REFERENCE O-3001 1.1.1	
Company / Organisation	UIC ERTMS/GSM-R Operators Group

Cab Radio

Functional Test Specification

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EVOLUTION SHEET

Revision	Date	Author	Object of revision
0.4	March 2007	Kapsch	Creation
0.5	April 2007	Kapsch	Revision
0.6	May 2007	Kapsch	Revision
0.7	February 2008	Kapsch / GSM-R IG/ OG Ad Hoc Group	Inclusion of written comments from TIG members & OG Ad Hoc Group
0.8	August 2008	Kapsch / GSM-R IG/ OG Ad Hoc Group	Inclusion of comments following phone conference of 13/03/2008
0.9	January 2009	Kapsch / GSM-R IG	Inclusion of further written comments and corrections. Approval by OG Ad Hoc Group
0.10	January 2009	Kapsch / GSM-R IG	Inclusion of omitted corrections plus additional typographical amendments. Content Approval by TIG/OG/FG
1.0	July 2009	UIC/OG Chairman	Change of format for front page and head/footpage. Final Version
1.1	December 2011	Siemens	Update for EIRENE 7.1/15.1 Remove tests for items which are not TSI-mandatory Add tests for some functions previously untested List other untested items Clarification within some tests Some minor language and formatting modifications
1.1.1	14 December 2011	UIC HQ	Update for review and validation

Content

1. OBJECT

1.1 PURPOSE OF THE DOCUMENT

The purpose of this document is to describe the test cases to be performed for the functional validation of the GSM-R Cab Radio with respect to the parts of the EIRENE specifications (refs [2] and [3] which have been identified to be mandatory for interoperability within refs [7] and [8].

The test cases are considered to be a minimum set for functional interoperability.

The generic description of the user action and the behaviour of the Cab Radio system shall be supplemented using the User's Manual of the Cab Radio subject to the test mutually agreed by the supplier and the assessor.

1.2 DEFINITIONS

1.3 ABBREVIATIONS

BSS	Base Station Subsystem
CR	Cab Radio
DUT	Device Under Test
GSM-R	GSM-Railway, GSM train radio system
FN	Functional number
GCA	Group Call Area
GId	Group call Identity
HMI	Human-Machine-Interface
HS	Hand set
LAS	Link Assurance Signal
LS	Loudspeaker
MS	Mobile Station, GSM-R mobile phone with a valid SIM Card for the test
n/a	not applicable
NSS	Network switching subsystem
O&M	Operations & Maintenance
OPS	Operational Shunting Radio
PA	Public Address
PTP	Point-to-Point call
PTT	Push to Talk
REC	Railway Emergency Call
SR	Shunting Radio
TEC	Train Emergency Call
UIC	Union Internationale des Chemins de Fer

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USSD	Unstructured Supplementary Service Data
UUS	User-User Signalling
VBC	Voice Broadcast Call
VGC	Voice Group Call

1.4 REFERENCE DOCUMENTS

[1]*   Cab Radio User's Manual

[2]   EIRENE - Functional Requirement Specification (FRS) Version 7

[3]   EIRENE - System Requirement Specification (SRS) Version 15

[4]   ASCI Options for Interoperability A 01 T 0004 x

[5]   Applikationstests Cab Radio V3.3 (Nortel)

[6]   Cab Radio Application Tests V02 (HFWK)

[7]   GSM-R B0 FRS Version 0.1r1 (ERA)

[8]   GSM-R B0 SRS Version 0.1r1 (ERA)

* Document [1] refers to the User's Manual of the tested type of Cab Radio. It is imperative to use the User's Manual corresponding to the tested version of the Cab Radio.

Documents [5] and [6] are mentioned for information only. They formed the starting point regarding the issue of cab radio testing.

1.5 DEDICATION

This document is based on refs [5] and [6] which were kindly provided by Nortel and Hörmann Funkwerk Kölleda.

2. TEST CONFIGURATION

2.1 OVERVIEW

Following components of the EIRENE GSM-R system are needed to execute the tests:

GSM-R Network

Cab Radio, (DUT)

Mobile Station GPH and OPH

Dispatchers

SIM Cards

2.2 EQUIPMENT REQUIRED

- GSM-R network with BTS operating in GSM-R bands around 900MHz.
- An Abis or an A tracer, in order to check the contents on the messages exchanged between mobiles and network when required.
- At least 2 mobile stations of the type to be tested.
- At least 2 mobile stations of the type GPH
- At least 2 mobile stations of the type OPH or OPS
- Optional 1 fixed network Controller (dispatcher).
- GSM-R SIM cards with all the services and features provisioned and configured for the appropriate mobile user and function.
- A SIM card editor, in order to be able to modify the services and features provisioned and the configuration on the SIM cards for the different test requirements.
- User's Manual of the tested mobiles.
- User's Manual of the other mobiles involved testing.

2.3 NETWORK CONFIGURATION

The network has to support all of the different configurations required to execute all of the test cases. The network must be compliant to the ASCI Options for Interoperability [4]. It must be possible to adjust various functions within the network in order to carry out the cab radio tests.

The stationary work stations, especially for the primary controller, secondary controller, power supply controller, traffic controller and high priority call acknowledgement centre belong to the test environment and are provided by the test lab operator or the customer.

The configuration of the used GSM-R network, supplier and the software release of the network components such as e.g. NSS, BSS etc. must be documented in the test protocol.

2.4 CAB RADIO CONFIGURATION

2.4.1 Software

The software release of the Cab Radio and particular releases of the Cab Radio components and HMIs must be declared in the

test protocol.

2.4.2 Hardware

The hardware release of the Cab Radio and the HMI must be declared in the test protocol.

2.4.3 EIRENE Options

The contents of this section have been removed as the functions that were previously described are not mandatory for interoperability (refs [7] and [8]).

2.4.4 SIM cards

Provision of SIM cards and its configuration is done by the test lab operator or the customer.

The services and features provisioned and configured on the SIM cards for the tested Cab Radio must be documented in the test protocol and considered during test execution.

3. COMPLETION OF THE FUNCTIONAL TESTS

3.1 GENERAL

The following chapters contain a detailed description of all functional tests provided for the Cab Radio.

3.2 STRUCTURE OF THE TESTS

The tests are structured as follows:

- test title
- purpose of the test
- reference to EIRENE FRS and/or SRS requirement
- completion of the test in individual steps with individual results
- overall result

Where the term "CR User's Manual" is used, the required action and/or any audible and/or visual indication has to be referred to the User's Manual of the tested Cab Radio.

3.3 COMPLETION OF THE TESTS

The tests are carried out with 1-3 Cab Radios (CR-A, CR-B, CR-C). The entire series of tests has to be completed successfully two times. The order of the tests during the second test run must not be the same as during the first run.

If the result of a test case during one test run is PASSED and during another test run is FAILED, a third test run has to be conducted. If the result of the third test run is FAILED, the test case has to be considered as FAILED.

3.4 SPECIFIC ENVIRONMENTAL TEST CONDITIONS

For the dynamic tests, if executed in the field, the speed of the vehicle e.g. locomotive where the DUT and its antenna are installed shall be recorded in the test report as additional information.

Note: If a test fails in the field this status does not solely reflect the behaviour of the DUT i.e. Cab Radio and may have its reason in the network and/or its configuration.

4. SWITCHING ON THE CAB RADIO

Cab radio boots when the supply voltage is applied. All cab radio units are error-free.

4.1 SYSTEM BOOT WITH ERROR-FREE DEVICE

Purpose: An automatic self test is conducted while booting and initialising of the CR settings.

Reference: **FRS § 5.2.1.2, 5.2.3.1; SRS § 4.4.1, 5.4.1, 5.4.2**

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Switch on the supply voltage	According CR User Manual Indication of the startup procedure of the CR on the HMI Automatic self test Network registration, last registered network			
2	Initialization finished	Display of the last used operation mode (e.g. train radio, shunting radio) on the HMI HMI default settings initialised (e.g. brightness, loudspeaker volume, handset volume) Default user language selected Acoustic signal: ready for operation Display of the network on the HMI			

4.2 SYSTEM BOOT WITH FAULTY DEVICE

Purpose: The automatic self test during system start-up of the CR shall identify a faulty device in the system and the respective error message shall be displayed on the HMI display.

Reference: **FRS § 5.2.3.1; SRS § 5.4.1**

Depending on the architecture of the CR an artificial defect shall be implanted into the CR according CR documentation e.g. remove the Public Address and Intercom Unit.

Attention: To prepare this test, the CR system must be electrically powered off.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Switch on the supply voltage	According CR User Manual Indication of the startup procedure of the			

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
		CR on the HMI Automatic self test			
2	Initializing finished	HMI default settings initialised Default user language selected Display of the network status (if available last used network shall be selected and name of selected network shall be displayed) on the HMI Acoustic signal: ready for operation Display of the error message according CR User Manual on the HMI			

4.3 SYSTEM BOOT WITH NO GSM-R NETWORK

Purpose: To check that an audible and visual indication is given that connection to a GSM-R network was not possible.

Reference: **FRS § 5.2.3.1; SRS § 5.4.3**

The antenna cable shall be removed from the GSM-MT antenna connector or the network coverage of the BTS shall be switched off (Radio Signal < -110dBm).

Attention: To prepare this test, the CR system must be electrically powered off.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Switch on the supply voltage	According CR User Manual Indication of the startup procedure of the CR on the HMI Automatic self test			
2	Initializing finished	HMI default settings initialised Default user language selected Audible and visual indication of no GSM-R coverage. Display of the error message according CR User Manual on the HMI			

5. OPERATION IN IDLE MODE

5.1 NO GSM-R NETWORK COVERAGE INDICATION

Purpose: In case that the selected network is not available an audible and visual indication shall be provided to the user.

Reference: FRS § 5.2.3.1, 5.4.16, SRS § 5.4.3. 5.6.6

The antenna cable shall be removed from the GSM-MT antenna connector or the network coverage of the BTS shall be switched off (Radio Signal < -110dBm).

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR is in idle mode,	According CR User Manual CR idle status displayed on the HMI			
2	Network coverage is lost	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI.			

5.2 MANUAL SETTINGS OF THE CAB RADIO HMI

Purpose: To check display and volume settings.

5.2.1 Display Brightness

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

5.2.2 Display Contrast

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

5.2.3 Loudspeaker Volume

Purpose: The driver shall be able to adjust the volume of the loudspeaker manually.

Reference: **FRS § 5.2.1.2, 5.2.3.18**

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3

1	According CR User Manual Select volume setting for loudspeaker	According CR User Manual Loudspeaker volume setting is activated			
2	Increase loudspeaker volume	Loudspeaker volume is increased. Last loudspeaker volume adjusted is activated. CR HMI display returns to idle screen			
3	Select volume setting for loudspeaker	Loudspeaker volume setting is activated			
4	Decrease loudspeaker volume	Loudspeaker volume is decreased. Last loudspeaker volume adjusted is activated. CR HMI display returns to idle screen			

6. ENTRY OF TRAIN DATA / REGISTRATION

6.1 REGISTRATION OF THE TRAIN NUMBER

6.1.1 Registration of train number to Cab Radio

Purpose: To check the correct registration of the train number to the Cab Radio of the leading driver and on board system(s) e.g. PA system and intercom if available.

Reference: **FRS § 5.2.1.2, 5.2.3.26, 5.2.3.27, 5.2.3.34, 5.2.3.35, 11.3.2.2; SRS § 4.3.3, 4.3.4, 5.4.7, 5.4.9, 11.3.5, 11.3.7**

Note: Function codes FC 80-99 (for national use) are not registered automatically while registering a train.

The successful registration has to be checked by making PTP calls to the CR:

- PTP call to driver using train number and function code 01 (leading driver)
- PTP call to PA system using train number and FC 08, applicable only for option: PA
- PTP call to intercom using train number and FC 07, applicable only for option: ICOM

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Select train data entry menu	According CR User Manual Train data entry menu activated on the display of the HMI The train data must be empty i.e. CR is not registered to any train number previously.			
2	Enter train number and confirm.	Train number displayed on the HMI of CR			
3	Enter the function code for leading driver and confirm	Train function displayed on the HMI of CR			

4	Start registration	Registration progress is displayed on the HMI of CR Registration status is displayed on the HMI of CR Check that USSD message is sent by CR-A			
5	Check registration using PTP call by MS-A to train number and function - leading driver Terminate call by MS-A	PTP call established to the CR leading driver MS-A CR communication			
6	Check registration using PTP call by MS-A to train number and function - PA system (option: PA) Terminate call by MS-A	PTP call established to the CR PA system MS-A to CR PA system announcement			
7	Check registration using PTP call by MS-A to train number and function - intercom (option: ICOM)	Audio signal (e.g. GONG) via UIC intercom can be heard on PA loudspeaker CR-A returns to default idle status			

6.1.2 Registration of functional address to other driver (non-leading driver)

Purpose: To check the correct registration of the train number to the Cab Radio of the other driver (non-leading). The on board system(s) e.g. PA system and intercom if available must not be registered to the Cab Radio of the other driver.

The precondition of this test is that there is no functionally registered Cab Radio to train number as leading driver.

Reference: **FRS § 5.2.3.33, 5.2.3.34, 5.2.3.35; SRS § 4.3.3, 4.3.4, 5.4.7, 5.4.9**

The successful registration has to be checked by making PTP calls to the CR:

- PTP call to driver using train number and function code 02, 03, 04, 05 (2nd, 3rd, etc. driver), call shall be possible and successful.
- PTP call to PA system using train number and FC 08, call must not be possible, applicable only for option: PA
- PTP call to intercom using train number and FC 07, call must not be possible, applicable only for option: ICOM

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Select train data entry menu	According CR User Manual Train data entry menu activated on the display of the HMI The train data must be empty i.e. CR is not registered to any train number previously.			
2	Enter train number and confirm.	Train number displayed on the HMI of CR			
3a	Enter the function code for other driver (2nd driver) and confirm	Train function displayed on the HMI of CR			
3b	Enter the function code for other driver (3rd driver) and confirm	Train function displayed on the HMI of CR			
3c	Enter the function code for other driver (4th driver) and confirm	Train function displayed on the HMI of CR			
3d	Enter the function code for other driver (5th driver) and confirm	Train function displayed on the HMI of CR			
4	Start registration	Registration progress is displayed on the HMI of CR Registration status is displayed on the HMI of CR			
5a	Check registration using PTP call by MS-A to train number and function (02) - other driver (2nd driver) Terminate call by MS-A	PTP call established to 2nd driver's CR MS-A CR communication			

5b	Check registration using PTP call by MS-A to train number and function (03) - other driver (3rd driver) Terminate call by MS-A	PTP call established to 3rd driver's CR MS-A CR communication			
5c	Check registration using PTP call by MS-A to train number and function (04) - other driver (4th driver) Terminate call by MS-A	PTP call established to 4th driver's CR MS-A CR communication			
5d	Check registration using PTP call by MS-A to train number and function (05) - other driver (5th driver) Terminate call by MS-A	PTP call established to 5th driver's CR MS-A CR communication			
6	Check registration using PTP call by MS-A to train number and function - PA system (option: PA) Terminate call by MS-A	PTP call establishment to the CR PA system fails MS-A to CR PA system announcement not possible			
7	Check registration using PTP call by MS-A to train number and function - intercom (option: ICOM) Terminate call by MS-A	PTP call establishment to the CR ICOM fails MS-A to CR ICOM communication not possible			

6.1.3 Incoming Voice Call during Functional Number Registration

Purpose: The registration procedure must not prevent to receive an incoming voice calls.

Reference: **FRS § 5.2.1.2; SRS § 5.5.19**

The successful reception of an incoming voice call to the CR has to be checked during the registration transaction by making calls to the CR.

6.1.3.1 Incoming point-to-point Call

The successful reception of the incoming ptp call to the CR has to be checked during the registration transaction by making calls to the MSISDN of the CR:

- call to driver using MSISDN

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Select train data entry menu	According CR User Manual Train data entry menu activated on the display of the HMI The train data must be empty i.e. CR is not registered to any train number previously.			
2	Enter train number and confirm.	Train number displayed on the HMI of CR			
3	Enter the function code for leading driver and confirm	Train function displayed on the HMI of CR			
4	Start registration Simultaneously initiate a ptp call using MSISDN of the CR with priority 3 by MS-A	Registration progress is displayed on the HMI of CR PTP call established to the CR leading driver MS-A CR communication			
5	Terminate call by MS-A	MS-A CR communication terminated Registration status is displayed on the HMI of CR			

6.1.3.2 Incoming Voice Group Call

The successful reception of an incoming voice group call to the CR has to be checked during the registration transaction by making calls to "all trains group":

- call to CR using "all trains group" Gid (200)

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Select train data entry menu	According CR User Manual Train data entry menu activated on the display of the HMI The train data must be empty i.e. CR is not registered to any train number previously.			
2	Enter train number and confirm.	Train number displayed on the HMI of CR			
3	Enter the function code for leading driver and confirm	Train function displayed on the HMI of CR			
4	Start registration Simultaneously initiate a call using "all trains group" Gid (200) by MS-A Take the uplink by MS-A using PTT after successful call establishment	Registration progress is displayed on the HMI of CR "all trains group" call established to the CR leading driver MS-A CR communication, CR is listener.			
5	Terminate "all trains group" call by MS-A	MS-A CR "all trains group" call communication terminated Registration status is displayed on the HMI of CR			

6.1.3.3 Incoming Emergency Call

The successful reception of an incoming train emergency call to the CR has to be checked during the registration transaction by making a REC to "train groups":

- call to CR using REC "train groups" Gld (299)

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Select train data entry menu	According CR User Manual Train data entry menu activated on the display of the HMI The train data must be empty i.e. CR is not registered to any train number previously.			
2	Enter train number and confirm.	Train number displayed on the HMI of CR			
3	Enter the function code for leading driver and confirm	Train function displayed on the HMI of CR			
4	Start registration Simultaneously initiate a call using TEC "train groups" Gld (299) by MS-A Take the uplink by MS-A using PTT after successful call establishment	Registration progress is displayed on the HMI of CR REC "train groups" call established to the CR leading driver MS-A CR communication, CR is listener.			
5	Terminate REC "train groups" call by MS-A	MS-A CR REC "train groups" call communication terminated Registration status is displayed on the HMI of CR			

6.2 CORRECTION OF REGISTRATION ERROR

6.2.1 Correction of train data

Purpose: After registration failure an audible and visual indication shall be provided to the user. The train data can be corrected by the user.

Reference: **FRS § 5.2.3.29, 5.2.3.30, 5.2.3.32, 5.2.3.33 SRS § 11.3.12**

The train data corrected by the user after registration failure and a new registration attempt is started.

- PTP call to driver using train number and function code 02 (2nd driver) shall be possible and successful.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	CR-B: According CR User Manual Register to train number and leading driver				
2	CR-A: According CR User Manual Select train data entry menu	According CR User Manual Train data entry menu activated on the display of the HMI The train data must be empty i.e. CR is not registered to any train number previously.			
3	Enter train number (same as CR-B above) and confirm.	Train number displayed on the HMI of CR			
4	Enter the function code for leading driver (same as CR-B above) and confirm	Train function displayed on the HMI of CR			
5	Start registration	Registration progress is displayed on the HMI of CR An audible indication is given on the loudspeaker A visual indication is displayed on the HMI. Registration status is displayed on the HMI of CR as failed e.g. "FN already in use"			
6	According CR User Manual Select train data entry menu again	Train data entry menu activated on the display of the HMI The train data contains previously entered train number.			
7	Enter confirm.	Train number displayed on the HMI of CR			
8	Enter the function code for other driver (2nd driver) and confirm	Train function displayed on the HMI of CR			
9	Start registration	Registration progress is displayed on the HMI of CR Registration status is displayed on the HMI of CR			
10	Check registration using PTP call by MS-A to train number and function - other driver (2nd driver) to CR-A Terminate call by MS-A	PTP call established to the CR-A 2nd driver MS-A CR-A communication			

11	CR-A: According CR User Manual Select train data entry menu	According CR User Manual Train data entry menu activated on the display of the HMI			
12	Enter a new train number and confirm.	Train number displayed on the HMI of CR			
13	Enter the function code for leading driver and confirm	(Option) The previous train number is deregistered. The new train number and function code is registered The new train number and function are displayed on the HMI of CR-A			
14	Check registration using PTP call by MS-A to the newly registered train number and function	PTP call established to CR-A MS-A CR communication			
15	Terminate call by MS-A	CR-A is idle			

6.2.2 Forced de-registration

Purpose: The CR can also be forced to register to an already registered (assigned) functional number, e.g. train number.

Preconditions for the test: CR-A is not registered, CR-B is registered

Reference: **FRS § 5.2.3.29, 5.2.3.30, 5.2.3.31, 11.3.2.4, 11.3.2.5, 11.3.3.4, 11.3.3.5; SRS § 11.3.7, 11.3.9, 11.3.9i**

Note - SRS 11.3.7 not on the ERA (M1) list. This seems strange.

The train data corrected by the user after registration failure and a new registration attempt is started.

The successful registration has to be checked by making PTP calls to the CR:

- PTP call to driver using train number and function code 01 (leading driver) shall be possible and successful.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	CR-B: According CR User Manual Register to train number and leading driver				
2	CR-A: According CR User Manual Select train data entry menu	According CR User Manual Train data entry menu activated on the display of the HMI The train data must be empty i.e. CR is not registered to any train number previously.			
3	Enter train number (same as CR-B above) and confirm.	Train number displayed on the HMI of CR			
4	Enter the function code for leading driver (same as CR-B above) and confirm	Train function displayed on the HMI of CR			
5	According CR User Manual Start registration	Registration progress is displayed on the HMI of CR An audible indication is given on the loudspeaker A visual indication is displayed on the HMI. Registration status is displayed on the HMI of CR as failed e.g. "FN already in use"			
6	Start forced de-registration Start registration	Forced De-registration progress is displayed on the HMI of CR Registration progress is displayed on the HMI of CR Registration status is displayed on the HMI of CR Check USSD messages for details of transaction			

7	CR-B: Optional user action to confirm the forced de-registration indication	An audible Forced De-registration indication is given on the loudspeaker A visual Forced De-registration indication is displayed on the HMI Train data status updated on the display of the HMI			
8	Check registration using PTP call by MS-A to train number and function - leading driver to CR-A Terminate call by MS-A	PTP call established to the CR-A leading driver MS-A CR-A communication			

6.3 DEREGISTRATION

6.3.1 Deregistration of train number

Purpose: To check the correct deregistration of the train number registered to the Cab Radio of the leading driver and on board system(s) e.g. PA system and intercom if available.

Reference: **FRS § 5.2.1.2, 5.2.3.34, 5.2.3.35, 11.3.3.1, 11.3.3.5; SRS § 4.3.3, 4.3.4, 5.4.8, 5.4.9, 11.3.7**

The successful deregistration has to be checked by making PTP calls to the CR:

- PTP call to driver using train number and function code 01 (leading driver)
- PTP call to PA system using train number and FC 08, applicable only for option: PA
- PTP call to intercom using train number and FC 07, applicable only for option: ICOM

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Select deregistration menu	According CR User Manual Deregistration menu activated on the display of the HMI The CR must have been registered to any train number previously.			
2	Start deregistration	Deregistration progress is displayed on the HMI of CR Check that USSD message is sent by CR-A Deregistration successful Registration status is displayed on the HMI of CR i.e. train number is removed from the display of the HMI			

3	Check deregistration using PTP call by MS-A to train number and function - leading driver Terminate call by MS-A	PTP call cannot be established to the CRs leading driver			
4	Check deregistration using PTP call by MS-A to train number and function - PA system (option: PA) Terminate call by MS-A	PTP call cannot be established to the CR PA system			
5	Check deregistration using PTP call by MS-A to train number and function - intercom (option: ICOM) Terminate call by MS-A	PTP call cannot be established to the CR ICOM			

6.3.2 Incoming Voice Call during Functional Number Deregistration

Purpose: The registration procedure must not prevent to receive an incoming voice calls.

Reference: **FRS § 5.2.1.2; SRS § 5.5.19**

The successful reception of an incoming voice call to the CR has to be checked during the deregistration transaction by making calls to the CR.

6.3.2.1 Incoming point-to point Call

The successful reception of the incoming ptp call to the CR has to be checked during the deregistration transaction by making calls to the MSISDN of the CR:

- call to driver using MSISDN

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Select deregistration menu	According CR User Manual Deregistration menu activated on the display of the HMI The CR must have been registered to any train number previously.			
2	Start deregistration Simultaneously initiate a ptp call using MSISDN of the CR with priority 3 by MS-A	Deregistration progress is displayed on the HMI of CR PTP call established to the CR leading driver MS-A CR communication			
5	Terminate call by MS-A	MS-A CR communication terminated Registration status is displayed on the HMI of CR			

6.3.2.2 Incoming Voice Group Call

The successful reception of an incoming voice group call to the CR has to be checked during the deregistration transaction by making calls to "all trains group":

▪ call to CR using "all trains group" Gld (200)

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Select deregistration menu	According CR User Manual Deregistration menu activated on the display of the HMI The CR must have been registered to any train number previously.			
2	Start deregistration Simultaneously initiate a call using "all trains group" Gld (200) by MS-A Take the uplink by MS-A using PTT after successful call establishment	Deregistration progress is displayed on the HMI of CR "all trains group" call established to the CR leading driver MS-A CR communication, CR is listener.			
3	Terminate "all trains group" call by MS-A	MS-A CR "all trains group" call communication terminated Registration status is displayed on the HMI of CR			

6.3.2.3 Incoming Emergency Call

The successful reception of an incoming train emergency call to the CR has to be checked during the deregistration transaction by making a REC to "train groups":

- call to CR using REC "train groups" GId (299)

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Select deregistration menu	According CR User Manual Deregistration menu activated on the display of the HMI The CR must have been registered to any train number previously.			
2	Start deregistration Simultaneously initiate a call using REC "train groups" GId (299) by MS-A Take the uplink by MS-A using PTT after successful call establishment	Deregistration progress is displayed on the HMI of CR REC "train groups" call established to the CR leading driver MS-A CR communication, CR is listener.			
3	Terminate REC "train groups" call by MS-A	MS-A CR REC "train groups" call communication terminated Registration status is displayed on the HMI of CR			

6.3.3 Deregistration after entering another GSM-R Network

Purpose: The deregistration procedure must be possible for re-registration in roaming/home network.

Reference: **FRS § 11.3.4; SRS § 11.3.14**

The test is included in 14.1.1 Manual network selection in idle mode.

6.3.4 Unsuccessful deregistration

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

7. POINT-TO-POINT CALL

7.1 INCOMING PTP CALL

7.1.1 Incoming ptp call to driver with priority 4

7.1.1.1 Incoming ptp call to driver with priority 4 using MS-ISDN

Purpose: This test is to check the procedures concerning accepting calls, conducting calls and terminating calls. The priority of the call makes it necessary to manually accept the call.

The precondition of this test are that t MS-A does has a functional number.

Reference: **FRS § 4.2.1, 4.2.3, 5.2.1.2, 5.2.2ii, 5.2.2iii, 5.2.2.6, 5.2.2.43, 5.2.2.44, 5.2.2.45, 5.2.2.46, 5.2.3.19, 5.5.2;**

SRS § 4.3.1, 4.3.3, 4.3.4 5.4.4, 5.5.19, 5.5.22, 5A.2, 11.5.1

- Call to driver using MSISDN
- The call to drivers CR is accepted by user action

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual MS-A setup a ptp call to driver's MSISDN CR-A with Priority 4	According CR User Manual For the incoming ptp call: An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Identification of the caller FN of MS-A is displayed on the HMI			
2	Accept the call by driver's CR-A HMI menu	Incoming ptp call is accepted The communication MS-A CR-A is established For the ongoing ptp call: A visual indication is displayed on the HMI Identification of the caller is displayed on the HMI Caller can be heard on driver's loudspeaker			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to MS-A is activated on the HS of the CR-A			
4a	Terminate call by CR-A: Using the HMI menu	Ongoing ptp call terminated. CR-A in default idle status			

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
4b	Terminate call by CR-A: Hang-up handset	Ongoing ptp call terminated. CR-A in default idle status			
4c	Terminate call by MS-A: MS-A hangs up	Ongoing ptp call terminated. CR-A in default idle status			

7.1.1.2 Incoming ptp call to driver with priority 4 using functional number

Purpose: This test is to check the procedures concerning accepting calls, conducting calls and terminating calls using a functional number. The priority of the call makes it necessary to manually accept the call.

The preconditions of this test are that the Cab Radio is functionally registered to train number as leading driver and MS-A does not have a functional number.

Reference: **FRS § 4.2.1, 4.2.4, 5.2.2.6, 5.2.2.44; SRS § 4.3.4, 5.5.2, 5.5.3, 11.5.1, 11.5.3**

▪ call leading driver using Functional Number e.g. train number and function code (=01) for the leading driver

▪ The call to CR is accepted by user action

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual MS-A setup a ptp call to driver's FN CR-A e.g. train number and leading driver with Priority 4	According CR User Manual For the incoming ptp call: An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Identification of the caller MSISDN of MS-A is displayed on the HMI			
2	Accept the call by driver's CR-A HMI menu	Incoming ptp call is accepted The communication MS-A CR-A is established For the ongoing ptp call: A visual indication is displayed on the HMI Identification of the caller is displayed on the HMI Caller can be heard on driver's loudspeaker			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to MS-A is activated on the HS of the CR-A			
4a	Terminate call by CR-A: Using the HMI menu	Ongoing ptp call terminated. CR-A in default idle status			
4b	Terminate call by CR-A: Hang-up handset	Ongoing ptp call terminated. CR-A in default idle status			

| 4c | Terminate call by MS-A:
MS-A hangs up | Ongoing ptp call terminated.
CR-A in default idle status | | | |

7.1.1.3 Incoming ptp call with priority 4 using Engine Number

Purpose: This test is to check the procedures concerning accepting calls, conducting calls and terminating calls using the engine number. The priority of the call makes it necessary to manually accept the call.

The precondition of this test is that the Cab Radio is functionally registered to engine number as leading driver.

