Permanent Representation of the Republic of Latvia to the European Union

39-41, rue d'Arlon, 1000 Brussels tel. (32 2) 282 03 60 fax (32 2) 282 03 69

Matthias Ruete
Director-General
Directorate-General Energy and Transport
European Commission

Brussels, 20 December
2007
No. 2.3.10 – 3594

Regarding: **The European Rail Traffic Management System (ERTMS) Latvian National Implementation Plan in compliance with** the requirements of Decision 2006/679/EC of the European Commission of 28 March 2006

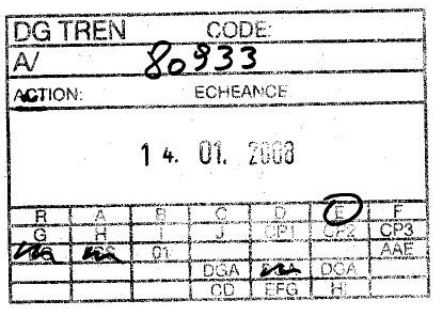
Dear Dr Ruete,

On the basis of Article 3 of Commission Decision 2006/679/EC of 28 March 2006 concerning the technical specification for interoperability relating to the control-command and signalling subsystem of the trans-European conventional rail system and in reply to your letter TREN E2 NB/aca D(2007) 326700 03.13.02.04.08.F002 of 07.11.2007, Latvia hereby notifies the Commission of the European Rail Traffic Management System (ERTMS) Latvian National Implementation Plan.

Enclosed: European Rail Traffic Management System (ERTMS) National Implementation Plan.

Respectfully,

Janis Silis
Counsellor,
Deputy Permanent Representative



European Rail Traffic Management System (ERTMS) National Implementation Plan

Latvia

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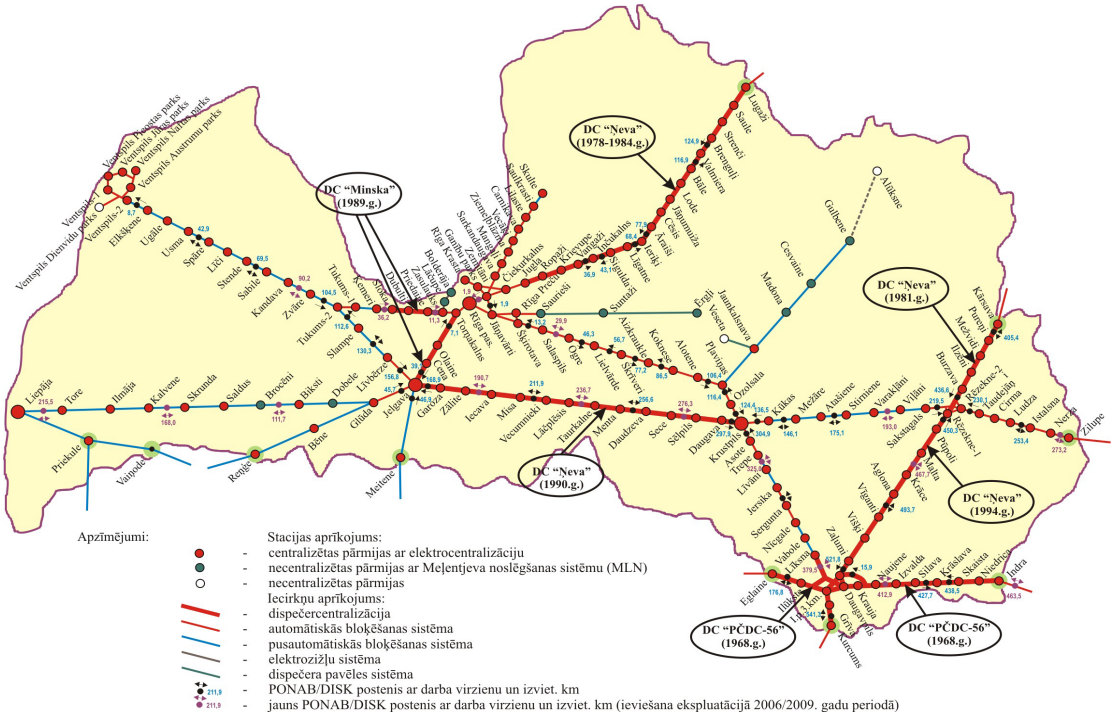
Introduction

The Plan has been drafted in compliance with the requirement to develop a TSI implementation plan laid down in Commission Decision 2006/679/EC concerning the technical specification for interoperability relating to the control-command and signalling subsystem of the trans-European conventional rail system (hereinafter referred to in the text as TSI).

