



Annexe “C”

RAIL LINE RADIO SYSTEMS

I. BASIC TERMS

- 1. Basic radio connection** is a radio connection which allows, on a line equipped by appropriate radio infrastructure, full communication (both voice and data) of stipulated quality¹) between the engine driver and the dispatcher or between automated on-board and fixed radio devices.
- 2. Alternative radio connection** is a radio connection which must allow establishing radio connection between the engine driver and the dispatcher from any place within the area controlled by the dispatcher. For alternative radio connection, only stipulated types of radio devices can be used. The kind and type of the radio device stipulated as alternative radio connection is set by the railway operator individually for particular lines with regard to the level of coverage of relevant radio line sections with usable signal. The alternative radio connection must not be used permanently instead of the basic radio connection.
- 3. Remote control of control and blocking equipment** (further referenced to as “RCS”) is, for the purposes of this Network Statement, a set of technical devices allowing operation of control and blocking equipment that ensures safe movement of rail vehicles in real-time at several stations and inter-station sections and indication of their status at a service workplace.

II. LINE RADIO SYSTEMS USED

1. On national and regional networks operated by RIA, following line radio systems are used:
- 2. Mobile telephone network GSM-R**

Operator	Network identification	MCC - MNC
Railway Infrastructure Administration, state organization	GSM-R CZ	230-98

- 2.1.** The mobile telephone network GSM-R (further referenced to as “GSM-R network”) ensures radio connection and data transfer between moving terminals (on-board radio stations - so-called cab radio, mobile phones etc.) and fixed stations (dispatcher terminals, workplaces of train dispatchers etc.) and connection with other networks of electronic communication (railway telephone network, public telephone or mobile phone networks etc.). The system works in the frequency band of 900 MHz and is based on the GSM standard enhanced, according to the UIC project, by other railway-specific functionalities included in the technical documentation EIRENE.
- 2.2.** The system is interoperable, being part of the control and safety subsystem, class A²).

¹ For GSM-R, this is set by the project UIC EIRENE, by specification of function requirements (FRS, version 7.0, March 2006) and by specification of system requirements (SRS, version 15.0, March 2006). For TRS, this is set by recommendation of UIC no. 751-3.

² Regulation no. 352/2004 Coll., On Operational and Technical Interconnectivity of European Railway System; Directive 2001/16/EC of the European Parliament and Council, On Interoperability of Trans-European Conventional Railway System, annex "Technical Specifications for Interoperability, subsystem "Control and Command Systems".



2.3. List of line sections with the basic radio connection ensured by the GSM-R network:

Line #	Line section [BOLD - lines with remote-controlled control and blocking equipment – RCC*)]	
320	Lanžhot, state border – Břeclav – Brno, main station; Břeclav, state border – Břeclav	
324	Brno, main station – Brno Maloměřice	
326	Brno Maloměřice – Česká Třebová	
501	Česká Třebová – Pardubice – Kolín	
501	Kolín – Praha-Libeň	
525/526	Praha-Libeň – Praha-Bubeneč	
	Praha-Libeň – Praha Masarykovo n. – Praha-Holešovice-Stromovka	
	Praha-Vysočany – Praha, main station	
	Praha-Libeň – výh. Praha-Vítkov	
527	Praha-Bubeneč – Kralupy nad Vltavou – Děčín, main station	
544	Děčín, main station – Dolní Žleb, state border	
	Děčín východ – Prostřední Žleb	
545	Děčín, main station – Děčín východ	
Připravované úseky [BOLD - lines with remote-controlled control and blocking equipment – RCC*)]		
301	Bohumín – Dětmarovice – Petrovice u Karviné, state border	2010 **)
305	Přerov – Polanka nad Odrou – Bohumín; Bohumín/Bohumín-Vrbice – Bohumín, state border	
316	Břeclav – Přerov	
301	Dětmarovice – Mosty u Jablunkova, state border; Odb. Závada – Odb. Koukolná;	
	Ostrava-Svinov – Ostrava-Kunčice – Český Těšín; passing loop Polanka nad	
	Odrou – branch Odra; Český Těšín – Český Těšín, state border	
302	Ostrava, main station – Ostrava-Kunčice	
305	Passing loop Dluhonice – Prosenice	
307	Ostrava-Svinov – Opava East	
309	Česká Třebová – Zábřeh na Moravě – Olomouc, main station – Přerov	
502	Kutná Hora, main station – Kolín – Nymburk – Lysá nad Labem; Nymburk – Poříčany	2011 **)
	Lysá nad Labem – Všetaty – Ústí nad Labem-Střekov – Děčín východ	
	Praha-Vysočany – Lysá nad Labem – Milovice	
	Děčín východ – Prostřední Žleb	
	Brno-Horní Heršpice – Brno dolní nádraží – Brno-Maloměřice	
324	Brno-Maloměřice – Havlíčkův Brod – Kutná Hora, main station	
521	Praha-Smíchov – Beroun	2012 **)
712	Plzeň, main station – Domažlice – Česká Kubice, state border	
713	Beroun – Zdice – Plzeň, main station	
720	Plzeň, main station – Cheb – Cheb, state border	
519	Praha-Hostivař – Benešov u Prahy	
704	Benešov u Prahy – Tábor – Veselí nad Lužnicí – České Budějovice	



