TETRA Mobile Radio System ACCESSNET®-T

Russian railway – on the right track with TETRA

A success story …

In the third quarter of 2002, R&S BICK Mobilfunk GmbH furnished the Russian railway management with an ACCESSNET®-T TETRA radio system to provide radio coverage for the railway lines around Yekaterinburg (formerly Sverdlovsk). A local company installed the system between late 2002 and early 2003. Once the installation was completed, R&S BICK Mobilfunk configured and tested the system, which started its trial operation in the spring of 2003. Already in the summer of the same year, the system was handed over to the Yekaterinburg railway management and started actual operation.

At that time, the ACCESSNET®-T radio system covered roughly 180 km (112 miles) of railway lines plus the entire railway works of the Yekaterinburg railway management. The system provided radiotelephony for the railway, service and maintenance staff and controlled railway traffic.

During its initial stage, the radio system consisted of two R&S®DMX-521 exchanges and sixteen R&S®DTX-500 base stations (FIG). Sixteen R&S®REM-500 dispatcher consoles (not shown in FIG) served as cost-efficient dispatcher stations. The R&S®NMS-500 network management system, including the clients for subscriber management and network configuration, monitored network operation. TETRA radios from different manufacturers were deployed in the network, proving that ACCESSNET®-T supports diverse terminals.

Four base stations were all connected in series, with the first and the last station connected with one of the two exchanges, forming four circle structures. These were additionally complemented by a direct line between the exchanges. Even if a communications line failed, the functionality of the entire system remained unaffected. The individual network elements were connected with each other via an optical network.

… to be continued

In November 2004, after the TETRA radio system had been successfully operating for about one and a half years, the Russian railway management decided to cover yet another railway line of the Yekaterinburg railway management with the TETRA radio system. One R&S®DMX-582 TETRA exchange and ten R&S®DIB-540 TETRA digital indoor base stations are part of the delivery package. The exchange comes configured in such a way as to provide capacity for up to 80 base stations. A multiposition R&S®TRD-500 control center will also be supplied as part of the new contract; the R&S®TRD-500 consists of one server and two clients and is connected to the ACAPI application interface of ACCESSNET®-T. The control center is connected to the exchange via a LAN. Voice communications are handled via a voice-over-IP connection.

The equipment supplied also includes the R&S®APS-500 train application server; for communication purposes, it now allows the staff to use train numbers as addresses instead of individual dialing numbers, as is usual. To place a
call, the staff uses the respective train number as the call address, which is then displayed in the radios and the control center. The advantage of this procedure is obvious: The operating staff no longer needs to know the dialing numbers of the TETRA terminals because these numbers are assigned dynamically. This feature helps avoid misunderstandings or errors.

Using an ACAPI interface is highly beneficial because, in addition to the control center, customized applications can also be connected to the ACCESSNET*-T radio system.

The system was supplied in December 2004 and is currently being installed. The handover and start of actual operation are scheduled for the second quarter of 2005. As a result of this expansion, well over 400 km (249 miles) of railway lines, plus the railway territory and the railway works of the Yekaterinburg railway management, will be covered by TETRA radio.

And there’s more to come

The radio system operators deliberately designed the second stage in such a way that further expansion would pose no problems: Just recently, R&S BICK Mobilfunk GmbH was commissioned by the Yekaterinburg railway management to supply ten additional base stations to provide radio coverage for yet another railway line.

Harald Haage