1. Description of the current situation

The infrastructure of the public railway in Latvia is equipped with the rail traffic control-command and signalling systems specified in Figure 1.1.

Latvijas dzelzceļa iecirkņu tekošais aprīkojums



Apzīmējumi	Designations
Stacijas aprīkojums	Station equipment
centralizētas pārmijas ar elektrocentralizāciju	centralised turnouts with electrical centralization
necentralizētas pārmijas ar Meļentjeva noslēgšanas sistēmu (MLN)	no centralised turnouts with Melentjev interlocking system (MLN)
necentralizētas pārmijas	no centralised turnouts
Iecirkņu aprīkojums	Section equipment
dispečercentralizācija	controller centralization
automātiskās bloķēšanas sistēma	automatic blockage system
pusautomātiskās bloķēšanas sistēma	semiautomatic blockage system
elektrizīļu sistēma	electrical stick system
dispečera pavēles sistēma	controller command system
PONAB/DISK postenis ar darba virzienu un izviet. km	Hot box detect system with working direction and site km
jauns PONAB/DISK postenis ar darba	Hot box detect system with working

virzienu un izviet. km (ieviešana ekspluatācijā 2006/2009.gadu periodā)	direction and site km (putting into operation in 2006 – 2009)

Figure 1.1. Equipment of the Latvian railway sections

Automatic and semi-automatic blocking systems ensure the transmission of information to rolling stock by means of the automatic locomotive signalisation system ALSN (continuously in sections equipped with the automatic blocking system and before certain wayside signals when the semiautomatic blocking system is used). This system also ensures periodical checks on the alertness of locomotive drivers and speed monitoring. The Annex to the technical specification for interoperability relating to the control-command and signalling subsystem of the trans-European conventional rail system describes this system under Class B.

The train radio communication system is an analogue simplex voice communication system, operating in the frequency of 2130 kHz. All railway sections are equipped with this system.

Besides the aforementioned system, an intra-station radio communication system is also used, which comprises shunting, maintenance-technological and special communication for emergency conditions. This system is based on the zonal principle and operates in the frequencies of 150 and 450 MHz.

Historically the 1520 mm track gauge railway system in Latvia has full interoperability with the railway systems of the neighbouring Member States of the European Union (EU) Lithuania and Estonia as well as such non-EU countries as Russia and Belarus. The same interoperability also applies to the Class B system ALSN specified in the Annex to the TSI. The new systems in these countries (for instance, KLUB system in Russia and VEPS system in Estonia) are based on the ALSN standard and basically are its latest modifications with individual additional functions.

The sections of strategic significance in the Latvian public railway infrastructure shape the East-West and South-North corridors (Rail Baltica).

The main function of the Latvian East-West railway corridor is to ensure freight transport from the Russian Federation and Belarus to the Latvian ports. The TSI also takes this factor into account, as Article 7.4.2.3 provides that the functional and technical upgrading of the control-command and signalling subsystem equipment of the Latvian railway infrastructure is allowed according to the current functionality of such equipment deployed on the 1520 mm track gauge lines if it is deemed necessary to enable the operation of the locomotives of the railway undertakings of both the Russian Federation and Belarus. The said locomotives are presently operated on these railway lines from the state borders to the stations of Rezekne and Daugavpils.

With regard to the Rail Baltica corridor, within the framework of an individual EU priority project, there are plans to renovate the existing railway line and to carry out technical, engineering and economic research towards the development of a new railway line that would comply with European Union standards. Annex H to the TSI indicates the Rail Baltica axis as a part of the ETCS-Net corridor.

