BELORUSNEFT MIGRATES TO MOTOTRBO™ & ACE3600

NETWORKS ENABLE BETTER VOICE AND TELEMETRY INTEGRATION FOR OIL & GAS COMPANY

To improve communications among personnel, obtain critical data and manage equipment remotely across its oil fields in south-east Belarus, oil and gas production organisation Belorusneft is migrating its Motorola SmartNet system to a MOTOTRBO™ network using new ACE3600 remote terminal units (RTUs) to provide direct and seamless connectivity. In addition, Motorola Application Partner, Friendly LLC has developed an option board solution that allows older type RTUs to connect to the MOTOTRBO system.

Formed in the mid-1960s to develop Belarus' oil and natural gas deposits, Belorusneft's operations today include gas processing plants, storage facilities and the wholesale distribution of oil, liquefied gas and mixed biofuel products.

The company's analogue systems – used at three sites - were unable to handle future communication needs, so MOTOTRBO was chosen for its ability to provide increased network capacity, better output and allow existing analogue devices to be retained in the interim.

CUSTOMER PROFILE

Company
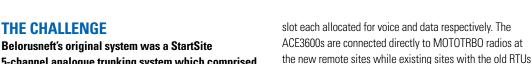Belorusneft

Partner Name:
Friendly LLC

Industry Name:
Oil & Gas

Product Name:
- RTU ACE3600
- MOTOTRBO DM 3400 & DP 3400 Radios
- MOTOTRBO DR 3000 Repeaters
- Motorola PMP 100 and PMP 430 Series with Access Points & Subscriber Modules
- FS-3000 RS-232 Option Board

> **"The move to MOTOTRBO and the option board solution has proven to be highly successful and we have plans to replace all the legacy SmartNet equipment across the three sites with MOTOTRBO technology in the near future. In addition, by introducing a 7-channel Capacity Plus system at each site, we'll have a fail-safe solution in the event of a repeater failure."**
>
> Victor V. Litvinenko, Director of "SvyazInformService" Department at Belarusneft

THE CHALLENGE

Belorusneft's original system was a StartSite 5-channel analogue trunking system which comprised a Central Controller with five Quantar base stations installed at each site.

A mix of MTS2000 and MCS2000 radios were used for voice communications and to connect with Motorola MOSCAD-L and Delta-X RTUs SCADA systems that allow for real-time remote monitoring and control of equipment. This was upgraded to an 8-channel SmartNet system in 2004 and the central controller replaced with a MTC3600 model and three additional Quantar base stations.

While the system filled the immediate communication needs at the time, in early 2010, Belorusneft looked for a solution that would provide more reliable, higher speed data output and improved voice communications.

Andrei Schakatsikhin, chief engineer at Friendly LLC, explained: "We proposed the cost-effective MOTOTRBO solution as it would allow the seamless migration to digital two-way radio networking technology while preserving existing equipment investment. For example, there were hundreds of portable and mobile analogue radios in use with 24 Quantar base stations and numerous RTUs at each site.

"However, while we were able to use ACE3600 RTUs with MOTOTRBO, the challenge was how to connect the old RTUs (with RS-232 serial ports) to the MOTOTRBO radios which have a USB port," he said.

THE SOLUTION

Friendly LLC decided to develop its own option board (FS-3000) to solve the problem of interfacing the older RTUs to the MOTOTRBO radios. The integrated option board allows data rates of up to 2.4 Kbps, has its own data buffering and error correction and can be easily programmed locally or remotely 'over-the-air'. It can also be used with many other controllers that have an RS-232 interface.

Each site has a network comprising seven Quantar base stations and a MOTOTRBO DR 3000 repeater with one

slot each allocated for voice and data respectively. The ACE3600s are connected directly to MOTOTRBO radios at the new remote sites while existing sites with the old RTUs are connected to MOTOTRBO radios using the option board solution.

The individual networks also have their own control centre where a LAN-attached remote dispatcher controls and monitors workgroups and SCADA applications link to remote devices through an IP Gateway. Connections are set up through:

- a MOTOTRBO DM 3400 base station (with FS-3000 option board) to communicate with new radio groups of between 10 and 12 users and to control and monitor RTUs.
- a MCS2000 analogue base station (with radio interface) to communicate with existing radio groups
- a LAN-connected fixed wireless access point to provide broadband speed connectivity for monitoring and managing equipment with extensive data output.

THE BENEFIT

By adopting a phased approach towards a full digital network, Belorusneft can now replace network devices as and when it becomes necessary. This has resulted in negligible downtime and realised significant cost savings.

Retaining the existing RTUs and using the FS-3000 option board solution has been beneficial for the company. While the new ACE3600s support direct connectivity to MOTOTRBO, the older RTUs – which still provide the required functionality - now have the advantage of being connected to a more powerful and stable network. This helps with the monitoring and management process across all the sites and has enhanced efficiency throughout the organisation.

Also, as there are still many older radios in use, MOTOTRBO's ability to accommodate both analogue and digital on the same network ensures equipment investment protection. The company, however, intends to replace them (and the Quantar repeaters) gradually as many are over ten years old. This will provide improved voice communications and increase network capacity.

ACE3600 Solution Features:
- Allows easy migration from Moscad-L with improved capabilities
- Monitors and controls transportation of oil and gas through pipelines
- Provides remote online information about oil and gas flow
- Remote maintenance via PC at control centre, remote site or radio – a feature unique to Motorola ACE3600

Solution Benefits:
- Low migration cost, investment protection
- Supports multiple communication technologies
- Remotely monitors radios
- Remote programming of RTUs
- Automatic data rerouting

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