Reference: **SRS § 5.4.4**

▪ Call CR using engine number and function code (=01) for the leading driver
▪ The call to drivers CR is accepted by user action

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual MS-A setup a ptp call to engine number CR-A with Priority 4	According CR User Manual For the incoming ptp call: An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Identification of the caller FN (if MS-A registered) MSISDN (if MS-A not registered) is displayed on the HMI			
2	Accept the call by driver's CR-A HMI menu	Incoming ptp call is accepted The communication MS-A CR-A is established For the ongoing ptp call: A visual indication is displayed on the HMI Identification of the caller is displayed on the HMI Caller can be heard on driver's loudspeaker			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to MS-A is activated on the HS of the CR-A			
4a	Terminate call by CR-A: Using the HMI menu	Ongoing ptp call terminated. CR-A in default idle status			
4b	Terminate call by CR-A: Hang-up handset	Ongoing ptp call terminated. CR-A in default idle status			
4c	Terminate call by MS-A: MS-A hangs up	Ongoing ptp call terminated. CR-A in default idle status			

7.1.2 Incoming call to driver with priority higher than 4 (automatic answering)

Purpose: This test is to check the procedures concerning accepting calls, conducting calls and terminating calls. The call has to be automatically accepted due to its priority.

Reference: **FRS § 4.2.3, 5.2.1.2; SRS § 5A.3, 10.2.1**

- Call received from controller e.g. primary controller
- The call is accepted by the CR automatically i.e. without user action

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Incoming ptp call (Priority is not = 4) from controller e.g. primary controller	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Identification of the caller Automatic acceptance of the call by the CR The communication controller CR is established For the ongoing ptp call: A visual indication is displayed on the HMI Identification of the caller is displayed on the HMI Caller can be heard on driver's loudspeaker			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to MS-A is activated on the HS of the CR-A			
4a	Terminate call by CR-A: Using the HMI menu	Ongoing ptp call terminated. CR-A in default idle status			
4b	Terminate call by CR-A: Hang-up handset	Ongoing ptp call terminated. CR-A in default idle status			
4c	Terminate call by MS-A: MS-A hangs up	Ongoing ptp call terminated. CR-A in default idle status			

7.1.3 Incoming PA call from Primary Controller

Applicable if the CR provides an interface to Public Address.

Reference: **SRS § 5.8.1(O)**

7.1.3.1 PA system is Idle (not in use)

Purpose: This test is to show the automatic connection of incoming calls to appropriate on-train users or devices e.g. public address PA.

The capability to monitor calls to other on-train users/devices using the Cab radio is also tested.

The precondition of this test is that the PA of the Cab Radio is functionally registered to train number.

Reference: **FRS § 5.2.1.2, 5.2.2.71, 5.2.2.73, 5.2.2.74, 5.2.3.35 ; SRS § 5.6.1**

- The call is established by the Primary Controller to the PA system.
- The call is connected by the CR automatically to the PA system i.e. without user action
- The call is terminated by the Primary Controller or the driver.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Incoming call from Primary Controller to PA using functional number	According CR User Manual An indication is given to the driver The call is connected to PA system Announcement of the Primary Controller can be heard on the PA loudspeaker			
3	Driver joins PA call by picking up the handset	The driver joins the communication and may speak to and listen to the primary controller.			
4	Driver leaves PA call by replacing the handset	PA call continues			
5	Primary Controller terminates PA call	PA call is terminated CR in default idle status			

7.1.3.2 PA system is busy (in use)

Purpose: This test is to show the automatic connection of incoming calls to appropriate on-train users or devices e.g. public address PA during an ongoing PA call established by the driver .

The precondition of this test is that the PA of the Cab Radio is functionally registered to train number.

The PA of the CR is in use e.g. by the driver.

Reference: **FRS § 5.2.1.2, 5.2.2.71, 5.2.2.72, 5.2.2.73, 5.2.2.74, 5.2.3.35; SRS § 5.6.1**

- The call is established by the Primary Controller to the PA system.
- The call is received

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Driver establishes a PA call	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI The call is connected to PA system Driver may conduct an announcement on the PA system			
2	Incoming call from Primary Controller to PA system using functional number of the PA	The Primary Controller call is received on the loudspeaker of the CR. Driver PA announcement is kept on the HS of the CR and can be heard on the PA system.			

7.1.4 Incoming call to Intercom

This section is a candidate for removal. It has been retained currently as it provides a baseline performance which may be useful when dealing with arbitration issues later in the specification.

Applicable if the CR provides an interface to UIC Intercom.
Reference: **SRS § 5.8.1(O)**

7.1.4.1 Intercom system in use

Purpose: This test is to show that the automatic connection of incoming calls to appropriate on-train users or devices e.g. Intercom will be rejected if the PA system is in use.

The precondition of this test is that the Intercom of the Cab Radio is functionally registered to train number.

The PA of the CR is in use e.g. by the driver.

Reference: **FRS § 5.2.1.2, 5.2.2.71, 5.2.2.72, 5.2.2.73, 5.2.2.74, 5.2.3.35; SRS § 5.6.1**

- The call is established by the Primary Controller to the Intercom.
- The call is rejected by the CR automatically i.e. without user action
- The call is terminated by the Primary Controller

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Driver establishes a PA call	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI The call is connected to PA system Driver may conduct an announcement on the PA system			
2	Incoming call from Primary Controller to Intercom system using functional number of the Intercom	Incoming call from Primary Controller is received Driver PA announcement is kept ongoing			

7.1.5 Incoming call from Conductor via UIC Intercom system

Purpose: This test is to show that the conductor may establish a connection to the driver via the UIC Intercom system.

Reference: **FRS § 5.2.2.41; SRS § 5.6.1**

It is noted that FRS 5.2.2.41 is not currently considered to be TSI-mandatory

- The call is established by the conductor using the UIC Intercom system.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Conductor initiates a call via UIC Intercom	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI			
2	Accept the call by driver's CR HMI menu or handset	Incoming Intercom call is accepted The communication CR Intercom is established For the ongoing ptp call: A visual indication is displayed on the HMI Identification of the caller is displayed on the HMI Caller can be heard on driver's loudspeaker			
3	Pick up handset of CR	Driver's loudspeaker set to reduced volume Communication to Intercom is activated on the HS of the CR			
4	Hang up handset	Ongoing call is terminated. CR in default idle status			

7.1.6 Call hold for incoming ptp calls

7.1.6.1 New Incoming ptp call during ongoing ptp call

Purpose: This test is to check the procedures concerning call wait and call hold for an incoming point-to-point voice call during an ongoing ptp voice call with the same or a lower priority.

Reference: **FRS § 4.2.3, 5.2.1.2, 5.2.3.42; SRS § 4.3.3**

- MS-A calls to driver using MSISDN
- The call to drivers CR is accepted by user action
- MS-B calls to driver using MSISDN
- The 2nd call to drivers CR is accepted by user action
- Swap calls
- Terminate calls

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1a	According CR User Manual MS-A setup a ptp call to driver's MSISDN CR-A with Priority 4	According CR User Manual For the incoming ptp call: An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Identification of the caller FN (if MS-A registered) MSISDN (if MS-A not registered) is displayed on the HMI			
1b	MS-A setup a ptp call to driver's MSISDN CR-A with Priority 3	For the incoming ptp call: An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Identification of the caller FN (if MS-A registered) MSISDN (if MS-A not registered) is displayed on the HMI			
2	Accept the call by driver's CR-A HMI menu	Incoming ptp call is accepted The communication MS-A CR-A is established For the ongoing ptp call: A visual indication is displayed on the HMI Identification of the caller is displayed on the HMI Caller can be heard on driver's loudspeaker			

3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to MS-A is activated on the HS of the CR-A			

4	MS-B setup a ptp call (2nd call) to driver's MSISDN CR-A with Priority 4	For the 2nd incoming ptp call:
		
		An audible indication is given on the loudspeaker
		
		A visual indication is displayed on the HMI
		
		(Option) Identification of the caller
		
		  FN (if MS-B registered)
		
		  MSISDN (if MS-B not registered)
		
		is displayed on the HMI			

5	Accept the call by driver's CR-A HMI menu	Call to MS-A (1st call) is on hold Information displayed on the HMI updated Call MS-B active Call MS-A on hold Audio connection with MS-B (2nd call)			
6	Swap calls by driver's CR-A HMI menu	Call to MS-B (2nd call) is on hold Information displayed on the HMI updated Call MS-A active Call MS-B on hold Audio connection with MS-A (1st call)			
7	Swap calls by driver's CR-A HMI menu	Call to MS-A (1st call) is on hold Information displayed on the HMI updated Call MS-B active Call MS-A on hold Audio connection with MS-B (2nd call)			
8	Terminate call by CR-A: Using the HMI menu	Call to MS-B (2nd call) is terminated Information displayed on the HMI updated Call MS-A active Audio connection with MS-A (1st call)			
9	Terminate call by CR-A: Hang-up handset	Call to MS-A (1st call) is terminated CR-A in default idle status			

7.1.6.2 Placing first call on hold and initiating a second outgoing call

Purpose: This test is to show that a point-to-point call can be placed on hold and a second point-to-point call can then be initiated.

Reference: **FRS § 4.2.3, 5.2.1.2, 5.2.3.42; SRS § 4.3.3**

- MS-A calls to driver using MSISDN
- The call to drivers CR is accepted by user action
- CR calls MS-B
- The 1st call is put on hold
- Terminate calls

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual MS-A setup a ptp call to driver's MSISDN CR-A with Priority 4	According CR User Manual For the incoming ptp call: An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Identification of the caller FN (if MS-A registered) MSISDN (if MS-A not registered) is displayed on the HMI			
2	Accept the call by driver's CR-A HMI menu	Incoming ptp call is accepted The communication MS-A CR-A is established For the ongoing ptp call: A visual indication is displayed on the HMI Identification of the caller is displayed on the HMI Caller can be heard on driver's loudspeaker			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to MS-A is activated on the HS of the CR-A			
4	Enter data for a 2nd ptp call to MS-B Initiate 2nd ptp call to MS-B	Information displayed on the CR-A HMI updated 1st call is put on hold, 2nd call started			
5	Accept call by MS-B	The communication MS-B CR-A is established For the ongoing 2nd ptp call: A visual indication is displayed on the HMI Identification of the caller is displayed on the HMI Audio connection with MS-B (2nd call)			

6	Terminate call by CR-A: Using the HMI menu	Call to MS-B (2nd call) is terminated Information displayed on the HMI updated			
	CR-A may retrieve the call on hold to MS-A automatically or by user action (This is an implementation option)	Information displayed on the HMI updated Call to MS-A active Audio connection with MS-A (1st call)			
7	Terminate call by CR-A: Hang-up handset	Call to MS-A (1st call) is terminated CR-A in default idle status			

7.1.7 Handover during incoming call (cell change in the same location area)

This test could be handled by a supplier's factory acceptance test. It should not be necessary to repeat it as part of the tests specified in the present document.

Purpose: This test is to show that an incoming ptp-call during the transfer to a new radio cell is only shortly interrupted by the handover procedure.

Reference: **System requirement**

- MS-A calls the driver of CR-A
- The call to drivers CR is accepted by user action
- Handover during ptp call [this test may be executed dynamic in the field or in the test lab using a handover machine]
- Terminate call

Remark: Neighbour (target) cell in the same location area.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual MS-A setup a ptp call to driver's MSISDN CR-A with Priority 4	According CR User Manual For the incoming ptp call: An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Identification of the caller FN (if MS-A registered) MSISDN (if MS-A not registered) is displayed on the HMI			
2	Accept the call by driver's CR-A HMI menu	Incoming ptp call is accepted The communication MS-A CR-A is established For the ongoing ptp call: A visual indication is displayed on the HMI Identification of the caller is displayed on the HMI Caller can be heard on driver's loudspeaker			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to MS-A is activated on the HS of the CR-A			
4	Change of attenuation at the handover machine to initiate a handover or Wait for handover during dynamic test Handover	Handover in the network Audio connection with MS-A may be disturbed shortly because of handover Call is maintained and good audio connection persisting			
5	MS-A terminates call	Call to MS-A is terminated			

		CR-A in default idle status			

7.1.8 Handover during incoming call (cell change to different location area)

This test could be handled by a supplier's factory acceptance test. It should not be necessary to repeat it as part of the tests specified in the present document.

Purpose: This test is to show that an incoming call during the transfer to a new radio cell is only shortly interrupted by the handover procedure.

Reference: **System requirement**

- MS-A calls the driver of CR-A
- The call to drivers CR is accepted by user action
- Handover during ptp call [this test may be executed dynamic in the field or in the test lab using a handover machine]
- Terminate call

Remark: Neighbour (target) cell in different location area.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual MS-A setup a ptp call to driver's MSISDN CR-A with Priority 4	According CR User Manual For the incoming ptp call: An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Identification of the caller FN (if MS-A registered) MSISDN (if MS-A not registered) is displayed on the HMI			
2	Accept the call by driver's CR-A HMI menu	Incoming ptp call is accepted The communication MS-A CR-A is established For the ongoing ptp call: A visual indication is displayed on the HMI Identification of the caller is displayed on the HMI Caller can be heard on driver's loudspeaker			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to MS-A is activated on the HS of the CR-A			
4	Change of attenuation at the handover machine to initiate a handover or Wait for handover during dynamic test Handover	Handover in the network Audio connection with MS-A may be disturbed shortly because of handover Call is maintained and good audio connection persisting			

Step	Procedure	Effects			
5	MS-A terminates call	Call to MS-A is terminated CR-A in default idle status			

7.2 OUTGOING CALLS (POINT-TO-POINT CALL, MOC)

7.2.1 Call to Controller (Primary, Secondary, Power Supply)

Purpose: This test is to show that the driver can initiate a call to any of the following types of controller primary, secondary and power supply controller with a minimum of driver action e.g. a single keystroke, and that the call is set up at Priority 3 (railway operation) using the appropriate short code. The short codes are used as part of the Location Dependent Addressing function within the network.

The precondition of this test is that the CR-A is registered to a train number

Reference: **FRS § 4.2.1, 4.2.4, 5.2.1.2, 5.2.2i, 5.2.2ii, 5.2.2iii, 5.2.2.1, 5.2.2.3, 5.2.2.3i; 5.2.2.4, 5.2.2.5, 5.2.2.6, 5.2.2.7, 5.4.3, 10.2.1, 10.2.2, 11.4.1, 11.4.2, 11.4.5**

SRS § 5.3.1, 5.3.2, 5.5.1, 5.5.3, 5.5.4, 5.5.6, 5A.2, 10.2.1, 11.5.1, 11.5.4, 11.5.5

- ▪ CR-A initiates a call to primary, secondary and power supply controller with a minimum of driver action
- ▪ The call to the controller is established
- ▪ CR-A terminates the call
- ▪ Controller terminates the call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1a	According CR User Manual CR-A initiates call to Primary Controller	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment incl. identification of Primary Controller Check that call was set up at Priority 3 using short code 1200			
2a	Primary Controller accepts the call	The communication CR-A Primary Controller is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI, including letters as well as numbers if applicable Primary Controller can be heard on driver's			

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
		Train Number is displayed at the HMI of the Primary Controller (Destination subscriber). Confirm that UUS1 information has been used in the correct format by CR-A to transfer the functional number.			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to Controller is activated on the HS of the CR-A			
4a	Terminate call by CR-A: Using the HMI menu	Ongoing Primary Controller call terminated. CR-A in default idle status			

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
0	Pick up handset of CR-A				
1b	CR-A initiates call to Secondary Controller	An audible indication is given on the loudspeaker and handset A visual indication is displayed on the HMI Call establishment incl. identification of Secondary Controller Check that call was set up at Priority 3 using short code 1300			
2b	Secondary Controller accepts the call	The communication CR-A Secondary Controller is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI, including letters as well as numbers if applicable Secondary Controller can be heard on driver's loudspeaker (at reduced volume) and handset			
		Train Number is displayed at the HMI of the Secondary Controller (Destination subscriber			
3		Communication to Controller is activated on the HS of the CR-A			
4b	Terminate call by CR-A: Hang-up handset	Ongoing Secondary Controller call terminated. CR-A in default idle status			

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3

1c	CR-A initiates call to Power Supply Controller	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment incl. identification of Power Supply Controller Check that call was set up at Priority 3 using short code 1400			
2c	Power Supply Controller accepts the call	The communication CR-A Power Supply Controller is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI, including letters as well as numbers if applicable Power Supply Controller can be heard on			
		Train Number is displayed at the HMI of the Power Supply Controller (Destination subscriber			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to Controller is activated on the HS of the CR-A			
4c	Terminate call by Power Supply Controller: Power Supply Controller hangs up	Ongoing Power Supply Controller call terminated. CR-A in default idle status			

7.2.2 Call to busy Controller

Purpose: This test is to show that if the system is not able to connect the call, due to link capacity, an audible and visual indication is provided to the driver that the call was not received by the controller. Drivers HMI shall also indicate if the called party was busy or if the network could not connect the call.

Reference: **FRS § 5.2.1.2, 5.2.2.1, 5.2.2.8;**

▪ CR-A initiates a call to primary, secondary and power supply controller with a minimum of driver action
▪ The call to the controller can not be established, because the controller is not reachable due to link capacity
▪ CR-A terminates the call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1a	According CR User Manual CR-A initiates call to Primary Controller	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment incl. identification of Primary Controller			
1d	Primary Controller can not be reached due to link capacity	The communication CR-A Primary Controller can not be established An audible indication is given on the loudspeaker A visual indication "busy" is displayed on the HMI			
2a	Terminate call by CR-A: Using the HMI menu	Call terminated. CR-A in default idle status			
2b	Terminate call by CR-A: Hang-up handset (if handset off hook else 2a)	Call terminated. CR-A in default idle status			

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1b	CR-A initiates call to Secondary Controller	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment incl. identification of Secondary Controller			
1e	Secondary Controller can not be reached due to link capacity	The communication CR-A Secondary Controller can not be established An audible indication is given on the loudspeaker A visual indication "busy" is displayed on the HMI			

| 2a | Terminate call by CR-A: Using the HMI menu | Call terminated. CR-A in default idle status | | | |
| 2b | Terminate call by CR-A: Hang-up handset (if handset off hook else 2a) | Call terminated. CR-A in default idle status | | | |

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1c	CR-A initiates call to Power Supply Controller	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment incl. identification of Power Supply Controller			
1f	Power Supply Controller can not be reached due to link capacity	The communication CR-A Power Supply Controller can not be established An audible indication is given on the loudspeaker A visual indication "busy" is displayed on the HMI			
2a	Terminate call by CR-A: Using the HMI menu	Call terminated. CR-A in default idle status			
2b	Terminate call by CR-A: Hang-up handset (if handset off hook else 2a)	Call terminated. CR-A in default idle status			

7.2.3 Call train staff

7.2.3.1 Call chief conductor using ptp voice call

Purpose: This test is to show that it is possible for the driver to contact members of on-board train staff e.g. chief conductor using a point-to-point voice call. The test validates also that the drivers functional ID is transmitted correctly.

The precondition of this test is that the Cab Radio CR-A is functionally registered to train number as a driver and the MS-A is functionally registered to train number as chief conductor.

Reference: **FRS § 4.2.1, 5.2.1.2, 5.2.2.38, 5.2.2.39, 5.2.2.40, 5.2.2.41; SRS § 5.3.4, 5.3.10, 5.5.4, 5.5.6**

- CR-A initiates a call to chief conductor
- The call to chief Conductor's MS-A is established
- CR-A terminates the call
- Chief conductor terminates the call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates call to Chief Conductor's MS-A	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment incl. identification of Chief Conductor			
2	Chief Conductor's MS-A accepts the call	The communication CR-A Chief Conductor is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI Chief Conductor can be heard on driver's loudspeaker			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to Chief Conductor is activated on the HS of the CR-A			
4a	Terminate call by CR-A: Using the HMI menu	Ongoing Chief Conductor call terminated. CR-A in default idle status			
4b	Terminate call by CR-A: Hang-up handset	Ongoing Chief Conductor call terminated. CR-A in default idle status			
4c	Terminate call by Chief Conductor's MS-A: MS-A hangs up	Ongoing Chief Conductor call terminated. CR-A in default idle status			

7.2.3.2 Call chief conductor via UIC intercom

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

7.2.3.3 Call chief conductor via UIC intercom (HMI powered off)

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

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7.2.4 Call cab radio's public address system

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

7.2.5 Call to Primary Controller

The contents of this section have been removed as they were a duplicate of part of 7.2.1.

7.2.6 Call to Power Supply Controller

The contents of this section have been removed as they were a duplicate of part of 7.2.1.

7.2.7 Initiate call dialling a functional number

Purpose: This test is to show that the cab radio is capable to initiate a call dialling a functional number and that this is set up at Priority 4 (railway information).

The precondition of this test is that the MS-A is functionally registered to train number as chief conductor.

Reference: **FRS § 4.2.1, 5.2.1.2, 5.2.2.42 SRS § 5.5.4, 5.5.14, 5.5.15**

- CR-A initiates a call dialling a functional number
- The call to chief Conductor's MS-A is established
- CR-A terminates the call
- Chief conductor's MS-A terminates the call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates call to MS-A dialling its functional number	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment to MS-A			
2	MS-A accepts the call	The communication CR-A MS-A is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI MS-A can be heard on driver's loudspeaker			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to MS-A is activated on the HS of the CR-A			
4a	Terminate call by CR-A: Using the HMI menu	Ongoing call terminated. CR-A in default idle status			
4b	Terminate call by CR-A: Hang-up handset	Ongoing call terminated. CR-A in default idle status			
4c	Terminate call by MS-A: MS-A hangs up	Ongoing call terminated. CR-A in default idle status			

7.2.8 Initiate call dialling MSISDN or number of fixed network user

Purpose: This test is to show that the cab radio is capable to initiate a call dialling a ISDN or MSISDN number and that this is set up at Priority 4 (railway information).

Reference: **FRS § 4.2.1, 5.2.1.2, 5.2.2.42, 10.2.1, 10.2.2 SRS § 5.3.11, 5.5.4, 5.5.14,5.5.15, 5.5.17, 5.5.18, 10.2.1**

- CR-A initiates a call dialling MSISDN of MS-A
- CR-A initiates a call dialling telephone number of fixed network user, called B-Party
- The call to MS-A is established
- The call to dialled fixed network user is established
- CR-A terminates the call
- MS-A terminates the call
- Fixed network user terminates the call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1a	According CR User Manual CR-A initiates call to MS-A dialling its MSISDN	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment to MS-A Check that the call was set up at Priority 4			
2a	MS-A accepts the call	The communication CR-A MS-A is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI MS-A can be heard on driver's loudspeaker			
3a	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to MS-A is activated on the HS of the CR-A			

Step	Procedure	Effects			
4a	Terminate call by CR-A: Using the HMI menu	Ongoing call terminated. CR-A in default idle status			
4c	Terminate call by MS-A: MS-A hangs up	Ongoing call terminated. CR-A in default idle status			

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1b	CR-A initiates call to fixed network user (B-Party) dialling its telephone number	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment to B-Party			
2b	B-Party accepts the call	The communication CR-A B-Party is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI B-Party can be heard on driver's loudspeaker			
3b	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to B-Party is activated on the HS of the CR-A			
4b	Terminate call by CR-A: Hang-up handset	Ongoing call terminated. CR-A in default idle status			
4d	Terminate call by B-Party: B-Party hangs up	Ongoing call terminated. CR-A in default idle status			

7.2.9 Point-to-point call using train staff list to catering staff

Purpose: This test is to show that Cab radio provides the driver with a list of 'generic' staff e.g. catering staff.

The precondition of this test is that the MS-A is functionally registered to train number as catering staff.

Reference: **FRS § 5.2.1.2, 5.2.2.39, 5.2.2.40, 5.2.3.39, 5.2.3.40 SRS § 5.3.10, 5.5.4, 5.5.9, 5.5.16**

- CR-A initiates call selecting "Catering Staff" from a generic list
- The call to catering staff's MS-A is established
- CR-A terminates the call
- MS-A terminates the call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates a call to MS-A selecting "catering staff" (FCs=20-29) from a list on the HMI menu	According CR User Manual A list of staff is provided An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment to MS-A			
2	MS-A accepts the call	The communication CR-A MS-A is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI MS-A can be heard on driver's loudspeaker			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to MS-A is activated on the HS of the CR-A			
4a	Terminate call by CR-A: Using the HMI menu	Ongoing call terminated. CR-A in default idle status			
4b	Terminate call by CR-A: Hang-up handset	Ongoing call terminated. CR-A in default idle status			
4c	Terminate call by MS-A: MS-A hangs up	Ongoing call terminated. CR-A in default idle status			

7.2.10 Presentation of functional number of the Cab Radio, no train number is registered

Purpose: This test is to show that the engine number is transmitted as functional number if no train number is registered by the Cab Radio. The engine number shall be displayed to the called party e.g. controller.

The precondition of this test is that the CR-A is not registered to any train number. The engine number must be pre-registered to the cab radios MSISDN and stored on the SIM by a O&M function.

Reference: **FRS § 5.2.2.3, 5.2.2.3i; SRS § 5.3.2**

- CR-A initiates a call to primary controller
- The call to primary controller is established
- CR-A terminates the call
- Primary controller terminates the call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates call to Primary Controller	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment incl. identification of Primary Controller			
2	Primary Controller accepts the call	The communication CR-A Primary Controller is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI Primary Controller can be heard on driver's loudspeaker			
		Engine Number is displayed at the HMI of the Primary Controller (Destination subscriber)			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to Controller is activated on the HS of the CR-A			
4a	Terminate call by CR-A: Using the HMI menu	Ongoing Primary Controller call terminated. CR-A in default idle status			
4b	Terminate call by Primary Controller: Primary Controller hangs up	Ongoing call terminated. CR-A in default idle status			

7.2.11 Handover during outgoing call (cell change in the same location area)

This test could be handled by a supplier's factory acceptance test. It should not be necessary to repeat it as part of the tests specified in the present document.

Purpose: This test is to show that an outgoing ptp-call during the transfer to a new radio cell is only shortly interrupted by the handover procedure.

Reference: **System requirement**

- CR-A calls the MSISDN of MS-A
- The call to MS-A is accepted by user action
- Handover during ptp call [this test may be executed dynamic in the field or in the test lab using a handover machine]
- Terminate call

Remark: Neighbour (target) cell in the same location area.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A setup a ptp call to the MSISDN MS-A with Priority 4	According CR User Manual For the incoming ptp call: An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Identification of the caller FN (if MS-A registered) MSISDN (if MS-A not registered) is displayed on the HMI			
		Functional Number (engine or train number) is displayed on the HMI of MS-A			
2	Accept the call by MS-A	Incoming ptp call is accepted The communication MS-A CR-A is established For the ongoing ptp call: A visual indication is displayed on the HMI Identification of the caller is displayed on the HMI Caller can be heard on driver's loudspeaker			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to MS-A is activated on the HS of the CR-A			

4	Change of attenuation at the handover machine to initiate a handover or Wait for handover during dynamic test Handover	Handover in the network Audio connection with MS-A may be disturbed shortly because of handover Call is maintained and good audio connection persisting			
5	MS-A terminates call	Call to MS-A is terminated CR-A in default idle status			

7.2.12 Handover during outgoing call (cell change different location area)

Purpose: This test is to show that an outgoing ptp-call during the transfer to a new radio cell is only shortly interrupted by the handover procedure to different location area.

Reference: **System requirement**

Remark: Neighbour (target) cell in different location area.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A setup a ptp call to the MSISDN MS-A with Priority 4	According CR User Manual For the incoming ptp call: An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Identification of the caller FN (if MS-A registered) MSISDN (if MS-A not registered) is displayed on the HMI			
		Functional Number (engine or train number) is displayed on the HMI of MS-A			
2	Accept the call by MS-A	Incoming ptp call is accepted The communication MS-A CR-A is established For the ongoing ptp call: A visual indication is displayed on the HMI Identification of the caller is displayed on the HMI Caller can be heard on driver's loudspeaker			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to MS-A is activated on the HS of the CR-A			
4	Change of attenuation at the handover machine to initiate a handover or Wait for handover during dynamic test Handover	Handover in the network Audio connection with MS-A may be disturbed shortly because of handover Call is maintained and good audio connection persisting			
5	MS-A terminates call	Call to MS-A is terminated CR-A in default idle status			

7.2.13 Outgoing calls with the aid of the telephone book

7.2.13.1 Point to Point Call

Purpose: This test is to show that an outgoing call can be initiated using stored number access

The precondition of this test is that the subscriber CR-A has the number of MS-A stored in its phonebook with no specified priority

Reference: **FRS § 5.2.3.39, 5.2.3.40, SRS § 5.5.4, 5.5.9, 5.5.11,, 5.5.12, 5.5.13**

- CR-A initiates a call to a stored number to MS-A
- MS-A receives the call
- CR-a and MS-A communicate
- CR-A terminates the call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A access the list of entries in the phonebook. CR-A initiates call to MS-A using the phonebook	According CR User Manual CR-A indicates call establishment and progress Check that priority is 4			
		MS-A receives the call A visual indication is displayed on the HMI incl. caller's identity CR-A indicates established call			
2	Pick up handset of CR-A CR-A may speak using the HS	CR-A driver's loudspeaker set to minimal volume Caller can be heard at MS-A			
3	CR-A terminates call:	Call is terminated CR-A in default idle status MS-A in default idle status			

7.2.13.2 Voice Group Call

Purpose: This test is to show that an outgoing group call can be initiated using stored number access

The precondition of this test is that the subscriber CR-A has the number of MS-A stored in it s phonebook which initiates a group call.

There is no priority specifically associated with this stored number.

Reference: **FRS § 5.2.3.39, 5.2.3.40, SRS § 5.5.4, 5.5.9, 5.5.11,, 5.5.12, 5.5.13**

- CR-A initiates a group call to a stored number
- MS-A receives the call

- CR-A and MS-A communicate as part of a group
- CR-A terminates the call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A access the list of entries in the phonebook. CR-A initiates call to a group using the phonebook	According CR User Manual CR-A indicates call establishment and progress Check that priority is 4			
		MS-A receives the call A visual indication is displayed on the HMI incl. caller's identity CR-A indicates established call A visual indication is displayed on the HMI Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	CR-A driver's loudspeaker set to minimal volume Group call communication is activated on the HS of the CR-A			
4	Press PTT button on CR-A (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			
5	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-A			
6	CR-A terminates call:	Call is terminated CR-A in default idle status MS-A in default idle status			

7.2.13.3 Voice Broadcast Call

Not required for interoperability – to be confirmed

7.2.14 Presentation of functional number of the Cab Radio, no train number is registered

Purpose: This test is to show that the correct UUS1 information if no functional number is registered by the Cab Radio.

The precondition of this test is that the CR-A has neither a registered train number nor a registered engine number.

