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National plan of implementation of technical specification for interoperability of the “energy“ subsystem

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Introduction

Interoperability within the meaning of Directive No 2008/57/EC of the European Parliament and of the Council of 17 June 2008 on the interoperability of the rail system within the Community means the ability of a rail system to allow the safe and uninterrupted movement of trains which accomplish the required levels of performance for these lines.

The pursuit of its objectives in the rail system within the Union must lead to the definition of an optimal level of technical harmonisation and make it possible to facilitate, improve and develop international rail transport services. The technical specifications for interoperability, which serve for fulfilment of the essential requirements for ensuring the operation of the rail system, refer to the obligation of development of national plans for their implementation. In order to achieve the defined objective of interoperability the Slovak Republic has drawn up the national plan for the implementation of technical specification for interoperability of the "energy" subsystem.

1. Approval part

Pursuant to point 9 (1) of the Commission Regulation (EU) No 1301/2014 of 18 November 2014 on the technical specifications for interoperability (TSI) relating to the 'energy' subsystem of the rail system in the European Union each member state shall develop a national plan for the implementation, describing measures concerning this technical specification for interoperability (hereinafter "TSI").

In accordance with this provision the Ministry of Transport, Construction and Regional Development of the Slovak Republic (hereinafter "MTCRD SR") has drawn up the national plan for the implementation of the TSI energy (hereinafter "TSI ENE") , which will be made available to the Commission and other Member States.

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2. Characteristics of network operated by ŽSR

The Railways of the Slovak Republic (hereinafter "ŽSR") were created on 1 January 1993 by division of the Czechoslovak State Railways into two independent entities. The first transformation of the railways was implemented on 1 January 2002, giving rise to the company Železničná spoločnosť, a. s. engaged in the passenger and freight transport, and ŽSR as infrastructure manager. The second step was the division of Železničná spoločnosť, a. s. as of 1 January 2005 into the companies Železničná spoločnosť Slovensko, a. s. as operator of passenger railway transport and Železničná spoločnosť Cargo Slovakia, a. s. as operator of freight railway transport. Both companies are successors of Železničná spoločnosť, a. s. established during the first transformation phase. ŽSR remained the infrastructure manager.

As of 31 December 2014 ŽSR managed and operated lines with total length of 3627.102 km. Table No 1 shows the lengths of individual lines in km.

Table 1 Administered lines

Lines	**km**
Single-track	2610.379
Double-track	1016.723
Track gauge	
Lines with gauge 1435 mm	3482.183
Lines with gauge 1520 mm	98.718

