

Annex "F"**Train Radio Devices****1 Basic and substitute railway radio communication, emergency communication**

1.1 Train radio devices¹⁾ on railways operated by SŽDC are used as a basic or substitute radio communication or emergency communication.

1.2 Basic radio communication is a radio communication that allows a full-fledged voice communication between the conductor and the dispatcher²⁾, between conductors and also data communication between mobile and fixed radio devices (working on an unmanned basis, as the case may be) in a prescribed quality on routes equipped with relevant radio infrastructure³⁾.

1.3. Substitute radio communication is a radio communication that allows the driver to communicate with the dispatcher in the area controlled by the driver. Only specified types of radio equipment may be used for substitute radio communication. The type of radio communication to be used as a substitute radio communication shall be determined by the railway operator individually for each route, taking into account the level of coverage of the relevant radio sections of the track by a usable signal. The substitute radio communication must not be permanently used instead of the basic radio communication.

1.4. Emergency track link means any voice link, including an emergency radio link, which allows the driver to communicate with the dispatcher of the relevant control area in the event of a breakdown or abnormality during the driving or special driving vehicle (hereinafter referred to as "traction vehicle"); this only until the vehicle arrives at the destination train station. Emergency voice communication must never be used as a permanent replacement for basic or substitute radio communication. When using emergency communication, the maximum train speed is limited to 100 km/h.

1.5 Table 01 TTP is the relevant document identifying the current train radio device used as basic or substitute radio communication or, the emergency communication on individual lines equipped with the relevant infrastructure. For convenience, the equipment of individual lines with specific train radio device is also listed in the Network Statement, map M10.

1.6 Technical specifications of train radio devices and the principles for their implementation on railways operated by SŽDC are set out in the *"SŽDC Directive No 35 setting technical specifications for radio equipment units and principles of their preparation and implementation on the infrastructure owned by the state,"* as amended.

¹⁾ See Section 71 of Decree No. 173/1995 Coll., which issues the Railways Traffic Rules.

²⁾ The term "dispatcher" is used in the text as a common name for employees with professional competence in organising and managing rail transport. If there is a need to clearly define the employees, definitions according to SŽDC Code D1 are used.

³⁾ For GSM-R defined by UIC EIRENE, Functional Requirements Specification (FRS) version 7.3.0, March 2012, and System Requirements Specification (SRS) version 15.3.0, March 2012 (at the time of issue of this Statement), for TRS determined by UIC Recommendation No. 751-3.

2 Used Train Radio Devices

2.1 Mobile Radio Network in Gsm-R System

Operator	Mobile Terminal Network Presentation
Správa železniční dopravní cesty, státní organizace	GSM-R CZ

2.1.1 The GSM-R system provides voice communication and data transmission between mobile devices (dispatching terminals, automated data radio devices etc.) and fixed stations (dispatcher stations, workplaces by station dispatchers, etc.) and communication to other electronic communication networks (railway telephone network, public fixed or mobile networks, etc.).

2.1.2 The GSM-R system operates in the 900 MHz frequency band and is based on the GSM public mobile telephone network standard with additional specific railway functions according to UIC that are part of the EIRENE technical documentation. The system is interoperable as part of the Control-Command and Signalling subsystem, Class A ⁴⁾.

2.1.3 On the SŽDC website www.szdc.cz, the link "Radio Networks", the following is to be found:

- general operating and business conditions of non-public electronic communication services provided in the non-public mobile telephone network GSM-R SŽDC,
- procedure for ordering, issuing and verifying SIM cards,
- a list of mobile terminals approved for use on railways owned by the Czech Republic and their operation in the GSM-R system,

as well as other operational and organisational information.

2.1.4 Lines equipped with GSM-R system are indicated using signals "Prepare a GSM-R radio device for registration"⁵⁾ which is usually located close to the entry warning signal of the operating control point equipped with GSM-R system using the signal "Change of the radio system"⁶⁾, which is placed at the point where the GSM-R radio equipment is to be registered and also on national borders. At the branches of lines equipped with a GSM-R system that are not equipped with another track radio system (TRS systems or SRV radio network) are indicated using the signal "End of GSM-R radio system"⁷⁾.

2.1.5 The envisaged procedure for the construction of GSM-R system is published on SŽDC website SŽDC – www.szdc.cz, link "Radio Networks".

