

Ministry of Transport and Construction of the Slovak Republic  
Námestie slobody 6, 810 05 Bratislava

**National implementation plan for the technical specification of interoperability related  
to “Traffic Operation and Management” subsystem of the railway system  
of the European Union**

## **Legislative Background**

In order to achieve a common transport policy for the interoperability of national rail systems, it is necessary to harmonize technical, administrative and safety rules. In order to ensure the interoperability of the Community's rail system and to enable Union citizens, economic operators or competent authorities to take full advantage of the existence of the Single European Railway Area, EU legislative instruments have been developed, including Directive 2016/797 of the European Parliament and of the Council of 11 May 2016 on the interoperability of the rail system within the European Union (hereinafter referred to as the "Interoperability Directive"). In order to pursue the objective of interoperability set, the level of technical harmonization should be optimized and the improvement and development of international rail transport services should be facilitated and it should be contributed to the progressive establishment of the internal market for equipment and services for the construction, renewal, modernization and operation of the Union's rail system.

In order to reduce the technical barriers to interoperability and given the scale and complexity of the railway system, it has proved necessary, for practical reasons, to break it down into subsystems. In order to ensure the safe and uninterrupted movement of trains which achieve the level of performance required for the rail system, technical specifications for interoperability (hereinafter referred to as "TSIs") have been established for each subsystem, including the traffic and operation management subsystem. The first comprehensive adaptation at the European level through TSI for the Traffic Operation and Management subsystem was introduced by the Commission Decision on the technical specification for interoperability relating to the traffic operation and management subsystem of the railway system in the European Union and amending Decision 2007/756 /EC. In view of the fact that the Decision has been amended several times, in order to ensure both clarity and legal certainty, it has been repealed and replaced by Commission Implementing Regulation 2019/773 on the technical specification for interoperability relating to the 'traffic operation and management' subsystem of the railway system in the European Union, repealing Decision 2012/757/EU. The Traffic Operation and Management subsystem is defined as the procedures and equipment enabling the coherent operation of the different structural subsystems, both during normal operation and during breakdown operation, including train composition and running, railway traffic planning and control. The functional and technical specifications of that subsystem include the specifications concerning the staff, the specifications concerning the trains and the specifications concerning the operation of the trains. The scope of the Traffic Operation and Management TSI is extensive and its requirements are linked to other European acts that complement it.

At national level, there was the harmonization in particular through the adoption of Act No. 513/2009 Coll. on Railways and on Amendments to Certain Acts, as amended. The implementing regulation to the Act is the Decree of the Ministry of Transport, Posts and Telecommunications of the Slovak Republic No. 351/2010 Coll. on Traffic Regulations of Railways, as amended, and the Decree of the Ministry of Transport, Posts and Telecommunications of the Slovak Republic No. 245/2010 Coll. on Professional, Medical and

Psychological Competence of Persons Involved in Railway Operations and Rail Transport, as amended.

## **Basic information**

The railway network consists of the sum of all transport routes - lines. These are lines that serve public rail transport. From a technical point of view, railway transport routes - railway lines that are included in one railway network do not have to have the same gauge, they do not have to be electrified by one current system.

In the territory of the Slovak Republic (hereinafter referred to as the "SR"), the Railways of the Slovak Republic (hereinafter referred to as the "ŽSR") are the administrator of the railway infrastructure. ŽSR ensures the operability of railway infrastructure in the sectors of railway lines, structures and buildings, bridges and tunnels, electrical and energy equipment and security devices. They take care of its maintenance and development in accordance with technical progress and requirements for safety and smoothness of railway traffic.

ŽSR manages and operates railways of national and regional importance and facilities in the following parameters:

### **RAILWAY LINES AND**

<b>CONSTRUCTIONS</b>	<b>As of 31 Dec 2019</b>	<b>Unit of measure</b>
Construction length of operated lines	3 582	km
Construction length of managed lines	3 629	km
Total construction length of tracks	6 872	km
Number of crossings	2 082	pcs
Number of switches	8 379	pcs
Number of bridges	2 326	pcs
Total length of bridges	52 544	m
Number of tunnels	76	pcs
Total length of tunnels	45 007	m

The data on the "Construction length of managed lines" also include lines with suspended operation due to unsatisfactory technical condition. The total length of lines with suspended operation is 46,692 km.

