



Cab Radio Technical Compatibility Checks
TECHNICAL SPECIFICATION
Rail Communications

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0. General Information

0.1. References

- [1] Commission Regulation (EU) 2016/919 of 27 May 2016
- [2] Corrigendum to Commission Regulation (EU) 2016/919 of 27 May 2016
- [3] Commission Implementing Regulation (EU) 2019/776 of 16 May 2019
- [4] <https://eradis.era.europa.eu/>

0.2. Abbreviations

CHPC	Confirmation of High Priority Call
FC	Function Code
FM	Follow Me
GID	Group Identity
GSM-R	Global System for Mobile Railway communications
HMI	Human Machine Interface
IC	International Code
LAC	Location Area Code
NLU	Normal Location Update
NTR	National Technical Rule
PLMN	Public Land Mobile Network
PTT	Push-To-Talk
RSC	Radio System Compatibility
SIM	Subscriber Identity Module
SMS	Short Message Service
SMS-MT	Short Message Service Mobile Terminated
TCC	Traffic Control Centre
TEC	Train Emergency Communication
VACMA	Veille Automatique par Contrôle de Maintien d'Appui
VGCS	Voice Group Call Service

0.3. Glossary

Nihil.

0.4. Version history

Version	Issue Date	Description
1.0	28/01/2019	First version shared with ERA
2.0	23/10/2020	Update based on comments from ERA

0.5. Review history

Version	Review Date	Reviewer	Review files
1.0	28/05/2020	ERA	Cf. email from C. Klecha on 28/05/2020
2.0	11/01/2021	Philippe Zimmer	

0.6. Scope

The aim of this document is to define the checks that shall be performed to demonstrate the technical compatibility of a certified on-board subsystem with the certified infrastructure subsystem in the framework of the **radio voice communications** (cab radio). This document shall serve as a base for the notification as NTR for the Radio System Compatibility (RSC) checks required for cab radio terminals on the INFRABEL railway network.

This document does not cover the checks applicable to an EDOR terminal (ESC).

1. Introduction

The following chapters are specifying the checks that shall be performed in order to verify the compatibility of a cab radio with the INFRABEL network infrastructure.

These checks are divided into two categories:

- Binding check: successful execution of the test is a prerequisite to cab radio authorisation
- Optional check: unsuccessful execution of the test shall not block the authorisation

The SIM card used to perform the checks is an INFRABEL SIM card with cab radio profile. The declaration of conformity related to this SIM card can be found on ERADIS database (see reference [4]).

2. Binding checks

2.1. Basic static checks

The compatibility of the on-board radio with the INFRABEL GSM-R network infrastructure shall be checked in a laboratory regarding the following functions.

2.1.1. National language setting

Purpose	Check that it is possible to configure the HMI of the cab radio in the Belgian national languages.	
Prerequisites	The cab radio and its HMI are powered on and ready for train operations.	
Step	Operation	Expected Result
1	Change the configuration of the HMI in order to set Dutch as HMI language	Texts displayed on HMI in Dutch
2	Change the configuration of the HMI in order to set French as HMI language	Texts displayed on HMI in French
3	Change the configuration of the HMI in order to set German as HMI language	Texts displayed on HMI in German

2.1.2. Manual selection of GSM-R B network

Purpose	Check that it is possible to perform a network registration on the INFRABEL network.	
Prerequisites	The cab radio and its HMI are powered on and ready for train operations.	
Step	Operation	Expected Result
1	Select the HMI menu dedicated to network selection	The list of networks defined on the SIM is displayed
2	Set the network selection mode in manual mode (in the case cab radio is also supporting automatic mode)	The manual network selection mode is set
3	Select "GSM-R B"	Cab radio is successfully registered on GSM-R B network

4	Switch off GSM-R B Radio coverage	The loss of radio coverage is clearly indicated by cab radio MMI
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2.1.3. National engine number registration

Purpose	Check that it is possible to register an engine number into the functional addressing database of INFRABEL.	
Prerequisites	The cab radio and its HMI are powered on and ready for maintenance operations.	
Step	Operation	Expected Result
1	Use the HMI menu or any other maintenance tool to configure an engine number	The engine number is successfully registered into INFRABEL functional addressing database

2.1.4. National short train number registration

Purpose	Check that it is possible to register a short train number into the functional addressing database of INFRABEL.	
Prerequisites	The cab radio and its HMI are powered on and ready for train operations.	
Step	Operation	Expected Result
1	Use the HMI menu dedicated to train number registration to register 9999 as train number with leading driver function	The train number is successfully registered into INFRABEL functional addressing database The train number is displayed on the HMI

2.1.5. Forced deregistration from supervisor

Purpose	Check that it is possible for a supervisor to force the deregistration of a train number.	
Prerequisites	The cab radio and its HMI are powered, ready for train operations and a train number is registered. Another GSM-R Terminal is available and is provided with a SIM for which the subscription includes the FM Supervisor privilege.	