2.1.6 On some lines, the so-called national roaming on a public GSM mobile network of an operator may be used to connect mobile devices (equipped with GSM-R terminals) with fixed stations. In such a case, adequate and reliable coverage of the operating control points and lines with radio signal is not guaranteed and some functions of GSM-R system may not be

⁴⁾ Decree No. 352/2004 Coll., on the operational and technical interconnection of the European railway system; Directive 2008/57/EC of the European Parliament and of the Council on the interoperability of the rail system within the Community and the technical specification for the interoperability constituents of the Control-Command and Signalling subsystem according to Commission Decision 2006/679/EC, as amended by Decisions 2006/860/EC, 2007/153/EC, 2008/386/EC, 2010/79/EC and 2012/88/EC.

⁵⁾ See Article 1233 of SŽDC Internal Regulation D1 "the Transport and Signalling Regulation".

⁶⁾ See Article 1234 of SŽDC Internal Regulation D1 "the Transport and Signalling Regulation" and also SŽDC (ČD) Internal Regulation Z11 „Radio Device Operation Regulation" including related Amending provisions.

⁷⁾ See Article 1235 of SŽDC Internal Regulation D1 "the Transport and Signalling Regulation".

available, in particular the emergency call (REC – *Railway Emergency Call*), *Group Call* and *LDA (Location Depending Addressing)*.

2.1.7 List of foreign operators of GSM-R systems with which agreements on network interconnection and international roaming are concluded at the date of issue of this Statement:

<i>Serial No.</i>	<i>Operator</i>	<i>Network indication at the terminal</i>		
1.	Deutsche Bahn AG, DB-Netz, Germany	GSM-R D	or	262-10
2.	Österreichische Bundesbahnen, Austria	GSM-R A		232-91
3.	ProRail, Netherlands	GSM-R NL		204-21
4.	Železnice Slovenskej republiky, Slovakia*)	GSM-R SK		231-99
5.	Hungarian Railways MÁV, Hungary *)	GSM-R HU		216-99
*) As of the day of publication				

The current list of roaming partners can be found on SŽDC website – www.szdc.cz, link "Radio Networks".

2.1.8 The national application "STOP function in the GSM-R system" is implemented in the infrastructure part of the GSM-R CZ radio network in accordance with the Technical specification of SŽDC No. TS 3/2014-S enabling the railway servicing personnel to activate remote stopping of traction vehicles in the selected area, whose vehicle radio stations are interconnected via a locomotive adapter with a brake system and are equipped with a SIM card of the GSM-R CZ radio network. In the case that a vehicle radio is registered in a public GSM mobile telephone network of an operator within national roaming (see 2.1.6), the use of the "STOP function in the GSM-R system" is not possible.

2.2 Track Radio System

2.2.1 The TRS-Tesla system provides voice communication of track dispatcher, dispatcher, employee of the carrier or other persons involved in control and organisation of rail transport and its operation with the engine driver of the traction vehicle as well as the transmission of coded information (commands, reports).

2.2.2 The TRS-Tesla system respects the essential functions resulting from the relevant provisions of UIC Recommendation 751–3 and operates in the 450 MHz frequency band. The system is interoperable as part of the Control-Command and Signalling Subsystem, Class B⁴⁾.

2.2.3 The TRS-Tesla system channel groups used on the track are indicated using a signal "Switch Channel Group"⁸⁾ that is placed at the location where the vehicle radio station is operated to change the channel group used or to change the radio system from GSM-R to TRS-Tesla. Branches of lines equipped with a TRS-Tesla system that are not equipped with

⁸⁾ See Article 1232 of SŽDC Internal Regulation D1 "the Transport and Signalling Regulation".

another track radio system (GSM-R systems or SRV radio network) are indicated using the signal "End of the radio system"⁹⁾.

2.2.4 On the SŽDC web site www.szdc.cz, link "Radio Networks", there is list of vehicle radios for which permission has been given to use the product on a railway owned by the Czech Republic and their operation in the TRS-Tesla system. Appropriate radio stations, including documentation of their installation into existing vehicles, are subject to approval as a change to a rail vehicle.

2.2.5 The TRS-Tesla vehicle radio can also be equipped for 150 MHz radio communications (for radio operation on other lines or local radio networks).

