Lithuania Leads with Baltic’s first
GSM-R Compliant Railway

Lithuanian Railways (LitRail) achieved an important step towards the clear vision of seamless movement of trains across the European rail network. In a historic event, Lithuanian Railways made the first GSM-R call in the Baltic countries using GSM-R technology from Nortel. The call was completed on the Vilnius - Kaunas route which is one of Lithuania’s busiest rail lines. The event took place on June 11, 2006, and marked the official start of the first pilot phase of the LitRail GSM-R project that is scheduled to be completed by the end of 2010, when the country-wide network of 1,563 km has to be in commercial operation.

The EUR 50.5 million country-wide GSM-R contract was signed in December 2007 between LitRail and the Nortel/Bel Amor Consortium. The deployment includes the implementation of a GSM-R radio communication system along 1,360 km (approximately 88% of the country’s rail network) of Lithuania’s rail routes. The remainder of the railway network will be covered via an ongoing agreement with one of the local public mobile operators in Lithuania. This is the first GSM-R project in the Baltic region and it will enable LitRail to comply with European Commission (EC) railway standards and provide high-speed, dependable communications to help make the railways in Lithuania faster and safer. The June GSM-R call marked the conclusion of the first successful phase of the multi-year project. Now almost the entire fleet of electric trains is equipped with cab radios. The remaining diesel locomotives and road machines will be ready by November 2010. The pilot line sites were all built by July 2009. Fifteen dispatchers (of the 190 dispatchers to work with this equipment) were equipped with new terminals. Stage 1 sites will be completed by the end of this year. Altogether 935 km of tracks will be covered by GSM-R. Local subcontractors are used for fiber optic cable laying; also towers and containers are manufactured by domestic manufacturers. Civil engineering work (building foundations, erecting towers) are also being performed by local subcontractors.

The June GSM-R call signified the first major milestone on the way to Lithuanian Railways’ integration into the European Railway “ecosystem”. The Baltic countries (Estonia, Latvia and Lithuania) are all members of the European Union. Since joining the EU, these countries have made a significant contribution to becoming “full-format” members of the community with the attendant commitment to implement all EU-required standards, processes and procedures. This list includes the implementation of the ERTMS (European Rail Traffic Management System) control and signaling system utilizing an interoperable GSM-R communication system. GSM-R, the international wireless communications standard for railway communications helps to increase the efficiency and safety of the railway by supporting reliable and secure voice and data communication among railway operational staff, including drivers, dispatchers, train engineers and station controllers. GSM-R is part of the new European Rail Traffic Management System (ERTMS) standard and carries signalling information directly to the train driver, enables faster train speeds and increases traffic density while maintaining a high level of safety. GSM-R is specified for train speeds up to 500 km/h, so it is ideally suited for the planned speed increases in conventional rail networks as well as for new high-speed routes. Most significantly GSM-R provides operational and commercial advantage to railways and makes them more competitive modes of transport in a changing environment. It helps to reduce operational costs through ease-of-maintenance, improved network management features and the ability to operate efficiently using less power. For the Baltic Countries, the opportunity to improve transportation links with their fellow EU members was a major imperative for joining the EU. The EU similarly recognizes the importance of safe and efficient transportation links which is one of the reasons why it set up a special financing program to accelerate the modernization of the Baltic Railways. Lithuania was the first of the Baltic States to seize the opportunity, announcing its tender for GSM-R infrastructure in 2005. The Lithuanian government supported this tender and put forward local co-financing in addition to European Union financing according to the original EU requirements.

The Lithuanian Railways Project

With the Lithuanian government providing the necessary political and financial support to make this large-scale railway modernization process real, Lithuanian Railways turned its attention to finding a vendor that could meet their requirements. Lithuanian Railway worked out and presented a very detailed tender proposal with requirements for a turn-key solution - the wireless communication infrastructure with ac-

Delivering the ultimate safety level of rail traffic is our major goal in implementing this project. Lithuanian Railways continuously improves passenger and cargo transportation by railway services. This work covers many areas such as rails, rolling-stock, automation, information, and undoubtedly communication systems. Many technological processes in railway services increasingly depend on the development level of information and communication systems. Being aware of this, Lithuanian Railways gives special attention to modernization and development of their communications network. Installing the GSM-R wireless communication system would not only improve safety of rail traffic, but would also help to reduce operational costs and increase service quality. Also, it is important that the implementation of the GSM-R system which complies with the EU interoperability requirements clearly signals Lithuania’s aim to get integrated into the European Community not only at a political but technical level too.