Step	Operation	Expected Result
1	Use GSM-R terminal to perform a forced deregistration of the train number registered by the cab radio	The train number is successfully deregistered from INFRABEL functional addressing database. The deregistration is indicated by cab radio HMI and the train number is no more displayed on the HMI

2.1.6. National long train number registration

Purpose	Check that it is possible to register a long train number into the functional addressing database of INFRABEL.	
Prerequisites	The cab radio and its HMI are powered on and ready for train operations.	
Step	Operation	Expected Result
1	Use the HMI menu dedicated to train number registration to register the train number with following number 99999999 as leading driver	The train number is successfully registered into INFRABEL functional addressing database The train number is displayed on the HMI

2.1.7. Outgoing call to Signal Box (secondary controller)

Purpose	Check that it is possible to establish a voice communication with a Signal Box operator from cab radio.	
Prerequisites	The cab radio and its HMI are powered, ready for train operations and a train number is registered. Signal Box terminal defined as destination in the GSM-R system is available.	
Step	Operation	Expected Result
1	Press the HMI key of the cab radio dedicated to secondary controller communication	An incoming communication is presented on the Signal Box terminal with the train number registered by cab radio The priority level 3 is requested by cab radio



2	Accept the communication on the Signal Box terminal	Voice communication is correctly established and the functional identity or role of the Signal Box operator is correctly displayed on the cab radio HMI
3	Release the communication on the Signal Box terminal	Voice communication is correctly released

2.1.8. Incoming call from Signal Box (secondary controller)

Purpose	Check that it is possible to establish a voice communication with train driver from Signal Box.	
Prerequisites	The cab radio and its HMI are powered, ready for train operations and a train number is registered. Signal Box terminal is available.	
Step	Operation	Expected Result
1	Dial the train number registered by cab radio on the Signal Box terminal	An incoming communication is presented on the cab radio terminal with the functional identity or role of the Signal Box operator The communication is automatically accepted by cab radio and correctly established
2	Release the communication on the cab radio	Voice communication is correctly released

2.1.9. Multi-drivers communication

Purpose	Check that it is possible to establish a multi-driver voice communication between drivers of a same train and involving the primary controller (Traffic Control Centre).
Prerequisites	The cab radio and its HMI are powered, ready for train operations and a train number is registered with leading driver function. Another GSM-R Terminal is available and is registered into the same train number with function “second conducteur” (FC02).

	Traffic Control Centre terminal defined as destination in the GSM-R system is available.	
Step	Operation	Expected Result
1	On cab radio, use the HMI menu dedicated to multi-driver communication to establish a communication with other driver (FC02)	An incoming communication is presented on the other GSM-R terminal with appropriate functional identity The communication is automatically accepted by other GSM-R terminal (priority level 3)
2	Dial the train number of the leading driver from the TCC terminal	An incoming communication is presented on the cab radio terminal with the functional identity or role of TCC operator The communication is automatically accepted by cab radio and automatically merged with previous ongoing communication (3-party communication)
3	Release the communication on the TCC operator terminal	The communication leg related to primary controller is disconnected but the communication is maintained between train drivers The cab radio indicates the primary controller has left the communication
4	Press the HMI key of the cab radio dedicated to primary controller communication	An incoming communication is presented on the TCC terminal with the train number registered by cab radio The priority level 3 is requested by cab radio
5	Accept the communication on the Signal	Voice communication is correctly established and the functional

	Box terminal	identity or role of the Signal Box operator is correctly displayed on the cab radio HMI The communication is automatically merged with previous ongoing communication (3-party communication)
6	Release the communication on the cab radio	Voice communication is correctly released