ŽSR, as the infrastructure manager, operates traffic control points of different categories and types:

<b>TRAFFIC CONTROL POINTS</b>	<b>As of 31 Dec 2019</b>	<b>Unit of measure</b>
Traffic control points together	1,024	pcs
Traffic control points occupied/unoccupied by employees	378/651	pcs
of which		
railway stations	298	pcs
border stations	22	pcs
other traffic control points (gates, branches, switches, stops, transshipments, barrier posts, traffic control points according to the regulation ŽSR Z1 and others)	704	pcs

### ***Liberalization of the railway market***

The rail transport market is liberalized. There are several railway carriers operating in the territory of the Slovak Republic (hereinafter referred to as the “SR”), which provide services in both passenger and freight transport.

*Carriers operating in passenger rail transport include:*

#### **Ariva Service, s. r. o.**

Ariva Service focuses on long-distance and regional rail transport. Its aim is to contribute to the liberalization of rail passenger transport.

#### **LEO Express, a. s.**

LEO Express, a. s. is a private carrier providing passenger transport. The first operation was launched at the end of 2012 and is currently operating in 4 different countries. In addition to passenger transport, it also provides additional services such as rental of headphones and board games, daily newspapers and free WiFi connection.

#### **RegioJet, a. s.**

The railway company RegioJet provides regular passenger rail transport on routes in Slovakia and the Czech Republic. In the Slovak Republic, it performs transport on the route Bratislava - Žilina and Bratislava - Komárno. Free daily newspapers, magazines and drinks are offered to each passenger. Customers can borrow headphones and connect to the entertainment portal

for free, where movies, series, e-books and games are prepared for them. WiFi is freely available on the trains.

### **Železničná spoločnosť Slovensko, a. s. (hereinafter referred to as "ZSSK")**

ZSSK is the largest passenger railway carrier in Slovakia, operating an average of 1,518 trains per day, of which 226 long-distance trains and 1,292 regional and suburban connections. It stops at 713 stations and stops, runs on 2,909 kilometres of lines in all regions of Slovakia. ZSSK is a leader in the provision of passenger rail transport services and a member of important European and world institutions.

### **Wagon Service Travel, s. r. o.**

The company Wagon Service Travel, s.r.o. is a private transport company dealing with passenger transport, which has been offering specialized railway transport, special and tourist trains on the Slovak as well as on the European market for 20 years. The company owns bed wagons of the Bcmh, Bvcnz, Bvcmbz type and air-conditioned bed wagons of the WLABmee type, which it leases to the companies ZSSK and České dráhy.

*The largest freight rail transport carriers are:*

### **ZSSK Cargo, a. s.**

The main business activity of Železničná spoločnosť Cargo Slovakia, a. s. is the provision of transport-shipping services in rail freight transport. In addition to additional services directly related to the implementation of freight and combined transport, the company, as its second main product, provides services related to the rental of rolling stock, their maintenance and repairs.

### **Express Group, a. s.**

As a private rail carrier, it provides comprehensive services in freight rail transport on the territory of the Slovak Republic and the Czech Republic, ensures the operation of transport on national and regional railways, including border crossing stations and on railway sidings, including the performance of handling activities.

### **Lokorail, a. s.**

The enterprise is a transport-shipping company, whose main activity is the provision of transport services on national railways and the operation of sidings and transport on sidings. For its customers, the company can provide the long-term rental of commonly used freight wagons.

### **LTE Logistik a Transport Slovakia, a. s.**

The enterprise focuses on the transport of various kinds of commodities both at home and abroad, and also on logistics. It carries out its activities on the basis of a valid license. It owns more than 30 electric and diesel locomotives.

**Metrans, a. s.**

The enterprise engaged mainly in intermodal transport. It uses innovative modern technologies. It provides logistics between ports and terminals of combined transport, repairs and maintenance of locomotives, and so on.

## Current status

The operation and management of rail transport is ensured by procedures and equipment enabling the smooth operation of the various structural subsystems during normal and emergency operation, including train composition and control, traffic planning and management. The aim of traffic management is to ensure a smooth course and reduce transport costs while maintaining the required level of services and adherence to transport time.

The railway traffic management system is a part of the automated traffic management system with the possibility of connection to the railway administration management systems of neighbouring countries. Automated system means the management of activities related to data collection and processing and activities in making optimal decisions in the management process using information technology. In terms of methods, railway traffic management is based on respecting the information and energy links of a complex system. When dividing automated control into individual subsystems of this type of transport, it is necessary to respect the characteristics of this complex technological process:

- centralization of management with a precise definition of functions of individual components in the hierarchical structure,
- relatively large distances of technological places of the transport process to control nodes,
- large number of control objects, continuous operation,
- the necessary participation of man in the management process,
- time delay of information necessary for operational management of operational work.

