interdisciplinary team of experts with deep insights into the structure's movement behavior in near real time. The automated monitoring system enabled immediate responses to construction activities, thereby guaranteeing safety throughout the entire infrastructure project. In addition, the innovative measurement concept proved to be highly cost-effective, as the rapid installation process and the durability of the sensors eliminated the need for extensive maintenance cycles within the tunnel.

"With the 3D-Sensors XT, we receive precise and stable measurement data wirelessly in three dimensions. This enables reliable remote monitoring of sensitive tunnel areas and significantly reduces our on-site effort."

Mohammed Ismail, Geomatik Ingenieur, TABERG ISB GmbH & Co. KG

Source: www.business-geomatics.com/tunnel-rastatt-unter-genauester-beobachtung/