2. ERTMS implementation steps

The European Rail Traffic Management System (ERTMS) has two elements:

- GSM-R – basically built on the basis of the GSM standard, while operating in other frequencies created for trains only, as well as having some progressive functions. It is a radio system used for information (voice and data) exchange with trains;
- ETCS – the European Train Control System, foreseen not only for transmission of information on the permitted speed to traction unit drivers, , at the same time constantly checking whether these instructions are observed.

2.1. GSM-R implementation

The Latvian Railway radio system modernisation projects have the following objectives:

- to replace the existing radio communication system by installing a uniform GSM-R voice radio communication system for trains and stations complying with EU requirements;
- to ensure communication among all rail traffic personnel at different priority levels, for different users groups, local and functional addressing and emergency calls, thus guaranteeing safety and the prevention of accidents;
- to increase rail traffic safety;
- to reduce the risk of traffic accidents that can injure people, damage property or cause the escape of hazardous substances into the environment;
- to set up conditions for providing new communications services to passengers, hauliers and other railway-related companies;
- to work out basic regulations to facilitate the fitting of the ETCS traffic control system at Level 2 and Level 3;
- to reduce the radio communications system operating costs;
- to comply with the requirements of Council Directive 96/48/EC on the interoperability of the trans-European high-speed rail system and Directive 2001/16/EC of the European Parliament and of the Council On the interoperability of the trans-European conventional rail system.

The current radio systems are used mostly for communication with train dispatchers and drivers as well as for shunting. GSM-R will enable railway personnel to communicate via a single shared radio communication system, which will provide a new basis for the operation and maintenance of trains, thus meeting the needs of railway subscribers and clients.

The total length of the railway infrastructure lines is 1947 km; GSM-R will cover 1625 km.

Line type	km	Coverage
Line category 1	983	GSM-R
Line category 2	642	GSM-R
Local lines with low traffic density	322	Roaming service
Total railway network	1.947	

Table 2.1: Lines covered by GSM-R and State roaming services

The local railway lines are described as having very low traffic density and they are mostly used for freight transportation. Voice communications for these lines will be provided via roaming services. The GSM-R infrastructure will be implemented in three packages, as shown in Figure 2.1. The first package will include the most important section of the East-West corridor, i.e., from the Russian border (Zilupe) to Ventspils; the second package will encompass another section of the East-West corridor from Indra to Liepaja; the third package concerns corridor I and other major railway lines.

