



THE INTEROPERABILITY OF EUROPEAN RAIL TRANSPORT FROM POLISH AUTHORITY OF MESSAGES OF VIEW

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Abstract:

Development of the market of the rail transport is a huge impulse to introduce technological innovations. It is necessary to adapt technological solutions to exploitation requirements in the transgenic move. European Union wants to introduce full interoperability into the rail transport. Railways supported new technologies: European Railway Traffic Management System (ERTMS), European Train Control System (ETCS) and Global System for Mobile Communications – Railway (GSM-R).

Introduction

The system of the railways is standing in Europe in the face of revolution connected with progress in technologies of the signalling and the safety of railways and with new answers in structures of trains. Proposed political changes are opening the possibility of competing on the entire continent with road and air hauliers before them. Opening of the rail grid for the wide competition, initiated by UE, is integrating an European, rail space.

1. Costs of implementing new train technologies

According to the European Rail Research Advisory Council (ERRAC) which is consisting of operators, producers of the equipment and of representatives of authorities, the standardized rail grid would let on 40% rise in passenger transports and 70% of goods transports until 2020. The share of railways would amount to 15% in the market of goods transports and 12% in the market of passenger transports. Introduce ERTMS by European train enterprises will lower costs and will assure the fast return of investment.

Cost of implementing the European Train Control System (ETCS) on the European level are assessing at 400÷500 of EUR million annually or about 5 EUR milliards through the next 10÷12 of years. Annual expenses of the signalling equipment which had been realized by the Networks of Trans-European (TEN-T) in 1996÷2001 years amounted 1 EUR milliard. Conception of the trans-European networks has arisen in European Community in 80s years, together with the plan of create the uniform market. Trans-European network is providing the transport infrastructure, systems of managing of the move and systems of establishing the

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position and the navigation (essential technical installations and systems of the information and the telecommunications).

The Polish side can demand for co-financing projects of TEN. Condition of contest for the support from the European Community is fulfilling by the plan all of the conditions made by the EU. Year 2004 was first, which Poland had the access to financial means from the programme TEN-T. Till 2006 Poland has realized 16 projects connected with TEN-T (3 approved in 2004, 6 approved in 2005 and 7 approved in 2006).



Fig. 1. Location of train projects proposed in Poland for the realization from European Funds in years 2007÷2013

2. Interoperability of trans-European rail system

In accordance with directives 96/48/WE and 2001/16/WE interoperability means an ability the system of railways to the safe and undisturbed traffic of trains. This ability is based on all control, technical and exploitation conditions, which must be fulfilled for fundamental requirements.

In the other side, interoperability for the single country means the cohesion of the railway system in the scale of the European Union, in every aspect – technical, functional, syntactic and semantic. Suppose that there have been established actions which have achieve interoperability in view and which have been realize both on the road of joint undertakings (creating the network of corridors trans-European) and on the road of action of independent membership states with own strategies.

In practice that means, that interpretational rolling-stock can move on the interpretational train infrastructure and between the rail grids of individual states:

- without the need to stop on borders of states,
- without the necessity of the change locomotives on borders,
- without the necessity of the change engine drivers on borders,

- without the need of making by engine drivers any activities peculiar to the given infrastructure.

In individual states there are significant differences of railways functioning. Manifestations display both in technical and organizational aspects. The most substantial technical differences concern:

- of rail way (e.g.: width of paths, legal stresses on the axis),
- of system of power supply (e.g.: the size and stretching powering of the traction, the structure of the traction grid),
- of system of the control (e.g.: signal images, functional and technical aspects of systems of the automatic inspection of the ride at using transmission track-vehicle),
- of the rail traffic regulations.