Reference: **SRS § 11.5.4, 11.5.6**

- CR-A initiates a call to primary controller
- The call to primary controller is established
- CR-A terminates the call
- Primary controller terminates the call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates call to Primary Controller	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment incl. identification of Primary Controller			
2	Primary Controller accepts the call	The communication CR-A Primary Controller is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI (NOT a functional number) Primary Controller can be heard on driver's loudspeaker			
		Confirm that UUS1 information has been used in the correct format by CR-A to transfer the lack of a functional number.			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to Controller is activated on the HS of the CR-A			
4a	Terminate call by CR-A: Using the HMI menu	Ongoing Primary Controller call terminated. CR-A in default idle status			
4b	Terminate call by Primary Controller: Primary Controller hangs up	Ongoing call terminated. CR-A in default idle status			

7.2.15 Initiate call dialling (VGCS)

Purpose: This test is to show that the cab radio is capable to initiate a VGCS by selecting the number from a phonebook and that this is set up at Priority 4 (railway information).

The preconditions of this test are that the subscriber CR-A and MS-A have the group call Gid 201 subscribed and activated on the SIM and the network. In addition, CR-A has a phone book entry with the appropriate number to set up the call.

Reference: **SRS § 5.5.14, 5.5.15, 5.5.18,**

- CR-A initiates a VGCS call to Group 201 by selecting a number from a phonebook
- The call to the group is established
- The participants can communicate
- CR-A terminates the call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates call to Group 201 by selecting a phonebook entry	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Group call establishment Check that the call was set up at Priority 4			
2	MS-A accepts the call	The communication CR-A MS-A as a group call is established A visual indication is displayed on the HMI Indication to use PTT to talk is given to the driver on the HMI			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Group call communication is activated on the HS of the CR-A			
4	Press PTT button on CR-A (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			
5	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-A			
6	Terminate call by CR-A:	Ongoing call terminated. CR-A in default idle status			

7.2.16 Initiate call dialling (VBS)

Not required for interoperability – to be confirmed

7.3 PRE-EMPTION OF A PTP CALL

Purpose: This test is to show that an individual call can be pre-empted by a call with a higher priority.

Reference: **FRS § 5.2.4.5, 5.2.4.6; SRS § 4.3.3**

- MS-A initiates ptp call to CR-A
- The ptp call MS-A to CR-A is established
- Primary controller initiates ptp call to CR-A
- Call from primary controller is indicated
- CR-A puts ptp call to MS-A on hold
- CR-A accepts higher priority call from primary controller

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	Incoming individual call with Priority 4	Procedures in accordance with 7.1.1.1 According CR User Manual For the incoming ptp call: An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Identification of the caller FN (if MS-A registered) MSISDN (if MS-A not registered) is displayed on the HMI			
2	New ptp call from primary controller (Priority 3)				
2a		Implementation option "put on hold" First call is put on hold and automatic acceptance of second call from the primary controller Further procedures as in 7.1.2 (see below)			
2b		Implementation option "clear down" First call is terminated and automatic acceptance of second call from the primary controller Further procedures as in 7.1.2 (see below)			

3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to MS-A is activated on the HS of the CR-A			
4	Terminate call by CR-A: Using the HMI menu	Ongoing ptp call terminated. CR-A in default idle status			

7.4 CALL FORWARDING TO DRIVERS HANDHELD (O)

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

7.5 CONFERENCE CALLS

7.5.1 Multiple driver communications within the same train by the leading driver

Purpose: This test is to show that communication with other drivers on the same train can be established by the leading driver. The precondition of this test is that all cab radios involved are registered to the according functional number i.e. train number and driver ID.

Reference: **FRS § 4.2.1, 4.2.4, 5.2.1.2, 5.2.2.26, 5.2.2.28, 5.2.2.30, 5.2.2.31, 5.2.2.32, 5.2.2.33, 5.2.2.34, 5.2.2.35, 5.2.3.42;**
SRS § 4.3.3, 4.3.4, 5.3.8, 5.3.9, 5.5.6, 5.5.7, 5.5.19, 5A.2, 5A.3

Note: The initiator of the MTPY-call shall be able to call all other drivers (FC's 02-05) for the MTPY-call automatically or via Menu**.**

- ▪ CR-A (leading driver) initiates Multi Driver Communication
- ▪ CR-A adds other driver CR-C and/or controller to Multi Driver Communication
- ▪ Other driver CR-B leaves Multi Driver Communication
- ▪ Other driver CR-B calls CR-A
- ▪ CR-A adds other driver CR-B to Multi Driver Communication
- ▪ CR-A removes other driver CR-B from Multi Driver Communication
- ▪ CR-A terminates Multi Driver Communication

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Initiate a ptp call to other driver (FN of the CR-B) by CR-A (leading driver) with HMI guidance	According CR User Manual A visual indication "Multi Driver Communication" incl. driver CR-B is displayed on the HMI			
2	Called driver CR-B (other driver) automatically accepts call (Call priority 3)	An audible indication is given on the loudspeaker of CR-B A visual indication is displayed on the HMI of CR-B incl. indication "Multi Driver Communication" Identification of the caller FN Check that call was set up at Priority 3			
3	Called driver CR-B picks up handset	The communication CR-A to CR-B is established			
4	Leading driver CR-A establishes call to other driver CR-C or controller with HMI guidance	MPTY put on hold on CR-A Call connected to CR-C other driver or controller with the option to join it to MPTY			

5	Leading driver CR-A adds call to other driver CR-C or controller with HMI guidance to MPTY	Connection of other driver or controller to driver Multi Driver Communication The communication CR-A to CR-B and CR-C or controller is established A visual indication is displayed on the HMI of the CR-A indicating "Multi Driver Communication"			
6a	CR-A hangs up (handset on-hook)	CR-A listens to the ongoing Multi Driver Communication on the loudspeaker.			
6b	CR-B hangs up (handset on-hook)	CR-B listens to the ongoing Multi Driver Communication on the loudspeaker.			
7	CR-B leaves the ongoing Multi Driver Communication by HMI action	CR-B is disconnected from the ongoing Multi Driver Communication Notification is given to user of CR-A that CR-B has left the call. Multi Driver call continues			
8	CR-B initiates a ptp call to FN of the CR-A (leading driver)	An audible indication is given on the loudspeaker of CR-A A visual indication is displayed on the HMI of CR-A Identification of the caller FN (CR-B)			
9	CR-A accepts the call	The communication CR-A to CR-B is established Multi Driver Communication is put on hold on CR-A			
10	Leading driver CR-A adds call CR-B to Multi Driver Communication with HMI guidance to MPTY	The communication CR-A to CR-B and CR-C or controller is established A visual indication is displayed on the HMI of the CR-A indicating "Multi Driver Communication"			
11	CR-A removes CR-B from Multi Driver Communication with HMI guidance	CR-B is disconnected from the ongoing Multi Driver Communication Multi Driver Communication continues with CR-A and CR-C			
12	Terminate call by CR-A: Using the HMI menu	Ongoing Multi Driver Communication is terminated. CR-A in default idle status			

7.5.2 Multiple driver communications within the same train by the other drivers

Purpose: This test is to show that communication with other drivers on the same train can not be established by the other drivers than the leading driver

The precondition of this test is that all cab radios involved are registered to the according functional number i.e. train number and

driver ID.

Reference: **FRS § 5.2.2.26; SRS § 5.3.9**

- CR-B (other driver than the leading driver) initiates Multi Driver Communication
- Access to HMI guidance for "Multi Driver Communication" is not available on the CR-B

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Initiate a ptp call to FN of the CR-A (leading driver) by CR-B (other driver) with HMI guidance for "Multi Driver Communication"	According CR User Manual HMI guidance i.e. menu for "Multi Driver Communication" not available on the CR-B HMI			

7.5.3 Incoming call from controller during multiple driver communications

Purpose: This test is to show that a ptp call from the controller (primary or secondary) is automatically accepted and added to the "Multi Driver Communication" established by the leading driver.

The precondition of this test is that all cab radios involved are registered to the according functional number i.e. train number and driver ID.

Reference: **FRS § 4.2.1, 5.2.2.37;**

- CR-A (leading driver) initiates Multi Driver Communication
- CR-A adds other driver CR-B to Multi Driver Communication
- CR-A receives call from controller (primary or secondary)
- Call from controller is automatically added to the Multi Driver Communication on CR-A
- CR-B puts call on-hold and leaves the call
- CR-A terminates Multi Driver Communication

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Initiate a ptp call to other driver (FN of the CR-B) by CR-A (leading driver) with HMI guidance	According CR User Manual A visual indication "Multi Driver Communication" is displayed on the HMI			
2	Called driver CR-B (other driver) automatically accepts call (Call priority 3)	An audible indication is given on the loudspeaker of CR-B A visual indication is displayed on the HMI of CR-B incl. indication "Multi Driver Communication" Identification of the caller FN			
3	Called driver CR-B picks up handset	The communication CR-A to CR-B is established			

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
4	Incoming call from Controller to CR-A leading driver using functional number	An audible indication is given on the loudspeaker

A visual indication is displayed on the HMI

The incoming call is automatically accepted and added to the ongoing "Multi Driver Communication"

The communication CR-A to CR-B and controller is established | | | |
| 6 | CR-B puts call on-hold | A visual indication is displayed on the HMI of the CR-A | | | |
| 7 | CR-B leaves the ongoing Multi Driver Communication | CR-B is disconnected from the ongoing Multi Driver Communication

Functional identification of the CR-B is removed from display on leading driver HMI CR-A

Ongoing Multi Driver Communication continues | | | |
| 8 | Terminate call by CR-A:
 Using the HMI menu | Ongoing Multi Driver Communication is terminated.

CR-A in default idle status | | | |

7.5.4 Multiparty call (general)

Purpose: This test is to show that a general multiparty call (NOT communication with other drivers on the same train) can be established and is handled correctly.

The precondition of this test is that all cab radios involved are NOT registered to the same train number.

Reference: **FRS § 4.2.1 SRS § 4.3.3,, 5.5.19, 5A.2, 5A.3**

- CR-A calls CR-B
- CR-A adds CR-C and/or controller to Multiparty Communication
- CR-B leaves Multiparty Communication
- CR-A calls CR-B
- CR-A adds CR-B to Multiparty Communication
- CR-A terminates Multi Driver Communication

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual

Initiate a ptp call to CR-B by CR-A with HMI guidance | According CR User Manual

A visual indication is displayed on the HMI | | | |

2	CR-B accepts call	An audible indication is given on the loudspeaker of CR-B A visual indication is displayed on the HMI of CR-B Identification of the caller FN			
4	CR-A establishes call to CR-C or controller with HMI guidance	Call to CR-B put on hold on CR-A Call connected to CR-C or controller with the option to join it to MPTY			
5	CR-A adds call to CR-C or controller with HMI guidance to CR-B call to form a MPTY call.	MPTY connection CR-A to CR-B and CR-C or controller is established A visual indication is displayed on the HMI of the CR-A indicating "Multiparty call"			
6	CR-B hangs up (handset on-hook)	CR-B leaves call. CR-A is notified of CR-B leaving the call (optional). Call continues.			
7	CR-A adds call to CR-B with HMI guidance to on-going call to form a MPTY call	MPTY connection CR-A to CR-B and CR-C or controller is established A visual indication is displayed on the HMI of the CR-A indicating "Multiparty call"			
8	CR-B leaves the ongoing Multi Driver Communication by HMI action	CR-B is disconnected from the ongoing Multi Driver Communication Notification is given to user of CR-A that CR-B has left the call (optional) Call continues			
12a	Terminate call by CR-A: Using the HMI menu	Ongoing MPTY call terminated. All users in default idle status			
12b	Hand up handset at CR-A	Ongoing MPTY call terminated. All users in default idle status			

8. GROUP CALLS

8.1 INCOMING GROUP CALLS

8.1.1 Incoming group call "All drivers in same area"

Purpose: This test is to show that the group call "other drivers in the area" is received and managed by the CR-A.

The precondition of this test is that the subscriber CR-A has the group call Gld 200 subscribed and activated on the SIM and the network.

Reference: **FRS § 4.2.1, 5.2.1.2, 5.2.2iii, 5.2.2iv, 5.2.2.9, 5.2.2.11, 5.2.2.47, 5.2.2.48, 5.2.2.49, 5.2.2.51, 5.2.2.52, 5.2.2.54, 5.2.2.61;**

SRS § 4.3.1, 5.3.3, 5.5.19, 5A.2, 5A.3

- CR-B initiates group call "other drivers in the area"
- CR-A receives and indicates group call "other drivers in the area"
- CR-A joins group call "other drivers in the area" automatically
- CR-A listens to group call to "other drivers in the area"
- CR-A talks in group call to "other drivers in the area"
- CR-B terminates group call "other drivers in the area"
- CR-A leaves group call "other drivers in the area"

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates group call "other drivers in the area" and takes the uplink, press PTT	According CR User Manual CR-A receives group call "other drivers in the area" and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Group call communication is activated on the HS of the CR-A			
3	Press PTT button on CR-A (uplink is in use by CR-B)	An audible indication is given on the loudspeaker "Uplink busy" indication is displayed on the HMI of the CR-A			
4	Release PTT on CR-B	Indication to use PTT to talk is given to the driver on the HMI of the CR-A			

5	Press PTT button on CR-A (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			
6	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
7	Press PTT on CR-B	An audible indication is given on the loudspeaker of CR-B. "You can talk" indication is displayed on the HMI of CR-B.			
8	Hang-up handset on CR-A	Talker can be heard on driver's loudspeaker			
9a	Leave group call by CR-A: Using the HMI menu	CR-A leaves group call "other drivers in the area" CR-A in default idle status Call continues for other participants			
9b	CR-B terminates group call by replacing handset	Group call "other drivers in the area" is terminated CR-A in default idle status			
9c	CR-B terminates group call By HMI action	Group call "other drivers in the area" is terminated CR-A in default idle status			

8.1.2 Incoming other group call

Purpose: test is to show that the group call subscribed and activated on SIM is received and managed by the CR-A.

The precondition of this test is that the subscriber CR-A has the group call Gid 201 subscribed and activated on the SIM and the network.

Reference: **FRS § 4.2.1, 5.2.1.2, 5.2.2.47, 5.2.2.48, 5.2.2.49, 5.2.2.51, 5.2.2.52, 5.2.2.54, 5.2.2.61;**

SRS § 4.3.1, 5.5.11, 5.5.19

- CR-B initiates group call 201, eMLPP priority 4
- CR-A receives and indicates group call 201
- CR-A joins group call 201
- CR-A listens to group call
- CR-A talks in group call
- CR-B terminates group call
- CR-A leaves group call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates group call to Gid 201 and takes the uplink, press PTT (eMLPP priority 4)	According CR User Manual CR-A receives group call 201 and accepts the call by user action An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Group call communication is activated on the HS of the CR-A			
3	Press PTT button on CR-A (uplink is in use by CR-B)	An audible indication is given on the loudspeaker "Uplink busy" indication is displayed on the HMI of the CR-A			
4	Release PTT on CR-B	Indication to use PTT to talk is given to the driver on the HMI of the CR-A			
5	Press PTT button on CR-A (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			

6	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
7	Press PTT on CR-B	An audible indication is given on the loudspeaker HMI			
8	Hang-up handset on CR-A	Talker can be heard on driver's loudspeaker			
9a	CR-B terminates group call	Group call "other drivers in the area" is terminated CR-A in default idle status			
9b	Leave group call by CR-A: Using the HMI menu	CR-A leaves group call "other drivers in the area" CR-A in default idle status Call continues for other participants			

8.1.3 Cell change of the group call listener (same location area)

This test could be handled by a supplier's factory acceptance test. It should not be necessary to repeat it as part of the tests specified in the present document.

Purpose: This test is to show that an incoming group call is continued by the listening Cab Radio during a cell change.

Reference: **System requirement**

- CR-B initiates group call "other drivers in the area"
- CR-A receives and indicates group call "other drivers in the area"
- CR-A joins group call "other drivers in the area" automatically
- CR-A listens to group call to "other drivers in the area"
- CR-B terminates group call "other drivers in the area"

Remark: Neighbour (target) cell in the same location area and group call area.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates group call "other drivers in the area" and takes the uplink, press PTT	According CR User Manual CR-A receives group call "other drivers in the area" and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Group call communication is activated on the HS of the CR-A			
3	Change of attenuation at the handover machine to initiate a cell change or Wait for cell change during dynamic test	Cell change in the network Audio connection with CR-B may be disturbed shortly because of cell change Call is maintained and good audio connection persisting after cell change			
4	CR-B terminates group call	Group call "other drivers in the area" is terminated An audible indication is given on the loudspeaker CR-A in default idle status			

8.1.4 Cell change of the group call listener (different location area)

This test could be handled by a supplier's factory acceptance test. It should not be necessary to repeat it as part of the tests specified in the present document.

Purpose: This test is to show that an incoming group call is continued by the listening Cab Radio after a cell change to different location area after location update.

Reference: **System requirement**

- CR-B initiates group call "other drivers in the area"
- CR-A receives and indicates group call "other drivers in the area"
- CR-A joins group call "other drivers in the area" automatically
- CR-A listens to group call to "other drivers in the area"
- CR-B terminates group call "other drivers in the area"

Remark: Neighbour (target) cell in different location area but same group call area.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates group call "other drivers in the area" and takes the uplink, press PTT	According CR User Manual CR-A receives group call "other drivers in the area" and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Group call communication is activated on the HS of the CR-A			
3	Change of attenuation at the handover machine to initiate a cell change or Wait for cell change during dynamic test	Cell change in the network Audio connection with CR-B will be interrupted shortly because of cell change and location update of the CR-A The group call is resumed by CR-A and good audio connection persisting after cell change and location update			
4	CR-B terminates group call	Group call "other drivers in the area" is terminated An audible indication is given on the loudspeaker CR-A in default idle status			

8.1.5 Moving out of the group call area of the group call listener

Purpose: This test is to show that the cab radio drops the group call after moving out of the group call area and an audible and visual indication is given to the driver. The Cab Radio returns to idle mode.

Reference: **FRS § System requirement 3.5.5 (I), 5.2.2.16, 5.2.2.55;**

- CR-B initiates group call "other drivers in the area"
- CR-A receives and indicates group call "other drivers in the area"
- CR-A joins group call "other drivers in the area" automatically
- CR-A listens to group call to "other drivers in the area"
- CR-B terminates group call "other drivers in the area"

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates group call "other drivers in the area" and takes the uplink, press PTT	According CR User Manual CR-A receives group call "other drivers in the area" and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Group call communication is activated on the HS of the CR-A			
3	Change of attenuation at the handover machine to suppress coverage (< -110dBm) or Wait for moving out of group call area during dynamic test	Audio connection disturbed on the CR-A Group Call loss on CR-A An audible indication is given on the loudspeaker A visual indication is displayed on the HMI CR-A returns in default idle status			
5	CR-B terminates group call	Group call "other drivers in the area" is terminated			

8.1.6 Switching on the Cab Radio during an ongoing group call

Purpose: This test is to show that the Cab Radio automatically receives an ongoing group call after switching-on. The ongoing group call will be joined automatically if automatic answering applies.

The precondition of this test is that the CR-A is switched off.

Reference: **System requirement**

- CR-B initiates group call "other drivers in the area"
- CR-A is switched on
- CR-A receives and indicates group call "other drivers in the area"
- CR-A joins group call "other drivers in the area" automatically
- CR-A listens to group call to "other drivers in the area"
- CR-B terminates group call "other drivers in the area"

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates group call "other drivers in the area" and takes the uplink, press PTT	According CR User Manual			
	Switch on cab radio CR-A	CR-A initialises …. Until CR-A in default idle status			
		CR-A receives group call "other drivers in the area" and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Group call communication is activated on the HS of the CR-A			
3	Press PTT button on CR-A (uplink is in use by CR-B)	An audible indication is given on the loudspeaker "Uplink busy" indication is displayed on the HMI of the CR-A			
4	Release PTT on CR-B	Indication to use PTT to talk is given to the driver on the HMI of the CR-A			
5	Press PTT button on CR-A (uplink free)	An audible indication is given on the loudspeaker			

		"You can talk" indication is displayed on the HMI			
6	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
7	Press PTT on CR-B	An audible indication is given on the loudspeaker			
8	Hang-up handset on CR-A	Talker can be heard on driver's loudspeaker			
9a	CR-B terminates group call	Group call "other drivers in the area" is terminated. CR-A in default idle status			
9b	Leave group call by CR-A: Using the HMI menu	CR-A leaves group call "other drivers in the area" CR-A in default idle status Call continues for other participants			

8.2 OUTGOING GROUP CALLS

8.2.1 Outgoing group call "All drivers in same area"

Purpose: This test is to show that the group call "other drivers in the area" is initiated and managed by the Cab Radio. The call is to be set up at Priority 2 (Public emergency and calls between drivers in the same area).

Reference: **FRS § 4.2.1, 5.2.1.2, 5.2.2ii, 5.2.2iii, 5.2.2iv, 5.2.2.9, 5.2.2.11, 5.2.2.12, 5.2.2.13, 5.2.2.14, 5.2.2.15, 5.2.2.48, 5.2.2.54, 5.2.2.60, 10.2.1, 10.2.2;**

SRS § 4.3.1, 5.3.3, 5.5.6, 10.2.1

- CR-A initiates group call "other drivers in the area"
- CR-B receives and indicates group call "other drivers in the area"
- CR-B joins group call "other drivers in the area" automatically
- CR-A talks in group call to "other drivers in the area"
- CR-B listens to group call to "other drivers in the area"
- CR-A and CR-B talker change
- CR-A terminates group call "other drivers in the area"
- Controller terminates group call "other drivers in the area"

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates group call "other drivers in the area"	According CR User Manual CR-A indicates call progress on the HMI incl. group identity			
		Group call "other drivers in the area" is established in the network CR-B receives group call "other drivers in the area" and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI including group identity Check that the call was set up at Priority 2			
		CR-A updates call status on the HMI An audible indication is given on the loudspeaker. Incoming audio is connected to the loudspeaker until the driver picks up the handset Indication to use PTT to talk is given to the			

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	On the Controller Terminal display	GId, GCA, Call Type and functional number of CR-A shall be presented. (This information is based on the information transmitted by the CR-A during VGC set-up via OTDI information.)			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Group call communication is activated on the HS of the CR-A			
	Press PTT on CR-A	An audible indication is given on the loudspeaker of the CR-A "You can talk" indication is displayed on the HMI CR-A talker can be heard on CR-B driver's loudspeaker			
3	Press PTT button on CR-B (uplink is in use by CR-A)	An audible indication is given on the loudspeaker "Uplink busy" indication is displayed on the HMI			
	Release PTT on CR-B				
4	Release PTT on CR-A	Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
5	Press PTT button on CR-B (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI CR-B talker can be heard on CR-A driver's loudspeaker			
6	Release PTT on CR-B	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-A			
7	Press PTT button on CR-A (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI CR-A talker can be heard on CR-B driver's loudspeaker			
8a	CR-A terminates group call Using the HMI menu	Group call "other drivers in the area" is terminated CR-A in default idle status			
8b	Controller terminates group call	Group call "other drivers in the area" is terminated CR-A in default idle status			

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8.2.2 Terminating outgoing group call "All drivers in same area", uplink busy

Purpose: This test is to show that the group call is only left when the uplink is occupied. The group call stays connected. In this case, re-entry is possible.

Reference: **FRS § 4.2.1, 5.2.1.2, 5.2.2.15, 5.2.2.61; SRS § 4.3.1, 5.5.24**

- CR-A initiates group call "other drivers in the area"
- CR-B receives and indicates group call "other drivers in the area"
- CR-B joins group call "other drivers in the area" automatically
- CR-A talks in group call to "other drivers in the area"
- CR-B listens to group call to "other drivers in the area"
- CR-B becomes talker
- CR-A cannot terminate but leaves the group call without uplink access, uplink busy by CR-B
- CR-A joins the ongoing group call "other drivers in the area"
- CR-A becomes talker
- CR-A terminates group call "other drivers in the area"

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates group call "other drivers in the area"	According CR User Manual CR-A indicates call progress on the HMI incl. group identity Group call "other drivers in the area" is established in the network CR-B receives group call "other drivers in the area" and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity			
		CR-A updates call status on the HMI An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
	On the Controller Terminal display	GId, GCA, Call Type and functional number of CR-A shall be presented.			

2	Pick up handset of CR-A Press PTT on CR-A	Driver's loudspeaker set to reduced volume Group call communication is activated on the HS of the CR-A An audible indication is given on the loudspeaker of the CR-A "You can talk" indication is displayed on the HMI CR-A talker can be heard on CR-B driver's loudspeaker			
3	Press PTT button on CR-B (uplink is in use by CR-A) Release PTT on CR-B	An audible indication is given on the loudspeaker "Uplink busy" indication is displayed on the HMI			
4	Release PTT on CR-A	Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
5	Press PTT button on CR-B (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI CR-B talker can be heard on CR-A driver's loudspeaker			
6	CR-A tries to terminate group call using the HMI menu	Group call "other drivers in the area" cannot be terminated (uplink busy by CR-B) An audible indication is given on the loudspeaker CR-A leaves group call "other drivers in the area" CR-A in default idle status			
		Group call "other drivers in the area" continues …			
7	CR-A initiates group call "other drivers in the area"	CR-A indicates call progress on the HMI incl. group identity CR-A joins ongoing group call "other drivers in the area" An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity			
8	Release PTT on CR-B	Indication to use PTT to talk is given to the driver on the HMI of the CR-B			

9	Press PTT button on CR-A (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI CR-A talker can be heard on CR-B driver's loudspeaker			
10	CR-A terminates group call Using the HMI menu	Group call "other drivers in the area" is terminated CR-A in default idle status			

8.2.3 Group call talking Cab Radio downlink mute / unmute procedure

Purpose: This test is to show that the talking group call Cab Radio mutes / unmutes the downlink in order to listen to the talking controller and avoid unintelligible echo.

Applicable only if the network architecture provides a common group call channel.

Reference: **System requirement**.

- CR-A initiates group call "other drivers in the area"
- Controller receives and indicates group call "other drivers in the area"
- Controller joins group call "other drivers in the area"
- CR-A talks in group call to "other drivers in the area"
- Controller listens to group call to "other drivers in the area"
- Controller unmutes downlink and talks in group call to "other drivers in the area"
- CR-A terminates group call "other drivers in the area"

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates group call "other drivers in the area" with priority access e.g. single key stroke	According CR User Manual CR-A indicates call progress on the HMI incl. group identity			
	Controller accepts group call "other drivers in the area"	Group call "other drivers in the area" is established in the network Controller receives group call "other drivers in the area" A visual indication is displayed on the HMI of the Controller incl. group identity			
		CR-A updates call status on the HMI An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI			

2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume			
		Group call communication is activated on the HS of the CR-A			
	Press PTT on CR-A	An audible indication is given on the loudspeaker of the CR-A			
		"You can talk" indication is displayed on the HMI			
		CR-A talker can be heard on Controller's HS / loudspeaker			
		CR-A talker can not be heard on CR-A's HS / loudspeaker (muted)			
3	Controller talks	Controller can not be heard on CR-A's HS / loudspeaker (muted)			
4	Controller executes unmute procedure	Network unmutes CR-A's downlink			
		CR-A's downlink unmuted			
5	Controller talks	Controller can be heard on CR-A's HS / loudspeaker (unmuted)			
6	CR-A driver talks	CR-A talker can be heard on CR-A's HS / loudspeaker (unmuted/echo)			
7	CR-A terminates group call Using the HMI menu	Group call "other drivers in the area" is terminated			
		CR-A in default idle status			

8.2.4 Handover of the talking CR during Outgoing group call "All drivers in same area"

Purpose: This test is to show that an outgoing group call is continued by the talking Cab Radio during handover.

Reference: **System requirement**

- CR-A initiates group call "other drivers in the area"
- CR-B receives and indicates group call "other drivers in the area"
- CR-B joins group call "other drivers in the area" automatically
- CR-A becomes talker of the group call "other drivers in the area"
- CR-B listens to group call to "other drivers in the area"
- Handover of CR-A during ongoing group call to "other drivers in the area" [this test may be executed dynamic in the field or in the test lab using a handover machine]
- CR-A terminates group call "other drivers in the area"

Remark: Neighbour (target) cell in the same location area and group call area.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates group call "other drivers in the area" and takes the uplink,	According CR User Manual CR-B receives group call "other drivers in the area" and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A Press PTT on CR-A	Driver's loudspeaker set to reduced volume Group call communication is activated on the HS of the CR-A Caller can be heard on CR-B's loudspeaker			
3	Change of attenuation at the handover machine to initiate a handover or Wait for handover during dynamic test	Handover in the network Audio connection with CR-B may be disturbed shortly because of handover Call is maintained and good audio connection persisting after handover			
4	CR-A terminates group call Using the HMI menu	Group call "other drivers in the area" is terminated CR-A in default idle status			

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8.2.5 Terminating outgoing group call "All drivers in same area", originator after cell change

Purpose: This test is to show that the originator of the group call can terminate group call after cell change.

Reference: **System requirement**

- CR-A initiates group call "other drivers in the area"
- CR-B receives and indicates group call "other drivers in the area"
- CR-B joins group call "other drivers in the area" automatically
- CR-A talks in group call to "other drivers in the area"
- CR-B listens to group call to "other drivers in the area"
- CR-B becomes talker
- Cell change of CR-A during ongoing group call to "other drivers in the area" [this test may be executed dynamic in the field or in the test lab using a handover machine]
- CR-A becomes talker
- CR-A terminates group call "other drivers in the area"

Remark: Neighbour (target) cell in the same location area and group call area.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates group call "other drivers in the area"	According CR User Manual CR-A indicates call progress on the HMI incl. group identity Group call "other drivers in the area" is established in the network CR-B receives group call "other drivers in the area" and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity			
		CR-A updates call status on the HMI An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
	On the Controller Terminal display	GId, GCA, Call Type and functional number of CR-A shall be presented.			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Group call communication is activated on the HS of the CR-A			
	Press PTT on CR-A	An audible indication is given on the			

		loudspeaker of the CR-A			
		"You can talk" indication is displayed on the HMI			
		CR-A talker can be heard on CR-B driver's loudspeaker			
3	Press PTT button on CR-B (uplink is in use by CR-A) Release PTT on CR-B	An audible indication is given on the loudspeaker "Uplink busy" indication is displayed on the HMI			
4	Release PTT on CR-A	Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
5	Press PTT button on CR-B (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI CR-B talker can be heard on CR-A driver's loudspeaker			
6	Change of attenuation at the handover machine to initiate a cell change or Wait for cell change during dynamic test	Cell change in the network Audio connection with CR-B may be disturbed shortly because of cell change Call is maintained and good audio connection persisting after cell change			
7	Release PTT on CR-B	Indication to use PTT to talk is given to the driver on the HMI			
8	Press PTT button on CR-A (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI CR-A talker can be heard on CR-B driver's loudspeaker			
9	CR-A terminates group call Using the HMI menu	Group call "other drivers in the area" is terminated CR-A in default idle status			

8.2.6 Moving out of the group call area of the group call talker

Purpose: This test is to show that the cab radio drops the group call after moving out of the group call area and an audible and visual indication is given to the driver. The Cab Radio returns to idle mode.