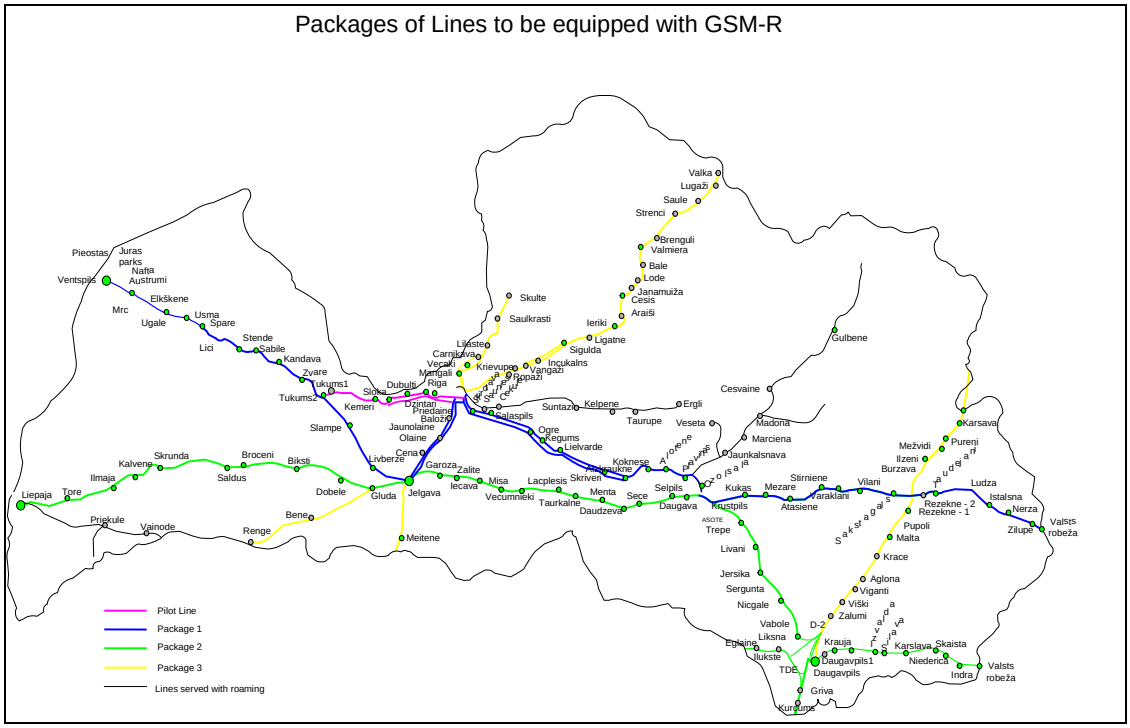


Figure 2.1: GSM-R coverage in the Latvian Railway network

The mobile communications network will be implemented in four stages, which will have an effect on the allocation of investments and operating costs:

- The first line trial fitting is scheduled for the railway sections Tornakalns–Tukums II (65 km) and Daugavpils–Indra–(Bigosovo, Belarus) (80 km) (agreement with the Belarus Railway) in 2014
- Package 1: the main railway sections in the East-West corridor (529 km) will be equipped in 2014 and 2015
- Package 2: all the state railway sections in the East-West corridor (587 km) will be equipped in 2015 and 2016
- Package 3: the remaining railway sections (444 km) will be equipped in 2017

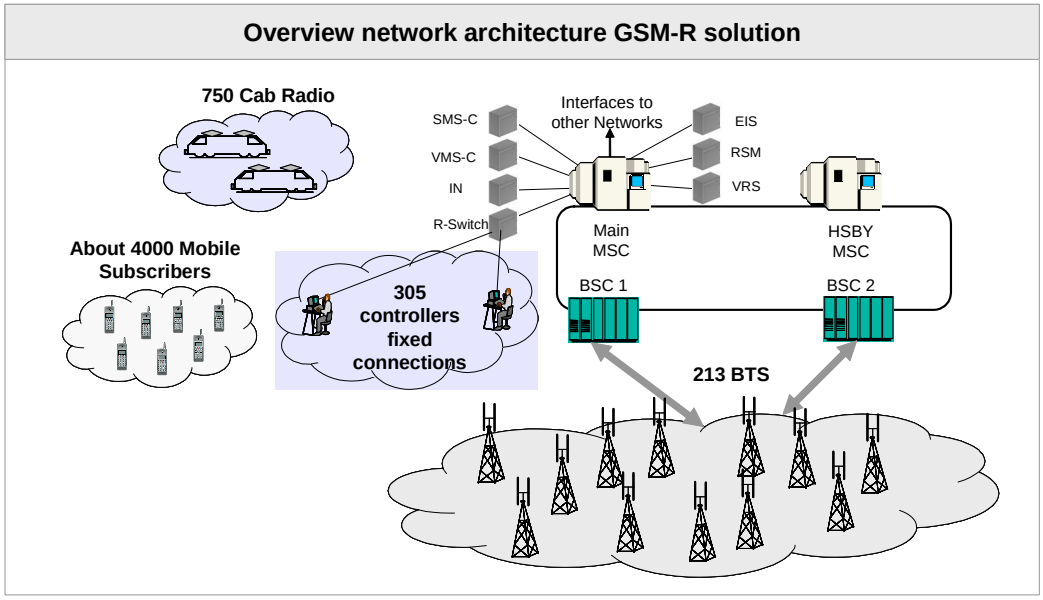
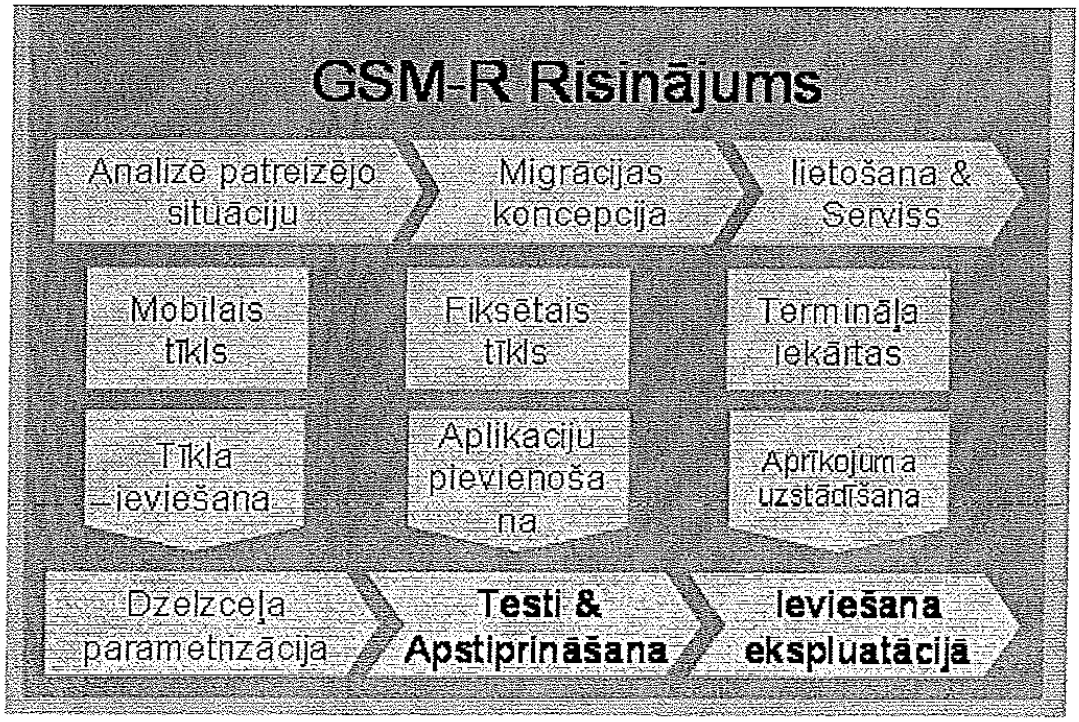