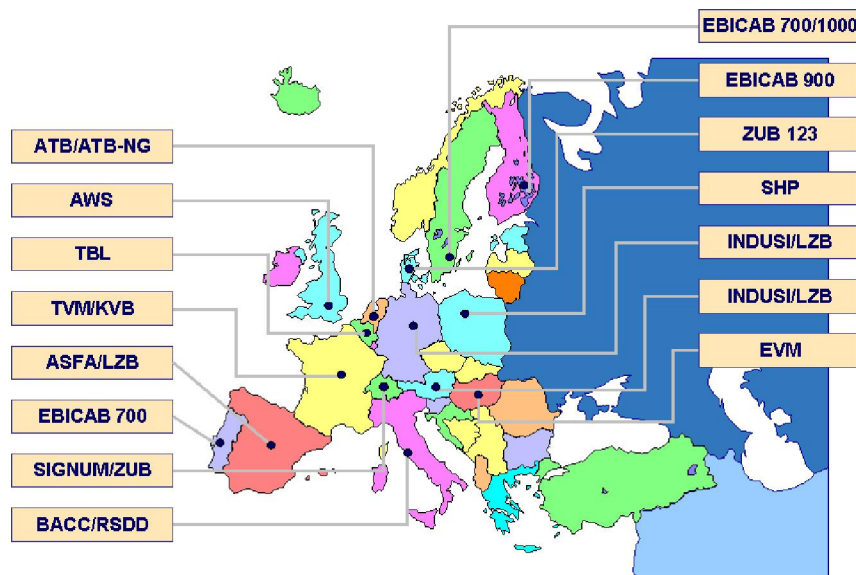


Fig. 2. Arranging different of the train signalling in Europe

This diversity usually results from intended action, to which the following reasons had the influence:

- strategic (railways as the means of mass transport had to be protected for possible using by armies neighbouring states),
- economic (railways of individual countries relied on examinations and the production realized by national companies, which had the monopoly on train products in individual countries),
- political (railways were subjected to political influences – accepting alien solutions was perceived as the defeat).

In the strategy of initiation interoperability on first distance, appears necessity to introduce European Railway Traffic Management System (ERTMS), which is composed of:

- GSM-R – Global System for Mobile Communications – Railway,
- ETCS – European Train Control System.

Both systems are essential components of European policy of elimination barriers in transport, both in range of technical barriers on rail grid inside borders of UE and in range of building the common market of products and services for the benefit of railway.

3. Legislative records of interoperability of European railways

Basic standard acts on the common level bound with implementing, applying and with supervising applying principles interoperability are:

- the directive 96/48/WE of the European Parliament and Advice in the cause interoperability of trans-European system of railways of high velocities,
- the directive 2001/16/WE of the European Parliament and Advice in the cause interoperability of trans-European system of conventional railways,
- the directive 2004/49/WE of the European Parliament and Advice from 29st April 2004 in the cause of the safety of common railways,
- the directive 2004/50/WE about interoperability of railways (updating 96/48/WE and 2001/16/WE),
- the directive of the European Parliament and Advice of the No. 881/2004 establishing the European Train Agency.

Issue interoperability concerns both the lines anew erected and the lines modernised, included into the European train system. To determine technical and organizational conditions which must be fulfilled in order to guarantee interoperability, the train system have been divided in subsystems, for which requirements are determined and presented in TSI specifications (Technical Specifications for Interoperability).

The division into subsystems has to facilitate achieving the harmonization trans-European train system, on account of extensiveness and complicating. Trans-European system of railways is divided into subsystems (technical planes):

- structural: the infrastructure, the energy, controlling, the rail traffic, rolling-stock,
- functional: the maintenance, the telematics.

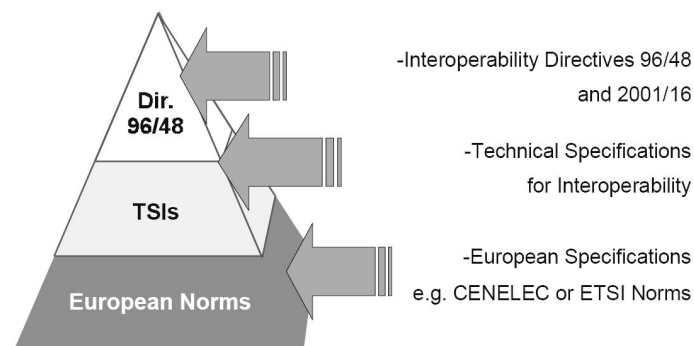


Fig. 3. 3-layers of document structure

For each of subsystems Technical Specifications are being worked out for Interoperability (TSI). From economic reasons they decided that the subsystems must consider existing technical answers and possibility of gradual reaching the target solution and they determine basic parameters and technical specifications, particularly with reference to elements interoperability and interfaces.

TSI specifications are compulsory regulations. Decisions included in TSI refer to two principal areas:

- of very subsystem and his interfaces,
- of elements of interoperability.

For many parameters required defined values are through the adduction to appropriate records normalizing, particularly to European specifications and norms.

Conclusions

The transport politics of European Union is aiming to the revitalization of the rail transport, which is friendly to the natural environment and the society. The uniform European network would let on 40% rise in passenger transports and 70% of goods transports until 2020.

Issues of the shared train transport system of the European Union is an object of the coherent approach and for many years it is consistently realized by European Union. There has followed relatively great progress in the scope of making uniform regulations of interoperability for the rail transport. Railways and the train industry must take into the rise in costs which will be an effect of making regulations uniform.

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