Reference: **FRS § System requirement 3.5.5 (I), 5.2.2.16, 5.2.2.55;**

- CR-A initiates group call "other drivers in the area"
- CR-B receives and indicates group call "other drivers in the area"
- CR-B joins group call "other drivers in the area" automatically
- CR-A becomes talker
- CR-B listens to group call to "other drivers in the area"
- Moving of CR-A during ongoing group call to "other drivers in the area" [this test may be executed dynamic in the field or in the test lab using a handover machine]
- CR-A drops the group call and returns to idle

Remark: Neighbour (target) cell in different group call area.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates group call "other drivers in the area"	According CR User Manual CR-A indicates call progress on the HMI incl. group identity			
		Group call "other drivers in the area" is established in the network CR-B receives group call "other drivers in the area" and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity			
		CR-A updates call status on the HMI An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
	On the Controller Terminal display	GId, GCA, Call Type and functional number of CR-A shall be presented.			
2	Pick up handset of CR-A Press PTT on CR-A	Driver's loudspeaker set to reduced volume Group call communication is activated on the HS of the CR-A An audible indication is given on the loudspeaker of the CR-A "You can talk" indication is displayed on the HMI			

		CR-A talker can be heard on CR-B driver's loudspeaker			
3	Press PTT button on CR-B (uplink is in use by CR-A) Release PTT on CR-B	An audible indication is given on the loudspeaker "Uplink busy" indication is displayed on the HMI			
4	Release PTT on CR-A	Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
5	Press PTT button on CR-B (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI CR-B talker can be heard on CR-A driver's loudspeaker			
6	Change of attenuation at the handover machine to initiate a cell change or Wait for cell change during dynamic test	Handover in the network			
7		CR-A drops ongoing group call An audible indication is given on the loudspeaker A visual indication is displayed on the HMI CR-A in default idle status			

8.2.7 Unable to set-up a group call

Purpose: This test is to show that the cab radio provides and audible and visual indication if it is unable to set-up a group call.

Reference: **FRS § 5.2.2.17;**

- CR-A initiates group call "other drivers in the area"
- Call can not be established
- Audible and visual indication
- User acknowledges the failure (optional)
- CR-A returns to idle

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates group call "other drivers in the area"	According CR User Manual CR-A indicates call progress on the HMI incl. group identity			
		Group call cannot be established			
2		CR-A updates call status on the HMI An audible indication is given on the loudspeaker A visual indication is displayed on the HMI			
3	According CR User Manual	User acknowledges the failure (optional) CR-A in default idle status			

8.3 PREEMPTION OF GROUP CALLS

Purpose: This test is to show that a group call can be pre-empted by another higher priority call.

Reference: **FRS § 5.2.4.6**

See 10.1.6.

9. BROADCAST CALLS

9.1 INCOMING BROADCAST CALLS

9.1.1 Incoming broadcast call "All drivers in area"

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

9.1.2 Cell change of the broadcast call listener (same location area)

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

9.1.3 Cell change of the broadcast call listener (different location area)

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

9.1.4 Moving out of the broadcast call area of the broadcast call listener

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

9.1.5 Switching on the Cab Radio during an ongoing broadcast call

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

9.1.6 Pre-emption of broadcast calls

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

9.2 OUTGOING BROADCAST CALLS

9.2.1 Outgoing broadcast calls with the aid of the telephone book

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

9.2.2 Handover of the talking CR during Outgoing broadcast call

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

9.2.3 Moving out of the broadcast call area of the broadcast call originator

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

10. TRAIN EMERGENCY CALL

Remark: The cab radio shall be in train mode (i.e. not shunting mode). The railway emergency call which is used throughout this section is train emergency call.

10.1 INCOMING TRAIN EMERGENCY CALL

10.1.1 Incoming railway emergency call in idle mode

Purpose: This test is to show the cab radio receives and automatically joins an incoming train emergency call.

Reference: **FRS § 4.2.1, 4.2.4, 5.2.2.56, 5.2.2.60, 13.2.4.1, 13.3.1; SRS § 4.3.1, 4.3.4, 5.5.4, 5.5.19, 5A.2, 5A.3, 13.4.1, 13.4.2**

- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A joins the train emergency call automatically
- CR-A listens to the train emergency call
- CR-A talks in train emergency call
- CR-A tries to leave the train emergency call, not permitted
- CR-B terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates „train emergency call" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity (299 or textual translation of 299) Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume „train emergency call" communication is activated on the HS of the CR-A			
3	Release PTT on CR-B	Indication to use PTT to talk is given to the driver on the HMI of the CR-A			

4	Press PTT button on CR-A (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI				
5	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-B				
6	Press PTT on CR-B	An audible indication is given on the loudspeaker				
7a	Hang-up handset on CR-A	Call continues. A visual indication is displayed on the HMI Talker CR-B can be heard on driver's loudspeaker at normal volume				
7b	Pick up handset of CR-A	Call continues. A visual indication is displayed on the HMI Talker CR-B can be heard on driver's loudspeaker at reduced volume and on the handset				
8	Attempt to leave group call by CR-A: Using the HMI menu	CR-A can not leave the „train emergency call"				
9a	Hang-up handset on CR-B	Call continues A visual indication is displayed on the HMI Talker CR-A can be heard on driver's loudspeaker at normal volume				
9b	Pick up handset on CR-B	Call continues A visual indication is displayed on the HMI Talker CR-A can be heard on driver's loudspeaker at reduced volume and on the handset				
9	CR-A attempts to terminate the group call	CR-A can not terminate the „train emergency call"				
10	CR-B terminates group call	Group call „train emergency call" is terminated CR-A in default idle status CR-B in default idle status				

10.1.2 Incoming train emergency call during initiation of a ptp call

Purpose: This test is to show that the cab radio is able to receive and join an incoming train emergency call any time.

Reference: **FRS § 4.2.4, 5.2.2.56, 5.2.2.60, 13.3.1; SRS § 4.3.4, 5.5.19, 5.5.20, 5.5.21, 5.5.22, 5.5.23, 5.5.24, 5.5.26**

- CR-A initiates a call dialling FN / MSISDN of MS-A
- MS-A receives the ptp call
- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A terminate the outgoing ptp call and joins the train emergency call automatically
- CR-A listens to the train emergency call
- CR-B terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates call to MS-A dialling its functional number (driver's HS on hook)	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment to MS-A			
2	MS-A does not accept the call	MS-A ringing …			
3	CR-B initiates „train emergency call" and takes the uplink, press PTT	CR-A receives and accepts call automatically The ringing ptp call is terminated An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
4	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume „train emergency call" communication is activated on the HS of the CR-A			
5	Release PTT on CR-B	Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
6	Press PTT button on CR-A (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			

7	Release PTT on CR-A	An audible indication is given on the loudspeaker			
		Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
8	Press PTT on CR-B	An audible indication is given on the loudspeaker			
9	Hang-up handset on CR-A	A visual indication is displayed on the HMI Talker CR-B can be heard on driver's loudspeaker			
10	CR-B terminates group call	Group call „train emergency call" is terminated			
		CR-A in default idle status			

10.1.3 Incoming train emergency call during an ongoing ptp call

Purpose: This test is to show that the cab radio is able to receive and join an incoming train emergency call any time. The ongoing ptp call is pre-empted.

Reference: **FRS § 4.2.4, 5.2.2.56, 5.2.2.60, 13.3.1; SRS § 4.3.4, 5.5.19, 5.5.20, 5.5.21, 5.5.22, 5.5.23, 5.5.24, 5.5.26**

- CR-A initiates a call to primary controller
- Controller receives the ptp call
- Controller accepts the ptp call
- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A release the outgoing ptp call and joins the train emergency call automatically
- CR-A listens to the train emergency call
- CR-B terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates call to primary controller (driver's HS on hook)	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment to controller			
2	Controller accepts the call	The communication CR-A controller is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI Controller can be heard on driver's loudspeaker			
3	CR-B initiates „train emergency call" and takes the uplink, press PTT	CR-A receives and accepts call automatically The ongoing controller ptp call is terminated An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
4	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume „train emergency call" communication is activated on the HS of the CR-A			

5	Release PTT on CR-B	Indication to use PTT to talk is given to the driver on the HMI of the CR-A			
6	Press PTT button on CR-A (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			
7	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
8	Press PTT on CR-B	An audible indication is given on the loudspeaker			
9	Hang-up handset on CR-A	Talker CR-B can be heard on driver's loudspeaker			
10	CR-B terminates group call	Group call „train emergency call" is terminated CR-A in default idle status			

10.1.4 Incoming train emergency call during an ongoing call from the conductor via UIC Intercom system

Applicable if the CR provides an interface to UIC Intercom.

Purpose: This test is to show that the cab radio is able to receive and join an incoming train emergency call any time. The ongoing ICOM call with the conductor via UIC intercom system is maintained.

Reference: **FRS § 4.2.4, 5.2.2.56, 5.2.2.60, 13.3.1; SRS § 4.3.4, 5.5.19, 5.5.20, 5.5.21, 5.5.22, 5.5.23, 5.5.24, 5.5.26**

- The call is established by the conductor using the UIC Intercom system
- CR-A accepts the ICOM call
- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A joins the train emergency call automatically
- CR-A listens to the train emergency call on the loudspeaker and to the conductor on the handset
- CR-B terminates the train emergency call
- Conductor terminates ICOM call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Conductor initiates a call via UIC Intercom	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI			
2	Accept the call by driver's CR HMI menu or handset	Incoming Intercom call is accepted The communication CR Intercom is established For the ongoing ptp call: A visual indication is displayed on the HMI Identification of the caller is displayed on the HMI Caller can be heard on driver's loudspeaker			
3	Pick up handset of CR	Driver's loudspeaker set to reduced volume Communication to Intercom is activated on the HS of the CR			

4	CR-B initiates „train emergency call" and takes the uplink, press PTT	CR-A receives and accepts call automatically The ongoing conductor ICOM call is maintained on the HS An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
5	CR-B terminates group call	Group call „train emergency call" is terminated An audible indication is given on the loudspeaker The ongoing conductor ICOM call is maintained			
6	Conductor hangs up handset	Ongoing ICOM call is terminated. CR in default idle status			

10.1.5 Incoming train emergency call during a multi drivers' conference

Purpose: This test is to show that the cab radio is able to receive and join an incoming train emergency call any time. The ongoing multi drivers' conference call is pre-empted.

Reference: **FRS § 4.2.4, 5.2.2.56, 5.2.2.60, 13.3.1; SRS § 4.3.4, 5.5.19, 5.5.20, 5.5.21, 5.5.22, 5.5.23, 5.5.24, 5.5.26**

- A multi drivers' conference is established by CR-A as leading driver
- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A terminates multi drivers' conference and joins the train emergency call automatically
- CR-A listens to the train emergency call
- CR-B terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual	According CR User Manual			
	Initiate a multi drivers' conference by CR-A (leading driver) according 7.5.1	See 7.5.1			
2	CR-B initiates „train emergency call" and takes the uplink, press PTT	CR-A receives and accepts call automatically			
		The ongoing multi drivers' conference call is terminated			
		An audible indication is given on the loudspeaker			
		A visual indication is displayed on the HMI incl. group identity			
		Caller can be heard on driver's loudspeaker			
		Indication to use PTT to talk is given to the driver on the HMI			
3	CR-B terminates group call	Group call „train emergency call" is terminated			
		CR-A in default idle status			

10.1.6 Incoming train emergency call during an ongoing group call

Purpose: This test is to show that the cab radio is able to receive and join an incoming train emergency call any time. The ongoing group call is pre-empted.

Reference: **FRS § 4.2.4, 5.2.2.56, 5.2.2.60, 13.3.1; SRS § 4.3.4, 5.5.19, 5.5.20, 5.5.21, 5.5.22, 5.5.23, 5.5.24, 5.5.26**

- A group call "all drivers in same area" is established by CR-A
- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A releases the ongoing group call "all drivers in same area" and joins the train emergency call automatically
- CR-A listens to the train emergency call
- CR-B terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Initiate a group call "all drivers in same area" by CR-A according 8.2.1	According CR User Manual See 8.2.1			
2	CR-B initiates „train emergency call" and takes the uplink, press PTT	CR-A receives and accepts call automatically The ongoing group call "all drivers in same area" is released An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
3	CR-B terminates group call	Group call „train emergency call" is terminated CR-A in default idle status			

10.1.7 Incoming train emergency call during a broadcast call

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

10.1.8 Cell change of the listener in an ongoing train emergency call (different location area)

Purpose: This test is to show that an ongoing train emergency call is continued by the listening Cab Radio after a cell change to different location area after location update.

Reference: **System requirement**

- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A joins the train emergency call automatically
- CR-A listens to the train emergency call
- CR-B terminates the train emergency call

Remark: Neighbour (target) cell in different location area but same group call area.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates „train emergency call" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume „train emergency call" communication is activated on the HS of the CR-A			
3	Change of attenuation at the handover machine to initiate a cell change or Wait for cell change during dynamic test	Cell change in the network Audio connection with CR-B will be interrupted shortly because of cell change and location update of the CR-A The group call is resumed by CR-A on the same still ongoing „train emergency call" and good audio connection persisting after cell change and location update			
4	CR-B terminates group call	Group call „train emergency call" is terminated CR-A in default idle status			

10.1.9 Moving out of the group call area of the listener in an ongoing train emergency call

Purpose: This test is to show that the cab radio drops the train emergency call after moving out of the group call area and an audible and visual indication is given to the driver. The Cab Radio returns to idle mode.

Reference: **FRS § System requirement 3.5.5 (I), 5.2.2.55; 13.2.4.2**

- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A joins the train emergency call automatically
- CR-A listens to the train emergency call
- CR-A moves out of group call area
- CR-A indicates the loss of the call and returns to idle status
- CR-B terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates „train emergency call" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume „train emergency call" communication is activated on the HS of the CR-A			
3	Change of attenuation at the handover machine to suppress coverage (< -110dBm) or Wait for moving out of group call area during dynamic test	Audio connection disturbed on the CR-A Train emergency Call loss on CR-A An audible indication is given on the loudspeaker A visual indication is displayed on the HMI CR-A returns in default idle status			
4	CR-B terminates group call	Group call „train emergency call" is terminated			

10.1.10 Switching on the Cab Radio during an ongoing train emergency call

Purpose: This test is to show that the Cab Radio automatically receives an ongoing train emergency call after switching-on and joins it automatically.

The precondition of this test is that the CR-A is switched off.

Reference: **System requirement**

- CR-B initiates a train emergency call
- CR-A is switched on
- CR-A receives the train emergency call
- CR-A joins the train emergency call automatically
- CR-A listens to the train emergency call
- CR-B terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates train emergency call and takes the uplink, press PTT	According CR User Manual			
2	Switch on cab radio CR-A	CR-A initialises …. Until CR-A in default idle status			
		CR-A receives train emergency call and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
3	CR-B terminates group call	Group call „train emergency call" is terminated CR-A in default idle status			

10.1.11 Late entry into an area with an ongoing train emergency call

This test is to show that the Cab Radio automatically receives an ongoing train emergency call after entering an area with an ongoing train emergency call and joins it automatically.

The precondition of this test is that the CR-A is camped on in a cell outside of the train emergency call area..

Reference: **FRS § 3.5.6, 13.2.2.7 ,System requirement**

- CR-B initiates a train emergency call
- CR-A enters the area with the ongoing emergency call (CR-A may be engaged in a ptp §10.1.3, VGC §10.1.6 or VBC §10.1.7)
- CR-A receives the train emergency call
- CR-A joins the train emergency call automatically
- CR-A listens to the train emergency call
- CR-B terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates train emergency call and takes the uplink, press PTT CR-A is engaged in a ptp §10.1.3, VGC §10.1.6 or VBC §10.1.7	According CR User Manual			
2	Change of attenuation at the handover machine to initiate a cell change or Wait for cell change during dynamic test	Cell change of CR-A to the train emergency call area			
		CR-A receives train emergency call and accepts call automatically Status of the ongoing call is given in ptp §10.1.3, VGC §10.1.6 or VBC §10.1.7 An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
3	CR-B terminates group call	Group call „train emergency call" is terminated CR-A in default idle status			

10.1.12 Moving out of the group call area of the talker in an ongoing train emergency call

Purpose: This test is to show that the cab radio drops the emergency group call after moving out of the group call area and an audible and visual indication is given to the driver. The Cab Radio returns to idle mode.

Reference: **FRS § 5.2.2.23**

- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A joins the train emergency call automatically
- CR-A moves out the group call area
- CR-A indicates the loss of the call and returns to idle

Remark: Neighbour (target) cell in different group call area.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates „train emergency call" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Change of attenuation at the handover machine to suppress coverage (< -110dBm) or Wait for moving out of group call area during dynamic test	Audio connection disturbed on the CR-A Train emergency Call loss on CR-A An audible indication is given on the loudspeaker A visual indication is displayed on the HMI CR-A returns in default idle status			

10.2 OUTGOING TRAIN EMERGENCY CALL

10.2.1 Outgoing Train emergency call in idle mode

10.2.1.1 Outgoing Train emergency call in idle mode (Train Number Registered)

Purpose: This test is to show that a train emergency call is initiated and managed by the Cab Radio using emergency access

and that this is set up at Priority 0 (railway emergency)..The functional number of the Cab Radio is transmitted to the controller when sending a train emergency call.

The precondition of this test is that the CR-A is in Train Mode and has a Train Number registered.

Reference: **FRS § 4.2.4, 5.2.1.2, 5.2.2.18, 5.2.2.20, 5.2.2.21, 5.2.2.22, 5.2.2.24, 5.2.2.60, 10.2.1, 10.2.2, 13.1.4, 13.1.5, 13.2.2.1, 13.2.2.4, 13.2.2.6, 13.2.3.1, 13.2.3.3, 13.2.4.1; SRS § 4.3.4, 5.3.5, 5.3.6, 5.5.4, 5.5.5, 10.2.1, 13.2.2, 13.3.1**

- CR-A initiates a train emergency call
- CR-B receives and indicates the train emergency call
- CR-B joins the train emergency call automatically
- Controller receives and indicates the train emergency call incl. FN of the originator
- Controller joins the train emergency call
- CR-A talks in the train emergency call
- CR-B listens to the train emergency call
- CR-A and CR-B talker change
- CR-A terminates the train emergency call
- Controller terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates „train emergency call" using emergency access "Emergency button"	According CR User Manual A short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI incl. group identity			
	(Call established in the network)	Check that the call was set up at Priority 0 Indication to use PTT to talk is given to the driver on the HMI. Incoming audio is connected to the loudspeaker until the driver picks up the handset			
	On the Controller Terminal display	GId (299), GCA, Call Type and functional number of CR-A shall be presented. (This information is based on the information transmitted by the CR-A during REC set-up via compressed OTDI COTDI information.)			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume			
3	Press PTT on CR-A (CR-A talk)	CR-A takes the uplink „train emergency call" communication is activated on the HS of the CR-A to all train emergency call participants			

		CR-B receives and accepts call automatically			
		An audible indication is given on the loudspeaker			
		A visual indication is displayed on the HMI incl. group identity			
		Caller can be heard on driver's loudspeaker			
		Indication to use PTT to talk is given to the driver on the HMI			
		Controller receives and accepts call			
		The visual indication displayed on the HMI including the Train Number of CR-A as the originator of the call			
		Caller CR-A can be heard on driver's loudspeaker			
4	Release PTT on CR-A	An audible indication is given on the loudspeaker			
		Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
5	Press PTT button on CR-B (uplink free)	An audible indication is given on the loudspeaker			
		"You can talk" indication is displayed on the HMI of CR-B.			
		Audio from CR-B can be heard on HS and loudspeaker of CR-A			
6	Release PTT on CR-B	An audible indication is given on the loudspeaker			
		Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
7	Press PTT on CR-A	An audible indication is given on the loudspeaker			
		"You can talk" indication is displayed on the HMI			
8	Release PTT on CR-A	An audible indication is given on the loudspeaker			
		Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
9	Hang-up handset on CR-A	A visual indication is displayed on the HMI			
		Driver's loudspeaker set to default volume			
		(Talker e.g. controller may be heard on driver's loudspeaker)			

10a	CR-A terminates group call Using the HMI menu	Group call „train emergency call" is terminated. The visual indication regarding the call is cleared. CR-A in default idle status			

10.2.1.2 Outgoing Train emergency call in idle mode (No Train Number Registered)

Purpose: This test is to show that a train emergency call is initiated and managed by the Cab Radio using emergency access and that this is set up at Priority 0 (railway emergency). The functional number of the Cab Radio is transmitted to the controller when sending a train emergency call.

The precondition of this test is that the CR-A is in Train Mode and does NOT have a Train Number registered.

Reference: **FRS § 4.2.4, 5.2.1.2, 5.2.2.18, 5.2.2.20, 5.2.2.21, 5.2.2.22, 5.2.2.24, 5.2.2.60, 10.2.1, 10.2.2, 13.1.4, 13.1.5, 13.2.2.1, 13.2.2.4, 13.2.2.6, 13.2.3.1, 13.2.3.3, 13.2.4.1; SRS § 4.3.4, 5.3.5, 5.3.6, 5.5.4, 5.5.5, 13.3.1**

- CR-A initiates a train emergency call
- CR-B receives and indicates the train emergency call
- CR-B joins the train emergency call automatically
- Controller receives and indicates the train emergency call including Engine Number of the originator
- Controller joins the train emergency call
- CR-A talks in the train emergency call
- CR-B listens to the train emergency call
- CR-A and CR-B talker change
- CR-A terminates the train emergency call
- Controller terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates „train emergency call" using emergency access "Emergency button"	According CR User Manual A short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI incl. group identity			
	(Call established in the network)	Check that the call was set up at Priority 0 Indication to use PTT to talk is given to the driver on the HMI. Incoming audio is connected to the loudspeaker until the driver picks up the handset			

	On the Controller Terminal display	GId, GCA, Call Type and functional number of CR-A shall be presented. (This information is based on the information transmitted by the CR-A during REC set-up via compressed OTDI COTDI information.)			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume			
3	Press PTT on CR-A (CR-A talk)	CR-A takes the uplink „train emergency call" communication is activated on the HS of the CR-A to all train emergency call participants			
		CR-B receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
		Controller receives and accepts call The visual indication displayed on the HMI incl. FN of CR-A as the originator of the call Caller CR-A can be heard on driver's loudspeaker			
4	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
5	Press PTT button on CR-B (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI of CR-B.			
		Audio from CR-B can be heard on HS and loudspeaker of CR-A			
6	Release PTT on CR-B	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
7	Press PTT on CR-A	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			

8	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
9	Hang-up handset on CR-A	A visual indication is displayed on the HMI Driver's loudspeaker set to default volume (Talker e.g. controller may be heard on driver's loudspeaker)			
10a	Controller terminates group call	Group call „train emergency call" is terminated. The visual indication regarding the call s cleared. CR-A in default idle status			
10b	(No uplink activity) Wait according network setting… Network terminates group call	Train emergency group call terminated CR-A in default idle status			

10.2.2 Outgoing train emergency call during initiation of a PTP call

Purpose: This test is to show that a train emergency call can be initiated at any time i.e. also during the initiation of a PTP call.

Reference: **FRS § 4.2.4, 5.2.1.2, 5.2.2.18, 5.2.2.20, 5.2.2.21, 5.2.2.22, 5.2.2.24, 5.2.2.60, 13.2.2.1, 13.2.2.4, 13.2.2.6, 13.2.3.1, 13.2.3.3, 13.2.4.1; SRS § 4.3.4, 5.3.5, 5.3.6, 5.5.4, 5.5.5, 13.3.1**

- CR-A initiates a call dialling FN / MSISDN of MS-A
- MS-A receives ptp call and indicates ringing
- CR-A initiates a train emergency call
- Ptp call to MS-A is terminated
- CR-B receives and indicates the train emergency call
- CR-B joins the train emergency call automatically
- Controller receives and indicates the train emergency call incl. FN of the originator
- Controller joins the train emergency call
- CR-A talks in the train emergency call
- CR-B listens to the train emergency call
- CR-A and CR-B talker change
- CR-A terminates the train emergency call
- Controller terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates ptp call to MS-A dialling its functional number (driver's HS on hook)	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment to MS-A			
2	MS-A does not accept the call	MS-A ringing …			
3	CR-A initiates „train emergency call" using emergency access "Emergency button"	ptp call to MS-A initiated by CR-A is terminated An short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI incl. group identity			
	(Call established in the network)	Indication to use PTT to talk is given to the driver on the HMI			
4	Press PTT on CR-A (CR-A talk)	CR-A takes the uplink „train emergency call" communication is activated on the HS of the CR-A to all train emergency call participants			
		CR-B receives and accepts call automatically An audible indication is given on the loudspeaker			

		A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
		Controller receives and accepts call The visual indication displayed on the HMI incl. FN of CR-A as the originator of the call Caller CR-A can be heard on driver's loudspeaker			
5	CR-A terminates group call	Group call „train emergency call" is terminated			

10.2.3 Train emergency call during an ongoing ptp call

Purpose: This test is to show that a train emergency call can be initiated at any time i.e. also during an ongoing ptp call.

Reference: **FRS § 4.2.4, 5.2.1.2, 5.2.2.18, 5.2.2.20, 5.2.2.21, 5.2.2.22, 5.2.2.24, 5.2.2.60, 5.2.4.7, 13.2.2.1, 13.2.2.4, 13.2.2.6, 13.2.3.1, 13.2.3.3, 13.2.4.1; SRS § 4.3.4, 5.3.5, 5.3.6, 5.5.4, 5.5.5, 5.5.20, 13.3.1**

- CR-A initiates a call dialling FN / MSISDN of MS-A
- MS-A receives and accepts ptp call
- CR-A initiates a train emergency call
- Ptp call to MS-A is terminated
- CR-B receives and indicates the train emergency call
- CR-B joins the train emergency call automatically
- Controller receives and indicates the train emergency call incl. FN of the originator
- Controller joins the train emergency call
- CR-A talks in the train emergency call
- CR-B listens to the train emergency call
- CR-A and CR-B talker change
- CR-A terminates the train emergency call
- Controller terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates ptp call to MS-A dialling its functional number (driver's HS on hook)	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment to MS-A			
2	MS-A accepts the ptp call	The communication CR-A to MS-A is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI			
3	CR-A initiates „train emergency call" using emergency access "Emergency button"	Ongoing ptp call to MS-A is terminated by CR-A An short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI incl. group identity			
	(Call established in the network)	Indication to use PTT to talk is given to the driver on the HMI Incoming audio is connected to the loudspeaker until the driver picks up the handset			

	On the Controller Terminal display	GId (299), GCA, Call Type and functional number of CR-A shall be presented. (This information is based on the information transmitted by the CR-A during REC set-up via compressed OTDI COTDI information.)			
4	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume			
5	Press PTT on CR-A (CR-A talk)	CR-A takes the uplink „train emergency call" communication is activated on the HS of the CR-A to all train emergency call participants			
		CR-B receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity			
		Controller receives and accepts call The visual indication displayed on the HMI including the Train Number of CR-A as the originator of the call Caller CR-A can be heard on driver's loudspeaker			
6	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
7	CR-A terminates group call Using the HMI menu	Group call „train emergency call" is terminated. The visual indication regarding the call is cleared. CR-A in default idle status			

10.2.4 Train emergency call during an ongoing multi drivers' conference

Purpose: This test is to show that a train emergency call can be initiated at any time i.e. also during an ongoing multi drivers' conference.

Reference: **FRS § 4.2.4, 5.2.1.2, 5.2.2.18, 5.2.2.20, 5.2.2.21, 5.2.2.22, 5.2.2.24, 5.2.2.60, 5.2.4.7, 13.2.2.1, 13.2.2.4, 13.2.2.6, 13.2.3.1, 13.2.3.3, 13.2.4.1; SRS § 4.3.4, 5.3.5, 5.3.6, 5.5.4, 5.5.5, 13.3.1**

- A multi drivers' conference is established by CR-A as leading driver
- CR-A initiates a train emergency call
- Multi drivers' conference is terminated
- CR-B receives and indicates the train emergency call
- CR-B joins the train emergency call automatically
- Controller receives and indicates the train emergency call incl. FN of the originator
- Controller joins the train emergency call
- CR-A talks in the train emergency call
- CR-B listens to the train emergency call
- CR-A and CR-B talker change
- CR-A terminates the train emergency call
- Controller terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Initiate a multi drivers' conference by CR-A (leading driver) according 7.5.1 (driver's HS on hook)	According CR User Manual See 7.5.1			
	Multi drivers' conference is ongoing	The communication CR-A to multi drivers is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI			
2	CR-A initiates „train emergency call" using emergency access "Emergency button"	Ongoing multi drivers' conference is terminated by CR-A An short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI incl. group identity			
	(Call established in the network)	Indication to use PTT to talk is given to the driver on the HMI			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume			

4	Press PTT on CR-A (CR-A talk)	CR-A takes the uplink „train emergency call" communication is activated on the HS of the CR-A to all train emergency call participants			
4	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
5	CR-A terminates group call Using the HMI menu	Group call „train emergency call" is terminated CR-A in default idle status			

10.2.5 Train emergency call during an ongoing group call

Purpose: This test is to show that a train emergency call can be initiated at any time i.e. also during an ongoing group call.