2.1.10. Incoming call to all drivers in the area

Purpose	Check that it is possible to join a voice communication with all train drivers located in a given area.	
Prerequisites	The cab radio and its HMI are powered, ready for train operations. TCC operator terminal dedicated to the given area is available.	
Step	Operation	Expected Result
1	Press the “call to all drivers” button corresponding to the given area on the TCC operator terminal	An incoming “call to all drivers” communication is presented on the cab radio terminal as specified in applicable norms. The communication is automatically accepted by cab
2	On cab radio, keep the push-to-talk button pressed and speak	The voice is correctly heard on the TCC operator terminal
3	While the PTT button is kept pressed on the cab radio, press the push to talk button on the TCC operator terminal and speak	The voice is correctly heard on the cab radio
4	On cab radio, release the push-to-talk button then keep the push-to-talk button pressed on TCC operator terminal and speak	The voice is correctly heard on the cab radio
5	Release the communication on the TCC	Voice communication is correctly



	operator terminal	released
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2.1.11. Incoming Train Emergency Communication

Purpose	Check that it is possible to join a train emergency voice communication with all train drivers located in a given area.	
Prerequisites	The cab radio and its HMI are powered, ready for train operations. TCC operator terminal dedicated to the given area is available.	
Step	Operation	Expected Result
1	Press the emergency button corresponding to the given area on the TCC operator terminal	An incoming “train emergency call” communication is presented on the cab radio terminal as specified in applicable norms. The communication is automatically accepted by cab
2	On cab radio, keep the push-to-talk button pressed and speak	The voice is correctly heard on the TCC operator terminal
3	While the PTT button is kept pressed on the cab radio, press the push to talk button on the TCC operator terminal and speak	The voice is correctly heard on the cab radio
4	On cab radio, release the push-to-talk button then keep the push-to-talk button pressed on TCC operator terminal and speak	The voice is correctly heard on the cab radio
5	Terminate the communication on the TCC operator terminal	Voice communication is correctly released The CHPC is correctly delivered by cab radio after a delay which is compliant with applicable norms

2.1.12. Outgoing Train Emergency Communication

Purpose	Check that it is possible to establish a train emergency voice communication
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	with all train drivers located in a given area.	
Prerequisites	The cab radio and its HMI are powered, ready for train operations. TCC operator terminal dedicated to the given area is available.	
Step	Operation	Expected Result
1	Press the emergency button on cab radio	An incoming “train emergency call” communication is presented on the TCC operator terminal. The priority level 0 is requested by cab radio
2	On cab radio, keep the push-to-talk button pressed and speak	The voice is correctly heard on the TCC operator terminal
3	While the PTT button is kept pressed on the cab radio, press the push to talk button on the TCC operator terminal and speak	The voice is correctly heard on the cab radio
4	On cab radio, release the push-to-talk button then keep the push-to-talk button pressed on TCC operator terminal and speak	The voice is correctly heard on the cab radio
5	Terminate the communication on the TCC operator terminal	Voice communication is correctly released The CHPC is correctly delivered by cab radio after a delay which is compliant with applicable norms

2.1.13. Train number re-registration

Purpose	Check that it is possible to automatically register the train number upon border crossing (GSM-R Network change).	
Prerequisites	The cab radio and its HMI are powered, ready for train operations and a train number is registered. Simulated foreign GSM-R Network is available for cab radio.	
Step	Operation	Expected Result

1	Select the HMI menu dedicated to network selection	The list of networks defined on the SIM is displayed
2	Select in the list the identity of the simulated foreign network	Cab radio is successfully registered on simulated foreign network Registration of the current train number is triggered towards the new network with appropriate IC Then deregistration of the previously registered train number (with GSM-R B IC) is triggered
3	Select the HMI menu dedicated to network selection	The list of networks defined on the SIM is displayed
4	Select "GSM-R B"	Cab radio is successfully registered on GSM-R B network Registration of the current train number is triggered towards GSM-R B network with appropriate IC Then deregistration of the previously registered train number (with foreign IC) is triggered

2.1.14. National train number deregistration

Purpose	Check that it is possible to deregister a train number from the functional addressing database of INFRABEL.	
Prerequisites	The cab radio and its HMI are powered, ready for train operations and a train number is registered.	
Step	Operation	Expected Result
1	Use the HMI menu dedicated to train number registration to deregister the registered train number	The train number is successfully deregistered from INFRABEL functional addressing database