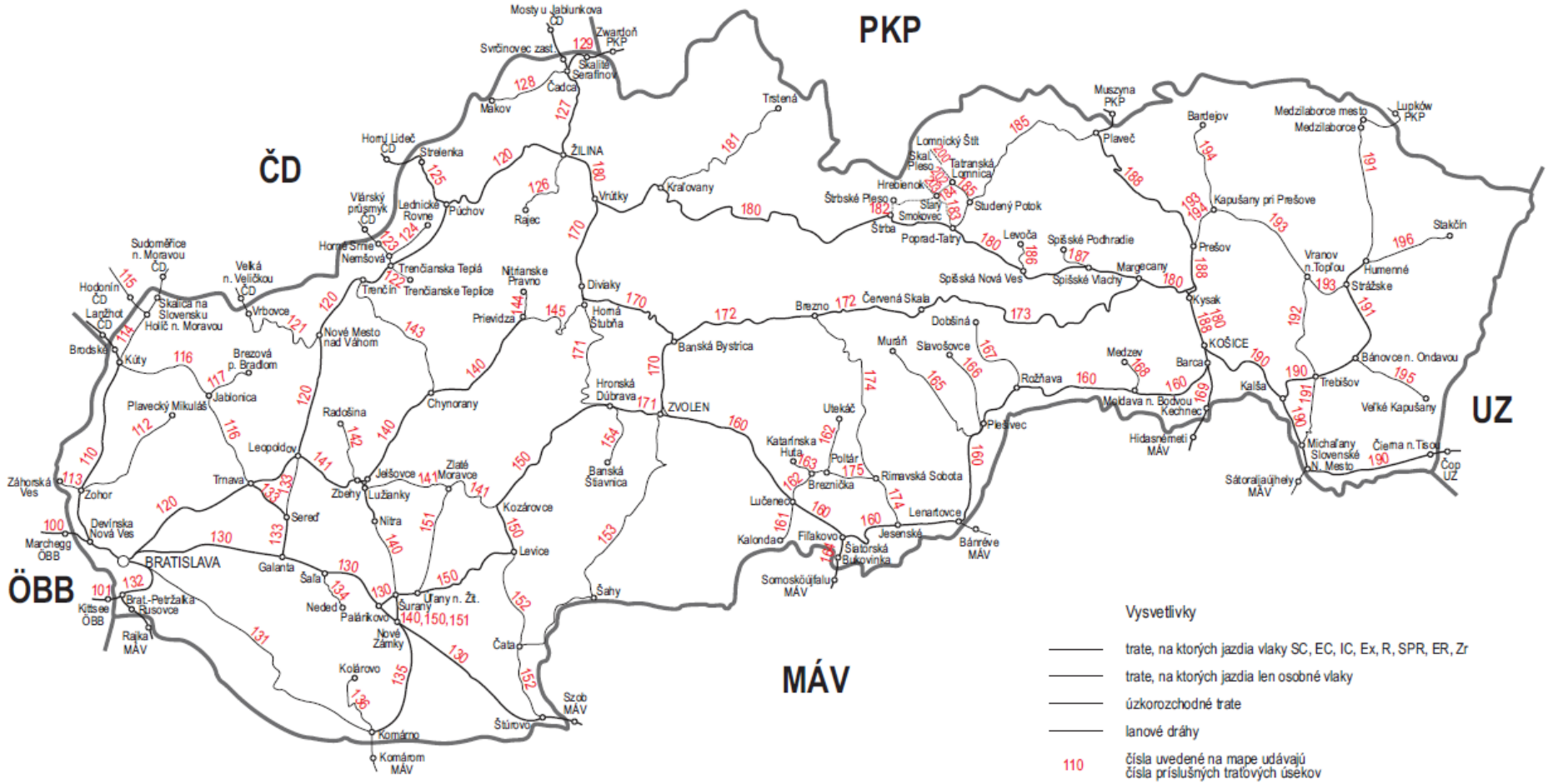
The operation of 45.544 km of lines was suspended due to their unsatisfactory condition . Figure No 1 shows the railway network administered by ŽSR.
ŽSR as infrastructure manager operates electrified and non-electrified railway lines. The respective data are shown in Table No. 2.

Table 2 Classification of lines in terms of traction

Lines	**km**
Electrified AC 25 000 V/50Hz	759,094
Electrified DC 3000 V	826,764
Developed length of traction lines	
Single-phase traction lines	2279,085
DC traction lines	2728,615
Power supply and switching stations	
Single-phase traction power supply stations	12
DC traction power supply stations	36
Converting substations	3
Single-phase switching stations	18
DC switching stations	20
Container substations	3

According to Table No 2, the network of ŽSR comprises 1585.858 km of electrified lines. The developed length of traction lines is 5007.700 km and the total number of supply and switching stations is 92.
The 25 kV/50 Hz system, which reports the lowest costs caused by power transmission and thus allows to obtain traction voltage by transformation from the public power distribution system, seems to be the most prospective. The plan is to transform the existing DC system on the network of ŽSR to the AC 25 kV/50 Hz system, while upgrading the railway corridor in the section Lúky pod Makytou, state border – Púchov – Žilina – Košice.

Figure 1 Network ŽSR



Source: (1)