Reference: **FRS § 4.2.4, 5.2.1.2, 5.2.2.18, 5.2.2.20, 5.2.2.21, 5.2.2.22, 5.2.2.24, 5.2.2.60, 5.2.4.7, 13.2.2.1, 13.2.2.4, 13.2.2.6, 13.2.3.1, 13.2.3.3, 13.2.4.1; SRS § 4.3.4, 5.3.5, 5.3.6, 5.5.4, 5.5.5, 13.3.1**

- A group call "all drivers in same area" is established by CR-A
- CR-A initiates a train emergency call
- Group call "all drivers in same area" is released
- CR-B receives and indicates the train emergency call
- CR-B joins the train emergency call automatically
- Controller receives and indicates the train emergency call incl. FN of the originator
- Controller joins the train emergency call
- CR-A talks in the train emergency call
- CR-B listens to the train emergency call
- CR-A and CR-B talker change
- CR-A terminates the train emergency call
- Controller terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Initiate a group call "all drivers in same area" by CR-A	According CR User Manual CR-A indicates call progress on the HMI incl. group identity			
		Group call "other drivers in the area" is established in the network CR-B receives group call "other drivers in the area" and accepts call automatically An audible indication is given on the loudspeaker			
		CR-A updates call status on the HMI An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
	Group call "all drivers in same area" is ongoing	The communication CR-A to "all drivers in same area" is established			
2a	CR-A is group call listener (See 8.2.1 step 4) CR-A initiates „train emergency call" using emergency access "Emergency button"	Ongoing "all drivers in same area" is released by CR-A An short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI incl. group identity			

2b	CR-A is group call talker (See 8.2.1 step 2) CR-A initiates „train emergency call" using emergency access "Emergency button"	Ongoing "all drivers in same area" is released by CR-A An short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI incl. group identity			
2c	CR-B is group call talker (See 8.2.1 step 5) CR-A initiates „train emergency call" using emergency access "Emergency button"	Ongoing "all drivers in same area" is released by CR-A An short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI incl. group identity			
	(Call established in the network)	Indication to use PTT to talk is given to the driver on the HMI			
3	Press PTT on CR-A (CR-A talk)	CR-A takes the uplink „train emergency call" communication is activated on the HS of the CR-A to all train emergency call participants			
4	Press PTT on CR-A	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			
5	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
6	CR-A terminates group call Using the HMI menu	Group call „train emergency call" is terminated. The visual indication regarding the call is cleared. CR-A in default idle status			

10.2.6 Train emergency call during an ongoing broadcast call

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

10.2.7 Handover of the train emergency call originator

Purpose: This test is to show that an ongoing train emergency call is continued by the originator (talking) Cab Radio during handover in the same train emergency call area.

Reference: **System requirement**

- CR-A initiates a train emergency call
- CR-B receives and indicates the train emergency call
- CR-B joins the train emergency call automatically
- Controller receives and indicates the train emergency call incl. FN of the originator
- Controller joins the train emergency call
- CR-A talks in the train emergency call
- CR-B listens to the train emergency call
- Handover of CR-A during ongoing train emergency call [this test may be executed dynamic in the field or in the test lab using a handover machine]
- CR-A terminates the train emergency call

Remark: Neighbour (target) cell in the same train emergency call (group call) area.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates „train emergency call" using emergency access "Emergency button"	According CR User Manual An short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI incl. group identity			
	(Call established in the network)	Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume			
3	Press PTT on CR-A (CR-A talk)	CR-A takes the uplink „train emergency call" communication is activated on the HS of the CR-A to all train emergency call participants			
		CR-B receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			

		Controller receives and accepts call			
		The visual indication displayed on the HMI incl. FN of CR-A as the originator of the call			
		Caller CR-A can be heard on driver's loudspeaker			
4	Change of attenuation at the handover machine to initiate a handover or Wait for handover during dynamic test	Handover in the network Audio connection with CR-B may be disturbed shortly because of handover Call is maintained and good audio connection persisting after handover			
5	CR-A terminates group call	Group call „train emergency call" is terminated CR-A in default idle status			

10.2.8 Moving out of the train emergency call area of the originator in an ongoing train emergency call

Purpose: This test is to show that the cab radio drops the train emergency call after moving out of the train emergency (group) call area and an audible and visual indication is given to the driver. The Cab Radio returns to idle mode.

Reference: **FRS § System requirement 3.5.5 (I), 5.2.2.23;**

- CR-A initiates a train emergency call
- CR-B receives and indicates the train emergency call
- CR-B joins the train emergency call automatically
- Controller receives and indicates the train emergency call incl. FN of the originator
- Controller joins the train emergency call
- CR-A talks in the train emergency call
- CR-B listens to the train emergency call
- Moving of CR-A during ongoing train emergency call out of the train emergency call area [this test may be executed dynamic in the field or in the test lab using a handover machine]
- CR-A drops the group call and returns to idle

Remark: Neighbour (target) cell in different train emergency call area (group call) area.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates „train emergency call" using emergency access "Emergency button"	According CR User Manual An short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI incl. group identity			
	(Call established in the network)	Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume			
3	Press PTT on CR-A (CR-A talk)	CR-A takes the uplink „train emergency call" communication is activated on the HS of the CR-A to all train emergency call participants			
		CR-B receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			

		Controller receives and accepts call The visual indication displayed on the HMI incl. FN of CR-A as the originator of the call Caller CR-A can be heard on driver's loudspeaker			
4	Change of attenuation at the handover machine to initiate a handover or Wait for handover during dynamic test	Handover in the network			
5		CR-A drops ongoing train emergency call An audible indication is given on the loudspeaker A visual indication is displayed on the HMI CR-A in default idle status			

10.2.9 Re-entry into train emergency call area as originator

Purpose: This test is to show that the train emergency call is treated as an incoming train emergency call after leaving and re-entering the train emergency call area. The originator processes the "originator" information after becoming talker again (uplink access using PTT) and can terminate the train emergency call.

Reference: **System requirement**

- CR-A initiates a train emergency call
- CR-B receives and indicates the train emergency call
- CR-B joins the train emergency call automatically
- Controller receives and indicates the train emergency call incl. FN of the originator
- Controller joins the train emergency call
- CR-A talks in the train emergency call
- CR-B listens to the train emergency call
- Moving of CR-A during ongoing emergency call out of the emergency call area [this test may be executed dynamic in the field or in the test lab using a handover machine]
- CR-A drops the group call and returns to idle
- Moving of CR-A during ongoing emergency call into the emergency call area [this test may be executed dynamic in the field or in the test lab using a handover machine]
- CR-A re-enters the emergency call area
- CR-A receives and indicates the train emergency call
- CR-A joins the train emergency call automatically
- CR-A becomes talker in the train emergency call
- CR-B listens to the train emergency call
- CR-A terminates the train emergency call

Remark: Neighbour (target) cell in different train emergency call (group call) area.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates „train emergency call" using emergency access "Emergency button"	According CR User Manual An short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI incl. group identity			
	(Call established in the network)	Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume			
3	Press PTT on CR-A (CR-A talk)	CR-A takes the uplink „train emergency call" communication is activated on the HS of the CR-A to all train emergency call participants			

		CR-B receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
		Controller receives and accepts call The visual indication displayed on the HMI incl. FN of CR-A as the originator of the call Caller CR-A can be heard on driver's loudspeaker			
4	Change of attenuation at the handover machine to initiate a handover or Wait for handover during dynamic test	Handover in the network			
5		CR-A drops ongoing train emergency call An audible indication is given on the loudspeaker A visual indication is displayed on the HMI CR-A in default idle status			
6	Wait for 30 secs.				
7	Change of attenuation at the handover machine to initiate a cell re-selection or Wait for cell re-selection during dynamic test	CR-A re-enters the old cell in the network (ongoing train emergency call initiated by CR-A)			
		CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Indication to use PTT to talk is given to the driver on the HMI			
8	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume			

9	Press PTT on CR-A (CR-A talk)	CR-A takes the uplink „train emergency call" communication is activated on the HS of the CR-A to all train emergency call participants			
10	CR-A terminates group call	Group call „train emergency call" is terminated CR-A in default idle status			

10.2.10 Re-dial of train emergency call after unsuccessful train emergency call initiation

Purpose: This test is to show that if a train emergency call establishment is unsuccessful, the cab radio shall automatically re-attempt the call initiation until the call establishment is successful in the next 30 secs. If the call cannot be connected, an audible and visual indication shall be provided to the driver.

Precondition of this test is that the network shall be prepared in order to prevent the establishment of the train emergency call. The establishment requests of the cab radio shall be traced in the network e.g. Abis interface.

Reference: **FRS § 5.2.2.25, 13.2.2.3, 13.2.2.3i, 13.2.2.3ii; SRS § 4.3.5, 4.4.3**

- CR-A initiates a train emergency call
- The train emergency call establishment refused by the network
- CR-A issues the status of the train emergency call establishment request
- CR-A re-attempt to initiate the train emergency call for the next 30 secs.
- CR-A issues final status of the train emergency call establishment request

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates „train emergency call" using emergency access "Emergency button"	According CR User Manual An short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI incl. group identity			
	(Call established in the network)	Train emergency call cannot be established			
	After approx. 2 secs.	An audible indication is given on the loudspeaker and/or A visual indication is displayed on the HMI about the unsuccessful "train emergency call" establishment status			
3	CR-A re-attempting "train emergency call" establishment for the next 30 secs.	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI About the process "trying to connect the call"			
	After approx. 30 secs. re-attempting "train emergency call" establishment unsuccessful	"train emergency call" establishment process is finalised on the CR-A An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity about the final status CR-A in default idle status			

10.3 TRAIN EMERGENCY CALL CONFIRMATION

10.3.1 Train emergency call confirmation for incoming train emergency calls

Purpose: This test is to show that an automatic confirmation is generated by the Cab Radio at the end of the train emergency call.

Remark: The correct contents of the UUIE must be validated at the confirmation centre or Abis interface.

Reference: **FRS § 5.2.1.2, 5.2.2.58, 13.4.2, 13.4.3, 13.4.6; SRS § 13.5.2, 13.5.3, 13.5.4, 13.5.5, 13.5.6, 13.5.7, 13.5.9, 13.5.10**

- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A joins the train emergency call automatically
- CR-A listens to the train emergency call
- CR-B terminates the train emergency call
- CR-A executes the train emergency call confirmation procedure

Case positive acknowledgement: RELEASE COMPLETE message incl. ACK:

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates "train emergency call" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Continue call for approx. 30 secs.				
3	CR-B terminates "train emergency call"	Group call „train emergency call" is terminated CR-A in default idle status			

| 4 | CR-A starts the train emergency call confirmation procedure

(automatically in the background) | After a delay between 0 and 30 seconds fro the termination of the call, a ptp call to call confirmation centre 1612 with priority level 4 is established.

SETUP message with the content:

- the time at which the call was first received

- the time at which the call was terminated (or lost)

- the group identity of the sender

- the train number and engine number of CR-A

is sent by CR-A.

RELEASE COMPLETE message incl. ACK | | | |
| 5 | CR-A completes the train emergency call confirmation procedure | CR-A in default idle status | | | |

Case negative acknowledgement #1: RELEASE COMPLETE message incl. NACK1:

For this test case to generate the RELEASE COMPLETE message incl. NACK1 special test environment or manipulation of the test environment may be necessary.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates "train emergency call" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Continue call for approx. 30 secs.				
3	CR-B terminates "train emergency call"	Group call „train emergency call" is terminated CR-A in default idle status			

4	CR-A starts the train emergency call confirmation procedure (automatically in the background)	ptp call to call confirmation centre 1612 with priority level 4 is established. SETUP message with the content: - the time at which the call was first received - the time at which the call was terminated (or lost) - the group identity of the sender - the train number and engine number of CR-A is sent by CR-A. RELEASE COMPLETE message incl. NACK1 is received from the confirmation centre			
		Note: negative acknowledgement #1 (NACK1) indicates a reparable error, the mobile is requested to repeat the confirmation (as long as the maximum repetition value is not reached) using an updated confirmation message			
5	CR-A starts the train emergency call confirmation procedure (automatically in the background)	ptp call to call confirmation centre 1612 with priority level 4 is established. SETUP message with the content: - the time at which the call was first received - the time at which the call was terminated (or lost) - the group identity of the sender - the FN i.e. train number or engine number of CR-A is sent by CR-A. RELEASE COMPLETE message incl. ACK is received from the confirmation centre			
6	CR-A completes the train emergency call confirmation procedure	CR-A in default idle status			

Case negative acknowledgement #2: RELEASE COMPLETE message incl. NACK2:

For this test case to generate the RELEASE COMPLETE message incl. NACK2 special test environment or manipulation of the test environment may be necessary.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates "train emergency call" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Continue call for approx. 30 secs.				
3	CR-B terminates "train emergency call"	Group call „train emergency call" is terminated CR-A in default idle status			
4	CR-A starts the train emergency call confirmation procedure (automatically in the background)	ptp call to call confirmation centre 1612 with priority level 4 is established. SETUP message with the content: - the time at which the call was first received - the time at which the call was terminated (or lost) - the group identity of the sender - the train number and engine number of CR-A is sent by CR-A. RELEASE COMPLETE message incl. NACK2 is received from the confirmation centre			
5	CR-A completes the train emergency call confirmation procedure	CR-A in default idle status			

10.3.2 Train emergency call confirmation for outgoing train emergency calls

Purpose: This test is to show that an automatic confirmation is generated by the Cab Radio at the end of the train emergency call.

Remark: The correct contents of the UUIE must be validated at the confirmation centre or Abis interface.

Reference: **FRS § 5.2.2.58, 13.4.2, 13.4.3, 13.4.5; SRS § 13.5.2, 13.5.3, 13.5.4, 13.5.5, 13.5.6, 13.5.7, 13.5.9, 13.5.10**

- CR-A initiates a train emergency call
- CR-B receives the train emergency call
- CR-B joins the train emergency call automatically
- CR-B listens to the train emergency call
- CR-A terminates the train emergency call
- CR-A executes the train emergency call confirmation procedure

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates "train emergency call" and takes the uplink, press PTT	According CR User Manual CR-B receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Continue call for approx. 30 secs.				
3	CR-A terminates "train emergency call"	Group call „train emergency call" is terminated CR-A in default idle status			
4	CR-A starts the train emergency call confirmation procedure (automatically in the background)	ptp call to call confirmation centre 1612 with priority level 4 is established. SETUP message with the content: - the time at call establishment - the time at clear down - the train number and engine number of the call originator, CR-A is sent by CR-A. RELEASE COMPLETE message is received from the confirmation centre			

5	CR-A completes the train emergency call confirmation procedure	CR-A in default idle status			

10.3.3 Train emergency call confirmation after loss of network coverage

Purpose: This test is to show that an automatic confirmation is generated by the Cab Radio after loss of GSM-R radio coverage or moving out of the call area in an ongoing train emergency call.

Remark: The correct contents of the UUIE must be validated at the confirmation centre or Abis interface.

Reference: **FRS § 5.2.2.58, 13.4.2, 13.4.3, 13.4.4, 13.4.6; SRS § 13.5.2, 13.5.3, 13.5.4, 13.5.5, 13.5.6, 13.5.7, 13.5.9, 13.5.10**

- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A joins the train emergency call automatically
- CR-A listens to the train emergency call
- Moving of CR-A during ongoing train emergency call out of the train emergency call area [this test may be executed dynamic in the field or in the test lab using a handover machine]
- CR-A drops the train emergency call and returns to idle
- CR-B terminates the train emergency call
- CR-A executes the train emergency call confirmation procedure

Remark: Neighbour (target) cell in different train emergency call (group call) area.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates "train emergency call" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Continue call for approx. 20 secs.				

3	Change of attenuation at the handover machine to suppress coverage (< -110dBm) or Wait for loss of coverage or moving out of group call area during dynamic test	Audio connection disturbed on the CR-A Group Call loss on CR-A An audible indication is given on the loudspeaker A visual indication is displayed on the HMI CR-A is searching network (may be presented also as no network)			
4	CR-B terminates "train emergency call"	Group call „train emergency call" is terminated CR-A in default idle status			
5	Change of attenuation at the handover machine to establish coverage (> -90dBm) or Wait for entering GSM-R coverage area during dynamic test	CR-A search for network CR-A selects network An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. network name CR-A returns in default idle status			
6	CR-A starts the train emergency call confirmation procedure (automatically in the background)	ptp call to call confirmation centre 1612 with priority level 4 is established. SETUP message with the content: - the time at which the call was first received - the time at which the call was terminated (or lost) - the group identity of the sender - the FN i.e. train number or engine number of CR-A is sent by CR-A. RELEASE COMPLETE message is received from the confirmation centre			
7	CR-A completes the train emergency call confirmation procedure	CR-A in default idle status			

10.3.4 Train emergency call confirmation after higher priority (3) outgoing ptp call

Purpose: This test is to show that the train emergency call confirmation is resumed after an outgoing higher priority ptp call e.g. primary controller

Remark: The correct contents of the UUIE must be validated at the confirmation centre or Abis interface.

Reference: **System requirement**, **FRS § 5.2.2.58, 13.4.2, 13.4.3, 13.4.6; SRS § 13.5.2, 13.5.3, 13.5.4, 13.5.5, 13.5.6, 13.5.7, 13.5.9, 13.5.10**

- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A joins the train emergency call automatically
- CR-A listens to the train emergency call
- CR-B terminates the train emergency call
- CR-A initiates a call to primary controller immediately
- The call to the primary controller is established
- CR-A terminates the call
- CR-A executes the train emergency call confirmation procedure

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates "train emergency call" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Continue call for approx. 30 secs.				
3	CR-B terminates "train emergency call"	Group call „train emergency call" is terminated CR-A in default idle status			

4	Immediately after termination of the train emergency call: CR-A initiates call to Primary Controller	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment incl. identification of Primary Controller			
5	Primary Controller accepts the call	The communication CR-A Primary Controller is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI Primary Controller can be heard on driver's loudspeaker			
6	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to Controller is activated on the HS of the CR-A			
7	Terminate call by CR-A not before 30 secs.: Using the HMI menu	Ongoing Primary Controller call terminated. CR-A in default idle status			
8	CR-A starts the train emergency call confirmation procedure (automatically in the background)	ptp call to call confirmation centre 1612 with priority level 4 is established. SETUP message with the content: - the time at which the call was first received - the time at which the call was terminated (or lost) - the group identity of the sender - the FN i.e. train number or engine number of CR-A is sent by CR-A. RELEASE COMPLETE message is received from the confirmation centre			
9	CR-A completes the train emergency call confirmation procedure	CR-A in default idle status			

10.3.5 Train emergency call confirmation after an outgoing ptp call same priority (4)

Purpose: This test is to show that the train emergency call confirmation is resumed after an outgoing ptp call same priority.

Remark: The correct contents of the UUIE must be validated at the confirmation centre or Abis interface.

Reference: **System requirement**, **FRS § 5.2.2.58, 13.4.2, 13.4.3, 13.4.6; SRS § 13.5.2, 13.5.3, 13.5.4, 13.5.5, 13.5.6, 13.5.7, 13.5.9, 13.5.10**

- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A joins the train emergency call automatically
- CR-A listens to the train emergency call
- CR-B terminates the train emergency call
- CR-A initiates a call to MS-A
- The call to the MS-A is established
- CR-A terminates the call
- CR-A executes the train emergency call confirmation procedure

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates "train emergency call" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Continue call for approx. 30 secs.				
3	CR-B terminates "train emergency call"	Group call „train emergency call" is terminated CR-A in default idle status			
4	Immediately after termination of the train emergency call: CR-A initiates call to MS-A	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment incl. identification of MS-A			

5	MS-A accepts the call	The communication CR-A MS-A is established			
		A visual indication is displayed on the HMI			
		Identification of the connected party is displayed on the HMI			
		Primary Controller can be heard on driver's loudspeaker			
6	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume			
		Communication to MS-A is activated on the HS of the CR-A			
7	Terminate call by CR-A not before 30 secs.: Using the HMI menu	Ongoing ptp call to MS-A is terminated. CR-A in default idle status			
8	CR-A starts the train emergency call confirmation procedure (automatically in the background)	ptp call to call confirmation centre 1612 with priority level 4 is established. SETUP message with the content: - the time at which the call was first received - the time at which the call was terminated (or lost) - the group identity of the sender - the FN i.e. train number or engine number of CR-A is sent by CR-A. RELEASE COMPLETE message is received from the confirmation centre			
9	CR-A completes the train emergency call confirmation procedure	CR-A in default idle status			

10.3.6 Train emergency call confirmation after higher priority (3) incoming ptp call

Purpose: This test is to show that the train emergency call confirmation is resumed after an incoming higher priority ptp call e.g. primary controller

Remark: The correct contents of the UUIE must be validated at the confirmation centre or Abis interface.

Reference: **System requirement**, **FRS § 5.2.2.58, 13.4.2, 13.4.3, 13.4.6; SRS § 13.5.2, 13.5.3, 13.5.4, 13.5.5, 13.5.6, 13.5.7, 13.5.9, 13.5.10**

- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A joins the train emergency call automatically
- CR-A listens to the train emergency call
- CR-B terminates the train emergency call
- CR-A receives a ptp call from primary controller immediately
- CR-A accepts call automatically
- The call to the primary controller is established
- CR-A terminates the call
- CR-A executes the train emergency call confirmation procedure

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates "train emergency call" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Continue call for approx. 30 secs.				
3	CR-B terminates "train emergency call"	Group call „train emergency call" is terminated CR-A in default idle status			

4	Immediately after termination of the train emergency call: Primary Controller initiates ptp call to CR-A	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment incl. identification of Primary Controller			
5	CR-A accepts the call automatically	The communication CR-A Primary Controller is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI Primary Controller can be heard on driver's loudspeaker			
6	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to Controller is activated on the HS of the CR-A			
7	Terminate call by CR-A not before 30 secs.: Using the HMI menu	Ongoing Primary Controller call terminated. CR-A in default idle status			
8	CR-A starts the train emergency call confirmation procedure (automatically in the background)	ptp call to call confirmation centre 1612 with priority level 4 is established. SETUP message with the content: - the time at which the call was first received - the time at which the call was terminated (or lost) - the group identity of the sender - the FN i.e. train number or engine number of CR-A is sent by CR-A. RELEASE COMPLETE message is received from the confirmation centre			
9	CR-A completes the train emergency call confirmation procedure	CR-A in default idle status			

10.3.7 Train emergency call confirmation after an incoming ptp call same priority (4)

Purpose: This test is to show that the train emergency call confirmation is resumed after an incoming ptp call same priority.

Remark: The correct contents of the UUIE must be validated at the confirmation centre or Abis interface.

Reference: **System requirement**, **FRS § 5.2.2.58, 13.4.2, 13.4.3, 13.4.6; SRS § 13.5.2, 13.5.3, 13.5.4, 13.5.5, 13.5.6, 13.5.7, 13.5.9, 13.5.10**

- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A joins the train emergency call automatically
- CR-A listens to the train emergency call
- CR-B terminates the train emergency call
- MS-A initiates a ptp call to CR-A
- The call to the CR-A is established
- MS-A terminates the call
- CR-A executes the train emergency call confirmation procedure

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates "train emergency call" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Continue call for approx. 30 secs.				
3	CR-B terminates "train emergency call"	Group call „train emergency call" is terminated CR-A in default idle status			
4	Immediately after termination of the train emergency call: MS-A initiates ptp call to CR-A	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment incl. identification of MS-A			

5	CR-A accepts the call	The communication CR-A MS-A is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI MS-A can be heard on driver's loudspeaker			
6	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to MS-A is activated on the HS of the CR-A			
7	Terminate call by MS-A not before 30 secs.	Ongoing ptp call to CR-A is terminated. CR-A in default idle status			
8	CR-A starts the train emergency call confirmation procedure (automatically in the background)	ptp call to call confirmation centre 1612 with priority level 4 is established. SETUP message with the content: - the time at which the call was first received - the time at which the call was terminated (or lost) - the group identity of the sender - the FN i.e. train number or engine number of CR-A is sent by CR-A. RELEASE COMPLETE message is received from the confirmation centre			
9	CR-A completes the train emergency call confirmation procedure	CR-A in default idle status			

11. CALL ARBITRATION

11.1 CALL ARBITRATION DURING AN ONGOING TRAIN EMERGENCY CALL

11.1.1 Emergency call during an ongoing train emergency call

Purpose: This test is to show that during an ongoing train emergency call no other emergency call can be processed.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A joins the train emergency call automatically
- CR-A listens to the train emergency call
- CR-A utilise emergency access to initiate a train emergency call, no change in CR-A status
- CR-B terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates „train emergency call" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume „train emergency call" communication is activated on the HS of the CR-A			
3	CR-A presses "Emergency button" to try to initiate „train emergency call"	No change in the status of CR-A No change in the status of CR-B Ongoing train emergency call" continues			
4	CR-B terminates group call	Group call „train emergency call" is terminated CR-A in default idle status			

11.1.2 Intercom call during an ongoing train emergency call

Applicable if the CR provides an interface to UIC Intercom.

Reference: **SRS § 5.8.1(O)**

Purpose: This test is to show that during an ongoing train emergency call the UIC intercom can be used by the driver for intercom call.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A joins the train emergency call automatically
- CR-A listens to the train emergency call
- CR-A initiate intercom call via UIC intercom
- "train emergency call" continues on the loudspeaker of the CR-A, intercom call is connected to the HS of CR-A
- CR-B terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates „train emergency call" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume „train emergency call" communication is activated on the HS of the CR-A			
3	CR-A initiates intercom call via UIC intercom	A visual indication is displayed on the HMI Intercom call is established on the HS via UIC intercom „train emergency call" is continued on the CR-A loudspeaker			
4	CR-A terminates intercom call	The visual indication displayed on the HMI is updated „train emergency call" communication is activated on the HS of the CR-A and continued			

5	CR-B terminates group call	Group call „train emergency call" is terminated CR-A in default idle status			

11.1.3 Call to PA system during an ongoing train emergency call

Applicable if the CR provides an interface to Public Address.

Reference: **SRS § 5.8.1(O)**

Purpose: This test is to show that during an ongoing train emergency call the PA system can be used by the driver for announcement.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A joins the train emergency call automatically
- CR-A listens to the train emergency call
- CR-A initiates an announcement to the PA system
- "train emergency call" continues on the loudspeaker of the CR-A, call to PA system is connected to the HS of CR-A
- CR-A terminates the PA call
- CR-B terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates „train emergency call" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume „train emergency call" communication is activated on the HS of the CR-A			
3	CR-A initiates call to PA system	Call establishment to PA system Update of visual indication is displayed on the HMI PA system is connected to CR-A on the HS train emergency call" is continued on the CR-A loudspeaker			
4	(Implementation option) Use PTT to talk on the PA system	Announcement on the PA system			

5	CR-A terminates call to PA system	Ongoing PA call terminated			
		Update of visual indication is displayed on the HMI			
		„train emergency call" communication is activated on the HS of the CR-A			
		and continued			
6	CR-B terminates group call	Group call „train emergency call" is terminated			
		CR-A in default idle status			

11.1.4 Call to chief conductor during an ongoing train emergency call

Applicable if the CR provides an interface to UIC Intercom.

Reference: **SRS § 5.8.1(O)**

Purpose: This test is to show that during an ongoing train emergency call the initiation of a call to the chief conductor using UIC intercom and audible indication on the PA system via "gong".

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A joins the train emergency call automatically
- CR-A listens to the train emergency call
- CR-A initiate call to chief conductor via UIC intercom
- "train emergency call" continues on the loudspeaker of the CR-A, chief conductor is connected to the HS of CR-A
- CR-B terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates „train emergency call" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume „train emergency call" communication is activated on the HS of the CR-A			
3	CR-A initiates call to the chief conductor via UIC intercom	A visual indication is displayed on the HMI Audio signal (e.g. GONG) on the PA system			
4	Chief conductor calls back CR-A	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI			

5	CR-A accepts call from chief conductor	A visual indication is displayed on the HMI			
		Chief conductor is connected to CR-A via UIC intercom on the HS			
		„train emergency call" is continued on the CR-A loudspeaker			
6	Chief conductor hangs up the HS	Connection Chief conductor to CR-A via UIC intercom on the HS is released			
		„train emergency call" communication is activated on the HS of the CR-A			
		and continued			
7	CR-B terminates group call	Group call „train emergency call" is terminated			
		CR-A in default idle status			

11.1.5 Incoming calls during an ongoing train emergency call

Purpose: This test is to show that during an ongoing emergency call another incoming call can be received and indicated. There is no possibility to accept the call for the driver.

Precondition of this test is that the network shall be prepared in order to support in-band paging for ptp calls.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A joins the train emergency call automatically
- CR-A listens to the train emergency call
- MS-A initiates a ptp call to CR-A FN or MSISDN
- CR-A indicates the incoming ptp call on the HMI
- CR-B terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates „train emergency call" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume „train emergency call" communication is activated on the HS of the CR-A			
3	MS-A setup a ptp call to driver's MSISDN or FN CR-A	A visual indication is displayed on the HMI The "train emergency call" is continued as before			
4	MS-A cancels the call	The 'waiting' indication is removed on the HMI The "train emergency call" is continued as before.			
5	CR-B terminates group call	Group call „train emergency call" is terminated CR-A in default idle status			

11.2 CALL ARBITRATION DURING AN ONGOING GROUP CALL "ALL DRIVERS IN SAME AREA"

11.2.1 Outgoing emergency call during an ongoing group call "all drivers in same area"

See 10.2.5

11.2.2 Call to PA system during an ongoing group call "all drivers in same area"

Applicable if the CR provides an interface to Public Address.

Reference: **SRS § 5.8.1(O)**

Purpose: This test is to show that during an ongoing group call "all drivers in same area" the PA system can be used by the driver for announcement.

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- CR-B initiates an "all drivers in same area"
- CR-A receives the "all drivers in same area" call
- CR-A joins the "all drivers in same area" call automatically
- CR-A listens to the "all drivers in same area" call
- CR-A initiates an announcement to the PA system
- "all drivers in same area" continues on the loudspeaker of the CR-A, call to PA system is connected to the HS of CR-A
- CR-A terminates the PA call
- CR-B terminates the "all drivers in same area" call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates "all drivers in same area" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to minimal volume "all drivers in same area" communication is activated on the HS of the CR-A			
3	CR-A initiates call to PA system	Call establishment to PA system Update of visual indication is displayed on the HMI PA system is connected to CR-A on the HS "all drivers in same area" is continued on the CR-A loudspeaker			
4	(Implementation option) Use PTT to talk on the PA system	Announcement on the PA system			
5	CR-A terminates call to PA system	Ongoing PA call terminated Update of visual indication is displayed on the HMI "all drivers in same area" communication is activated on the HS of the CR-A and continued			
6	CR-B terminates group call	Group call "all drivers in same area" is terminated CR-A in default idle status			

11.2.3 Call to chief conductor during an ongoing group call "all drivers in same area"

Applicable if the CR provides an interface to UIC Intercom.