		The train number is no more displayed on the HMI
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2.1.15. Incoming SMS

Purpose	Check that it is possible to receive a short message.	
Prerequisites	The cab radio and its HMI are powered, ready for train operations. Another GSM-R Terminal is available and is provided with a SIM for which the subscription includes the SMS-MT privilege.	
Step	Operation	Expected Result
1	From other GSM-R terminal send a SMS with maximal length towards the cab radio based on its MSISDN	The receipt of SMS is indicated on the cab radio HMI
2	On cab radio, use the menu related to SMS to read the received short message	The short message is displayed correctly

2.2. Arbitration static checks

The compatibility of the on-board radio with the INFRABEL GSM-R network infrastructure shall be checked in a laboratory regarding the following functions.

2.2.1. Arbitration for outgoing Train Emergency Communication

Purpose	Check that arbitration is correctly applied upon an outgoing train emergency communication.	
Prerequisites	The cab radio and its HMI are powered, ready for train operations and a train number is registered. TCC operator terminal dedicated to the concerned TEC area is available. Signal Box operator terminal is available. Another GSM-R Terminal is available and is registered into the same train number with function “conducteur d’allège” (FC03).	
Step	Operation	Expected Result
1	On cab radio, press the HMI key of the cab radio dedicated to secondary controller communication then press immediately emergency button	The call set up to secondary controller is immediately interrupted and the TEC is correctly established



2	Release the communication on the TCC operator terminal	TEC is correctly released
3	On cab radio, press the HMI key of the cab radio dedicated to secondary controller communication	An incoming communication is presented on the Signal Box terminal
4	Accept the communication on the Signal Box terminal	Voice communication is correctly established
5	On cab radio, press the emergency button	Voice communication with Signal Box is immediately released and the TEC is correctly established
6	Release the communication on the TCC operator terminal	TEC is correctly released
7	On cab radio, use the HMI menu dedicated to multi-driver communication to establish a communication with other driver (FC03) then immediately press the emergency button	The call set up for multi-drivers communication is immediately interrupted and the TEC is correctly established
8	Release the communication on the TCC operator terminal	TEC is correctly released
9	Press the “call to all drivers” button corresponding to the given area on the TCC operator terminal	An incoming “call to all drivers” communication is presented on the cab radio and is automatically accepted by cab
10	On cab radio, press the emergency button	“Call to all drivers” communication is immediately left by cab radio and the TEC is correctly established
11	Terminate TEC from TCC operator terminal	TEC is correctly released Ongoing “Call to all drivers” communication is immediately re-joined by cab radio
12	Release the call to all drivers from TCC	“Call to all drivers” is correctly

	operator terminal	released
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2.2.2. Arbitration for incoming Train Emergency Communication

Purpose	Check that arbitration is correctly applied upon an incoming train emergency communication.	
Prerequisites	The cab radio and its HMI are powered, ready for train operations and a train number is registered. TCC operator terminal dedicated to the concerned TEC area is available. Signal Box operator terminal is available. Another GSM-R Terminal is available and is registered into the same train number with function “conducteur d’allège” (FC03).	
Step	Operation	Expected Result
1	On cab radio, press the HMI key of the cab radio dedicated to secondary controller communication then press immediately the emergency button corresponding to the given area on the TCC operator terminal	The call set up to secondary controller is immediately interrupted and the TEC is correctly joined by cab radio
2	Release the communication on the TCC operator terminal	TEC is correctly released
3	On cab radio, press the HMI key of the cab radio dedicated to secondary controller communication	An incoming communication is presented on the Signal Box terminal
4	Accept the communication on the Signal Box terminal	Voice communication is correctly established
5	Press the emergency button corresponding to the given area on the TCC operator terminal	Voice communication with Signal Box is immediately released and the TEC is correctly joined by cab radio
6	Release the communication on the TCC operator terminal	TEC is correctly released
7	On cab radio, use the HMI menu dedicated to multi-driver communication to establish a communication with other	The call set up for multi-drivers communication is immediately interrupted and the TEC is



	driver (FC02) then press immediately the emergency button corresponding to the given area on the TCC operator terminal	correctly joined by cab radio
8	Release the communication on the TCC operator terminal	TEC is correctly released
9	Press the “call to all drivers” button corresponding to the given area on the TCC operator terminal	An incoming “call to all drivers” communication is presented on the cab radio and is automatically accepted by cab
10	Press the emergency button corresponding to the given area on the TCC operator terminal	“Call to all drivers” communication is immediately left by cab radio and the TEC is correctly joined by cab radio
11	Release “call to all drivers” on TCC operator terminal	“call to all drivers” is correctly released
11	Terminate the TEC from TCC operator terminal	TEC is correctly released No ongoing communication on cab radio