706	České Budějovice – Horní Dvořiště, state border	2013 **)
706	Veselí nad Lužnicí – České Velenice, state border; České Budějovice – České Velenice	
709	České Budějovice – Strakonice – Plzeň, main station	
308	Hranice na Moravě – Valašské Meziříčí – Horní Lideč, state border	
315	Brno, main station – Nezamyslice – Přerov; Nezamyslice – Olomouc, main station; Blažovice – Holubice	
318	Brno, main station – Brno-Černovice - Blažovice	
503	Ústí nad Labem Střekov – Ústí nad Labem západ	2014 **)
504	Ústí nad Labem západ – Řetenice – Most nové n. – Chomutov; Ústí nad Labem západ – Úpořiny – Bílina	
533	Chomutov – Kadaň – Karlovy Vary – Cheb	
543	Cheb – Františkovy Lázně – Vojtanov, state border; Tršnice – Františkovy Lázně	
505	Velký Osek – Hradec Králové, main station – Týniště nad Orlicí – Choceň; Hradec Králové, main station – Pardubice, main station; Odb. Plačice – Opatovice nad Labem	
512	Ústí nad Orlicí – Letohrad – Lichov, state border	
513	Týniště nad Orlicí – Letohrad	
*) situation on the date December 31th, 2009 **) anticipated year of placing into operation		

- 2.4. Contractual terms of provision of services and using the GSM-R network, procedure of ordering, delivery and verification of SIM cards as well as business conditions are provided on RIA's website, www.szdc.cz, link "Operation of infrastructure / Radio networks / GSM-R network".
- 2.5. The Operation Code for the GSM-R network, obligatory for all users, is issued by RIA and made public on RIA's website, www.szdc.cz, link "Operation of infrastructure / Radio networks / GSM-R network".
- 2.6. List of moving terminals, for which the approval for usage on railway infrastructure owned by the Czech Republic and operation within the GSM-R network has been issued, is made public on RIA's website, www.szdc.cz, link "Operation of infrastructure / Radio networks / Approval for usage on railway infrastructure".
- 2.7. List of foreign GSM-R network operators with which roaming agreements have been concluded on the date of issuing of this Statement:

Order #	Operator	Network identification	MCC - MNC
1.	Deutsche Bahn AG, DB-Netz, Germany	DB-Tel.M	262-10
2.	Österreichische Bundesbahnen, Austria	GSM-R OBB	

Current status of roaming partners is provided on RIA's website www.szdc.cz, link "Operation of infrastructure / Radio networks / GSM-R network".

3. Line radio system – TRS

- 3.1. The system ensures radio connection between the dispatcher, train dispatcher, locomotive running foreman and eventually other workers involved in operation of railway transport with the engine driver of the hauling vehicle and transfer of routine



information (commands, reports). The system respects basic functions resulting from provisions in the recommendation UIC 751-3 and works within frequency band 450 MHz.