Reference: **SRS § 5.8.1(O)**

Purpose: This test is to show that during an ongoing group call "all drivers in same area" a call to the chief conductor via UIC intercom (gong) can be initiated.

- CR-B initiates an "all drivers in same area" call
- CR-A receives the "all drivers in same area" call
- CR-A joins the "all drivers in same area" automatically
- CR-A listens to the "all drivers in same area" call
- CR-A initiate call to chief conductor via UIC intercom
- "all drivers in same area" continues on the loudspeaker of the CR-A, chief conductor is connected to the HS of CR-A
- CR-B terminates the "all drivers in same area"

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates "all drivers in same area" call and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to minimal volume "all drivers in same area" communication is activated on the HS of the CR-A			
3	CR-A initiates call to the chief conductor via UIC intercom	A visual indication is displayed on the HMI Audio signal (e.g. GONG) on the PA system			
4	Chief conductor calls back CR-A	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI			
5	CR-A accepts call from chief conductor	A visual indication is displayed on the HMI Chief conductor is connected to CR-A via UIC intercom on the HS "all drivers in same area" call is continued on the CR-A loudspeaker			

6	Chief conductor hangs up the HS	Connection Chief conductor to CR-A via UIC intercom on the HS is released			
		"all drivers in same area" communication is activated on the HS of the CR-A			
		and continued			
7	CR-B terminates group call	Group call "all drivers in same area" is terminated			
		CR-A in default idle status			

11.2.4 Intercom call to other engine during an ongoing group call "all drivers in same area"

Applicable if the CR provides an interface to UIC Intercom.

Reference: **SRS § 5.8.1(O)**

Purpose: This test is to show that during an ongoing group call "all drivers in same area" the UIC intercom can be used by the driver for intercom call to other engine.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-B initiates an "all drivers in same area" call
- CR-A receives the "all drivers in same area" call
- CR-A joins the "all drivers in same area" call automatically
- CR-A listens to the "all drivers in same area" call
- CR-A initiates intercom call via UIC intercom
- The "all drivers in same area" call continues on the loudspeaker of the CR-A, intercom call is connected to the HS of CR-A
- CR-A terminates the intercom call
- CR-B terminates the "all drivers in same area" call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates "all drivers in same area" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to minimal volume "all drivers in same area" communication is activated on the HS of the CR-A			
3	CR-A initiates intercom call via UIC intercom	A visual indication is displayed on the HMI An audible indication is given on the loudspeaker (implementation option) Intercom call is established on the HS via UIC intercom The "all drivers in same area" call is continued on the CR-A loudspeaker			
4	CR-A terminates intercom call	The visual indication displayed on the HMI is updated The "all drivers in same area" communication is activated on the HS of the CR-A			

| 5 | CR-B terminates group call | Group call "all drivers in same area" is terminated | | | |
| | | CR-A in default idle status | | | |

11.2.5 Incoming train emergency call during an ongoing group call "all drivers in same area"

See 10.1.6

11.2.6 Other calls during an ongoing group call "all drivers in same area"

Purpose: This test is to show that during an ongoing group call "all drivers in same area" an incoming call can be signalled.

Precondition of this test is that the network shall be prepared in order to support in-band paging for ptp calls.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

Note: If a call other than a ptp call is used as a VGCS/VBS with priority 3 or priority 4 this call may not be received by CR-A being engaged in the group call "all drivers in same area" as the new VGCS/VBS call will not be indicated with in-band signalling on the group call channel. It is recommended to clarify the EIRENE SRS 5A.1 requirement. The test below assumes the use of a ptp call as the new incoming call.

- CR-B initiates a group call "all drivers in same area"
- CR-A receives the group call "all drivers in same area"
- CR-A joins the group call "all drivers in same area" automatically
- CR-A listens to the group call "all drivers in same area"
- MS-A initiates a ptp call to CR-A FN or MSISDN
- CR-A indicates the incoming ptp call on the HMI
- MS-A terminates the waiting call
- CR-A removes the waiting indication
- CR-B terminates the group call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates group call "all drivers in same area" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Group call "all drivers in same area" communication is activated on the HS of the CR-A			

3	MS-A setup a ptp call to driver's MSISDN or FN CR-A	A visual indication is displayed on the HMI Group call "all drivers in same area" is continued as before			
4	MS-A cancels the call	The 'waiting' indication is removed on the HMI The group call is continued as before.			
5	CR-B terminates group call	Group call "all drivers in same area" is terminated CR-A in default idle status			

11.3 CALL ARBITRATION DURING AN ONGOING CONTROLLER CALL

11.3.1 Outgoing train emergency call during an ongoing call to controller

Purpose: This test is to show that during an ongoing ptp call to any controller e.g. "Primary Controller" or "Secondary Controller" an outgoing train emergency call can be initiated by the driver.

Reference: **FRS § 5.2.4.7 SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- ▪
- ▪ CR-A initiates a call to Primary Controller
- ▪ Primary Controller receives and accepts ptp call
- ▪ CR-A initiates a train emergency call
- ▪ Ptp call to Primary Controller is terminated
- ▪ CR-B receives and indicates the train emergency call
- ▪ CR-B joins the train emergency call automatically
- ▪ Controller receives and indicates the train emergency call incl. FN of the originator
- ▪ Controller joins the train emergency call
- ▪ CR-A talks in the train emergency call
- ▪ CR-B listens to the train emergency call
- ▪ CR-A and CR-B talker change
- ▪ CR-A terminates the train emergency call
- ▪ Controller terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates ptp call to Primary Controller (driver's HS on hook)	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment to Primary Controller			
2	Primary Controller accepts the ptp call	The communication CR-A to Primary Controller is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI			
3	CR-A initiates „train emergency call" using emergency access "Emergency button"	Ongoing ptp call to Primary Controller is terminated by CR-A A short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI incl. group identity			
	(Call established in the network)	Indication to use PTT to talk is given to the driver on the HMI			

3	Press PTT on CR-A (CR-A talk)	CR-A takes the uplink „train emergency call" communication is activated on the HS of the CR-A to all train emergency call participants			
		CR-B receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
		Controller receives and accepts call The visual indication displayed on the HMI incl. FN of CR-A as the originator of the call Caller CR-A can be heard on driver's loudspeaker			
4	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-A and CR-B			
5	Press PTT button on CR-B (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI of CR-B			
6	Release PTT on CR-B	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-A and CR-B			
7	Press PTT on CR-A	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			
8	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-A and CR-B			
9	Hang-up handset on CR-A	A visual indication is displayed on the HMI Driver's loudspeaker set to default volume (Talker e.g. controller may be heard on driver's loudspeaker)			
10	CR-A terminates group call	Group call „train emergency call" is terminated			

	Using the HMI menu	CR-A in default idle status			

11.3.2 Call to the PA system during an ongoing call to controller

Applicable if the CR provides an interface to Public Address.

Reference: **SRS § 5.8.1(O)**

Purpose: This test is to show that during an ongoing call to controller the PA system can be used by the driver for announcement. The initiation of an announcement on the PA system automatically terminates the call to the controller.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-A initiates a call to primary controller with a minimum of driver action
- The call to the controller is established
- CR-A initiates an announcement to the PA system
- Call to controller is terminated
- The call to PA system is established
- CR-A terminates the PA call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates call to Primary Controller	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment including identification of Primary Controller			
2	Primary Controller accepts the call	The communication CR-A Primary Controller is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI Primary Controller can be heard on driver's loudspeaker			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to Controller is activated on the HS of the CR-A			
4	Initiate call to CR-A PA system	Ongoing call to Controller is terminated. An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment to PA system			

5	Press "Push-to-Talk" button (Implementation Option)	Update of visual indication is displayed on the HMI Drivers voice will be transmitted on the PA system			
6	Release "Push-to-Talk" button (Implementation Option)	Update of visual indication is displayed on the HMI Drivers voice is not transmitted on the PA system			
7	Terminate call by CR-A: Using the HMI menu	Ongoing PA call terminated. CR-A in default idle status			

11.3.3 Call to chief conductor during an ongoing call to controller

Applicable if the CR provides an interface to UIC Intercom.

Reference: **SRS § 5.8.1(O)**

Purpose: This test is to show that during an ongoing call to controller the initiation of a call to the chief conductor using UIC intercom and audible indication on the PA system via "gong".

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- ▪ CR-A initiates a call to primary controller
- ▪ The call to the controller is established
- ▪ CR-A initiate call to chief conductor via UIC intercom
- ▪ Call to controller is continued, chief conductor is alarmed on the PA system via audio signal "gong"
- ▪ Chief conductor calls back and connected to the drivers' CR-A
- ▪ Call to controller terminated by CR-A
- ▪ Call to chief conductor terminated by CR-A

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates call to Primary Controller	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment incl. identification of Primary Controller			
2	Primary Controller accepts the call	The communication CR-A Primary Controller is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI Primary Controller can be heard on driver's loudspeaker			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to Controller is activated on the HS of the CR-A			
4	CR-A initiates call to the chief conductor via UIC intercom	A visual indication is displayed on the HMI Audio signal (e.g. GONG) on the PA system			
5	Chief conductor calls back CR-A	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI			

6	CR-A accepts call from chief conductor	A visual indication displayed on the HMI is updated Call to controller terminated by CR-A Chief conductor is connected to CR-A via UIC intercom			
7	Terminate call by CR-A: Using the HMI menu	Ongoing call to chief conductor is terminated. CR-A in default idle status			

11.3.4 Intercom call to other engine during an ongoing call to a controller

Applicable if the CR provides an interface to UIC Intercom.

Reference: **SRS § 5.8.1(O)**

Purpose: This test is to show that during an ongoing call to controller the intercom can be used by the driver for an outgoing intercom call to other engine. The initiation of the intercom call to other engine automatically terminates the call to the controller.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-A initiates a call to primary controller with a minimum of driver action
- The call to the controller is established
- CR-A initiates call to other engine via UIC intercom
- Call to controller is terminated
- The call to other engine via UIC intercom is established
- CR-A terminates the call to other engine

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates call to Primary Controller	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment incl. identification of Primary Controller			
2	Primary Controller accepts the call	The communication CR-A Primary Controller is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI Primary Controller can be heard on driver's loudspeaker			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to Controller is activated on the HS of the CR-A			
4	CR-A initiates call to other engine via UIC intercom	Ongoing call to Controller is terminated. An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call to other engine is established via UIC intercom			
5	CR-A terminates call to other engine	Ongoing intercom call terminated. CR-A in default idle status			

11.3.5 Other outgoing calls during an ongoing call to a controller

Purpose: This test is to show that during an ongoing call to a controller an additional ptp call can be initiated. The ongoing call to controller will be put on hold.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-A initiates a call to primary controller with a minimum of driver action
- The call to the controller is established
- CR-A initiate call to other user e.g. MS-A using MDISDN
- Call to controller is put on hold
- CR-A terminates the call to MS-A
- Call to controller is retrieved i.e. active
- CR-A terminates the call to controller

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates call to Primary Controller	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment incl. identification of Primary Controller			
2	Primary Controller accepts the call	The communication CR-A Primary Controller is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI Primary Controller can be heard on driver's loudspeaker			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to Controller is activated on the HS of the CR-A			
4	According CR User Manual CR-A initiates call to MS-A using MSISDN	Ongoing call to Controller is put on hold An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call to MS-A is ringing			
5	MS-A accepts call from CR-A	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Communication to MS-A is activated on the HS of the CR-A			

6	CR-A terminates call to MS-A	Ongoing call to MS-A is terminated. An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call to controller is retrieved Communication CR-A to controller is activated on the HS of the CR-A			
7	CR-A terminates call to controller	Call to controller is terminated. CR-A in default idle status			

11.3.6 Incoming train emergency call during an ongoing call to a controller

Purpose: This test is to show that during an ongoing call to a controller the cab radio is able to receive and join an incoming train emergency call. The ongoing call to controller is pre-empted and terminated.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

See 10.1.3

11.3.7 Incoming group call "all drivers in same area" during an ongoing call to a controller

Purpose: This test is to show that during an ongoing call to a controller an incoming group call "all drivers in same area" is accepted automatically and the ongoing call to controller is terminated.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-A initiates a call to primary controller
- Controller receives the ptp call
- Controller accepts the ptp call
- CR-B initiates an "all driver in same area" group call
- CR-A receives the group call
- CR-A releases the outgoing ptp call and joins group call automatically
- CR-A listens to the group call
- CR-B terminates the group call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates call to primary controller (driver's HS on hook)	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment to controller			
2	Controller accepts the call	The communication CR-A controller is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI Controller can be heard on driver's loudspeaker			

3	CR-B initiates "all drivers in same area" call and takes the uplink, press PTT	CR-A receives and accepts call automatically			
		The ongoing controller ptp call is terminated			
		An audible indication is given on the loudspeaker			
		A visual indication is displayed on the HMI incl. group identity			
		Caller (CR-B) can be heard on driver's loudspeaker of CR-A			
		Indication to use PTT to talk is given to the driver on the HMI			
4	Pick up handset of CR-A	Driver's loudspeaker set to minimal volume			
		"all drivers in same area" communication is activated on the HS of the CR-A			
5	Release PTT on CR-B	Indication to use PTT to talk is given to the driver on the HMI of the CR-A			
6	Press PTT button on CR-A (uplink free)	An audible indication is given on the loudspeaker			
		"You can talk" indication is displayed on the HMI			
7	Release PTT on CR-A	An audible indication is given on the loudspeaker			
		Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
8	Press PTT on CR-B	An audible indication is given on the loudspeaker			
9	Hang-up handset on CR-A	Talker CR-B can be heard on driver's loudspeaker			
10	CR-B terminates group call	Group call "all drivers in same area" call is terminated			
		CR-A in default idle status			

11.3.8 Other incoming calls during ongoing call to a controller

Purpose: This test is to show that during an ongoing call to a controller an incoming ptp call is received and indicated clearly to the driver.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-A initiates a call to primary controller with a minimum of driver action
- The call to the controller is established
- MS-A initiate call to CR-A using FN or MDISDN
- CR-A receives and indicates ptp call from MS-A
- MS-A terminates the call to CR-A

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- CR-A terminates the call to controller

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A initiates call to Primary Controller	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment incl. identification of Primary Controller			
2	Primary Controller accepts the call	The communication CR-A Primary Controller is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI Primary Controller can be heard on driver's loudspeaker			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to Controller is activated on the HS of the CR-A			
4	MS-A setup a ptp call to driver's FN or MSISDN CR-A with Priority 4	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Identification of the caller FN (if MS-A registered) MSISDN (if MS-A not registered) is displayed on the HMI			
		Option to Accept or Reject the call by driver's CR-A HMI menu Communication to Controller is continued			
5	MS-A terminates call to CR-A	An audible indication is given on the loudspeaker The visual indication displayed on the HMI is updated Communication to Controller is continued			
6	CR-A terminates call to controller	Call to controller is terminated. CR-A in default idle status			

11.4 CALL ARBITRATION DURING AN ONGOING MULTIPLE DRIVER COMMUNICATION

11.4.1 Train emergency call during an ongoing multi drivers' conference

Purpose: This test is to show that a train emergency call can be initiated at any time i.e. also during an ongoing multi drivers' conference. The ongoing multi drivers' conference is terminated.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

See 10.2.4.

11.4.2 Call to PA system during an ongoing multi drivers' conference

Applicable if the CR provides an interface to Public Address.

Reference: **SRS § 5.8.1(O)**

Purpose: This test is to show that during an ongoing multi drivers' conference the PA system can be used by the driver for announcement.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-A (leading driver) initiates Multi Driver Communication
- CR-A adds other driver CR-B and/or controller to Multi Driver Communication
- CR-A initiates an announcement to the PA system
- Multi drivers' conference continues on the loudspeaker of the CR-A, call to PA system is connected to the HS of CR-A
- CR-A terminates the PA call
- CR-A terminates Multi Driver Communication

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual	According CR User Manual			
	Initiate a ptp call to other driver (FN of the CR-B) by CR-A (leading driver) with HMI guidance	A visual indication "Multi Driver Communication" is displayed on the HMI			
2	Called driver CR-B (other driver) automatically accepts call	An audible indication is given on the loudspeaker of CR-B			
	(Call priority 3)	A visual indication is displayed on the HMI of CR-B incl. indication "Multi Driver Communication"			
		Identification of the caller FN			
3	Called driver CR-B picks up handset	The communication CR-A to CR-B is established			

4	Leading driver CR-A establishes call to other driver CR-C or controller with HMI guidance	MPTY put on hold on CR-A Call connected to CR-C other driver or controller with the option to join it to MPTY			
5	Leading driver CR-A adds call to other driver CR-C or controller with HMI guidance to MPTY	Connection of other driver or controller to driver Multi Driver Communication The communication CR-A to CR-B and CR-C or controller is established A visual indication is displayed on the HMI of the CR-A indicating other driver CR-C or controller			
6	CR-A initiates call to PA system	Call establishment to PA system Update of visual indication is displayed on the HMI PA system is connected to CR-A on the HS Multi drivers' conference is continued on the CR-A loudspeaker			
7	(Implementation option) Use PTT to talk on the PA system	Announcement on the PA system			
8	CR-A terminates call to PA system	Ongoing PA call terminated Update of visual indication is displayed on the HMI Multi drivers' conference is activated on the HS of the CR-A and continued			
9	Terminate call by CR-A: Using the HMI menu	Ongoing Multi Driver Communication is terminated. CR-A in default idle status			

11.4.3 Call to chief conductor during an ongoing multi drivers' conference

Applicable if the CR provides an interface to UIC Intercom.

Reference: **SRS § 5.8.1(O)**

Purpose: This test is to show that during an ongoing multi drivers' conference the initiation of a call to the chief conductor using UIC intercom and audible indication on the PA system via "gong".

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-A (leading driver) initiates Multi Driver Communication
- CR-A adds other driver CR-B and/or controller to Multi Driver Communication
- CR-A initiate call to chief conductor via UIC intercom
- Multi drivers' conference continues on the loudspeaker of the CR-A, call to chief conductor is connected to the HS of CR-A
- CR-A terminates the call to chief conductor
- CR-A terminates Multi Driver Communication

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Initiate a ptp call to other driver (FN of the CR-B) by CR-A (leading driver) with HMI guidance	According CR User Manual A visual indication "Multi Driver Communication" is displayed on the HMI			
2	Called driver CR-B (other driver) automatically accepts call (Call priority 3)	An audible indication is given on the loudspeaker of CR-B A visual indication is displayed on the HMI of CR-B incl. indication "Multi Driver Communication" Identification of the caller FN			
3	Called driver CR-B picks up handset	The communication CR-A to CR-B is established			
4	Leading driver CR-A establishes call to other driver CR-C or controller with HMI guidance	MPTY put on hold on CR-A Call connected to CR-C other driver or controller with the option to join it to MPTY			
5	Leading driver CR-A adds call to other driver CR-C or controller with HMI guidance to MPTY	Connection of other driver or controller to driver Multi Driver Communication The communication CR-A to CR-B and CR-C or controller is established A visual indication is displayed on the HMI of the CR-A indicating other driver CR-C or controller			
6	CR-A initiates call to the chief conductor via UIC intercom	A visual indication is displayed on the HMI Audio signal (e.g. GONG) on the PA system			

7	Chief conductor calls back CR-A	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI			
8	CR-A accepts call from chief conductor	A visual indication is displayed on the HMI Chief conductor is connected to CR-A via UIC intercom on the HS Multiple drivers' conference is continued on the CR-A loudspeaker			
9	CR-A terminates call to chief conductor	Connection Chief conductor to CR-A via UIC intercom on the HS is released Multiple drivers' conference is activated on the HS of the CR-A and continued			
10	Terminate call by CR-A: Using the HMI menu	Ongoing Multi Driver Communication is terminated. CR-A in default idle status			

11.4.4 Incoming emergency call during an ongoing multi drivers' conference

Purpose: This test is to show that the cab radio is able to receive and join an incoming train emergency call any time. The ongoing multi drivers' conference call is terminated.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

See 10.1.5

11.4.5 Intercom call to other engine during an ongoing multi drivers' conference

Applicable if the CR provides an interface to UIC Intercom.
Reference: **SRS § 5.8.1(O)**

Purpose: This test is to show that during an ongoing multi drivers' conference the intercom can be used by the driver for intercom call to other engine.
Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-A (leading driver) initiates Multi Driver Communication
- CR-A adds other driver CR-B and/or controller to Multi Driver Communication
- CR-A initiate call to other engine via UIC intercom
- Multi drivers' conference continues on the loudspeaker of the CR-A, call to intercom is connected to the HS of CR-A
- CR-A terminates call to intercom
- CR-A terminates Multi Driver Communication

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Initiate a ptp call to other driver (FN of the CR-B) by CR-A (leading driver) with HMI guidance	According CR User Manual A visual indication "Multi Driver Communication" is displayed on the HMI			
2	Called driver CR-B (other driver) automatically accepts call (Call priority 3)	An audible indication is given on the loudspeaker of CR-B A visual indication is displayed on the HMI of CR-B incl. indication "Multi Driver Communication" Identification of the caller FN			
3	Called driver CR-B picks up handset	The communication CR-A to CR-B is established			
4	Leading driver CR-A establishes call to other driver CR-C or controller with HMI guidance	MPTY put on hold on CR-A Call connected to CR-C other driver or controller with the option to join it to MPTY			

5	Leading driver CR-A adds call to other driver CR-C or controller with HMI guidance to MPTY	Connection of other driver or controller to driver Multi Driver Communication The communication CR-A to CR-B and CR-C or controller is established A visual indication is displayed on the HMI of the CR-A indicating other driver CR-C or controller			
6	CR-A initiates call to other engine via UIC intercom	A visual indication is displayed on the HMI Call to other engine is established on the HS via UIC intercom Multiple drivers' conference is continued on the CR-A loudspeaker			
7	CR-A terminates call to other engine	The visual indication displayed on the HMI is updated Multiple drivers' conference is activated on the HS of the CR-A and continued			
8	Terminate call by CR-A: Using the HMI menu	Ongoing Multi Driver Communication is terminated. CR-A in default idle status			

11.4.6 Other outgoing calls during an ongoing multi drivers' conference

Purpose: This test is to show that during an ongoing multi drivers' conference other ptp calls can be initiated. The ongoing multi drivers' conference will be put on hold.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-A (leading driver) initiates Multi Driver Communication
- CR-A adds other driver CR-B and/or controller to Multi Driver Communication
- CR-A initiate call to other user e.g. MS-A using MDISDN
- Multi drivers' conference is put on hold
- CR-A terminates the call to MS-A
- Multi drivers' conference is retrieved i.e. active
- CR-A terminates Multi Driver Communication

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Initiate a ptp call to other driver (FN of the CR-B) by CR-A (leading driver) with HMI guidance	According CR User Manual A visual indication "Multi Driver Communication" is displayed on the HMI			
2	Called driver CR-B (other driver) automatically accepts call (Call priority 3)	An audible indication is given on the loudspeaker of CR-B A visual indication is displayed on the HMI of CR-B incl. indication "Multi Driver Communication" Identification of the caller FN			
3	Called driver CR-B picks up handset	The communication CR-A to CR-B is established			
4	Leading driver CR-A establishes call to other driver CR-C or controller with HMI guidance	MPTY put on hold on CR-A Call connected to CR-C other driver or controller with the option to join it to MPTY			
5	Leading driver CR-A adds call to other driver CR-C or controller with HMI guidance to MPTY	Connection of other driver or controller to driver Multi Driver Communication The communication CR-A to CR-B and CR-C or controller is established A visual indication is displayed on the HMI of the CR-A indicating other driver CR-C or controller			
6	According CR User Manual CR-A initiates call to MS-A using MSISDN	Multi Driver Communication is put on hold An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call to MS-A is ringing			

7	MS-A accepts call from CR-A	An audible indication is given on the loudspeaker			
		A visual indication is displayed on the HMI			
		Communication CR-A to MS-A is activated			
8	CR-A terminates call to MS-A	Ongoing call to MS-A is terminated.			
		An audible indication is given on the loudspeaker			
		A visual indication is displayed on the HMI			
		Multi Driver Communication is retrieved			
		Multi Driver Communication is activated on the HS of the CR-A			
9	Terminate call by CR-A: Using the HMI menu	Ongoing Multi Driver Communication is terminated.			
		CR-A in default idle status			

11.4.7 Call to a controller during an ongoing multi drivers' conference

Purpose: This test is to show that during an ongoing multi drivers' conference an additional call to a controller can be initiated. The ongoing multi drivers' conference will be put on hold. The call to the controller may be added to the ongoing multi drivers' conference.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

See 7.5.1.

11.4.8 Incoming group call "all drivers same area" during an ongoing multi drivers' conference

Purpose: This test is to show that, during an ongoing multi drivers' conference, an incoming group call "all drivers in same area" is accepted automatically and the ongoing multi drivers' conference is terminated.

Precondition of this test is that the network must support in-band notification for group call "all drivers in same area".

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Initiate a multi drivers' conference by CR-A (leading driver) according to 7.5.1	According CR User Manual A visual indication "Multi Driver Communication" incl. driver CR-B is displayed on the HMI			
2	CR-B initiates "all drivers in same area" "all drivers in same area" and takes the uplink, press PTT	CR-A receives and accepts call automatically The ongoing multi drivers' conference call is terminated An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
3	CR-B terminates group call	Group call „all trains in same area" call is terminated CR-A in default idle status			

11.4.9 Incoming call from controller during an ongoing multi drivers' conference

Purpose: This test is to show that a ptp call from the controller (primary or secondary) is automatically accepted and added to the "Multi Driver Communication" established by the leading driver.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

See 7.5.3.

11.4.10 Other incoming calls during an ongoing multi drivers' conference

Purpose: This test is to show that during an ongoing multi drivers' conference an incoming ptp call is received and indicated clearly to the driver.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-A (leading driver) initiates Multi Driver Communication
- CR-A adds other driver CR-B to Multi Driver Communication
- MS-A calls CR-A
- CR-A receives call from MS-A and indicates
- MS-A terminates call to CR-A
- CR-A terminates Multi Driver Communication

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Initiate a ptp call to other driver (FN of the CR-B) by CR-A (leading driver) with HMI guidance	According CR User Manual A visual indication "Multi Driver Communication" is displayed on the HMI			
2	Called driver CR-B (other driver) automatically accepts call (Call priority 3)	An audible indication is given on the loudspeaker of CR-B A visual indication is displayed on the HMI of CR-B incl. indication "Multi Driver Communication" Identification of the caller FN			
3	Called driver CR-B picks up handset	The communication CR-A to CR-B is established			
4	Incoming call from Controller to CR-A leading driver using functional number	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI The incoming call is automatically accepted and added to the ongoing "Multi Driver Communication" The communication CR-A to CR-B and controller is established			

5	MS-A calls CR-A using CR-A's MSISDN with Priority 4	An audible indication is given on the loudspeaker
		
		A visual indication is displayed on the HMI
		
		Identification of the caller
		
		  FN (if MS-A registered)
		
		  MSISDN (if MS-A not registered)
		
		is displayed on the HMI
		
		Option to Accept the call by driver's CR-A HMI menu
		
		Ongoing Multi Driver Communication is continued ….			

6	MS-A terminates call to CR-A	The visual indication displayed on the HMI of the CR-A is updated Ongoing Multi Driver Communication is continued ….			
7	Terminate call by CR-A: Using the HMI menu	Ongoing Multi Driver Communication is terminated. CR-A in default idle status			

11.5 CALL ARBITRATION DURING AN ONGOING CALL TO THE PA SYSTEM OVER RADIO LINK

Applicable if the CR provides an interface to Public Address.

Reference: **SRS § 5.8.1(O)**

The precondition for the following tests is that the PA of the Cab Radio is functionally registered to train number.

11.5.1 Outgoing emergency call during an ongoing call to the PA system over radio link

Purpose: This test is to show that during a call to the PA system over the radio e.g. by the controller an outgoing train emergency call can be initiated by the driver. The call to the PA system is terminated by the CR-A.

Reference: **FRS § 5.2.2.74 SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- The call is established by the Primary Controller to the PA system.
- The call is connected by the CR automatically to the PA system i.e. without user action
- CR-A initiates a train emergency call
- Call to the PA system is terminated
- CR-B receives and indicates the train emergency call
- CR-B joins the train emergency call automatically
- CR-A talks in the train emergency call
- CR-B listens to the train emergency call
- CR-A terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Incoming call from Primary Controller to PA using functional number	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI The call is connected to PA system Announcement of the Primary Controller can be heard on the PA loudspeaker			
2	CR-A initiates „train emergency call" using emergency access "Emergency button"	Ongoing call to PA system is terminated by CR-A PA, Primary Controller disconnected An short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI incl. group identity			
	(Call established in the network)	Indication to use PTT to talk is given to the driver on the HMI			

3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume			
4	Press PTT on CR-A (CR-A talk)	CR-A takes the uplink „train emergency call" communication is activated on the HS of the CR-A to all train emergency call participants			
		CR-B receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
5	CR-A terminates group call Using the HMI menu	Group call „train emergency call" is terminated CR-A in default idle status			

11.5.2 Call to PA system during an ongoing call to the PA system over radio link

Purpose: This test is to show that during a call to the PA system over the radio e.g. by the controller, the driver cannot talk directly to the PA system. The PA system is busy for the driver.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- The call is established by the Primary Controller to the PA system.
- The call is connected by the CR automatically to the PA system i.e. without user action
- Driver establishes a call to the internal PA system
- PA system is indicated busy to the driver
- Primary Controller terminates call to the PA system

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Incoming call from Primary Controller to PA using functional number	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI The call is connected to PA system Announcement of the Primary Controller can be heard on the PA loudspeaker			
2	Driver tries to establish a PA call	Internal call to the PA system is rejected A short audible indication is given on the loudspeaker Ongoing call to PA system by Primary Controller is continued			
3	Primary Controller terminates PA call	PA call is terminated CR in default idle status			

11.5.3 Call to chief conductor during an ongoing call to the PA system over radio link

Purpose: This test is to show that during a call to the PA system over the radio e.g. by the controller, the initiation of a call to the chief conductor using UIC intercom and audible indication on the PA system via "gong".