Figure 2.2: GSM-R solution network architecture overview

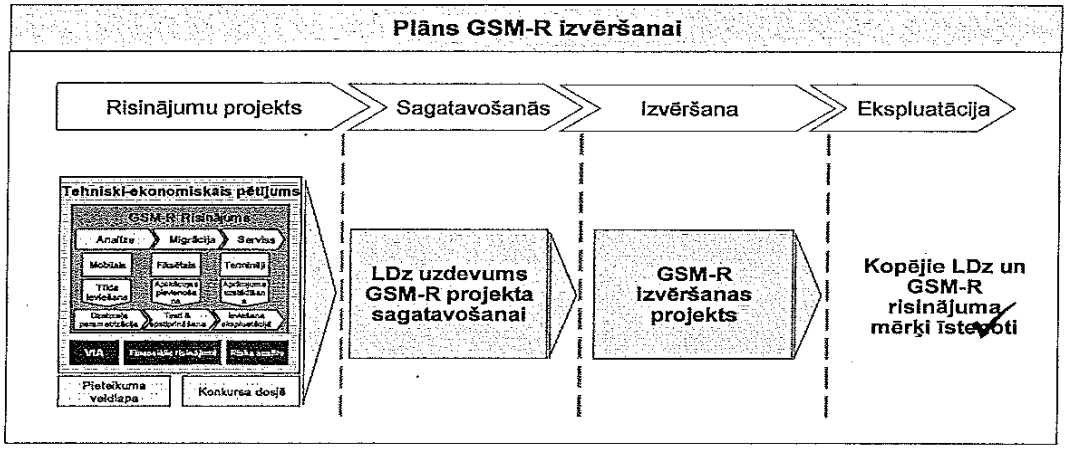
The public railway infrastructure provider, that is to say the state joint-stock company Latvian Railway (hereinafter LDZ), has realised that it needs an effective operating model to guarantee the successful preparation and implementation of GSM-R (Figure 2.3):



GSM-R Solution		
Analysis of the current situation	Migration conception	Use & Service
Mobile network	Fixed network	Terminal equipment
Network implementation	Connection of applications	Installation of equipment
Setting the railway parameters	**Tests & Approval**	**Putting into operation**