2.3. Dynamic checks

The compatibility of the on-board radio with the INFRABEL GSM-R network infrastructure shall be checked dynamically (on-board of a measurement coach) regarding the following functions.

2.3.1. Cell reselection in idle mode

Purpose	Check that it is possible to perform cell reselection when no communication is ongoing.	
Prerequisites	The cab radio and its HMI are powered, ready for train operations. Cab radio is installed on rolling stock engine/coach. An already approved cab radio is available on board to serve as reference.	
Step	Operation	Expected Result
1	Trigger a cell reselection from one GSM-R radio cell to another having the same LAC by moving	The new cell is correctly reselected by the cab radio which is still attached to the network (no network loss

		message)
2	Trigger a cell reselection from one GSM-R radio cell to another having a different LAC by moving	The new cell is correctly reselected by the cab radio which is still attached to the network A normal location update procedure is triggered successfully
3	Repeat the operations for all the cells concerned by the test trip	Check the reselected cells are in conformity with radio planning

2.3.2. Cell reselection in group receive mode

Purpose	Check that it is possible to perform cell reselection when cab radio is involved in TEC as listener.	
Prerequisites	The cab radio and its HMI are powered, ready for train operations. Cab radio is installed on rolling stock engine/coach. Another GSM-R terminal is available on board to serve as mobile “VGCS dispatcher”. An already approved cab radio is available on board to serve as reference. A test mode is activated on cab radio in order to replace the TEC GID (299) by a test GID	
Step	Operation	Expected Result
1	Press the emergency button on cab radio	An incoming “train emergency call” communication is presented on the mobile dispatcher terminal and automatically accepted.
2	On cab radio, keep the push-to-talk button pressed and speak	The voice is correctly heard on the mobile dispatcher
3	Trigger a cell reselection from one GSM-R radio cell to another having the same LAC by moving	The new cell is correctly reselected by the cab radio which is still attached to the network (no network loss message)
4	On cab radio, press the push-to-talk button immediately after the cell	The voice is correctly heard on the mobile dispatcher

	reselection	
5	Trigger a cell reselection from one GSM-R radio cell to another having a different LAC by moving	The new cell is correctly reselected by the cab radio which is still attached to the network A normal location update procedure is triggered successfully
6	On cab radio, press the push-to-talk button immediately after the cell reselection	The voice is correctly heard on the mobile dispatcher after a short delay due to NLU procedure
7	Terminate TEC from TCC operator terminal	TEC is correctly released

2.3.3. Handover in dedicated mode

Purpose	Check that it is possible to perform cell handover when cab radio is involved in point-to-point voice communication.	
Prerequisites	The cab radio and its HMI are powered, ready for train operations and registered in a train number. Cab radio is installed on rolling stock engine/coach. Another GSM-R terminal is available on board. Automated voice responder playing an audio file.	
Step	Operation	Expected Result
1	Dial number of the automated voice responder on cab radio	Communication automatically accepted by voice responder Audio content is heard on cab radio
2	Trigger a cell handover from one GSM-R radio cell to another having the same LAC by moving	Voice communication is correctly maintained, voice interruption < 500ms
3	Trigger a cell handover from one GSM-R radio cell to another having a different LAC by moving	Voice communication is correctly maintained, voice interruption < 500ms

4	Repeat the operations for all the cells concerned by the test trip	Check the cells used for the communication are in conformity with radio planning
5	Release communication on cab radio	Voice communication is correctly released Cab radio perform immediately a normal location update (NLU)