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- The call is established by the Primary Controller to the PA system.
- The call is connected by the CR automatically to the PA system i.e. without user action
- CR-A initiate call to chief conductor via UIC intercom
- Audible signal "gong" indicated to the chief conductor on the PA system
- Chief conductor calls back the driver
- Primary Controller's call to PA is terminated

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Incoming call from Primary Controller to PA using functional number	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI The call is connected to PA system Announcement of the Primary Controller can be heard on the PA loudspeaker			
2	CR-A initiates call to the chief conductor via UIC intercom	A visual indication is displayed on the HMI Audio signal (e.g. GONG) generated on the PA system			
		Chief conductor may call back via UIC intercom			
3	Chief conductor calls back via UIC intercom	An indication is given to the driver Primary Controller's call to PA is terminated			

11.5.4 Call to controller during an ongoing call to the PA system over radio link

Purpose: This test is to show that during a call to the PA system over the radio e.g. by the controller a new call to a controller (any type) can be initiated. The ongoing call to the PA system over the radio is terminated.

Reference: **FRS § 5.2.2.74 SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- The call is established by the Primary Controller to the PA system.
- The call is connected by the CR automatically to the PA system i.e. without user action
- CR-A initiates call to controller e.g. Secondary Controller
- Primary Controller's call to the PA system of the CR-A is terminated
- Call to controller is established
- CR-A terminates call to controller

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Incoming call from Primary Controller to PA using functional number	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI The call is connected to PA system Announcement of the Primary Controller can be heard on the PA loudspeaker			
2	Driver activates loudspeaker by user action	PA announcement is also connected to the driver's loudspeaker / handset			
3	CR-A initiates call to Secondary Controller	The visual indication displayed on the HMI is updated An audible indication is given on the loudspeaker Primary Controllers' call to the PA system of the CR-A is terminated			
4	Secondary Controller accepts call	The visual indication displayed on the HMI is updated An audible indication is given on the loudspeaker CR-A Secondary Controller communication is established			
5	CR-A terminates call to Secondary Controller	Ongoing call to Secondary Controller is terminated. CR-A in default idle status			

11.5.5 Incoming call to intercom during an ongoing call to the PA system over radio link

Purpose: This test is to show that during a call to the PA system over the radio e.g. by the controller an incoming call from a controller to the driver received and accepted automatically. The ongoing call to the PA system over the radio terminated.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- The call is established by the Primary Controller to the PA system.
- The call is connected by the CR automatically to the PA system i.e. without user action
- Controller e.g. Secondary Controller initiates call to CR-A
- Secondary controller's call is received and automatically accepted
- Primary Controller's call to the PA system of the CR-A is terminated
- Controller terminates call to CR-A

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Incoming call from Primary Controller to PA using functional number	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI The call is connected to PA system Announcement of the Primary Controller can be heard on the PA loudspeaker			
2	Driver activates loudspeaker by user action	PA announcement is also connected to the driver's loudspeaker / handset			
3	Secondary Controller initiates call to CR-A Note: Same behaviour is expected if the call received is to Intercom (controller initiated), a train emergency call (controller initiated), a group call "all drivers in same area" and a controller call (all types)	The visual indication displayed on the HMI is updated An audible indication is given on the loudspeaker Primary Controllers' call to the PA system of the CR-A is terminated			
4		Secondary Controllers call is automatically accepted The visual indication displayed on the HMI is updated An audible indication is given on the loudspeaker			
5	Secondary Controller terminates call to CR-A	Ongoing call to Secondary Controller is terminated. CR-A in default idle status			

11.5.6 Incoming emergency call during an ongoing call to the PA system over radio link

Purpose: This test is to show that during a call to the PA system over the radio e.g. by the controller an incoming train emergency call from a controller to the driver received and accepted automatically. The ongoing call to the PA system over the radio terminated.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- The call is established by the Primary Controller to the PA system.
- The call is connected by the CR automatically to the PA system i.e. without user action
- Controller e.g. Secondary Controller initiates train emergency call
- Train emergency call is received and automatically accepted
- Primary Controller's call to the PA system of the CR-A is terminated
- Controller terminates call to CR-A

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Incoming call from Primary Controller to PA using functional number	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI The call is connected to PA system Announcement of the Primary Controller can be heard on the PA loudspeaker			
2	Driver activates loudspeaker by user action	PA announcement is also connected to the driver's loudspeaker / handset			
3	Secondary Controller initiates train emergency call	The visual indication displayed on the HMI is updated An audible indication is given on the loudspeaker Primary Controllers' call to the PA system of the CR-A is terminated			
4		Secondary Controller's train emergency call is automatically accepted The visual indication displayed on the HMI is updated An audible indication is given on the loudspeaker			
5	Secondary Controller terminates train emergency call	Ongoing train emergency call is terminated. CR-A in default idle status			

11.5.7 Incoming group call "all drivers same area" during an ongoing call to the PA system over radio link

Purpose: This test is to show that during a call to the PA system over the radio e.g. by the controller an incoming group call "all drivers same area" received and accepted automatically. The ongoing call to the PA system over the radio terminated.

Precondition of this test is that the network must support in-band notification for group call "all drivers in same area".

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- The call is established by the Primary Controller to the PA system.
- The call is connected by the CR automatically to the PA system i.e. without user action
- Controller e.g. Secondary Controller initiates "all drivers same area" call
- The "all drivers same area" call is received and automatically accepted
- Primary Controller's call to the PA system of the CR-A is terminated
- Controller terminates call to CR-A

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Incoming call from Primary Controller to PA using functional number	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI The call is connected to PA system Announcement of the Primary Controller can be heard on the PA loudspeaker			
2	Driver activates loudspeaker by user action	PA announcement is also connected to the driver's loudspeaker / handset			
3	Secondary Controller initiates "all drivers same area" call to CR-A	The visual indication displayed on the HMI is updated An audible indication is given on the loudspeaker Primary Controller's call to the PA system of the CR-A is terminated			
4		The "all drivers same area" call is automatically accepted The visual indication displayed on the HMI is updated An audible indication is given on the loudspeaker			
5	Secondary Controller terminates "all drivers same area" call.	Ongoing "all drivers same area" call is terminated. CR-A in default idle status			

11.5.8 Call from a controller during an ongoing call to the PA system via radio

Purpose: This test is to show that during a call to the PA system over the radio e.g. by the controller an incoming call from a controller to the driver received and accepted automatically. The ongoing call to the PA system over the radio terminated.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- The call is established by the Primary Controller to the PA system.
- The call is connected by the CR automatically to the PA system i.e. without user action
- Controller e.g. Power Supply Controller initiates call to CR-A
- Controller's call is received and automatically accepted
- Primary Controller's call to the PA system of the CR-A is terminated
- Controller terminates call to CR-A

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Incoming call from Primary Controller to PA using functional number	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI The call is connected to PA system Announcement of the Primary Controller can be heard on the PA loudspeaker			
2	Driver activates loudspeaker by user action	PA announcement is also connected to the driver's loudspeaker / handset			
3	Power Supply Controller initiates call to CR-A	The visual indication displayed on the HMI is updated An audible indication is given on the loudspeaker Primary Controllers' call to the PA system of the CR-A is terminated			
4		Power Supply Controller's call is automatically accepted The visual indication displayed on the HMI is updated An audible indication is given on the loudspeaker			
5	Power Supply Controller terminates call to CR-A	Ongoing call to Power Supply Controller is terminated. CR-A in default idle status			

11.5.9 Other incoming calls during an ongoing call to the PA system over radio link

Purpose: This test is to show that during a call to the PA system over the radio e.g. by the controller an incoming call is received and indicated clearly to the driver.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- The call is established by the Primary Controller to the PA system.
- The call is connected by the CR automatically to the PA system i.e. without user action
- MS-A calls CR-A (ptp to FN or MSISDN priority 4)
- CR-A receives call from MS-A and indicates
- MS-A terminates call to CR-A
- Controller terminates call to the PA system of CR-A

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Incoming call from Primary Controller to PA using functional number	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI The call is connected to PA system Announcement of the Primary Controller can be heard on the PA loudspeaker			
2	Driver activates loudspeaker by user action	PA announcement is also connected to the driver's loudspeaker / handset			
3	MS-A calls CR-A using CR-A's MSISDN with Priority 4	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Identification of the caller FN (if MS-A registered) MSISDN (if MS-A not registered) is displayed on the HMI Option to Accept the call by driver's CR-A HMI menu Ongoing call to the PA system is continued ….			
4	MS-A terminates call to CR-A	The visual indication displayed on the HMI of the CR-A is updated Ongoing call to the PA system is continued ….			
5	Primary Controller terminates PA call	PA call is terminated CR-A in default idle status			

11.6 CALL ARBITRATION DURING AN ONGOING CALL TO THE PA SYSTEM BY THE DRIVER

Applicable if the CR provides an interface to Public Address.

Reference: **SRS § 5.8.1(O)**

11.6.1 Outgoing emergency call during an ongoing call to the PA system

Purpose: This test is to show that during a call to the PA system by the driver an outgoing train emergency call can be initiated by the driver. The call to the PA system is terminated by the CR-A.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-A initiates an announcement to the PA system
- The call to PA system is established
- CR-A initiates a train emergency call
- Call to the PA system is terminated
- CR-B receives and indicates the train emergency call
- CR-B joins the train emergency call automatically
- CR-A talks in the train emergency call
- CR-B listens to the train emergency call
- CR-A terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Initiates call to CR-A PA system using Hardkey (Handset on hook)	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment to PA system			
2	Pick up handset (Handset off hook)	Update of visual indication is displayed on the HMI			
3	Press "Push-to-Talk" button (Implementation Option)	Update of visual indication is displayed on the HMI Drivers voice will be transmitted on the PA system			
4	Release "Push-to-Talk" button (Implementation Option)	Update of visual indication is displayed on the HMI Drivers voice is not transmitted on the PA system			
5	CR-A initiates „train emergency call" using emergency access "Emergency button"	Ongoing call to PA system is terminated An short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI incl. group identity			

	(Call established in the network)	Indication to use PTT to talk is given to the driver on the HMI			
6	Press PTT on CR-A (CR-A talk)	CR-A takes the uplink „train emergency call" communication is activated on the HS of the CR-A to all train emergency call participants			
		CR-B receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker			
7	CR-A terminates group call Using the HMI menu	Group call „train emergency call" is terminated CR-A in default idle status			

11.6.2 Call to controller during an ongoing call to the PA system

Purpose: This test is to show that during a call to the PA system by the driver a new call to a controller (any type) can be initiated. The ongoing call to the PA system is terminated.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-A initiates an announcement to the PA system
- The call to PA system is established
- CR-A initiate call to controller e.g. Primary Controller
- Call to the PA system is terminated
- Call to controller is established
- CR-A terminates call to controller

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Initiates call to CR-A PA system using Hardkey (Handset on hook)	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment to PA system			
2	Pick up handset (Handset off hook)	Update of visual indication is displayed on the HMI			
3	Press "Push-to-Talk" button (Implementation Option)	Update of visual indication is displayed on the HMI Drivers voice will be transmitted on the PA system			
4	Release "Push-to-Talk" button (Implementation Option)	Update of visual indication is displayed on the HMI Drivers voice is not transmitted on the PA system			
5	CR-A initiates call to Primary Controller	The visual indication displayed on the HMI is updated An audible indication is given on the loudspeaker Call to the PA system of the CR-A is terminated			
6	Controller accepts call	The visual indication displayed on the HMI is updated An audible indication is given on the loudspeaker CR-A Controller communication is established			

7	CR-A terminates call to Controller	Ongoing call to Controller is terminated. CR-A in default idle status			

11.6.3 Call to PA system during an ongoing call to the PA system

Purpose: This test is to show that during a call to the PA system by the chief conductor driver cannot talk directly over the PA system. PA system is busy for the driver.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- Chief conductor calls the PA system.
- The call is connected by the CR automatically to the PA system i.e. without user action
- Driver calls the internal PA system
- PA system is indicated busy to the driver
- Chief conductor terminates call to the PA system

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Chief conductor initiates call to CR-A PA system (Handset on hook)	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment to PA system			
2	Chief conductor talks	Chief conductor's announcement on the PA system			
3	Driver tries to establish a PA call	Internal call to the PA system is rejected A short audible indication is given on the loudspeaker Ongoing call to PA system is continued …			
4	Chief conductor terminates call to PA system	Ongoing announcement to PA system is terminated. CR-A in default idle status			

11.6.4 Call to chief conductor during an ongoing call to the PA system

Purpose: This test is to show that during a call to the PA system by the driver a new call to the chief conductor can be initiated using UIC intercom. The call is indicated o the chief conductor via audio signal "gong" on the PA system.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-A initiates an announcement to the PA system
- The call to PA system is established
- CR-A initiate call to chief conductor via UIC intercom
- Audible signal "gong" indicated to the chief conductor on the PA system
- Chief conductor calls back the driver
- Primary Controller's call to PA is terminated

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Initiates call to CR-A PA system using Hardkey (Handset on hook)	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment to PA system			
2	Pick up handset (Handset off hook)	Update of visual indication is displayed on the HMI			
3	Press "Push-to-Talk" button (Implementation Option)	Update of visual indication is displayed on the HMI Drivers voice will be transmitted on the PA system			
4	Release "Push-to-Talk" button (Implementation Option)	Update of visual indication is displayed on the HMI Drivers voice is not transmitted on the PA system			
5	CR-A initiates call to the chief conductor via UIC intercom	A visual indication is displayed on the HMI Audio signal (e.g. GONG) generated on the PA system			
		Chief conductor may call back via UIC intercom			
6	Chief conductor calls back via UIC intercom	An indication is given to the driver Primary Controller's call to PA is terminated			

11.6.5 Intercom call to other engine during an ongoing call to the PA system

Purpose: This test is to show that during a call to the PA system by the driver the initiation of an intercom call to other engine using UIC intercom. The ongoing call to the PA system is terminated.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-A initiates an announcement to the PA system
- The call to PA system is established
- CR-A initiate call to other engine via UIC intercom
- Call to the PA system is terminated, call to other engine using UIC intercom is connected
- CR-A terminates call to intercom

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Initiates call to CR-A PA system using Hardkey (Handset on hook)	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment to PA system			
2	Pick up handset (Handset off hook)	Update of visual indication is displayed on the HMI			
3	Press "Push-to-Talk" button (Implementation Option)	Update of visual indication is displayed on the HMI Drivers voice will be transmitted on the PA system			
4	Release "Push-to-Talk" button (Implementation Option)	Update of visual indication is displayed on the HMI Drivers voice is not transmitted on the PA system			
5	CR-A initiates call to other engine via UIC intercom	Call to the PA system is terminated The visual indication displayed on the HMI is updated An audible indication is given on the loudspeaker (implementation option)			
6		Call to other engine is established via UIC intercom			

| 7 | CR-A terminates call to other engine | Ongoing Engine-to-engine Communication is terminated. | | | |
| | | CR-A in default idle status | | | |

11.6.6 Other incoming calls during an ongoing call to the PA system

Purpose: This test is to show that during a call to the PA system over the radio e.g. by the controller an incoming call is received and indicated clearly to the driver.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- CR-A initiates an announcement to the PA system
- The call to PA system is established
- Controller calls CR-A
- CR-A receives call from Controller and accepts automatically
- Controller terminates call to CR-A
- CR-A terminates call to the PA system

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Initiates call to CR-A PA system using Hardkey (Handset on hook)	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment to PA system			
2	Pick up handset (Handset off hook)	Update of visual indication is displayed on the HMI			
3	Press "Push-to-Talk" button (Implementation Option)	Update of visual indication is displayed on the HMI Drivers voice will be transmitted on the PA system			
4	Release "Push-to-Talk" button (Implementation Option)	Update of visual indication is displayed on the HMI Drivers voice is not transmitted on the PA system			
5	Controller initiates call to CR-A	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Identification of the caller is displayed on the HMI Call is accepted automatically and put on the loudspeaker Ongoing call to the PA system is continued on the HS….			

6	Controller terminates call to CR-A	An audible indication is given on the loudspeaker			
		A visual indication is displayed on the HMI			
		Call controller CR-A is terminated			
		Ongoing call to the PA system is continued			
7	CR-A call to the PA system Using the HMI menu	Call to the PA system is terminated			
		An audible indication is given on the loudspeaker			
		CR-A in default idle status			

11.7 CALL ARBITRATION DURING AN ONGOING CALL TO CHIEF CONDUCTOR OVER RADIO LINK

11.7.1 Outgoing emergency call during an ongoing call to chief conductor over radio link

Purpose: This test is to show that during a call to the chief conductor over the radio e.g. by the controller, an outgoing train emergency call can be initiated by the driver. The call to the chief conductor is terminated by the CR-A.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- The call is established by the Primary Controller to the chief conductor.
- Chief conductor calls Primary Controller via call back function
- Primary Controller call to chief conductor is established
- CR-A initiates a train emergency call
- Call to the chief conductor is terminated
- CR-B receives and indicates the train emergency call
- CR-B joins the train emergency call automatically
- CR-A talks in the train emergency call
- CR-B listens to the train emergency call
- CR-A terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Incoming call from Primary Controller to Intercom using functional number	According CR User Manual The call is answered automatically by the CR and an audible indication is given on the PA system to the conductor for Intercom call back Phone number of the calling party is stored in the CR The call is automatically terminated by the CR after the audible indication e.g. gong			
	Intercom and CR are Idle				
2	Conductor activates Intercom for calling back the last received phone number	Call is established to the Primary Controller An audible indication is given on the loudspeaker of the CR A visual indication is displayed on the HMI The call is connected to the Intercom Note: Conductor to Primary Controller communication			

3	CR-A initiates „train emergency call" using emergency access "Emergency button"	Ongoing call to intercom is terminated by CR-A PA, Primary Controller disconnected An short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI incl. group identity			
	(Call established in the network)	Indication to use PTT to talk is given to the driver on the HMI			
4	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume			
5	Press PTT on CR-A (CR-A talk)	CR-A takes the uplink „train emergency call" communication is activated on the HS of the CR-A to all train emergency call participants			
		CR-B receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
6	CR-A terminates group call Using the HMI menu	Group call „train emergency call" is terminated CR-A in default idle status			

11.7.2 Call to PA system during an ongoing call to chief conductor over radio link

Purpose: This test is to show that during a call to the chief conductor over the radio e.g. by the controller an outgoing call to the PA system can be initiated by the driver. The call to the chief conductor is terminated by the CR-A.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- The call is established by the Primary Controller to the chief conductor.
- Chief conductor calls Primary Controller via call back function
- Primary Controller call to chief conductor is established
- Driver establishes a call to the internal PA system
- Call to the chief conductor is terminated
- CR-A PA system call is established
- CR-A terminates call to the PA system

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Incoming call from Primary Controller to Intercom using functional number	According CR User Manual The call is answered automatically by the CR and an audible indication is given on the PA system to the conductor for Intercom call back Phone number of the calling party is stored in the CR The call is automatically terminated by the CR after the audible indication e.g. gong			
	Intercom and CR are Idle				
2	Conductor activates Intercom for calling back the last received phone number	Call is established to the Primary Controller An audible indication is given on the loudspeaker of the CR A visual indication is displayed on the HMI The call is connected to the Intercom Note: Conductor to Primary Controller communication			
3	Driver establishes a PA call	Ongoing call to intercom is terminated by CR-A PA, Primary Controller disconnected An audible indication is given on the loudspeaker of the CR A visual indication is displayed on the HMI The call is connected to the PA system			
4	Pick up handset (Handset off hook)	Update of visual indication is displayed on the HMI			

5	Press "Push-to-Talk" button (Implementation Option)	Update of visual indication is displayed on the HMI Drivers voice will be transmitted on the PA system			
6	Release "Push-to-Talk" button (Implementation Option)	Update of visual indication is displayed on the HMI Drivers voice is not transmitted on the PA system			
7	CR-A terminates call to the PA system Using the HMI menu	Call to the PA system is terminated CR-A in default idle status			

11.7.3 Call to chief conductor during an ongoing call to chief conductor over radio link

Purpose: This test is to show that during a call to the chief conductor over the radio e.g. by the controller an outgoing call to the chief conductor can be initiated by the driver using UIC intercom. The call is indicated o the chief conductor via audio signal "gong" on the PA system.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- The call is established by the Primary Controller to the chief conductor.
- Chief conductor calls Primary Controller via call back function
- Primary Controller call to chief conductor is established
- CR-A initiate call to chief conductor via UIC intercom
- Audible signal "gong" indicated to the chief conductor on the PA system
- Primary Controller terminates call to the chief conductor

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Incoming call from Primary Controller to Intercom using functional number	According CR User Manual The call is answered automatically by the CR and an audible indication is given on the PA system to the conductor for Intercom call back Phone number of the calling party is stored in the CR The call is automatically terminated by the CR after the audible indication e.g. gong			
	Intercom and CR are Idle				
2	Conductor activates Intercom for calling back the last received phone number	Call is established to the Primary Controller An audible indication is given on the loudspeaker of the CR A visual indication is displayed on the HMI The call is connected to the Intercom Note: Conductor to Primary Controller communication			
3	Driver establishes a call to the chief conductor via UIC intercom	A visual indication is displayed on the HMI Audio signal (e.g. GONG) generated on the PA system			
4	Controller terminates call to the PA system Using the HMI menu	Call to the PA system is terminated CR-A in default idle status			

11.7.4 Intercom call to other engine during an ongoing call to chief conductor over radio link

Purpose: This test is to show that during a call to the chief conductor over the radio e.g. by the controller an intercom call to other engine using UIC intercom cannot be initiated by the driver.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- The call is established by the Primary Controller to the chief conductor.
- Chief conductor calls Primary Controller via call back function
- Primary Controller call to chief conductor is established
- CR-A initiate call to other engine via UIC intercom
- Intercom is indicated busy to the driver
- Primary Controller terminates call to the chief conductor

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Incoming call from Primary Controller to Intercom using functional number	According CR User Manual The call is answered automatically by the CR and an audible indication is given on the PA system to the conductor for Intercom call back Phone number of the calling party is stored in the CR The call is automatically terminated by the CR after the audible indication e.g. gong			
	Intercom and CR are Idle				
2	Conductor activates Intercom for calling back the last received phone number	Call is established to the Primary Controller An audible indication is given on the loudspeaker of the CR A visual indication is displayed on the HMI The call is connected to the Intercom Note: Conductor to Primary Controller communication			
3	CR-A tries to initiate a call to other engine	Call to other engine using the UIC intercom is rejected The visual indication displayed on the HMI is updated (implementation option) An audible indication is given on the loudspeaker (implementation option) Ongoing call to chief conductor by Primary Controller is continued			
4	Controller terminates call to the chief conductor	Call to the chief conductor is terminated CR-A in default idle status			

11.7.5 Call to a controller during an ongoing call to chief conductor over radio link

Purpose: This test is to show that during a call to the chief conductor over the radio e.g. by the controller an outgoing call to a controller (all types) can be initiated by the driver. The ongoing call to the chief conductor will be terminated.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- The call is established by the Primary Controller to the chief conductor.
- Chief conductor calls Primary Controller via call back function
- Primary Controller call to chief conductor is established
- CR-A initiates call to controller e.g. Primary Controller
- Call to chief conductor is terminated
- Call to Primary Controller is established
- CR-A terminates call to Primary Controller

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Incoming call from Primary Controller to Intercom using functional number	According CR User Manual The call is answered automatically by the CR and an audible indication is given on the PA system to the conductor for Intercom call back Phone number of the calling party is stored in the CR The call is automatically terminated by the CR after the audible indication e.g. gong			
	Intercom and CR are Idle				
2	Conductor activates Intercom for calling back the last received phone number	Call is established to the Primary Controller An audible indication is given on the loudspeaker of the CR A visual indication is displayed on the HMI The call is connected to the Intercom Note: Conductor to Primary Controller communication			
3	CR-A initiates call to Primary Controller	Ongoing call to chief conductor is terminated by CR-A, Primary Controller disconnected An audible indication is given on the loudspeaker of the CR A visual indication is displayed on the HMI Call to Primary Controller is established			
4	CR-A terminates call to Primary Controller	Call to Primary Controller is terminated. CR-A in default idle state.			

11.7.6 Other incoming calls during an ongoing call to chief conductor over radio link

Purpose: This test is to show that during a call to the chief conductor over the radio e.g. by the controller an incoming call from a controller e.g. Secondary Controller is received and automatically accepted. The ongoing call to the chief conductor will be terminated.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- The call is established by the Primary Controller to the chief conductor.
- Chief conductor calls Primary Controller via call back function
- Primary Controller call to chief conductor is established
- Secondary Controller initiates call to CR-A
- CR-A receives and accepts call from Secondary Controller
- Call to chief conductor is terminated
- Secondary Controller terminates call to CR-A

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Incoming call from Primary Controller to Intercom using functional number	According CR User Manual The call is answered automatically by the CR and an audible indication is given on the PA system to the conductor for Intercom call back Phone number of the calling party is stored in the CR The call is automatically terminated by the CR after the audible indication e.g. gong			
	Intercom and CR are Idle				
2	Conductor activates Intercom for calling back the last received phone number	Call is established to the Primary Controller An audible indication is given on the loudspeaker of the CR A visual indication is displayed on the HMI The call is connected to the Intercom Note: Conductor to Primary Controller communication			
3	Secondary Controller initiates call to CR-A	An audible indication is given on the loudspeaker of the CR A visual indication is displayed on the HMI Ongoing call to chief conductor is terminated by CR-A, Primary Controller disconnected Call to Secondary Controller is established			

| 4 | Secondary Controller terminates call to CR-A | Call between Secondary Controller and CR-A is terminated

CR-A in default idle status | | | |

11.7.7 Call arbitration in shunting mode

See sections 17.8 and 17.9.

12. TEXT MESSAGING (SMS)

12.1 RECEIVING A TEXT MESSAGE

12.1.1 Receive and read a text message using SMS teleservice

Purpose: This test is to show that the cab radio is able to receive incoming text messages using teleservice SMS.

Reference: **FRS § 4.2.2, 5.2.1.2, 5.2.2.62, 12.2.2; SRS § 4.3.1, 5.3.12, 12.2.1**

Preconditions for the test: SMS is enabled for the SIM of CR-A. SIM of CR-A does not contain any received SMSs. SMS service centre number is stored on the SIM.

- MS-A sends a pre-defined message via SMS to CR-A's MSISDN
- CR-A receives pre-defined message send by MS-A via SMS
- CR-A indicates new unread SMS
- CR-A displays received SMS list via user action i.e. HMI menu

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A in default idle status MS-A sends a pre-defined message via SMS to CR-A's MSISDN	According CR User Manual			
2		CR-A receives pre-defined message send by MS-A via SMS A visual indication is displayed on the HMI for the new unread SMS			
3	Driver of CR-A selects the SMS menu to read the received SMS	The pre-defined text message received is displayed			

12.1.2 Receiving a text message during an ongoing ptp call

Purpose: This test is to show that an incoming text message using teleservice SMS is correctly received and indicted during a ptp call.

Reference: **FRS § 4.2.2, 5.2.1.2, 5.2.2.62, 12.2.2, 12.3.3; SRS § 4.3.1, 5.3.12, 12.2.1**

- Call received from controller e.g. primary controller
- The call is accepted by the CR automatically i.e. without user action
- MS-A sends a pre-defined message via SMS to CR-A's MSISDN
- CR-A receives pre-defined message send by MS-A via SMS
- CR-A indicates new unread SMS
- Controller terminates call to CR-A
- CR-A displays SMS via user action i.e. HMI menu

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Primary controller setup a ptp call to CR-A	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Identification of the caller is displayed on the HMI			
2		The call is accepted automatically by CR-A The communication Primary Controller CR-A is established Caller can be heard on driver's loudspeaker			
3	MS-A sends a pre-defined message via SMS to CR-A's MSISDN				
4		CR-A receives pre-defined message send by MS-A via SMS A visual indication is displayed on the HMI for the new unread SMS			
5	Primary Controller terminates call to CR-A	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI CR in default idle status			
6	Driver of CR-A selects the SMS menu to read the received SMS	All received text messages incl. the new unread pre-defined message is displayed			

12.1.3 Incoming text messages with maximum length

Purpose: This test is to show that the cab radio is able to receive incoming text messages with a length of 160 characters using teleservice SMS.

Reference: **FRS § 4.2.2, 5.2.1.2, 5.2.2.62, 12.2.2, SRS § 4.3.1, 5.3.12, 12.2.2**

- MS-A sends a pre-defined message with a length of 160 characters via SMS to CR-A's MSISDN
- CR-A receives pre-defined message send by MS-A via SMS
- CR-A indicates new unread SMS
- CR-A displays SMS via user action i.e. HMI menu

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A in default idle status MS-A sends a pre-defined message via SMS to CR-A's MSISDN	According CR User Manual			
2		CR-A receives pre-defined message send by MS-A via SMS A visual indication is displayed on the HMI for the new unread SMS			
3	Driver of CR-A selects the SMS menu to read the received SMS	All received text messages incl. the new unread pre-defined message are displayed The new unread pre-defined text message received is displayed containing all 160 characters			

12.2 SENDING A TEXT MESSAGE

Purpose: This test is to show that the cab radio is able to send outgoing text messages using teleservice SMS.

Reference: **FRS § 4.2.2, 12.2.2; SRS § 4.3.1, 12.2.1**

Preconditions for the test: SMS is enabled for the SIM of CR-A and MS-A. SIM of MS-A does not contain any received SMSs. SMS service centre number is stored on the SIM.

- CR-A sends a pre-defined message via SMS to MS-A's MSISDN
- MS-A receives pre-defined message send by CR-A via SMS
- MS-A displays pre-defined message SMS as send by CR-A

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A in default idle status CR-A sends a pre-defined text message via SMS to MS-A's MSISDN using HMI menu for example as in steps 1.1 - 1.4	According CR User Manual			
1.1	CR-A selects SMS menu				
1.2	CR-A selects pre-defined text message to send (or enters text message)				
1.3	CR-A enters destination MSISDN e.g. of MS-A for the text message to send				
1.4	CR-A issues SEND command using HMI menu				
2		MS-A receives pre-defined message send by CR-A via SMS A visual indication is displayed on the HMI for the new unread SMS			
3	MS-A selects the SMS menu to read the received SMS	The pre-defined text message received is displayed as originated by CR-A			

13. LANGUAGE SETTING

Purpose: This test is to show that the cab radio supports at least ten different languages on the HMI for related prompts and information displayed. It shall be possible for the user to select the preferred language from a list of available languages.