Figure 2.3: A model for GSM-R solution development

See the general plan for GSM-R deployment in **Figure 2.4** below



GSM-R deployment plan					
Solution project			Preparation	Deployment	Operation
Engineering-economical research			LDz commission for the GSM-R project preparation	GSM-R deployment project	The joint LDz and GSM-R solution objectives completed
GSM-R Solution					
Analysis	Migration	Service			
Mobile	Fixed	Terminals			
Network implementation	Connection of applications	Equipment installation			
Setting the railway parameters	Tests & validation	Putting into operation			
VIA	Financial solutions	Risk assesment			
Application form	Tender dossier				

The following strategy has been established to make the transition from the existing radio communications system to GSM-R radio communications:

- to develop the radio and fixed network, starting with the main corridors;
- to deploy the transitional solutions in international traffic;
- to begin the equipping of traction units. By the deadline set, every traction unit must be equipped with a GSM-R locomotive transmitting station. The old radio communications equipment will still be used until the transition to GSM-R radio communications has been completed in full;
- negotiations with all national public GSM operators concerning national

GSM-R roaming;

- after all the preparatory measures (such as setting up the mobile and fixed networks and train dispatcher terminals, equipping the traction units, registration of subscribers, training of personnel), the transition to GSM-R radio communications will first be implemented within the corridors;
- after the transition is complete, to terminate the use of the old radio communications system and find a temporary solution for international traffic.

The implementation of the first experimental line equipped with GSM-R is intended to obtaining practical transitional experience and will take place in the Tornakalns–Tukums and Daugavpils–Indra–(Bigosovo, Belarus) sections.

After the transition to GSM-R in Latvia, the implementation of a dual traffic control procedure is also planned for the cross border areas – in coordination with the competent institutions of the respective countries.

The railways of neighbouring countries (for example, in Russia and Belarus) will continue operating their current radio communications systems. Hence, in Latvia, the dual mode will be adapted on the basis of the existing radio communications. The neighbouring EU states Lithuania and Estonia also will implement GSM-R. The GSM-R solution will therefore also function as a transitional solution with these states. Taking the GSM-R implementation plans of Lithuania and Estonia into account, the implementation schedule for the border sections can be adjusted with the aim of synchronising implementation within these trans-border sections.

The implementation plan is given in Figure 2.5.