Today the radio communication equipment used by Lithuanian Railways is not certified according to the requirements of the Technical Regulation for Radio Equipment and Telecommunications Terminal Equipment approved by order No. 138 of the Director of the Communications Regulatory Authority under the Government of the Republic of Lithuania of 14 October 2002, and their further usage is in contradiction with the implementation of directive 93/68/EC of the European Parliament and of the Council of 3 March 1999 on radio equipment and telecommunications terminal and equipment and the mutual recognition of their conformity. The radio equipment is old physically, often causes problems, can hardly be used together with the new rolling-stock, and does not comply with the requirements for high-speed (160 km/h) rails. The implementation of wireless communication system GSM-R will help to meet the requirements of EU legislation related to the use of wireless communication systems in the railway industry. The new system will help to increase the rail traffic safety and reduce the risk of accidents that may cause injuries to people, damages to property, and may be hazardous to the environment. Also, plans are to expand the volume of radio communication services provided to passengers and cargo carriers, as well as other enterprises related to railway operations, and to use functions and new opportunities offered by GSM-R to ensure better functionality of communication services.
cess and core network, network management, locomotive cab radios and handsets, dispatching system and a full cycle of necessary services – RF engineering, radio-towers construction, equipment installation, and end-to-end integration of all systems and network optimization services based on the EIRENEI/ERTMS standards.

To date a completely new central switching site has been built close to the main railway station in Lithuania’s capital Vilnius, hosting all core network elements as well as the network monitoring and operating center. After the completion of the pilot line including the transmission network, base station installation and dispatcher rollout on the pilot line track between Vilnius and Kaunas, the current focus is to provide GSM-R coverage along the other railway tracks in Lithuania in accordance with the initial mid-2010 project date. The installation of GSM-R cab radios in the rolling stock is being managed in parallel as part of the migration plan. In the same time-frame, Lithuanian Railways staff will be trained through regular classroom training as well as through comprehensive on the job training to make the future transfer of the network as smooth as possible.

About NT experience in GSM-R

- As stated in the tender references a vendor and partner for this end-to-end turnkey project was requested by Lithuanian railways that has a long term experience in deploying and operating such a system. As a result of the tender process, Nortel, supported by Nortel Germany with their entire experience from the German railway GSM-R project, together with their local partner, Belam, was selected by Lithuanian railways. Several long term OEM partners of Nortel, like Sagem, Hörmann Funkwerk Köln, or Frequentis are involved as well.

- Nortel has more than 15 years of experience with the GSM-R mobile communications technology and is currently providing GSM-R on three continents. With a market share close to 60 percent of the 117,500 km of rail tracks installed using the GSM-R system, Nortel is the number one GSM-R provider globally. Nortel has been awarded national GSM-R contracts in Austria, France, Germany, Lithuania, and the UK as well as large GSM-R deployments in Algeria, China, Italy, India, Slovakia, Spain, and Turkey.

- Belam has worked with Nortel for more than 15 years, and I’m confident that together we will bring the project to a successful and timely implementation, acting in strict compliance with the project timeline and original tender requirements. We are combining the technology, global experience and commitment to innovation and continuous R&D to produce the very best solution for LitRail,” said Dmitry Krupnikov, Director for Business Development, Belam. “The LitRail GSM-R project is a good example of how telecom technologies can help a region’s economy, as an effective transportation system for the busiest geographic trade crossroads in the Baltic can bring untold benefits to the region.

- Nortel has over 15 years’ experience with GSM-R mobile communications technology and is currently providing GSM-R on three continents. With close to 60 percent of more than 117,500 km of tracks using the GSM-R system, Nortel is the number one GSM-R provider globally. Nortel has been awarded national GSM-R contracts in Austria, France, Germany, Lithuania, and the UK as well as large GSM-R deployments in Algeria, China, Italy, India, Slovakia, Spain, and Turkey.

- Nortel’s GSM-R technology will help to increase railway efficiency and safety by providing reliable and secure communications among railway operational staff, including conductors, dispatchers, train engineers and station controllers. GSM-R is also part of the European Rail Traffic Management System (ERTMS) standard that combines GSM-R for voice communication and European Train Control System (ETCS) for signaling systems. ERTMS carries the signaling information directly to the train conductor and operates traffic crossroad signals, enabling faster train speeds and higher traffic density while maintaining a high level of safety.

- The new network includes the Nortel All-IP Voice Core solution for rail operators based on the Advanced Telecommunications Computing Architecture (ATCA) platform. It provides a robust carrier-grade voice network using GSM-R infrastructure to deliver instant mobile communications benefits even at high-speeds. The system also provides the switching, mobility and subscriber management functions needed to achieve a seamless and secure operation of wireless voice service for railway operations. And it helps reduce operational costs through ease-of-maintenance, improved network management features and the ability to operate efficiently using less power.

- The Lithuanian railways GSM-R system is based on the state-of-the-art GSM/GSM-R technology - an all-IP Voice Core solution for rail operators, using the Advanced Telecommunications Computing Architecture (ATCA) platform. The open ATCA standards are emerging as preferred foundations for advanced high performance telecommunications applications. The new solution includes the switching, mobility and subscriber management functions needed to achieve the seamless and secure operation of wireless voice service for railway operations. And it helps to reduce operational costs through ease-of-maintenance, improved network management features and the ability to operate efficiently using less power.

- The new solution provides a robust carrier-grade voice core for GSM-R infrastructure delivering instant mobile communications benefits even at high-speeds and it reduces drastically the power consumption of the system.

- New generation Base Transceiver Stations (BTS) designed specifically for rail operators is also included in the solutions. The new generation BTS has a dual TDMA feature which increases radio coverage and enables a reduction in the number of base stations needed, or the height of the radio masts needed.
Stadler Rail Expands in Hungary

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