*A Metro Train
Departing a Station*

Kazakhstan Railway
Astana City, Kazakhstan

ҚАЗАҚСТАН ТЕМІР ЖОЛЫ
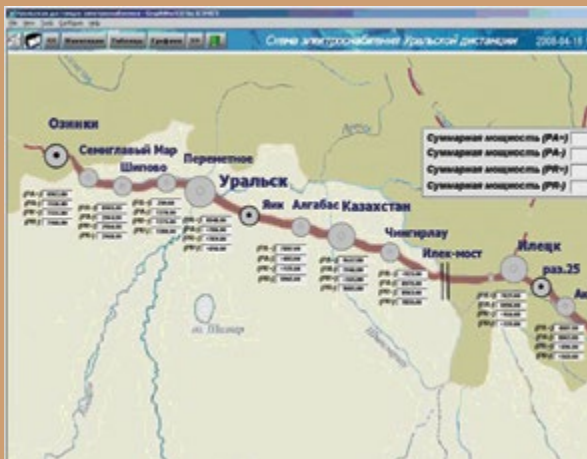
Kazakhstan Railway Network Monitoring Screen

> *"ICONICS' OPC technology has helped us to cut time for applications engineering."*
>
> **Boris Cherepanov**
> Chief Engineer
> Technik-Trade

Electricity usage reform and increasing prices for energy resource are common everywhere.

Therefore, implementation of an Automation System of Control and consumption for Energy (ASCUE) for the rail node was seen as a necessity. The railways need the system for real-time electricity monitoring to minimize energy use and ensure an optimum relationship between costs and the volume of work and services.

ICONICS Software Deployed

The system integrator Technik-Trade, a PROSOFT company dealer in Kazakhstan, offered ICONICS GENESIS32™ OPC-based HMI/SCADA suite for Kazakhstan's railway ASCUE. The solution was approved by KTZ's Energy Supply Department thanks to ICONICS ability to meet the specified project requirements. ICONICS' GENESIS32 software was selected to replace a competitor's legacy product.

Project Summary

The teamwork of Technik-Trade, KTZ's Energy Department engineers and managers, the railway division's ASCUE specialists, the metrological service direction of the Kazakhstan Electricity Grid Operating Company

About Kazakhstan Railway

Kazakhstan's railways celebrated their centennial in 2004. The state rail facilities have been incorporated into JSC National Company Kazakhstan Temir Zholy (KTZ) more than ten years ago. Kazakhstan's railroad combines about 14,000 kilometers of rails with 700 stations and KTZ is one of the railways reform leaders in the Commonwealth of Independent States (CIS).

According to KTZ's mission statement, the company works to ensure the "effective organization, coordination and maintenance of transportation processes with the purpose of the maximal satisfaction of needs of freight senders and the population at rational use of resources". The amount of cargo and passenger traffic grows every year, inevitably leading to higher electricity expenditures.

(KEGOC) and the contractors' staff (from organizations including Transtelecom, Astel, TEP, RECLE and KESH) helped ensure the success of the project.

KTZ's Uralskaya, Shalkarskaya, Kzylordinskaya, Mangyshlakskaya and Atyrauskaya electric power supply divisions were among 322 substations (including 58 energy nodes and 264 standard substations) that were automated in the project. They connect to the substations via RS-485 interface, radio modification VHF (150 MHz) connections, GSM (CSD/GPRS), DSL-lines, Ethernet-technologies and satellite communication (via SkyEdge Broadband Satellite Network). Three hundred data acquisition nodes and 9,100 parameters were configured as part of the project.

The integrators also needed to take into account the necessity of work on non-heated and maintenance-free stations (switch-yards) without any connection lines.

There are multiple (about 10 to 50) electric objects within the bounds of each railway node and every node can contain about 500 points for control. KTZ wanted to create a solution to generalize the energy control for thousands of switch-yards with similarly structured electric parameters. All involved with development of the ASCUE system sought a qualitative and inexpensive information delivery system that could provide data from multiple remote measuring points to a central control center in as safe and secure mode as possible.

A KTZ Railway Worker Signals from Aboard the "Astana"

KTZ's Remote Automated Power Supply Divisions Connect via Satellite Network

As part of the project, system integrator Technik-Trade ensured the control systems would work with KTZ's existing Microsoft software solutions, including Windows Server, Windows XP, Windows Small Business Server, Microsoft Office, Access and SQL Server.

The object nodes (railway distances) have specific demands for automation. One consideration was how the larger stations would require an equally large amount of limited electricity. Another factor in the project was the distance between where electricity was required within a node and the collecting information center (which could range from several hundred meters to over 50 kilometers).

Benefits of the System

The ASCUE system implemented with ICONICS GENESIS32 HMI/SCADA suite helps KTZ cut the cost of electric power purchasing, as well as control all levels of energy consumption. The project also supports the data exchange between analogous energy accounting control systems.

KTZ and Technik-Trade are working on expanding the system to other KTZ locations and developing a new ASCUE system for South Kazakhstan.