2.3.4. Handover in group transmit mode

Purpose	Check that it is possible to perform cell handover when cab radio is talker in train emergency communication.	
Prerequisites	The cab radio and its HMI are powered, ready for train operations and registered in a train number. Cab radio is installed on rolling stock engine/coach. Another GSM-R terminal is available on board to serve as mobile “VGCS dispatcher”. An already approved cab radio is available on board to serve as reference. A test mode is activated on cab radio in order to replace the TEC GID (299) by a test GID. Automated voice responder playing an audio file and configured as VGCS dispatcher.	
Step	Operation	Expected Result
1	Initiate a TEC from mobile VGCS dispatcher	TEC is presented on cab radio and automatically joined Audio content is heard on cab radio
2	Press push-to-talk button permanently and speak	The voice is correctly heard on the mobile dispatcher
3	Keep push-to-talk permanently pressed then trigger a cell handover from one GSM-R radio cell to another having the same LAC by moving	Voice communication is correctly maintained, voice interruption < 500ms
4	Keep push-to-talk permanently pressed then trigger a cell handover from one GSM-R radio cell to another having a different LAC by moving	Voice communication is correctly maintained, voice interruption < 500ms

5	Release the push-to-talk on cab radio	Uplink channel is free
6	Terminate the TEC from mobile VGCS dispatcher	TEC is correctly released Cab radio has performed the normal location update (NLU) either after PTT release or after end of call (depending on radio module)

2.3.5. Late entry in idle mode

Purpose	Check that it is possible to perform a late entry into an ongoing train emergency call in a given area while cab radio is not previously involved in a communication.	
Prerequisites	The cab radio and its HMI are powered, ready for train operations and registered in a train number. Cab radio is installed on rolling stock engine/coach. Another GSM-R terminal is available on board to serve as mobile “VGCS dispatcher”. An already approved cab radio is available on board to serve as reference. A test mode is activated on cab radio in order to replace the TEC GID (299) by a test GID.	
Step	Operation	Expected Result
1	Initiate a TEC from mobile VGCS dispatcher while cab radio is attached to a cell outside the given area	TEC is not received by cab radio
2	Trigger a cell reselection to a cell included in the given area	The TEC is correctly presented and joined by the cab radio
3	Keep push-to-talk pressed and speak	The voice is correctly heard on the mobile dispatcher
4	Speak from mobile VGCS dispatcher	The voice is correctly heard on the cab radio
5	Terminate the TEC from mobile VGCS dispatcher	TEC is correctly released

2.3.6. Late entry in dedicated mode

Purpose	Check that it is possible to perform a late entry into an ongoing train emergency call in a given area while cab radio is involved in a point-to-point communication.	
Prerequisites	The cab radio and its HMI are powered, ready for train operations and registered in a train number. Cab radio is installed on rolling stock engine/coach. Another GSM-R terminal is available on board to serve as mobile “VGCS dispatcher”. An already approved cab radio is available on board to serve as reference. A test mode is activated on cab radio in order to replace the TEC GID (299) by a test GID.	
Step	Operation	Expected Result
1	Dial the train number registered by cab radio from mobile VGCS dispatcher	Incoming communication presented on cab radio
2	Accept the communication on cab radio	Voice communication is correctly established
3	Put the point-to-point communication on hold on mobile VGCS dispatcher	On hold announcement is heard on cab radio
4	Initiate a TEC from mobile VGCS dispatcher while cab radio is attached to a cell outside the given area	TEC is not received by cab radio
5	Trigger a cell reselection to a cell included in the given area	The TEC is correctly presented and joined by the cab radio The point-to-point communication is released
6	Keep push-to-talk pressed and speak	The voice is correctly heard on the mobile dispatcher
7	Speak from mobile VGCS dispatcher	The voice is correctly heard on the cab radio
8	Terminate the TEC from mobile VGCS dispatcher	TEC is correctly released