Rail traffic management is divided into subsystems of the main activity as follows:

- automation of transport work management in the field of freight transport,
- creation of complex subsystems of automated control and their links to lower level subsystems,
- automation of the work control system of sorting stations,
- automated subsystem of record-keeping of railway vehicles with the possibility of reading data from oncoming vehicles,
- creation of an automated information system for the operational management of railway traffic at important nodes,
- automated subsystem of booking and sale of tickets in domestic and international transport.

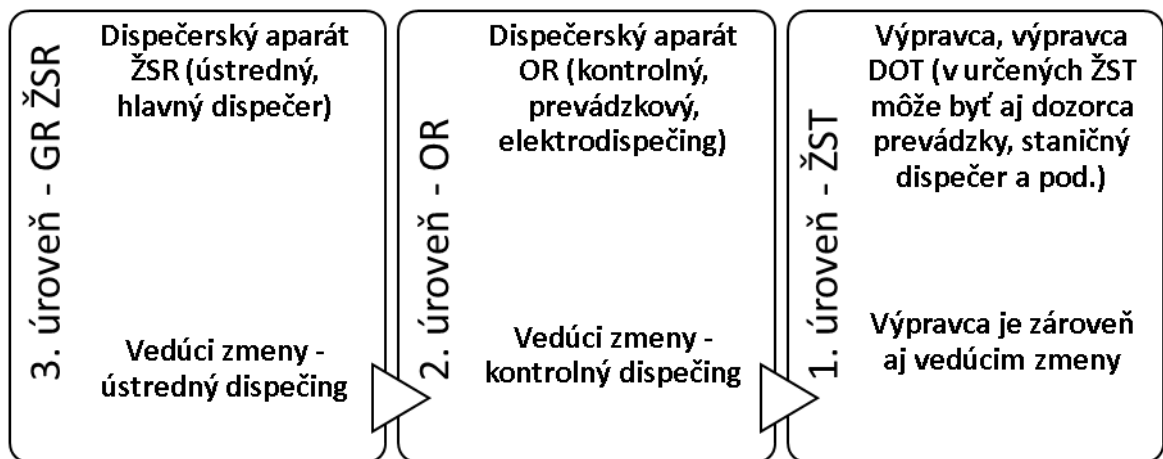
All activities related to the collection, transmission and distribution of data must be ensured by the railway communication network through its technical and software means.



Reliable flow of up-to-date information is a basic condition for the functioning and efficiency of any automated control system.

### ***Železnice Slovenskej republiky (Slovak Railways)***

The management and organization of traffic on the railways of the Railways of the Slovak Republic (hereinafter referred to as "ŽSR") is provided at three levels. In the designated district and shift, only one responsible ŽSR employee is responsible for the management and organization of traffic – the shift manager. The following diagram describes the management and organization of traffic on the track.



A record is kept of the performance of individual activities, which is archived in accordance with applicable regulations. The record is kept in writing in the Traffic Log, written orders, etc. or by means of communication and information systems (hereinafter referred to as "CIS"). Manuals have been issued for individual CIS ensuring the correct way of their operation, data entry, as well as control and responsibility for correct operation, e.g.:

- Train dispatching system (TDS) - used to monitor and evaluate the operation of trains, closures, etc.
- Operational information system (OIS) - serves for the basic activities of ŽSR in real time - planning, operation and management of train traffic, ordering routes, management and evaluation of transport processes (train traffic chart), etc.
- Electronic traffic log (EDD) - serves for keeping traffic documentation.
- REVOC (call recording) - allows you to record employees' calls.
- Integrated control and information system (ILTIS) - designed to operate a SIMIS W type switchgear.

- Integrated control system AŽD, Prague s. r. o. (ESA 11) - designed to operate electronic station security device.
- Voice and Visual Passenger Information System (HAVIS) - provides information for passengers.

Individual requirements of the TSI are implemented in the operational ŽSR. The operating regulations of ŽSR, as well as the national legislation of the Slovak Republic (hereinafter referred to as "SR") are not in conflict with the requirements arising from the TSI. The implementation of the requirements of the TSI is ensured to the greatest extent possible, as well as by "cleaning" and updating the national rules in accordance with the newly adopted TSIs.

ŽSR has created and updated the following regulations to ensure operation:

### **Z 1 "Rules of Railway Operation"**

These are operating regulations by which ŽSR determines the method, conditions and technological procedures for activities in the operation of the railway. They contain basic provisions for the performance of transport activities on railways administered by ŽSR.