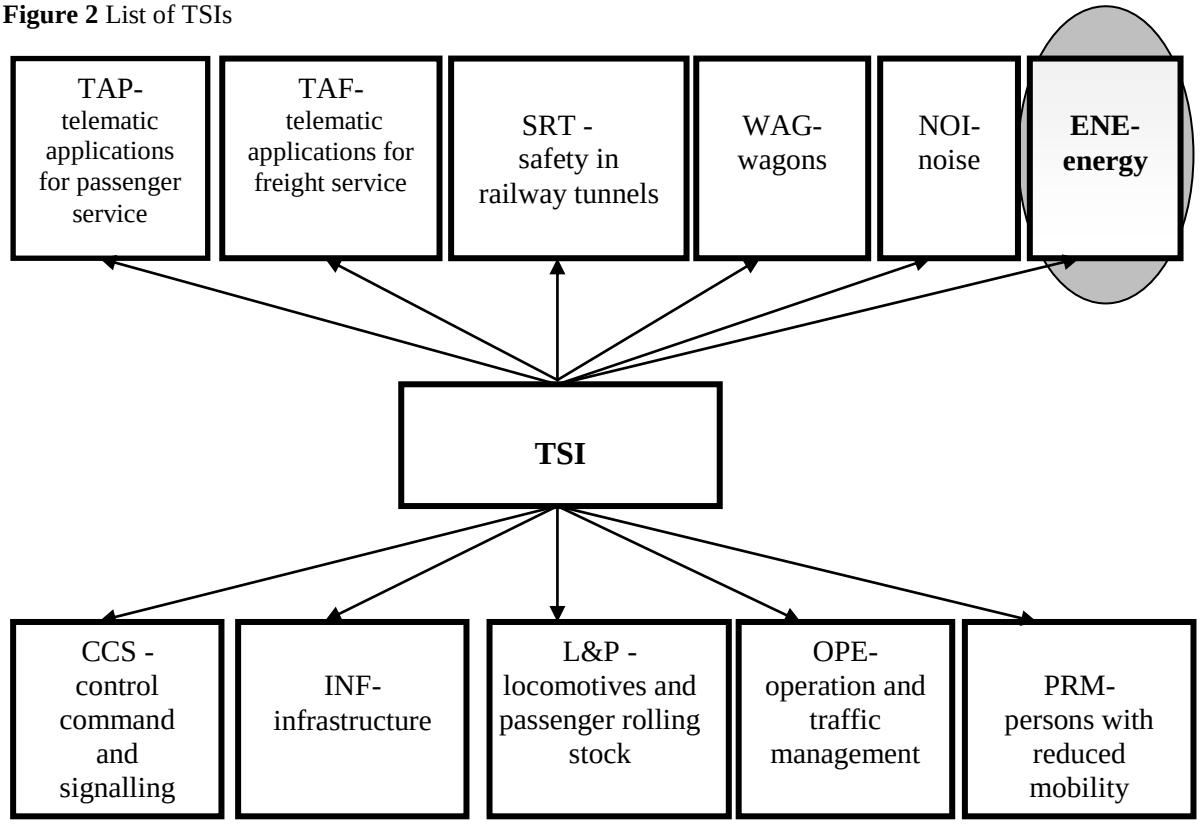
2.1. Legislative background

After the accession of SR to the European Union it was necessary to transpose individual legal acts of the European Union into national law. In 2009 the new Act of the National Council of SR No 513/2009 Coll. on railways and on amendment of certain acts was passed. This Act among others transposed the Directive No 2008/57/EC of the European Parliament and of the Council on the interoperability of the rail system within the Community and the Directive No 2004/49/EC of the European Parliament and of the Council on safety on the Community's railways. The Decree of MTPT SR No 351/2010 Coll. on railway traffic regulations and the Decree of MTPT 350/2010 Coll. on building and technical regulations of railways became regulations implementing the Act No 513/2009 Coll.

The Decree No 245/2010 Coll. on professional competence and health and physical fitness of persons for the operation of railways and railway transport was issued.

The Commission Regulation (EU) No 1301/2014 of 18 November 2014 on the technical specifications for interoperability relating to the 'energy' subsystem of the rail system in the European Union is fully applied to lines which fall within the geographical scope of this TSI and which will be put into operation as interoperable lines after the entry into force of this TSI. It also includes new, renewed or modernised railway lines. This regulation is directly applicable in all EU Member States and by individual concerned parties. SR endeavours to apply the individual TSI as much as possible and to respect their supremacy over national law.

Figure 2 List of TSIs



In providing the interoperability of the railway system, SR is bound among others by the Regulation (EU) No. 1315/2013 of EP and the Council on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU.