2.3.7. Late entry in group receive mode

Purpose	Check that it is possible to perform a late entry into an ongoing train emergency call in a given area while cab radio is involved in a group communication as listener.	
Prerequisites	The cab radio and its HMI are powered, ready for train operations and registered in a train number. Cab radio is installed on rolling stock engine/coach. Another GSM-R terminal is available on board to serve as mobile “VGCS dispatcher”. An already approved cab radio is available on board to serve as reference. A test mode is activated on cab radio in order to replace the TEC GID (299) by a test GID	
Step	Operation	Expected Result
1	Initiate a “call to all drivers” from mobile VGCS dispatcher	“Call to all drivers” communication presented and joined by cab radio
2	Initiate a TEC from mobile VGCS dispatcher while cab radio is attached to a cell outside the given area	TEC is not received by cab radio
3	Put the group communication on hold on mobile VGCS dispatcher	On hold announcement is heard on cab radio
4	Trigger a cell reselection to a cell included in the given TEC area and also included in the given “Call to all drivers” area	The “call to all drivers” is immediately left by cab radio The TEC is correctly presented and joined by the cab radio
6	Keep push-to-talk pressed and speak	The voice is correctly heard on the mobile dispatcher
7	Speak from mobile VGCS dispatcher	The voice is correctly heard on the cab radio
8	Terminate the TEC from mobile VGCS dispatcher	TEC is correctly released “Call to all drivers” is re-joined by cab radio
9	Release the “call to all drivers” from mobile VGCS dispatcher	“call to all drivers” communication is correctly released

2.3.8. Late entry in group transmit mode

Purpose	Check that it is possible to perform a late entry into an ongoing train emergency call in a given area while cab radio is involved in a group communication as talker.	
Prerequisites	The cab radio and its HMI are powered, ready for train operations and registered in a train number. Cab radio is installed on rolling stock engine/coach. Another GSM-R terminal is available on board to serve as mobile “VGCS dispatcher”. An already approved cab radio is available on board to serve as reference. A test mode is activated on cab radio in order to replace the TEC GID (299) by a test GID.	
Step	Operation	Expected Result
1	Initiate a “call to all drivers” from mobile VGCS dispatcher	“Call to all drivers” communication presented and joined by cab radio
2	Initiate a TEC from mobile VGCS dispatcher while cab radio is attached to a cell outside the given area	TEC is not received by cab radio
4	Keep push-to-talk pressed on cab radio and trigger (by moving) a cell reselection to a cell included in the given TEC area and also included in the given “Call to all drivers” area	The “call to all drivers” is immediately left by cab radio The TEC is correctly presented and joined by the cab radio
6	Keep push-to-talk pressed and speak	The voice is correctly heard on the mobile dispatcher
7	Speak from mobile VGCS dispatcher	The voice is correctly heard on the cab radio
8	Terminate the TEC from mobile VGCS dispatcher	TEC is correctly released “Call to all drivers” is re-joined by cab radio
9	Release the “call to all drivers” from mobile VGCS dispatcher	“call to all drivers” communication is correctly released

2.4. Checks related to non-harmonized functions

Additional tests could be foreseen case by case to check that non-harmonized functions of the on-board radio have no impact on INFRABEL GSM-R network infrastructure.

3. Optional checks

3.1. Driver Safety Device (VACMA)

3.1.1. Forewords

If the cab radio is able to relay the communication triggered by the driver safety device, this function could be checked.

3.1.2. Driver Safety Device communication with train number (idle mode)

3.1.3. Driver Safety Device communication with engine number (idle mode)

3.1.4. Driver Safety Device communication in dedicated mode

3.1.5. Driver Safety Device communication during a TEC

3.1.6. Driver Safety Device communication during a Call to all drivers

3.1.7. Driver Safety Device communication with unsuccessful outcome

3.2. Directed Network Selection (applicable on high speed line L1)

3.2.1. Forewords

If the cab radio is able to perform the network selection based on the trackside STM equipment placed on the border between Belgium and France, this function could be checked.

3.2.2. Directed Network Selection in idle mode

3.2.3. Directed Network Selection in dedicated mode

3.2.4. Directed Network Selection during a TEC

3.2.5. Directed Network Selection during a Call to all drivers

3.2.6. Directed Network Selection with unsuccessful re-registration

3.3. Train intercom and Public Address (when required for communications between drivers and conductors)

3.3.1. Forewords

If the cab radio is able to manage the on-board intercom and public address communications, this function could be checked.

3.3.2. Request a call with train conductor from on-board radio

3.3.3. Request a call with train conductor from controller

3.3.4. Call the train driver from train conductor's intercom

3.3.5. Connect the on-board public address from controller

3.4. Call forwarding to driver's handheld

3.4.1. Forewords

If the cab radio is able to set up call forwarding towards a handheld, this function could be checked.

3.4.2. Enable and verify call forwarding towards a GSM-R subscriber

3.4.3. Enable and verify call forwarding towards subscriber from partner PLMN

3.4.4. Disable call forwarding