

SOME ISSUES OF MODERNIZATION OF CRITICAL RAILWAY INFRASTRUCTURE IN SLOVAKIA

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Abstract: *The contribution deals with some issues of modernization plans of critical infrastructural sections of Slovakian railways in perspective of present economic situation and government priorities in the area of rail transport.*

Key words: *railways, ERTMS, GSM-R, ETCS, revitalization*

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INTRODUCTION

Freight transport is an important logistic activity, which can use any transport mode such as railways, roads, rivers, seas, and air. All of these transport kinds have different, less or more intensive social, economical and environmental impacts on regions through which the transport flows. One of the most environmentally friendly transports is the one via railways, which creates logical priority to promote modal shift of cargo from other modes to railways. These efforts are strongly depending on quality of railway networks in individual member states, which is very different. Therefore, the modernization of railway networks is a welcomed obligation of every country entering EU. The contribution deals with the national deployment plan of ERTMS on Slovakian railway infrastructure in reality of present situation and government plans and measures related to railways.

PRIORITIES OF ERTMS IN SLOVAKIA

Ranking of ZSR (Slovakian infrastructure manager) priorities in relation to railways significance to be equipped by ERTMS/ETCS is derived from their assignment to pan-European corridors and prior TEN-T projects, and they are:

- Corridor IV, Dresden – Prague – Bratislava/Wien – Budapest – Arad – Constanta; + branches, including **Komárno - Nové Zámky** as a part of corridor E, TEN-T 17
- Corridor V, Venezia – Trieste/Koper – Ljubljana – Budapest – Čop –Lvov; branch **Bratislava – Žilina – Košice –Čierna n/T. –Čop**, TEN-T 23

- Corridor VI, Gdansk – Warszawa – Katowice – Zwardon/Čadca - Žilina (branch Bielsko Biala – Ostrava – Břeclav), TEN-T 23
- Decision 1692/96 EC and Decision 884/2004 EC include following projects:
- No.17 Paris – Strasbourg – Stuttgart – Wien – Bratislava, (ZSR part ÖBB Kittsee/**Bratislava-Petržalka –node Bratislava**, ÖBB Marchegg / ZSR **Devínska Nová Ves**)
 - No.23 Gdansk – Warszawa – Brno/Bratislava (Zwardon PKP/ZSR **Skalité –Čadca – Žilina - Nové Mesto nad Váhom**)
 - Other railways included into European railway network TEN-T.

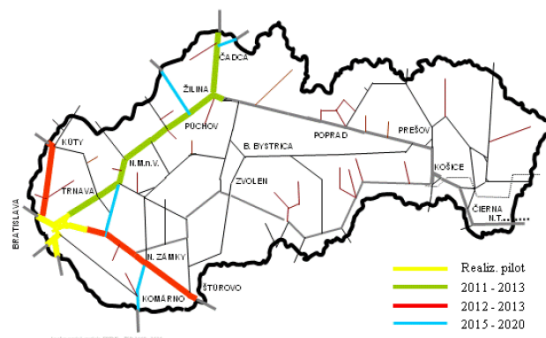


Fig. 1 Implementation plans of GSM-R on ZSR network up to 2020 [1]

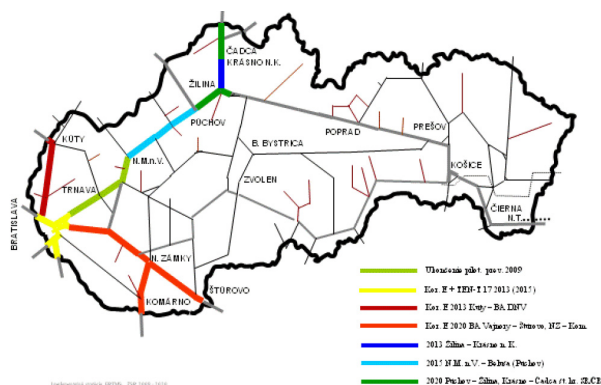


Fig. 2 Implementation plans of ETCS on ŽSR network up to 2020 [1]

The more illustrative overview of plans of ZSR according to modernization of selected railways can be seen from Figures 1 and 2 of this article.

PRESENT SITUATION

The following notes onto current situation of signaling systems in Slovakian railways can be stated:

- Different systems of various degree of obsolescence are used such as MULTIKOM and KAPS ZUGFUNK
- Technical details of modernization are defined by realized pilot project „ETCS L1 Bratislava Rača – Trnava – Leopoldov“
- MULTIKOM is a radio system enabling selective, eventually group calls of dispatchers with engine-drivers and/or with personnel in individual stations. Its disadvantage is that it enables only voice calls
- KAPS ZUGFUNK system is considerably obsolete for present conditions. It is radio system according to directive UIC 751 – 1. Its disadvantage is that only one dispatch workplace can be in network. Therefore, this system is supplemented by transmitters, which enable communication with engine-drives only in opened channel, not by selective choice

- Other stations use only local radio connections in bands 160 MHz, and/or exceptionally in band 450 MHz for connection of dispatcher in area of station.

SOME NOTES ON IMPLEMENTATION PLAN

The deployment plan concludes that most of the railway network requires renewal, since autoblocking systems are obsolete, and for communication train-rail, the infrastructure manager operating Class B cannot require this as condition of approach to network for mobile units after 2015 in corridor E [1]. The intentions of individual sections modernization time plan are shown in Figures 1 and 2.