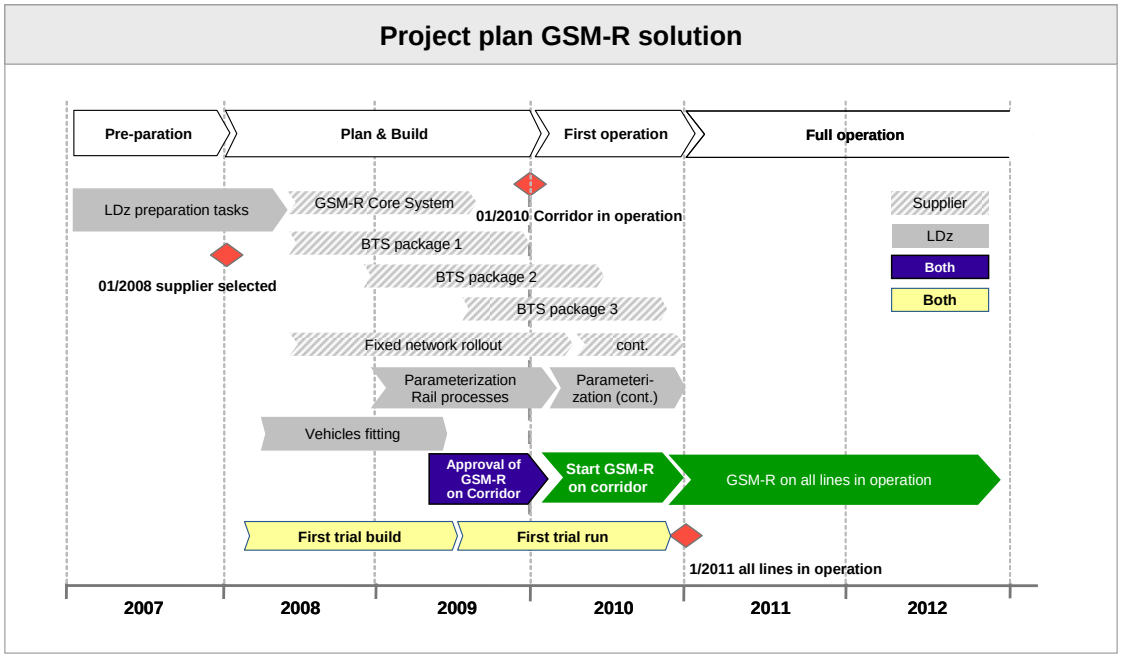


Figure 2.5: Schedule of the project terms

2.2. STM module development

Article 7.2.3 of the TSI provides that where the railway tracks covered by the TSI are not equipped with Class A systems, the Member State should make every effort to ensure that a relevant external specific transmission module (STM) for its existing Class B system or systems is available. In this context, due attention should be paid to ensure fair commercial conditions in the open market for the acquisition of the STM.

Since the Class B system used in Latvia is the same as in Lithuania and Estonia, all three states need the same STM module; it follows that the relevant specification should be drawn up jointly. Since the different track gauge prevents the traffic of new locomotives equipped with Class A systems to any of the Baltic States, the practical need for the aforementioned module is not vital at present. Nevertheless, Latvia envisages that this work – coordinated with Lithuania and Estonia by a joint taskforce – could be accomplished within three years, beginning in 2008.

Considering that the European Railway Agency, in compliance with the relevant European Commission mandate, carries out the interoperability analysis of 1520/1524 mm and 1435 mm railway systems, the results of this analysis should provide a foundation for the basic parameters of the STM module. The actual development deadline for the STM module could therefore be the end of 2011.

2.3. ETCS implementation

Taking into account the constant development of the ETCS and uncertain implementation plans for Latvia as a result of objective circumstances, it is impossible to specify the use of one or another ETCS version at the moment. The Latvian approach with regard to the implementation of ETCS is differentiated depending on the connection of one or another line with the neighbouring countries and future development opportunities. Consequently, the plans may differ for different lines.

2.3.1. ETCS implementation in the main network

As explained above, historically the 1520 mm track gauge railway network in Latvia has full interoperability with the railway systems of the neighbouring Member States of the European Union (EU) Lithuania and Estonia as well as such non-EU countries as Russia and Belarus. The same interoperability also applies to the Class B rail traffic control system ALSN specified in the Annex to the TSI. The new rail traffic control systems in these countries (for instance, KLUB system in Russia and VEPS system in Estonia) are based on the ALSN standard and basically are its latest modifications with individual additional functions.

The main function of the Latvian East-West railway corridor [(Karsava/Zilupe-Rezekne)/(Indra-Daugavpils)-Krustpils-Jelgava/Riga-Ventspils/Liepaja], which makes up the bulk of the Latvian railway network, is to ensure freight transport from the Russian Federation and Belarus to the Latvian ports. The TSI also takes this factor into account, as Article 7.4.2.3 provides that the functional and technical upgrading of the control-command and signalling subsystem equipment of the Latvian railway infrastructure is allowed according to the current functionality of such equipment deployed on the 1520 mm track gauge lines if it is deemed necessary to enable the

operation of the locomotives of the railway undertakings of both the Russian Federation and Belarus. The said locomotives are presently operated on these railway lines from the state borders to the stations of Rezekne and Daugavpils.

At present, there is no justification for implementing the ETCS system on the current 1520 mm track gauge network if full interoperability has already been functioning in the region, whereas when it come to traffic with the 1435 mm gauge railway network, locomotives cannot physically overcome the track gauge difference. Thus, the implementation of this system itself would not increase the overall interoperability level as the existing Class B system already fully ensures the interoperability for the 1520 mm gauge railway network. Furthermore, no other railway system improvements (for example, the maximum traffic speed increase) – that would require updating of the existing rail traffic control-command system – are planned in the foreseeable future. If the ETCS were implemented the existing Class B system would also have to be retained in order to ensure the operation of locomotives from the neighbouring countries. In effect, the potential investments required for the ETCS system implementation would be disproportionately high in terms of the possible gains from such implementation.

