

# Reference report Traffic & Transportation

Operational and traffic control station for the Espiye-Sarp tunnels

## Operational and traffic control station for the Espiye-Sarp tunnels

Siemens supplied an operations management and traffic control-system for one of the most progressive stretches of road in the world in terms of its traffic management and control equipment. The motorway from Espiye to Sarp, close to the border of Georgia is located along the 359 km long Black Sea coast in Turkey. There are 29 tunnels along a distance of altogether 33km.

### End user

Karayolları Genel Müdürlüğü is the general directorate of highways in Ankara, Turkey

### System integrator

Siemens

### Project details

The heart of the new traffic management and control system is the integrated SITRAFFIC® ITCC (International Tunnel Control Center) operations and traffic control center, based on SIMATIC WinCC Open Architecture (WinCC OA). Traffic specific software components are integrated via WinCC OA API (Application Program Interface). WinCC OA allows due to its open and object orientated standard to combine it with OEM specific developed configuration tools. That ensures high quality and consistent configuration.

The control center was built in Trabzon, the capitol of the region and one of the largest cities in this region. From there, all the control and monitoring processes of the 29 tunnels are coordinated. A central control station with seven control substations as well as the entire technical infrastructure with traffic control, fire protection, fire fighting, power supply, lighting, and ventilation systems are installed. Also communication and camera monitoring equipment with automatic event detection is included.

The center not only handle the traffic but look after the lighting, ventilation, power distribution and supply as well as the fire detection and fire fighting aspects. Emergency generators, pump stations and uninterruptible power supply equipment ensure permanent operation. Seven control substations, which can control their sections completely independently if necessary, are linked up to the control center.

In more than 20 tunnels, especially the longer ones, an automatic video detection system is installed. It is able to detect any possible obstacles and hindrances, vehicles that have stopped or are driving in the wrong direction as well as

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pedestrians, sudden vehicle speed changes and traffic jams. Foreign bodies on the road or smoke are also detected and alarm systems are activated.

Apart from all this, the system analyzes a wide variety of data such as the rise in the level of carbon monoxide, impairments to visibility or a change in the conditions outside the tunnels. It then automatically activates previously stored operating plans in order to respond appropriately to the given situation. The lighting in the tunnels can be adapted and the ventilation system can be controlled in order to ensure a safe and pleasant trip.

A communication system enables safety and warning information for car drivers to be displayed on variable traffic signs. General announcements are made over 825 loudspeakers. The automation system makes sure that the ventilation, lighting and traffic-control systems function quickly and reliably in the event of a fire. 140 turbine blowers alone are installed. A total of 353 fixed and 44 movable cameras monitor the tunnels. Fire protection rooms, including dry fire extinguishers, are also installed. Within the framework of the project, 275 kilometers of fiber-optic cable and more than 1500 kilometers of copper cable are laid.

WinCC OA Advanced Maintenance Suite (AMS) supports the customer in his daily operation and maintenance tasks. The software is used for maintaining the whole equipment within the system. The work of several technicians are planned and controlled via the AMS system.

WinCC OA in generally is used as middleware running the business rules like traffic management as well as basic SCADA system for data communication. Especially the distribution option of WinCC OA allows fulfilling the requirement of a SCADA system for the whole stretch of more than 300km of highway.

### Benefits

Finally the customer got a reliable and scalable Control and Monitoring system for the complete tunnel stretch.

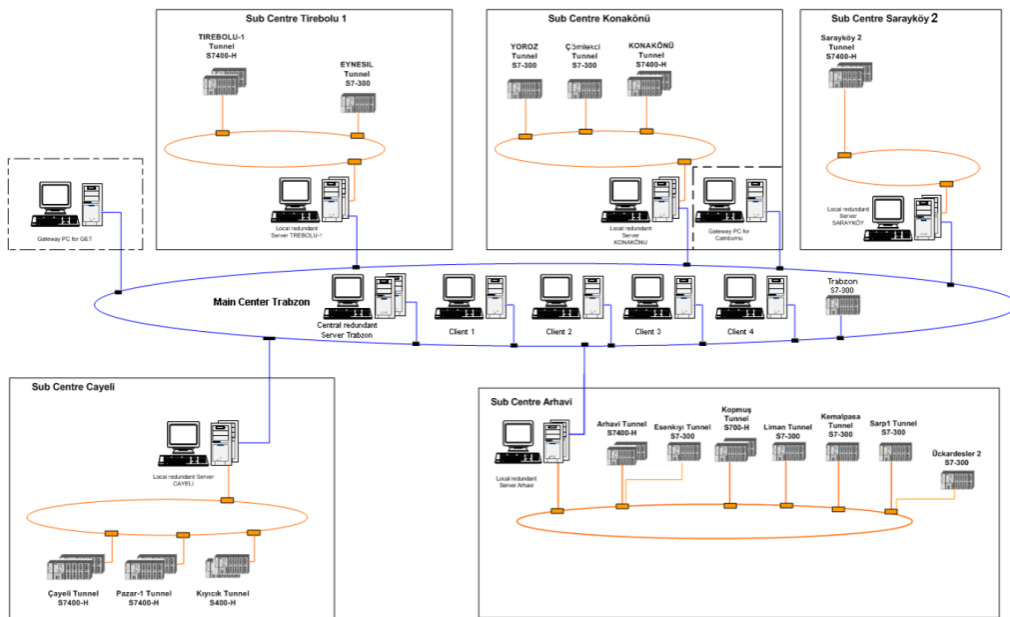
Additional the integrated maintenance tool (Advanced Maintenance Suite) is used for the planning, scheduling and coordinating of related maintenance works. Traffic specific software components are easily integrated via WinCC OA API (Application Program Interface). The fast engineering process should be mentioned, which was a major topic throughout the complete project.

The concept of a main traffic control center was chosen so that optimum use could be made of the available local specialists as they are rare in this thinly populated region.

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## Architecture



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## Pictures



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## Technical data

Central system:

- 1 pair of redundant servers in total with about 100,000 data points
- Distribution manager
- 10 Operating stations
- Excel reporting tool
- AMS (Advanced Maintenance Suite)

Local systems:

- 5 pairs of redundant servers
- 2 single servers
- Distribution manager
- S7 driver

SITRAFFIC® ITCC \*\*\*\* - An OEM product based on SIMATIC WinCC OA Open Architecture

SITRAFFIC ITCC comprises centrally developed and maintained software modules for the core functions of all connected tunnel systems, based on tried and trusted industrial software, which runs under Windows, Linux, or Solaris, irrespective of the hardware platform.