2.2. Methodology for the preparation of the National Implementation Plan

During the elaboration of the national implementation plan for TSI ENE its relation to other strategic plans, in particular the Strategic Plan for Transport Infrastructure Development in the SR until 2020 (so-called Master plan), National Implementation Plan for Introduction of Railway Infrastructure Register in SR, National Implementation Plan of Technical Specification Interoperability relating to the subsystem „infrastructure“ and National Implementation Plan of Technical Specification Interoperability relating to the safety in railway tunnels were taken into account. The interconnection of individual national implementation plans set out in legal acts concerning individual TSI is envisaged. The legislative acts aimed to the respective subsystems (see figure No 2), impose the obligation to prepare the national implementation plans by a determined date. For this reason the interconnection of these plans is envisaged. This fact was also taken into account in the process of defining the methodology for the preparation of the national implementation plan.

The general structure of the national implementation plan was determined in accordance with available information set out in the Commission Regulation (EU) No 1300/2014 of 18 November 2014 on the technical specifications for interoperability relating to accessibility of the Union's rail system for persons with disabilities and persons with reduced mobility. It also took account of the principles of implementation, i.e.:

- specific issues of human factors related to operation of the line
- individual operational and safety elements of the line
- whether implementation of the element is or is not envisaged for all trains on the line
- whether implementation of the element only concerns certain lines and whether it is applicable to all TEN lines
- relation to other TSI.

General structure of the National Implementation Plan

1. **Context**
- Setting the scene (facts and figures, technical data on the subsystem)
- Legislative background
- Methodology for the preparation of a national implementation plan (e.g. relation to other subsystems or other national implementation plans.

2. **Current situation**
- Information about the situation in SR (within the subsystem)
- Information about the situation in SR (operating rules).

3. **Definition of strategy**
- Criteria according to which subsystems are dealt with by the plan (in line with principles set out in Regulation 2011/314/EU).

4. **Technical and operating means**
- Scope of upgrade and renewal
- Introduction of operational measures.

5. **Financing**
- Cross-references to contract agreements (Article 30 of Directive 2012/34/EU)
- Other resources.

6. Follow-up work and feedback

- Inventory (or update) of assets and comparison with the objectives
- Updating of the plan, if appropriate.

2.3. Definition of a strategy

The process of upgrade and renewal of railway lines in connection with TSI ENE will take into account the strategic objectives adopted in SR (e.g. Strategic plan for Transport Infrastructure Development in the SR until 2020) and obligations resulting from the European law and international agreements. SR in accordance with TSI will send to the European Commission the lists of projects at an advanced stage of development, which are implemented in its territory. In the framework of national legislation the following legal acts were announced:

- Act No 513/2009 Coll. on railways and on amendment of certain acts
- Act No 514/2009 Coll. on railway transport
- Decree No 350/2010 Coll. on building and technical regulations of railways
- Decree No 351/2010 Coll. railway traffic regulations
- Z 1 Rail operating rules.

Furthermore, in accordance with Article 5 of the Commission Regulation (EU) No 1301/2014, the following national, bilateral, multilateral and international agreements were notified:

- Agreement between the Government of SR a the Government of CR on railway transport across the state border,
- Treaty between SR and CR on privileged toll-based railway transport in extraordinary situations,
- Agreement between the Government of SR a the Government of Poland on railway transport across the state border,
- Agreement between the Government SR a the Government of Ukraine on railway transport across the state border,
- Agreement between MTPT SR, MŽ RF and MD of Ukraine on international transport of goods by rail,
- Agreement between SR and Austria on amendment to the Agreement on regulation of railway border crossings.

Also partial application of the national implementation plan in accordance with modernisation of lines is envisaged.

In view of the transport policy and situation in the railway transport the Strategic Plan for Transport Infrastructure Development in the SR until 2020 defined visions of railway transport (see Table No 3):

Table 3 Visions

Vision (VS) No	Vision
VS 1	Balance between supply of and demand for transport services
VS 2	Balance between infrastructure supply and demand for transport services
VS 3	Creation of conditions for the proper functioning of railways

Source: (2)

These visions will be implemented through the fulfilment of partial strategic objectives set out in Table No 4.