3.2. The system is interoperable, being part of the control and safety subsystem, class B³).

3.3. List of lines equipped with the TRS system:

Line # (according to SJŘ)	Line section [lines with remote-controlled control and blocking equipment – RCC*] <i>[ITALIC – lines with traffic control according to Regulation RIA (ČD) D3]</i>
301	Mosty u Jablunkova, state border – Bohumín; Petrovice u Karviné – Dětmorovice; branch Koukolná – branch Závada
302	Ostrava, main station – Valašské Meziříčí; Frýdlant nad Ostravicí – Ostravice
304	Valašské Meziříčí – Kojetín; Bylnice – Horní Lideč; Zborovice – Kroměříž
305/308	Bohumín – Polanka nad Odrou – Přerov ; Prosenice – passing loop Dluhonice; Horní Lideč – Hranice na Moravě
306	<i>Suchdol nad Odrou – Budišov nad Budišovkou; Suchdol nad Odrou – Fulnek; Suchdol nad Odrou – Nový Jičín město</i>
307/310	Ostrava-Svinov – Opava – Krnov ; Krnov – Olomouc, main station; <i>Bruntál – Malá Morávka</i>
309	Přerov – Olomouc – Česká Třebová
311/312	Krnov – Jindřichovice ve Slezsku – Mikulovice – Hanušovice – Olomouc; Šumperk – Bludov – Zábřeh na Moravě; Zlaté Hory – Mikulovice
314	<i>Lanškroun – Rudoltice v Čechách</i>
315	Olomouc, main station – Nezamyslice; Přerov – Brno, main station; Holubice – Blažovice
316	Přerov – Břeclav
317	Vlářský průsmyk – Staré Město u Uherského Hradiště; Luhačovice – Újezdec u Luhačovic; Kunovice – Veselí nad Moravou
318	Veselí nad Moravou – Brno, main station; Moravský Písek – Bzenec; Velká nad Veličkou – Veselí nad Moravou – Rohatec
320	Lanžhot, state border – Břeclav
322	Brno, main station – Okříšky – Jihlava, Znojmo – Šatov
323	<i>Střelice – Hrušovany nad Jevišovkou – Břeclav; Břeclav – Lednice</i>
324	Brno, main station – Kutná Hora, main station
502/524	Kutná Hora, main station – Lysá nad Labem – Praha-Vysočany; Nymburk, main station – Poříčany
503	Ústí nad Labem západ – Ústí nad Labem Střekov; Všetaty – Lysá nad Labem
504	Ústí nad Labem, main station – Řetenice – Most; Ústí nad Labem West – Úpořiny – Bílina; branch České Zlatníky – Obrnice; Most – Most, new station; Třebušice – Most, new station
505	Choceň – Týniště nad Orlicí – Velký Osek; Pardubice, main station – Jaroměř
506	Týniště nad Orlicí – Meziměstí; Václavice – Starkoč; <i>Meziměstí – Otovice, train stop</i>

³ Regulation no. 352/2004 Coll., On Operational and Technical Interconnectivity of European Railway System; Directive 2001/16/EC of the European Parliament and Council, On Interoperability of Trans-European Conventional Railway System, annex "Technical Specifications for Interoperability, subsystem "Control and Command Systems".



507	Svitavy – Žďárec u Skutče
508	Jaroměř – Stará Paka – Železný Brod – Turnov
509	Jaroměř – Trutnov, main station; Trutnov, main station – Svoboda nad Úpou
511	Hradec Králové, main station – Jičín – Turnov; <i>Hněvčeves – Smiřice</i>
512	Hanušovice – Ústí nad Orlicí
513	Letohrad – Týniště nad Orlicí
515	<i>Čáslav, local station – Třemošnice</i>
517	Prachovice – Přelouč
519	Benešov u Prahy – Praha, main station
521	Praha-Vršovice, shunting station – Praha-Radotín; Praha, main station – Praha-Smíchov – Beroun
524	Praha-Vysočany – Lysá nad Labem, Lysá nad Labem – Milovice
525/526	Prague connecting lines (Praha-Libeň – Praha, main station; Praha-Vysočany – Praha, main station – Praha-Smíchov; Praha ONJ – Praha-Vršovice – Praha, main station; Praha-Hostivař – Praha-Libeň – Praha-Vysočany; Praha-Běchovice – Praha-Vršovice – passing loop Praha-Vyšehrad)
527	Passing loop Ústí nad Labem South – Ústí nad Labem West
531	Žatec západ – Žatec – Obrnice; Žatec západ – Odb Velichov; Žatec – Chomutov
532	<i>Čelákovice – Neratovice</i>
533	Chomutov – Kadaň-Pruněrov – Karlovy Vary – Cheb
535	Oldřichov u Duchcova – Louka u Litvínova – Most/Třebošice
536	Karlovy Vary – Potůčky, Chodov – Nová Role
537	Praha-Vysočany – Turnov
540	Bakov nad Jizerou – Česká Lípa, main station
541	Nymburk, main station – Mladá Boleslav, main station
543	Cheb – Františkovy Lázně – Vojtanov; Tršnice – Františkovy Lázně
701	Veselí nad Lužnicí – Havlíčkův Brod
702	Tábor – Písek
703	Horní Cerekev – Tábor
704	České Budějovice – Benešov u Prahy
705	České Velenice – České Budějovice ; České Velenice – Veselí nad Lužnicí
706	Horní Dvořiště – České Budějovice
709	České Budějovice – Plzeň, main station
710	Janovice nad Úhlavou – Domažlice; Klatovy – Horažďovice sub.
711	Plzeň, main station – Klatovy – Železná Ruda-Alžbětín
712	(Plzeň, main station) – Plzeň-Jižní předměstí – Česká Kubice, state border; <i>Nýřany – Heřmanova Hut'</i>
713	Beroun – Plzeň, main station
714	<i>Rokycany – Nezvěstice; Chrást u Plzně – Radnice</i>
715	Zdice – Protivín; Putim – Ražice
716	<i>Rožmitál pod Třemšínem – Březnice; Březnice – Blatná – Strakonice; Nepomuk – Blatná</i>
719	Plzeň, main station – Žatec západ
720	Plzeň, main station – Cheb
	*) situation on the date December 31st, 2009