### **Z 3 "Professional Competence at ŽSR"**

The regulation determines the conditions for acquiring, maintaining and verifying professional competence in accordance with Act No. 513/2009 Coll. on Railways and on Amendments to Certain Acts, as amended, and Act No. 514/2009 Coll. on Transport on Railways, as amended.

### **Z 4 "Assessment of Psychological Competence"**

The regulation contains provisions on the assessment of psychological competence, in particular the conditions and requirements for the assessment of psychological competence; the range of persons subject to the competence assessment; the scope and procedure of the assessment.

### **Z 10 "Rules for the Technical Operation of Railway Infrastructure"**

The rules stipulate the basic parameters of railway infrastructure constructions and equipment of main and secondary lines and special tracks administered by ŽSR, address the administration, operation, technical and safety requirements of railway infrastructure constructions and equipment in the application of ŽSR laws, decrees and conditions.

## **Z 14 "Rules of Operational Communication"**

The regulation regulates the rules for the use of communication and telecommunication equipment, and with the basic types of electronic communication in the conditions of ŽSR:

### **ZS 1 "Operation of Security Devices",**

The regulation determines the operational and technical conditions for the operation, service, operational treatment, control activities and maintenance of security devices on the ŽSR railway network.

### **DP 2 "Operational Information System" (hereinafter referred to as "OIS")**

The regulation stipulates the principles of entering data into the OIS, the procedure for OIS failures, the interconnection of data of individual databases and OIS applications, the interconnection of OIS with information systems of carriers, responsibilities of individual participating employees and organizational units, etc., the interconnection to extensions of Electronic Security Systems security equipment and Information and control Graphics and Technological Extension of security device and the Information and Control System for local or remote operation of switchgear.

### **DP 3 "Operational Traffic Management at ŽSR"**

The regulation determines the principles of operational traffic management at all levels of management.

### **DP 6 "Creation of Track Route Tables"**

The regulation sets out the principles for the elaboration of Track Route Tables (hereinafter referred to as "TRT"). TRTs are a tool that consists of the description and marking of parts of the track (stations and adjacent line sections) and technical-operational data crucial for the safe operation of traffic on the track.

### **DP 8 "Creation of Train Traffic Chart Aids"**

The regulation is valid on all railway lines that are under the administration of ŽSR. It supplements and clarifies the provisions of the basic regulations of ŽSR concerning the configuration of the train traffic chart.

## **V 65 "Regulation for the operation of hot running"**

The regulation determines the conditions for the operation of the indicator, the obligations of employees of individual components of ŽSR participating in the operation of the indicator, the provisions for control activities.

### ***Železničná spoločnosť Slovensko, a. s.***

The largest operator of rail passenger transport is the national carrier Železničná spoločnosť Slovensko, a.s. (hereinafter referred to as "ZSSK")

ZSSK provides effective traffic management, which is focused on customers of rail passenger transport. Operational management is carried out by means of the ZSSK dispatching apparatus, the basic task of which is to ensure the smooth implementation of transport and operation of regular passenger trains and in accordance with the valid timetable, as well as special trains introduced at the request of ZSSK. The ZSSK dispatching apparatus records all deficiencies in the violation of the regularity of the train traffic chart, which are being investigated as operational deviations.

ZSSK's internal regulations for ensuring the operation of transport on the railway determine the technological procedures for the activities of operational employees.

ZSSK has created and updated the following regulations to ensure operation:

### **ZSSK Regulation D 17 "Regulation for reporting, record-keeping, finding out the causes of accidents and extraordinary events"**

The regulation lays down the basic provisions on accidents and extraordinary events arising during the operation of rail transport on railways. It determines the detailed category, the method of determining causes of accidents and extraordinary events, determines the method of their reporting and record-keeping in order to take measures to prevent their occurrence. ZSSK is obliged to ensure the objectivity, expertise and independence of determining the causes of their origin.

### **ZSSK Regulation V 2 "Performance of the engine-driver's activity"**

The Regulation lays down the basic provisions for the performance of the service of employees in the capacity of engine-driver for rail vehicle (hereinafter referred to as "RV") and engine-driver in training or initial training. It lays down work procedures that are related to his work activities and the management of RV.

### **ZSSK Regulation V 3 "Performance of the activities of engine-driver - instructor"**

The regulation sets out the rights, obligations, responsibilities and conditions for the performance of the activities of engine-driver - instructor.

### **ZSSK Regulation V 8 "Operation and service of speedometers"**

The regulation regulates the basic provisions on the operation and service of speedometers at RV.