2.2.6 The TRS-Tesla system may be built on other routes if necessary (e.g. implementation of the remote control of a safety device, etc.) or just temporarily (until the GSM-R network is established) – Relevant notification including the effective date will be published by SŽDC on the Infrastructure Operation Portal six months before the respective date.

2.3 Simplex Communication in the 150 Mhz Band

2.3.1 The system of simplex communication in line and local radio networks in the 150 MHz band (so-called SRV radio network) ensures the radio communication of the dispatcher with the engine driver of the traction vehicle within the range of the base radio station located in the respective operating control point and the communication of the engine driver with other employees involved in the operation of railway transport. The system is not interoperable.

2.3.2. The system provides coverage of operating control points equipped with radio signal, the coverage of other track sections is not guaranteed.

2.3.3 The following radio stations are used in the railway infrastructure:

- selective voice-frequency calling for train → station dispatcher direction and voice calls towards train, or
- voice calls of any participant.

2.3.4 Simplex frequencies used on the line are indicated using the signal "Switch Channel Group"⁸⁾. Branches of lines equipped with the SRV system that are not equipped with another track radio system (GSM-R or TRS-Tesla systems) are indicated using the signal "End of the radio system"⁹⁾.

2.3.5 Simplex communication systems in the 150 MHz band are newly set up for rail traffic control on the respective route only exceptionally and only in justified cases.

2.3.6 In the railway operation, local 150 MHz simplex radio networks are also used to control certain technological processes (shunting control, vehicle inventory, wagon examination, track maintenance and repairs, etc.). This communication is indicated here for the sake of completeness and is established as required either by the railway operator or by the individual rail transport operators.

2.3.7 Radio equipment in the 150 MHz band operating at a 25 kHz channel spacing may not be used in the Czech Republic.

⁹⁾ See Article 1235 of SŽDC Internal Regulation D1 "the Transport and Signalling Regulation".

3 Track Access Conditions

3.1. Traction and control vehicles (hereinafter referred to as "traction vehicles") that are being moved on a track equipped with an infrastructure part of a train radio system (GSM-R system, TRS-Tesla system or SRV radio network) shall be equipped with a terminal enabling basic radio communication both for voice communication between the engine driver and persons involved in the control and organisation of rail transport, as well as for the bi-directional transmission of relevant signals, commands, messages or data between the railway infrastructure and the traction vehicles, i.e. a fully compatible and cooperative terminal while on track and in traffic of all functions with the infrastructure part of the train radio equipment used.

3.2 On lines where rail transport is organised and controlled according to SŽDC Regulation D4 and on which a specific technical facility (hereinafter referred to as "radio-block"¹⁰) is installed, the traction vehicles must be equipped with a terminal ensuring full communication and cooperation of the traction vehicle with the radio block from the date of putting the radio block into permanent operation.

3.3 If a mobile phone (GSM-R radio network) or a portable radio (TRS-Tesla or SRV radio systems) are temporarily used on a traction vehicle (SHV) as a terminal, such a terminal must be connected to a fixed external antenna of the traction vehicle, the main power supply must be provided from the recharged on-board battery of the traction vehicle and the terminal must operate at a high-frequency power of 8 W in the GSM-R system, 5 to 10 W in TRS-Tesla or SRV radio networks, respectively. Without a communication to a fixed external antenna and a main HV (SHV) power supply, the GSM-R mobile phone is considered to be an emergency radio communication only (see Decree No. 173/1995 Coll., Section 71(4)).

3.4 A traction vehicle (SHV) whose radio equipment does not allow basic radio communication on the route where the vehicle is being moved (e.g. due to equipment failure, infrastructure repairs, the lack of equipment due to an exceptional event etc.) must be provided with a means of enabling substitute radio communication (if set up) or emergency communication.

3.5 If basic radio communication cannot be established from the traction vehicle (SHV), the driver must inform the relevant dispatcher (operating or conducting, as specified in the Rules of Operation of the respective radio network) before entering the controlled area (intermediate station section) with the extent of the existing train communication possibilities (PMD). The dispatcher determines (if established) the method of radio communication by means of substitute radio communication. The dispatcher (operating or conducting) will notify persons involved in the management and organisation of rail transport that are affected by this issue of the designated method of radio communication. In the case of a substitute radio communication, dispatchers, station dispatchers, and engine drivers also use call signs assigned to the used substitute radio communication.