Table 4 Strategic objectives

Strategic objective (SO) number	Strategic objective
SO 1	High-quality and competitive passenger railway transport
SO 2	High-quality and competitive freight railway transport
SO 3	Modern and safe railway infrastructure
SO 4	Effective organisation and planning of development of railways
SO 5	Economically sustainable railways

Source: (2)

From these strategic objectives it is clear that SR endeavours to increase the competitiveness of railway transport and to strengthen its position on the transport market as much as possible.

3. Present state of the subsystem in SR

This chapter provides concise information on the state of the "energy" subsystem and its characteristics in SR.

3.1. Information on the state of subsystem in SR

Railway infrastructure of SR is generally characterised by a high network density, but also by a low track speed on railway lines, which is due among others to obsolete infrastructure. SR endeavours to fulfil the requirements for fixed installations, which are necessary for achievement of interoperability and required for supply of electric power to railway trains and thus to fully respect TSI ENE.

In the framework of upgrade of railway infrastructure the final phase of upgrade of the railway infrastructure within the Operational Programme Transport will be completed as late as in 2015. Funds of OPT in amount of EUR 151 558 055 were used for railway infrastructure investment projects (priority axis No 1) in 2015.

The investments were used for upgrade of railway infrastructure components, i.e.:

- Railway stations
- Superstructure and substructure
- Traction lines
- Safety equipment
- Construction of railway bridges, etc.

The most important investment projects implemented in the previous year 2014 in relation to TSI ENE were:

- Upgrade of railway line in the section Nové Mesto n. Váhom – Púchov (section Zlatovce – Trenčianska Teplá, Trenčianska Teplá – Ilava – Beluša, Beluša – Púchov),
- Upgrade of railway line Púchov – Žilina (section Púchov- Považská Teplá, Považská Teplá – Bytča).

These projects were also implemented in accordance with requirements of TSI ENE (Commission Decision No 2011/274/EU). The objective is to ensure an optimal process of upgrade.

3.2. Information on the state of subsystem in SR – operating rules

The individual operational rules of ŽSR, as well as national legislation of SR are not contrary to the rules resulting from the Commission Regulation (EU) No 1301/2014. The ambition is to ensure the application of TSI ENE to the largest possible extent, as well as to eliminate or update the national regulations in accordance with new adopted technical specifications for interoperability.

4. Technical and operating means

The primary objective is to provide modern, interoperable, safe, efficient, accessible and environmentally friendly railway infrastructure in order to increase its use by passenger and freight railway transport. In view of the present unsatisfactory condition of infrastructure this objective can be achieved only through the comprehensive upgrade and renewal of railway lines.

4.1. Scope of upgrade and renewal

During the preparation and implementation of projects of upgrade and renewal of railway lines the requirements of the European and Slovak legislation for the interoperability of the Community´s rail system must be fulfilled.

To railway lines included in the scope of the Commission Regulation (EU) No 1301/2014, which will be put into operation as interoperable, this regulation is applied in full scope. SR tries to fully accept the provisions of this regulation. According to Article 2 (2) of the Commission Regulation (EU) No 1301/2014 and paragraph 7.2 of its annex TSI ENE applies to new, renewed or upgraded lines. In the process of upgrading and renewal this TSI is fully applied in cases such as relocation of a part of existing line, construction of bypass roads, completion of one or more tracks in the existing line regardless of the distance between the initial and completed tracks, etc.

The upgrade of railway infrastructure is implemented through the final phase of implementation of the Operational Programme Transport 2007 – 2013 and the preparation of projects for the following period of the Operational Programme Integrated Infrastructure 2014 – 2020 (hereinafter "OPII"). Investments in transport under OPII should be used for integration of individual transport modes and development of robust infrastructure – continuation of modernisation of the TEN-T core network in accordance with Regulation No 1315/2013 of EP and of the Council.

Table 5 TEN - T sections

TEN-T core network	TEN-T comprehensive network
Bratislava – Kúty – SK/CZ border	Púchov – Lúky nad Makytou – SK/CZ border
Nové Mesto nad Váhom – Žilina	Čadca – SK/CZ border
Žilina – Košice	Bratislava – Nové Zámky – Štúrovo – SK/HU border
Košice – Čierna nad Tisou – SK/UA border	Košice – Čaňa – SK/HU border
Žilina – Čadca – Skalité – SK/PL border	

Source: (2)

The primary objective of the upgrade and renewal of railway lines also from the perspective of the subsystem "energy" is ensuring of the interoperability of the Community´s rail system according to requirements determined in valid legislation.