Current status of used channel group is indicated on individual lines by signals “Switch channel group” according to Art. 1022 of the regulation RIA (CD) D1.

- 3.4. The list of on-board terminals for which the approval for usage of the device on railway infrastructure owned by the Czech Republic and for its operating within the TRS system has been issued, is made public on RIA’s website, www.szdc.cz, link “Operation of infrastructure / Radio networks / Approval for usage on railway infrastructure”. Relevant radio stations, including their documentation for installation to existing vehicles, subject to approval proceedings as a change of a railway vehicle.
 - 3.5. On-board radio station within the TRS system can also be equipped for communication in frequency band 150 MHz (for the purpose of radio operation on other rail line networks or within local networks).
 - 3.6. The TRS system can be in case of need (e. g. realization of remote control of safety equipment etc.) or temporarily (by the time of establishing the GSM-R network) also built on other lines that are not mentioned here – RIA publishes the notification with indicated date of coming into effect in the Transport Bulletin, published by the Ministry of Transport, at least 6 months in advance.
4. For control of railway network, local radio systems are further used:

4.1. ASCOM system

The system ensures radio connection between the train dispatcher and the engine driver of the hauling vehicle within the coverage of the base radio station located in relevant railway station and connection between the engine driver and other workers involved in operation of railway transport. The system works in simplex mode in frequency band 450 MHz.

The system is not interoperable.

The system is used on following rail lines:

Line #	Line section (D3)
508	Turnov – Liberec
547	Liberec – Hrádek nad Nisou; Liberec – Raspenava – Frýdlant v Čechách – Černousy; Raspenava – Bílý Potok pod Smrkem; Frýdlant v Čechách – Jindřichovice pod Smrkem
548	Železný Brod – Tanvald; Liberec – Tanvald; Tanvald – Harrachov; Smržovka – Josefův důl

The system is not being developed any more.

4.2. Simplex connection in the 150 MHz band

The system of simplex connection in line and local radio networks in the 150 MHz band ensures radio connection between the train dispatcher and the engine driver of the hauling vehicle within the coverage of the base radio station located in relevant railway and connection between the engine driver and other workers involved in operation of railway transport. The system works in simplex mode in frequency band 450 MHz.

The system is not interoperable.



This system is used for traffic control on following line:

Line #	Line section
503	Děčín East – Ústí nad Labem-Střekov – Všetaty

On the part of railway infrastructure, radio station TESLA SELECTIC with dual-tone selective dial in the relation train -> train dispatcher and voice dial in the direction towards the train.

Similar system is used for traffic control on following line:

Line #	Line section
313	Chornice – Dzbel
314	Třebovice v Čechách – Chornice – Velké Opatovice
321	Šakvice – Hustopeče u Brna
522	Rakovník – Jesenice – Blatno u Jesenice; Rakovník - Mladotice
530	Lužec – Vraňany – Straškov – Libochovice
534	Kadaň – Vilémov u Kadaně – Kaštice; Vilémov u Kadaně – Kadaňský Rohozec
536	Karlovy Vary – Karlovy Vary, lower station – Bečov nad Teplou – Mariánské Lázně; Dalovice – Merklín
715	Zadní Třeboň – Lochovice
313	Chornice – Dzbel

On the part of railway infrastructure, radio station TESLA SELECTIC with voice user dial.

Since these systems use channel spacing (width of the band used for transmitting) 25 kHz, they can only be operated until December 31, 2011. Their further development is therefore not anticipated.

5. In railway traffic, local radio network are further used in the 150 MHz band for control of some technological procedures (shunting, wagon operators etc.). This connection is mentioned for completeness' sake; it is not part of railway infrastructure and is established as needed by individual operators of railway transport.