3.6 If the traction vehicle (SHV) does not meet conditions for substitute radio communication, it must not be transported into the controlled area (intermediate station section) equipped with the train radio infrastructure. In the event of a sudden loss of functionality of the basic or substitute radio communication when these are used on the train (PMD), the engine driver must immediately inform the relevant traffic control officer who

¹⁰ **Radio block** is a technical device enabling the control of train traffic in the defined area, in the form of authenticated driving permissions, transmitted to traction and control vehicles via radio network with data transmission and subsequent control of the movement of these vehicles according to the issued permissions.

controls the section where the train (PMD) is located and initiate negotiation of the conditions for further movement of the train according to Article 1.4. POD or this article.¹¹⁾

3.7 Special traction vehicles use basic radio communication according to the route where the train is moved at the time of entry into the transport mode "train or PMD" for communication to the dispatcher. If the design of the special traction vehicle does not allow the vehicle part of the applicable radio system to be used on the line, a substitute communication (see Art. 3.5) may be used for the communication with the dispatcher, subject to the prior consent of the dispatcher.

3.8. Provisions of article 3.1. do not apply for the purpose of radio communication of historical traction vehicles and historic special traction vehicles which will be used for the movement of exceptional historic or nostalgic trains for the purpose of celebrations, anniversaries or promotions of rail transport and the associated movement of the train to/from such events, to/from repair shops or to/from depot. Such a vehicle, however, or train set must always be equipped with at least an emergency communication for communication between the dispatcher and the engine driver or with members of the train crew. The mode of communication or the calling numbers shall be indicated by the carrier in the application for railway capacity allocation or in the system application of the railway operator for these movements and access to these applications must be provided to operation control and railway transport organisation employees.

3.9 Contrary to Art. 3.1, the implementation of the "Function STOP in the GSM-R system" according to Art. 2.1.8 on traction vehicles is not a condition for access to the infrastructure operated by SŽDC; its use is regulated by relevant Operation Rules.

4 Consent for product use on railway infrastructure operated by Správa železniční dopravní cesty, státní organizace

4.1 The use of operating terminals of train radio devices must be approved by SŽDC in a form of a consent for product use on railway infrastructure operated by Správa železniční dopravní cesty, státní organizace.

4.2 The authorisation procedure is governed by the SŽDC Directive No. 34 for initiating operation of products that are part of communication and signalling systems and electrical and power systems on railway infrastructure owned by the state as published on the Infrastructure Operation Portal.

4.3 The requirement for issuing the consent for product use as stated in paragraph 1 of this article shall not apply to GSM-R mobile terminals if they are properly put into operation in accordance with applicable statutory provisions.

5 Final Provisions

5.1 On lines not equipped with any infrastructure part of the train radio device at the date of issue of this Network Statement, the specific date for commencement of routine operation (after the equipment of the line is finished) will be published on the Infrastructure Operation Portal six months in advance.

¹¹ The engine driver's duties are stipulated by: EU Directive – TSI 995, Annex B, Article 8 and Act No. 266/1995 Coll., as amended, Article 49b(4).

5.2 On lines where the infrastructure part of the train radio device is to be changed, the specific end date for the operation of the original train radio device will be published on the Infrastructure Operation Portal six months in advance.

5.3 On lines where existing radio device is replaced by the new GSM-R digital system, both radio systems shall be operated simultaneously (where possible) for a maximum of **two months** from the date of initiation of GSM-R system operation. In such a case, the obligation set out by Art. 3.1 applies accordingly, i.e. traction vehicles must be equipped for a transition period with a vehicle terminal fully compatible at least with one of the systems in use.

5.4 On border lines, where the GSM-R system is built on the SŽDC side and such a system is not established on the other side, SHV traction vehicles and control vehicles registered abroad may only be equipped for communication on the SŽDC network contrary to paragraph 3.1 by a portable GSM-R terminal not meeting the conditions set out in Art. 3.3. Such a portable terminal is, in accordance with Decree No. No. 173/1995 Coll., §71, paragraph 4, always considered only as an emergency radio connection. This derogation applies only to movements between the state border and the first station in the SŽDC network. Operational and organisational matters are regulated by "the International Border Arrangements" and also by GSM-Operational regulations, the relevant Rules of Operation for the SRD-TRS Tesla radio network and regulation of the the respective operating control points.