### **ZSSK Regulation V 10 "Performance of transport activities of accompanying personnel"**

The regulation regulates the basic provisions for the performance of the service of employees in the position of engine-driver, the scope of operational and transport duties of accompanying personnel.

### **ZSSK Regulation V 11 "Performance of the activity of engine-driver - instructor"**

The regulation sets out the rights, obligations, responsibilities and conditions for the performance of the activities of engine-driver - instructor.

### **ZSSK Regulation V 15 "Operation and service of braking equipment of rail vehicles"**

The regulation regulates the basic provisions on the operation and service of RV braking devices on tracks. The individual provisions are derived from the UIC Decree, the railway traffic regulations and supplemented by other internal instructions to ensure activities for the operation of transport. The regulation is binding on all ZSSK employees who perform activities on the railway to the extent specified in the relevant professional examination and other legal and natural persons who, on the basis of a contractual relationship with ZSSK, perform work or other activities for ZSSK, as a result of which traffic and transport are affected.

### **ZSSK Regulation Z 7 "Ensuring operation in winter conditions"**

The regulation lays down the basic provisions for the manner of ensuring the operation of the carrier and the operator in winter conditions. The regulation is binding on ZSSK employees at all organizational levels, whose job classification and job content are related to the preparation and provision of operation in winter conditions.

### **Regulation "Local Labour and Safety Regulations for RV Electrical Traction"**

The regulation sets out the basic provisions for the performance of the service of the engine-driver and other authorized staff (e.g. persons taking over RVs, control staff) on or near electrical RV and electrical units located under or near the traction line. It determines the binding procedures before entering the engine room even if the RV is on the track without traction line.

### **Regulation - "Local Labour and Safety Regulations for RV Motor Traction"**

The regulation regulates the basic provisions for the performance of the engine-driver's service on motor locomotives, motor wagons, control wagons and motor units. They obligatorily determine the work activities that need to be performed for entrances to the RV engine room, work procedures for operation and work on electrical equipment (activities related to operation, fuse replacement, inspection) and repairs of RV (electrical equipment troubleshooting), scope of permitted activities on RV electrical equipment and other procedures for the service and operation of electrical equipment as part of the performance of the engine-driver's service.

### **Technological procedure "Additional provisions for the departure of ZSSK trains and the procedure for extraordinary crossing of stops"**

The technological procedure sets out the carrier's procedures for increasing safety for the departure of ZSSK trains with the transport of passengers after an emergency stop, after a stop for the embarkation and disembarkation of passengers and determining the conditions for extraordinary passage of trains through stops with a permitted request stop.

### **Technological procedure "Shift of ZSSK employees in the district of ŽSR railway stations"**

The technological procedure defines the scope, procedure and type of activities for ensuring the shift of ZSSK employees in the district of ŽSR railway stations for trains operated by ZSSK.

### **Measure "To ensure a change in the way trains are dispatched by using a signalling device when giving daily signals"**

The measure regulates the use of a signal aid when giving the daily Signal 113 "*Ready for departure*" and the daily Signal 114 "*Approval for departure*".

## **Directive "Operational Traffic Management"**

The directive sets out the principles of operational management of operation within ZSSK, the principles of cooperation with ŽSR, Železničná spoločnosť Cargo Slovakia, neighbouring railways and foreign carriers.

## Conclusion

Interoperability is an essential prerequisite for the functioning of the integrated trans-European rail system. Interoperability means the ability of this system to allow the safe and uninterrupted movement of trains of different carriers that meet the basic parameters established for these selected tracks. To achieve this goal, all regulatory, technical and operational conditions set out in the relevant European Union directives and regulations must be met.

The reasons why interoperability is needed are mainly of a security, economic and commercial nature. The competitiveness of the rail system currently depends on differences between Member States in terms of material, technology, signals, safety rules, braking systems, traction current and speed limits. International trains that cross many states are forced to stop at the border crossing points of neighbouring states in this situation where there are systemic differences.

Interoperability is one of the absolutely essential factors for the revival of rail transport and the consistent balancing of the transport market. Thanks to the interoperability and construction of the rail sector, which is legally and technically integrated and commercially competitive, the objective of reducing road congestion, while reducing pollution and clear environmental benefits, becomes real.

The Slovak Republic intensively deals with the issue of interoperability and emphasizes it in the modernization of rail transport, but also its transposition and implementation into national legislation. The fulfilment of the requirements resulting from the TSI is the basis for enhancing the quality, availability and unification of the European rail system.

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