The limitations of plan realization, as stated in [1], are as follows:

- Existence of old, present systems besides new ETCS
- The necessity of exchange of obsolete equipment in railway stations
- Continuous equipping of mobile units by on-board devices of GSM-R and ETCS
- Relative high costs of equipping the existing locomotives, since:
 - radio systems on existing network are various, which asks implementing the modular communication devices into locomotives enabling flexibility,
 - the costs of implementation of ETCS systems into locomotives are high

IMPLEMENTATION PLAN IN CONTEXT OF PRESENT PLANS AND MEASURES OF GOVERNMENT

The goal of government activities in railway market in Slovakia is to save its present ratio (approx.21%) [5] on total volume of transported goods and persons and to create conditions for its further grow. From 1st January 2005, there are existing three state owned independent subjects (according to separation model):

- Railways of Slovak Republic, a.s. – (ZSR) – infrastructure manager
- Slovak rail, a.s. - (ZSSK) – company performing passenger transport
- Rail Cargo Slovakia, a.s. - (ZSSK Cargo) – company performing freight transport

Current number of issued licenses to other private rail operators in Slovak Republic, after market liberalization, is such that 1 company performs passenger transport, 26 companies performs freight transport, 2 companies performs both, passenger and freight transport.

Selecting from conclusions of [2], it can be stated that the railway infrastructure:

- Is insufficiently used, much extended, and obsolete
- Infrastructure (with exception of modernized corridor tracks) is characteristic by gradually degrading parameters (speeds, axle loads), not accommodated to modern European rolling stocks (problem of electromagnetic compatibility), and thus limiting modernization of rolling stocks of commercial operators
- Investments are concentrated only to corridor projects, resigning to modernize others
- Low effort of all three state owned rail companies to optimize from inside

Therefore the infrastructure requires heavy modernization, which is dependent on measures for increasing the profitability of infrastructure manager (ZSR) and obtaining larger financing support from European funds and government. At present time, the government runs revitalization plan [3] of all three state owned railway companies, which is preliminary scheduled during 2011-2014. Revitalization plan includes also the decrease of employee's numbers about 5000 persons, so it is politically very sensitive. Such issues are always limiting and slowing any plans of the technological modernization, and the time plan perspective seems not to be realistic, from this point of view. All three companies were severely hit by global economic crisis, and need financial stabilization. One part of the government plans is a privatization of Slovak national rail freight cargo operator Rail Cargo Slovakia, a.s., which is dominant in Slovakian market, see Figure 3.

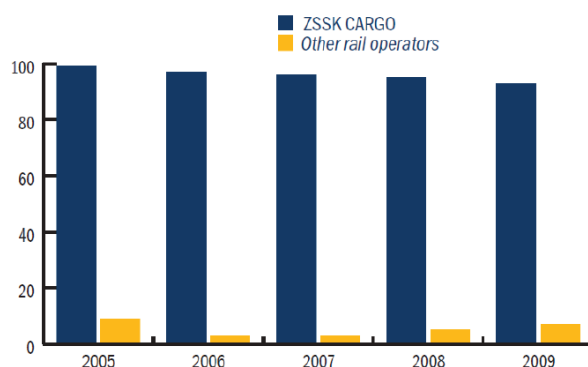


Fig. 3 Rail freight transport – ZSSK Cargo vs others [4]

Preliminary, the decision intent with starting privatization process should be available until the end of first half of 2012. Privatization of national rail freight operator ZSSK Cargo Slovakia, a.s. seems to be a key factor on the way of increased profitability of infrastructural manager ZSR, since it can bring strategic rail freight partner, which will increase transit via Slovakia. Also, until 30.4.2011, ZSSK Cargo Slovakia, a.s. has owed to infrastructure manager ZSR approximately 100 mil. €, which should be paid before entrance of private owner and will enable ZSR to accelerate infrastructure modernization. Also, strategic partner will help to modernize rolling stocks operating in Slovakian railways without the need of investments from public side, or publicly guaranteed.

CONCLUSION

The deployment plan priorities are set with respect of needs of European community, and plan is ambitious. The details and risks of implementation were already mentioned in above sections, and the most important of all is lack of available finances for planned investments.

But, on the other side, from the view of regional unbalances of Slovakia itself, the substantial effort in modernization of corridor sections is paid onto the more advanced regions of Slovakia, which will cause the increase of the differences in developments and economical attractiveness of individual Slovakian regions, and more intensive degradation of eastern regions. As evident from Figures 1 and 2, the branch of Corridor V, which is a backbone of Slovakian railway network, **Bratislava – Žilina – Košice – Čierna n/T. – Čop**, the ERTMS priority sets only sections between Bratislava – Žilina, including already more developed western part of Slovakia. Section from **Žilina – Košice – Čierna n/T. – Čop** is not a priority until 2020, despite the fact that the revitalization plan notes the increase of a rail transit flow from Asia to EU via Slovakia as an opportunity, and its realization will require to have preferably at use modernized all Slovakian sections of Corridor V.

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НЯКОИ ПРОБЛЕМИ В МОДЕРНИЗАЦИЯТА НА КРИТИЧНАТА ЖЕЛЕЗОПЪТНА ИНФРАСТРУКТУРА В СЛОВАКИЯ

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Ключови думи: железници, ERTMS, GSM-R, ETCS, ревитализация.

Резюме: Докладът разглежда някои въпроси от плановете за модернизация на критични инфраструктурни участъци от словашките железопътни линии от гледна точка на настоящата икономическа ситуация и приоритетите на правителството в областта на железопътния транспорт.