The rail traffic control-command and signalling systems of the East-West corridor are being updated using state-of-the-art microprocessor systems and it is planned to continue this work. Preparatory work on the updating process is already being carried out (for example, laying-in of additional cables) with the aim of simplifying the installation of ETCS modules in case such a need arises. These systems ensure performance of the ETCS Level 2 functions via GSM-R, while simultaneously maintaining the ALSN system Class B functions.

There is also no need for ETCS implementation on other lines (except the Rail Baltica axis) with lower traffic intensity. The current equipment is appropriate for the traffic density there and ensures interoperability with the railways of neighbouring countries as well.

2.3.2. ETCS implementation in the Rail Baltica corridor

As stated above with regard to the Rail Baltica corridor in the territory of Latvia (Sarkiai, Lithuania)-Meitene-Jelgava-Riga-Lugazi-(Valga, Estonia), there are plans within the framework of an individual EU priority project to renovate the existing railway line and to carry out technical, engineering and economic research towards the development of a new railway line that would comply with the European Union standards.

Annex H to the TSI specifically indicates the Rail Baltica axis as a part of the ETCS-Net corridor.

The said corridor is also listed in the UNO Agreement on main international railway lines (AGC) No E75: *Warszawa-Bialystok-Sokolka-Suwalki-Trakiszki-Mockava-Sestokai-Kaunas-Siauliai-Sarkiai-Meitene-Jelgava-Riga-Lugazi-(Valga).*

2.3.2.1. Stage I – until 2013

The measures planned for this period include the improvement of the technical condition of the line, including the increase of the rail traffic speed, though not to more than 120 km/h. Thus, the parameters of this line will not differ from those of the remaining railway network. In the same way as the remaining network, the implementation of the ETCS system will not increase the overall interoperability level already fully provided by the existing Class B system per se. In this case too, the potential investments required for

the ETCS system implementation would be disproportionately high in terms of the possible gains from such implementation.

2.3.2.2. Stage II – after 2013

A new EU financing period begins in 2014 and, on the basis of research into the system development of Rail Baltica carried out in the preceding period, several subsequent development scenarios are possible.

2.3.2.2.1. Scenario I –maximum speed of up to 120 km/h is preserved

In this case, no preconditions arise due to which the existing Class B system could not fulfil its functions or fail to ensure interoperability. Hence, there is no need for further implementation of ETCS.

2.3.2.2.2. Scenario II –speed is increased up to 160 km/h (or more)

In the case of the traffic maximum speed being increased while retaining the existing 1520 mm track gauge, the existing Class B system – which is designed and whose signals work for speeds of up to 120 km/h – is incapable of ensuring train traffic control at higher speeds and would need updating. Latvia is planning:

- to set up ETCS devices for the line (Sarkiai, Lithuania)-Meitene-Jelgava-Riga-Lugazi-(Valga, Estonia);
- since the line remains a part of the common 1520 mm track gauge railway network and the existing rolling stock will need to use it, the ALSN system would be simultaneously maintained, though subject to appropriate updating. The line ensures the movement of the said rolling stock with speeds of up to 120 km/h;
- the new rolling stock, designed for speeds above 120 km/h, will be equipped with ETCS on-board devices, whereas the STM module will provide its interoperability with Class B system on other lines.

An option of ETCS as the only system on the line also was considered. However, in this case, in order to permit the use of this line for existing rolling stock, practically all the traction units (owned by different carriers, including private ones) would have to be equipped with ETCS on-board devices and STM modules, making the total costs even higher.

The implementation terms and costs depend on the type of line update plan approved and should be established simultaneously with the line update. The fulfilment of the said tasks also depends on the plans of Lithuania and Estonia with regard to the equipping of the Rail Baltica line.

2.3.2.2.3. Scenario III – construction of a new 1435 mm railway line

If a decision is adopted regarding the construction of a new 1435 mm track gauge line, it will be fully equipped with the latest available version of the ERTMS system.