4.2. Introduction of operating measures

In SR the technical specifications for interoperability are applied to the largest possible extent. Individual operating measures included in the internal regulations of ŽSR take into account the present condition of railway infrastructure of SR, fully respecting the supremacy of European law.

5. Financial resources and follow-up work

In SR different sources of financing are used for coverage of investment costs. Individual activities related to the upgrade, renewal and construction of infrastructure are financed from:

a) Own resources of ŽSR

ŽSR uses its own funds for financing of investment projects and projects serving for simple reproduction of assets, e. g. investments used for the operation of railway infrastructure, enhancement of safety of train operation and passengers, improvement of the travel culture, but also handling of emergency situations on lines, facilities and buildings of ŽSR, removal of operational track speed limits and investments in information and telecommunication technologies.

b) Resources of third parties:

- Financing from the state budget (SB),
- Financing from EU resources + cofinancing from the state budget,
- Financing from loans of ŽSR.

The state budget resources for the upgrade and development of railway transport route are provided on the basis of the Contract on Provision of Funds, which is concluded in the respective budget year between ŽSR and MTCRD SR. In the contract the funds are determined for specific investment projects. As for the purpose of use, in particular investment projects (closely) related to projects and construction works financed from EU funds are included in the list. They include among others financing of costs of project documentation, engineering works, settlement of property rights to land, implementation of some construction works and operational complexes and financing of costs that are not eligible for financing from EU funds. Investment projects related to the development of railway infrastructure and safety of train transport are also financed from the budget of public administration. It concerns in particular the enhancement of safety of railroad crossings.

5.1. Follow-up work and feedback

ŽSR manage assets in accordance with Act of the National Council of SR No 258/1993 on the Railways of the Slovak Republic. The company keeps data relating to the railway network in its own information system. Information about the railway network should be registered in accordance with the Commission Implementing Decision 2014/880/EU of 26 November 2014 on the common specifications of the register of railway infrastructure and repealing Implementing Decision implementing Commission Decision 2011/633/EU. The national register administrator in SR is the Transport Authority (address: Letisko M. R. Štefánika, 823 05 Bratislava) and ŽSR intensively cooperate on the provision of data on infrastructure administered by ŽSR in accordance with the Commission implementing decision 2014/880/EU.

5.2. Plan update

The national implementation plan for TSI ENE will be updated ad hoc depending on changes in legislation and requirements for amendment of the methods and amount of financing. Its updating will be ensured by MTCRD SR in cooperation with stakeholders.

Conclusion

SR intensively deals with the issue of interoperability and regards it as its priority. It endeavours to ensure the fulfilment of requirements in this area. By transposition and monitoring of the implementation of European legislation it moves toward the achievement of this objective.

The purpose of this document was to provide an overview of railway infrastructure in SR in the framework of TSI ENE and of the methods of financing while increasing its quality. The implementation plan together with the register of infrastructure will ensure the accessibility of data on railway infrastructure from different perspectives. The plan will be regularly updated, thanks to which the Commission and the other Member States will be informed about changes in this area in SR. The member states will be informed about national implementation plans for individual TSIs through the website of MTCRD SR. The required level of its quality was also ensured by consultations with several experts on this field.

List of abbreviations

ČR	Czech Republic
EU	European Union
MTCRD SR	Ministry of Transport, Construction and Regional Development of SR
OPT	Operational Programme Transport
OPII	Operational Programme Integrated Infrastructure
SR	Slovak Republic
SB	state budget
TSI	technical specifications for interoperability
TSI ENE	technical specification for interoperability of the “energy“ subsystem
ŽSR	Railways of the Slovak Republic

Used sources

(1) http://data.railpage.net/prevadzka/grafikon/gvd2007navrh/Mapa_siet_ZSR.pdf

(2) Strategic Plan for Transport Infrastructure Development in the SR until 2020

(3) Gašparík, J., Blaho, P., Lichner, D. : *Railway transport operation – Fundamentals of railway transport operation*, ISBN 978 – 80 – 554 – 0996 – 2