Reference: **FRS § 5.2.1.2, 5.2.3.12, 5.2.3.14, 5.2.3.16;**

- CR-A selects menu for language selection
- Available languages are displayed as a selection list on the HMI
- CR-A selects different language as preferred language
- Information and prompts displayed on the HMI are changed to newly selected language

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A in default idle status CR-A activates HMI menu for language settings and selection for example as in steps 1.1 - 1.4	According CR User Manual			
1.1	CR-A selects settings menu	Settings menu is displayed on the HMI			
1.2	CR-A selects language settings	Available languages are displayed			
1.3	CR-A selects different language to activate	Different language is highlighted			
1.4	CR-A issues CONFIRM command using HMI menu	Different language is selected CR-A returns to default idle status			
2		Information, prompts and menu items displayed on the HMI are changed to newly selected language			

14. NETWORK SELECTION

14.1 MANUAL NETWORK SELECTION

14.1.1 Manual network selection in idle mode (e.g. border crossing)

Purpose: This test is to show that it is possible for the driver to view a prioritised list of all authorised mobile radio networks and select the preferred mobile radio network manually using a HMI action, whereupon the cab radio attempts to attach to this selected network. This test also show that it is possible to roam between EIRENE networks.

Reference: **FRS § 5.2.1.2, 5.2.3.23, 5.2.3.23i, 5.2.3.25§ 10.5.1, 11.3.4.1, 11.3.4.2, 11.3.4.3; SRS § 5.6.1i, 10.5.1, § 11.3.7, 11.3.13, 11.3.14, 11.3.15**

Preconditions for the test: Prioritised list of all authorised mobile radio networks is stored on the SIM of CR-A. At least 2 GSM-R networks are available i.e. as selected and newly preferred networks. The two GSM-R networks must be connected such that the de-registration command can be routed from the new network to the old network.

- CR-A activates menu for network selection
- Available networks are displayed as a selection list on the HMI
- CR-A selects different network as preferred network
- Network re-selection executed by the CR-A
- New network name displayed on the HMI after successful selection

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A in default idle status CR-A activates HMI menu for network selection for example as in steps 1.1 - 1.4	According CR User Manual			
1.1	CR-A selects settings menu	Settings menu is displayed on the HMI			
1.2	CR-A selects network selection settings	Available selection items are displayed			
1.3	CR-A selects manual network selection	A prioritised list of all authorised mobile radio networks is displayed in the following order: - home EIRENE network; - 'foreign' EIRENE networks; - public networks			
1.4	CR-A selects preferred network	Preferred network is highlighted			
1.5	CR-A issues CONFIRM command using HMI menu	Preferred network selection is started			

	(This procedure is carried out without manual intervention)	Network selection is executed Registration of on-train functional numbers based on the train number are executed			
	(This procedure is carried out without manual intervention)	Only after successful registration on the new network, de-registration of on-train functional numbers based on the train number are executed Progress of actions may be displayed on the HMI of CR			
2		CR-A returns to default idle status Network name displayed on the HMI is set to preferred network if the network selection is successful New registration information is displayed on the HMI if the network selection and re-registration is successful			

14.1.2 Manual network selection during an ongoing call

Purpose: This test is to show that the manual network selection function is not available when there are ongoing calls involving the cab radio.

Reference: **FRS § 5.2.1.2, 5.2.3.23, 5.2.3.24; SRS § 5.6.1i**

- CR-A activates menu for network selection
- Menu access for network selection is prevented during an ongoing call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A in an ongoing call any type CR-A activates HMI menu for network selection for example as in steps 1.1 - 1.4	According CR User Manual Menu for network selection is not available on the HMI or access to the menu item is prevented			
1.1	CR-A selects settings menu	Settings menu is displayed on the HMI Or Settings menu is not available			
1.2	CR-A selects network selection settings	Network selection settings menu is not available			
1.3	CR-A selects manual network selection	Item for manual network selection is not available in the menu			
1.3	CR-A selects preferred network	Prioritised list of authorised mobile radio networks is not displayed			
1.4	CR-A issues CONFIRM command using HMI menu	Preferred network selection is not started			
2		CR-A continues call as in 1 Network name displayed on the HMI is not changed			

14.2 AUTOMATIC NETWORK SELECTION

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

14.2.1 Automatic network selection

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

15. SWITCH CAB RADIO HMI ON/OFF

15.1 SWITCH CAB RADIO HMI OFF

15.1.1 Switch Cab Radio HMI Off after Train Emergency Call

Purpose: This test is to show that the HMI can be deactivated using a soft switch-off function.

Reference: **FRS § 5.2.1.2, 5.2.3.5, 5.2.3.9;**

- CR-A settings are made to be non-default levels
- CR-A receives a Train emergency call
- CR-A switch-off active HMI
- CR-A executes following house keeping functions
  - o store required data;
  - o confirmation of Train emergency calls
- CR-A HMI is set in standby mode
- Check that acknowledgement was sent correctly

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	CR-A is in Idle Mode According CR User Manual Set volume and brightness to non-default levels	Volume and brightness levels are set to non-default levels			
2	According CR User Manual CR-B initiates „train emergency call"	CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
3	CR-B terminates group call	Group call „train emergency call" is terminated CR-A in default idle status			
4	According CR User Manual Immediately switch off the active HMI of CR-A	According CR User Manual Indication of the switch-off procedure on the HMI Confirmation of Train Emergency Call is sent			

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
		HMI of CR-A is in standby mode			
5	Confirm that REC acknowledgement was sent. This can be by inspecting logs from a suitable location of checking the record at the Acknowledgement Centre.	Acknowledgement was sent.			

15.1.2 Switch Cab Radio HMI Off after Controller Call

Purpose: This test is to show that the HMI can be deactivated using a soft switch-off function.

Reference: **FRS § 5.2.1.2, 5.2.3.9;**

Preconditions for the test: CR-A is registered as a Lead Driver

- CR-A receives a call from a controller
- CR-A switch-off active HMI
- CR-A executes following house keeping functions
  - o controlled termination of a current call;
  - o deregister train number
- CR-A HMI is set in standby mode

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	CR-A is in Idle Mode According CR User Manual Incoming ptp call (Priority = 3) from controller	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Identification of the caller Automatic acceptance of the call by the CR The communication controller CR is established For the ongoing ptp call: A visual indication is displayed on the HMI Identification of the caller is displayed on the HMI Caller can be heard on driver's loudspeaker			
2	According CR User Manual Switch off the active HMI	According CR User Manual PTP call is terminated in a controlled manner			

3	(Implementation option) According CR User Manual User confirms that Train Number is to be deregistered.	Deregistration progress is displayed on the HMI of CR Deregistration successful Registration status is displayed on the HMI of CR i.e. train number is removed from the display of the HMI			
4		Indication of the switch-off procedure on the HMI HMI of CR-A is in standby mode			
5	Check deregistration using PTP call by MS-A to train number and function - leading driver Terminate call by MS-A	PTP call cannot be established to the CRs leading driver			

15.2 SWITCH CAB RADIO HMI ON

Purpose: This test is to show that the HMI can be activated using a soft switch-on function.

Reference: **FRS § 5.2.1.2, 5.2.3.6, 5.2.3.7; SRS § 5.4.1, 5.4.2, 5.4.3**

- HMI of CR-A is in standby mode
- CR-A switch-on HMI
- HMI was switched off less than t minutes
  - o HMI configuration as before switch-off
- HMI was switched off longer than t minutes
  - o HMI default configuration restored
- Self test of the HMI is executed
- Display of the selected network
- Audible and visual indication if no network
- CR-A HMI is active

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Switch on the HMI	According CR User Manual Indication of the switch-on procedure on the HMI			
2a	HMI was switched off less than t minutes	Self test is executed HMI configuration as before switch-off Display of selected network if available Or Audible and visual indication if no network			
2b	HMI was switched off longer than t minutes	Self test is executed HMI default configuration restored Display of selected network if available Or Audible and visual indication if no network			
3		CR-A in default idle status			

15.3 AVAILABLE CALL FUNCTIONS WHEN THE HMI IS SWITCHED OFF

The contents of this section have been removed as the function is not mandatory for interoperability (refs [7] and [8]).

16. MANUAL SELF TEST

16.1 MANUAL SELF TEST BY DRIVER

Purpose: This test is to show that it is possible to initiate tests of the cab radio to provide the driver with a reasonable level of certainty that the cab radio and HMI are working. The self test is manually initiated by the driver. The results are displayed on the HMI for the driver.

Reference: **FRS § 5.2.3.44,**

Precondition: It is to be declared by the cab radio manufacturer which tests are executed in the self test framework. The criteria for failure for each test is to be documented. The information displayed to the driver is to be documented.

This test shall be executed in 2 different conditions

        a) All cab radio units are error-free

        b) Cab radio with an artificially implanted defect based on the self test framework declared by the manufacturer.

- CR-A selects menu for self test
- CR-A invokes self test
- Self test is executed
- Results are displayed on the HMI to the driver.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A in default idle status CR-A activates HMI menu for self test for example as in steps 1.1 - 1.4	According CR User Manual			
1.1	CR-A selects settings menu	Settings menu is displayed on the HMI			
1.2	CR-A selects self test	Self test is highlighted			
1.3	CR-A issues CONFIRM command using HMI menu	Self test is started A visual indication is displayed on the HMI that self test is running			
1.4		A visual indication is displayed on the HMI that self test is completed			
1.5		Results of the self test are displayed on the HMI			
1.6	CR-A issues CONFIRM command using HMI menu that the results of the self test are recognized				
3		CR-A returns to default idle status			

16.2 INCOMING EMERGENCY CALL DURING AN ONGOING MANUAL SELF TEST

Purpose: This test is to show that an ongoing manually initiated self test by the driver doesn't prevent calls e.g. train emergency calls. The self test is terminated by the incoming train emergency call.

Reference: **FRS § 5.2.3.44, 5.2.3.45,**

- CR-A selects menu for self test
- CR-A invokes self test
- Self test is executed
- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A terminates the ongoing self test and joins the train emergency call automatically
- CR-A listens to the train emergency call
- CR-B terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-A in default idle status CR-A activates HMI menu for self test for example as in steps 1.1 - 1.3	According CR User Manual			
1.1	CR-A selects settings menu	Settings menu is displayed on the HMI			
1.2	CR-A selects self test	Self test is highlighted			
1.3	CR-A issues CONFIRM command using HMI menu	Self test is started A visual indication is displayed on the HMI that self test is running			
2	CR-B initiates „train emergency call" and takes the uplink, press PTT	CR-A receives and accepts call automatically The ongoing self test procedure is terminated An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume „train emergency call" communication is activated on the HS of the CR-A			

4	Release PTT on CR-B	Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
5	Press PTT button on CR-A (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			
6	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
7	Press PTT on CR-B	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			
8	Hang-up handset on CR-A	A visual indication is displayed on the HMI Talker CR-B can be heard on driver's loudspeaker			
9	CR-B terminates group call	Group call „train emergency call" is terminated CR-A in default idle status			

17. SHUNTING

The precondition for the following tests is that the subscriber CR using shunting radio has the group call GId 500, 501, 502, 503 and 599 subscribed on the SIM and in the network.

There are many options within shunting operation. The steps described within each test show the minimum information that is required to fulfil the requirement being tested. In many cases additional information will also be presented to the user. For example, depending on the implementation within a cab radio, the group call area may also be entered while entering shunting mode. Therefore the steps within 17.1.1 may also require group call area information to be entered but it is not explicitly tested there.

There is no mandatory requirement within EIRENE 7.1 / 15.1for a Cab Radio to make an outgoing group call except for an emergency call. Therefore there are no explicit tests regarding outgoing call other than emergency calls.

17.1 ENTERING SHUNTING MODE

17.1.1 Entering Shunting Mode with auto-activation of Group Id 500

Purpose: This test is to show that entering shunting mode is supported by the CR. After entering shunting mode the common shunting group Id 500 and shunting emergency group Id 599 are activated and other train group Id's incl. train emergency group Id 299 are deactivated.

Preconditions for the test: CR-A shall be in train mode, maintenance settings indicate Group ID 500 is to be activated automatically.

Reference: **FRS § 4.2.4, 5.2.1.2, 5.2.2.64; SRS § 4.3.4, 5.3., 14.4.1**

- CR-A selects menu for shunting mode
- CR-A enters shunting mode
- Train group Id's are deactivated (except 299)
- Shunting group Id 500 is activated automatically
- Shunting group Id 599 is activated
- Group 299 is deactivated
- MS-B initiates group call 200, CR-A does not receive and indicate group call 200
- MS-B initiates group call 201, CR-A does not receive and indicate group call 201
- MS-B initiates train emergency call group call 299, CR-A does not receive and indicate train emergency call 299
- MS-B initiates shunting group call 500 GId 500
- CR-A receives and indicates shunting group call 500
- CR-A joins the shunting group call GId 500 automatically
- CR-A listens to shunting group call 500
- CR-A talks in shunting group call to 500
- MS-A terminates shunting group call 500

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Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Activate shunting mode on the CR-A using menu options	According CR User Manual CR-A changes mode to shunting CR-A display according shunting mode (as documented in the User Manual) CR-A in default shunting idle status			
2		Group Ids of train radio are deactivated except 299 Group Id 500 is activated Group Id 599 is activated			
3	Check logs to confirm that 299 was deactivated after 599 was activated.				
4	MS-B initiates group call 200 and takes the uplink, press PTT	Group call 200 is established by MS-B CR-A in default shunting idle status (Group call 200 is not received by the CR-A in shunting mode)			
5	MS-B terminates group call 200				
6	MS-B initiates group call 201 and takes the uplink, press PTT	Group call 201 is established by MS-B CR-A in default shunting idle status (Group call 201 is not received by the CR-A in shunting mode)			
7	MS-B terminates group call 201				
8	MS-B initiates train emergency call 299 and takes the uplink, press PTT	Train emergency call 299 is established by MS-B CR-A in default shunting idle status (Train emergency call 299 is not received by the CR-A in shunting mode)			
9	MS-B terminates train emergency call 299				

	MS-B initiates group call 500 and takes the uplink, press PTT	According CR User Manual CR-A in default shunting idle status Area number and shunting group are displayed CR-A receives shunting group call Gld 500 and accepts the call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
10	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Group call communication is activated on the HS of the CR-A			
11	Press PTT button (uplink is in use by MS-A)	An audible indication is given on the loudspeaker "Uplink busy" indication is displayed on the HMI			
12	Release PTT on MS-A	Indication to use PTT to talk is given to the driver on the HMI of the CR-A			
13	Press PTT button on CR-A (uplink free)	An audible indication is given on the loudspeaker You can talk" indication is displayed on the HMI			
14	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the MS-A			
15	Press PTT on MS-A	An audible indication is given on the loudspeaker You can talk" indication is displayed on the HMI			
16	Hang-up handset on CR-A	A visual indication is displayed on the HMI Talker can be heard on driver's loudspeaker			
17	MS-A terminates group call	Shunting group call 500 is terminated An audible indication is given on the loudspeaker CR-A in default shunting idle status			

17.1.2 Entering Shunting Mode with driver confirmation of activation of Group Id 500

Purpose: This test is to show that entering shunting mode is supported by the CR. After entering shunting mode the driver accepts the option to activate the common shunting group Id 500. The shunting emergency group Id 599 is activated automatically and other train group Id's incl. train emergency group Id 299 are deactivated..

Preconditions for the test: CR-A shall be in train mode, maintenance settings indicate Group ID 500 is to be activated by driver confirmation.

Reference: **FRS § 4.2.4, 5.2.1.2, 5.2.2.64; SRS § 4.3.4, 5.3., 14.4.1**

- CR-A selects menu for shunting mode
- CR-A enters shunting mode
- Train group Id's are deactivated (except 299)
- Driver is given the option to activate group Id 500 – option is accepted
- Shunting group Id 500 is activated automatically
- Shunting group Id 599 is activated
- Group 299 is deactivated
- MS-B initiates group call 200, CR-A does not receive and indicate group call 200
- MS-B initiates group call 201, CR-A does not receive and indicate group call 201
- MS-B initiates train emergency call group call 299, CR-A does not receive and indicate train emergency call 299
- MS-B initiates shunting group call 500 Gid 500
- CR-A receives and indicates shunting group call 500
- CR-A joins the shunting group call Gid 500 automatically
- CR-A listens to shunting group call 500
- CR-A talks in shunting group call to 500
- MS-A terminates shunting group call 500

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Activate shunting mode on the CR-A using menu options	According CR User Manual CR-A changes mode to shunting CR-A display according shunting mode (as documented in the User Manual) CR-A in default shunting idle status			
2		Group Ids of train radio are deactivated except 299			
3	Driver is asked if he wants to activate group ID 500. Driver confirms that he wants to activate group-ID 500	Group Id 500 is activated			
		Group Id 599 is activated Group Id 299 is deactivated			

4	MS-B initiates group call 200 and takes the uplink, press PTT	Group call 200 is established by MS-B CR-A in default shunting idle status (Group call 200 is not received by the CR-A in shunting mode)			
5	MS-B terminates group call 200				
6	MS-B initiates group call 201 and takes the uplink, press PTT	Group call 201 is established by MS-B CR-A in default shunting idle status (Group call 201 is not received by the CR-A in shunting mode)			
7	MS-B terminates group call 201				
8	MS-B initiates train emergency call 299 and takes the uplink, press PTT	Train emergency call 299 is established by MS-B CR-A in default shunting idle status (Train emergency call 299 is not received by the CR-A in shunting mode)			
9	MS-B terminates train emergency call 299				
	MS-B initiates group call 500 and takes the uplink, press PTT	According CR User Manual CR-A in default shunting idle status Area number and shunting group are displayed CR-A receives shunting group call Gld 500 and accepts the call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
10	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Group call communication is activated on the HS of the CR-A			
11	Press PTT button (uplink is in use by MS-A)	An audible indication is given on the loudspeaker "Uplink busy" indication is displayed on the HMI			
12	Release PTT on MS-A	Indication to use PTT to talk is given to the driver on the HMI of the CR-A			

13	Press PTT button on CR-A (uplink free)	An audible indication is given on the loudspeaker You can talk" indication is displayed on the HMI			
14	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the MA-A			
15	Press PTT on MS-A	An audible indication is given on the loudspeaker You can talk" indication is displayed on the HMI			
16	Hang-up handset on CR-A	A visual indication is displayed on the HMI Talker can be heard on driver's loudspeaker			
17	MS-A terminates group call	Shunting group call 500 is terminated An audible indication is given on the loudspeaker CR-A in default shunting idle status			

17.1.3 Entering Shunting Mode with driver rejection of activation of Group Id 500

Purpose: This test is to show that entering shunting mode is supported by the CR. After entering shunting mode the driver accepts the option to activate the common shunting group Id 500. The shunting emergency group Id 599 is activated automatically and other train group Id's incl. train emergency group Id 299 are deactivated.

Preconditions for the test: CR-A shall be in train mode, maintenance settings indicate Group ID 500 is to be activated by driver confirmation.

Reference: **FRS § 4.2.4, 5.2.1.2, 5.2.2.64; SRS § 4.3.4, 5.3., 14.4.1**

- CR-A selects menu for shunting mode
- CR-A enters shunting mode
- Train group Id's are deactivated (except 299)
- Driver is given the option to activate group Id 500 – option is accepted
- Shunting group Id 500 is activated automatically
- Shunting group Id 599 is activated
- Group 299 is deactivated
- MS-B initiates group call 200, CR-A does not receive and indicate group call 200
- MS-B initiates group call 201, CR-A does not receive and indicate group call 201
- MS-B initiates train emergency call group call 299, CR-A does not receive and indicate train emergency call 299
- MS-B initiates shunting group call 500 GId 500
- MS-A terminates shunting group call 500

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Activate shunting mode on the CR-A using menu options	According CR User Manual CR-A changes mode to shunting CR-A display according shunting mode (as documented in the User Manual) CR-A in default shunting idle status			
2		Group Ids of train radio are deactivated except 299			
3	Driver is asked if he wants to activate group ID 500. Driver chooses NOT to activate group-ID 500	Group Id 500 is NOT activated			
		Group Id 599 is activated Group Id 299 is deactivated			
4	MS-B initiates group call 200 and takes the uplink, press PTT	Group call 200 is established by MS-B CR-A in default shunting idle status (Group call 200 is not received by the CR-A in shunting mode)			
5	MS-B terminates group call 200				
6	MS-B initiates group call 201 and takes the uplink, press PTT	Group call 201 is established by MS-B CR-A in default shunting idle status (Group call 201 is not received by the CR-A in shunting mode)			
7	MS-B terminates group call 201				
8	MS-B initiates train emergency call 299 and takes the uplink, press PTT	Train emergency call 299 is established by MS-B CR-A in default shunting idle status (Train emergency call 299 is not received by the CR-A in shunting mode)			
9	MS-B terminates train emergency call 299				
10	MS-B initiates group call 500 and takes the uplink, press PTT	Group call 500 is established by MS-B CR-A in default shunting idle status (Group call 500 is not received by the CR-A in shunting mode as the activation was rejected)			

17.1.4 Entering Shunting Mode with no activation of activation of Group Id 500

Purpose: This test is to show that entering shunting mode is supported by the CR. The shunting emergency group Id 599 is activated automatically and other train group Id's incl. train emergency group Id 299 are deactivated.

Preconditions for the test: CR-A shall be in train mode, maintenance settings indicate that Group ID 500 is NOT to be activated.

Reference: **FRS § 4.2.4, 5.2.1.2, 5.2.2.64; SRS § 4.3.4, 5.3., 14.4.1**

- CR-A selects menu for shunting mode
- CR-A enters shunting mode
- Train group Id's are deactivated (except 299)
- Shunting group Id 599 is activated
- Group 299 is deactivated
- MS-B initiates group call 200, CR-A does not receive and indicate group call 200
- MS-B initiates group call 201, CR-A does not receive and indicate group call 201
- MS-B initiates train emergency call group call 299, CR-A does not receive and indicate train emergency call 299
- MS-B initiates shunting group call 500 GId 500
- MS-A terminates shunting group call 500

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Activate shunting mode on the CR-A using menu options	According CR User Manual CR-A changes mode to shunting CR-A display according shunting mode (as documented in the User Manual) CR-A in default shunting idle status			
2		Group Ids of train radio are deactivated except 299			
		Group Id 599 is activated Group Id 299 is deactivated			
4	MS-B initiates group call 200 and takes the uplink, press PTT	Group call 200 is established by MS-B CR-A in default shunting idle status (Group call 200 is not received by the CR-A in shunting mode)			
5	MS-B terminates group call 200				
6	MS-B initiates group call 201 and takes the uplink, press PTT	Group call 201 is established by MS-B CR-A in default shunting idle status (Group call 201 is not received by the CR-A in shunting mode)			
7	MS-B terminates group call 201				

8	MS-B initiates train emergency call 299 and takes the uplink, press PTT	Train emergency call 299 is established by MS-B CR-A in default shunting idle status (Train emergency call 299 is not received by the CR-A in shunting mode)			
9	MS-B terminates train emergency call 299				
10	MS-B initiates group call 500 and takes the uplink, press PTT	Group call 500 is established by MS-B CR-A in default shunting idle status (Group call 500 is not received by the CR-A in shunting mode as the activation was rejected)			
9	MS-B terminates group call 500				

17.1.5 Entering Shunting Mode with auto-activation of Group Id 500 during on-going Group 500 call

Purpose: This test is to show that after entering shunting mode and activating the common shunting group Id 500 and shunting emergency group Id 599, the cab radio will automatically join an on-going Group 500 call.

Preconditions for the test: CR-A shall be in train mode, maintenance settings indicate Group ID 500 is to be activated automatically.

Reference: **FRS § 4.2.4, 5.2.1.2, 5.2.2.64; SRS § 4.3.4, 5.3., 14.4.1**

- MS-B initiates shunting group call 500 GId 500
- CR-A selects menu for shunting mode
- CR-A enters shunting mode
- Train group Id's are deactivated (except 299)
- Shunting group Id 500 is activated automatically
- Shunting group Id 599 is activated
- Group 299 is deactivated
- CR-A receives and indicates shunting group call 500
- CR-A joins the shunting group call GId 500 automatically
- CR-A listens to shunting group call 500
- CR-A talks in shunting group call to 500
- MS-A terminates shunting group call 500

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	MS-B initiates group call 500 and takes the uplink, press PTT	According CR User Manual CR-A in default train mode idle status and does not receive the Group 500 call.			
2	According CR User Manual Activate shunting mode on the CR-A using menu options	According CR User Manual CR-A changes mode to shunting CR-A display according shunting mode (as documented in the User Manual) CR-A in default shunting idle status			
2		Group Ids of train radio are deactivated except 299 Group Id 500 is activated Group Id 599 is activated			
3		Group Id 299 is deactivated			
4		According CR User Manual CR-A receives shunting group call GId 500 and accepts the call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
5	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Group call communication is activated on the HS of the CR-A			
6	Press PTT button (uplink is in use by MS-A)	An audible indication is given on the loudspeaker "Uplink busy" indication is displayed on the HMI			
7	Release PTT on MS-A	Indication to use PTT to talk is given to the driver on the HMI of the CR-A			
8	Press PTT button on CR-A (uplink free)	An audible indication is given on the loudspeaker You can talk" indication is displayed on the HMI			

9	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the MS-A			
10	Press PTT on MS-A	An audible indication is given on the loudspeaker You can talk" indication is displayed on the HMI			
11	Hang-up handset on CR-A	A visual indication is displayed on the HMI Talker can be heard on driver's loudspeaker			
12	MS-A terminates group call	Shunting group call 500 is terminated An audible indication is given on the loudspeaker CR-A in default shunting idle status			

17.1.6 Switching to shunting mode not available during ongoing call

Purpose: This test is to show that the functionality to enter shunting mode is not available when there are on-going calls involving the Cab radio.
Preconditions for the test: CR-A shall be in train mode.

Reference: **FRS §, 5.2.2.65;**

- MS-A calls CR-A using MSISDN
- Call to CR-A is accepted by user action
- CR-A tries to enter shunting mode
- CR-A can not switch to shunting mode
- MS-A terminates ongoing call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual MS-A setup a ptp call to driver's MSISDN CR-A with Priority 4	According CR User Manual For the incoming ptp call: An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Identification of the caller FN (if MS-A registered) MSISDN (if MS-A not registered) is displayed on the HMI			
2	Accept the call by driver's CR-A HMI menu	Incoming ptp call is accepted The communication MS-A CR-A is established For the ongoing ptp call: A visual indication is displayed on the HMI Identification of the caller is displayed on the HMI Caller can be heard on driver's loudspeaker			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to MS-A is activated on the HS of the CR-A			
4	Try to activate shunting mode on the CR-A using menu options	Activating shunting mode, switching to shunting mode not possible CR-A maintains the ongoing call			
5	Terminate call by MS-A: MS-A hangs up	Ongoing ptp call terminated. CR-A in default idle status			

17.2 OPERATION DURING ACTIVE CALL TO GROUP 500

17.2.1 Basic Operation

Covered within 17.1.1

17.2.2 Basic Operation with incoming emergency call

This test is to show that the cab radio is able to receive and join an incoming shunting emergency call any time. The ongoing common shunting group call is pre-empted.

Preconditions for the test: CR-A shall be in shunting mode, Group 500 is activated on the SIM.

Reference: **FRS § 4.2.4, 5.2.2.56, 13.3.1, 14.2.12; SRS § 4.3.4, 5.5.19, 5.5.20, 5.5.21, 5.5.22, 5.5.24, 5A.3**

- MS-A initiates common shunting group call Gld 500
- CR-A joins shunting group call Gld 500
- MS-B initiates a shunting emergency call
- CR-A receives the shunting emergency call
- CR-A releases the ongoing common shunting group call and joins the shunting emergency call automatically
- CR-A listens to the shunting emergency call
- MS-B terminates the shunting emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual	According CR User Manual CR-A in default shunting idle status			
2	MS-B initiates group call 500 and takes the uplink, press PTT	According CR User Manual CR-A in default shunting idle status Area number and shunting group are displayed CR-A receives shunting group call Gld 500 and accepts the call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
3	MS-B initiates „shunting emergency call" and takes the uplink, press PTT	CR-A receives and accepts call automatically The ongoing common shunting group call is released An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity MS-B can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
4	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Emergency call is activated on the HS of the CR-A			
5	Hang-up handset on CR-A	Talker MS-B can be heard on driver's loudspeaker			

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
6	MS-B terminates group call	Group call „shunting emergency call" is terminated CR-A in default shunting idle status			

17.2.3 Basic Operation with outgoing emergency call

Purpose: This test is to show that a shunting emergency call can be initiated at any time i.e. also during an ongoing common shunting group call Gld 500.

Preconditions for the test: CR-A shall be in shunting mode, Group 500 is activated on the SIM.

Reference: **FRS § 4.2.4, 5.2.1.2, 5.2.2.18, 5.2.2.20, 5.2.2.21, 5.2.2.22, 5.2.2.24, 5.2.2.60, 13.1.5, 13.2.2.1, 13.2.2.4, 13.2.2.6, 13.2.3.1, 13.2.3.3, 13.2.4.1, 14.2.2, 14.2.11, 14.4.7; SRS § 4.3.4, 5.3.5, 5.3.6, 5.5.4, 5.5.5, 5A.2, 13.3.1**

- MS-B initiates common shunting group call Gld 500
- CR-A joins the common shunting group call Gid 500
- CR-A initiates a shunting emergency call
- Common shunting group call is released
- MS-B receives and indicates the shunting emergency call
- MS-B joins the shunting emergency call automatically
- CR-A talks in the shunting emergency call
- MS-B listens to the shunting emergency call
- CR-A and MS-B talker change
- CR-A terminates the shunting emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual	According CR User Manual CR-A in default shunting idle status			
2	MS-B initiates group call 500 and takes the uplink, press PTT	According CR User Manual CR-A in default shunting idle status Area number and shunting group are displayed CR-A receives shunting group call Gid 500 and accepts the call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			

3	CR-A initiates „shunting emergency call" using emergency access "Emergency button"	Ongoing common shunting group call is released by CR-A An short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI incl. group identity			
	(Call established in the network)	Indication to use PTT to talk is given to the driver on the HMI			
4	Press PTT on CR-A (CR-A talk)	CR-A takes the uplink „shunting emergency call" communication is activated on the HS of the CR-A to all train emergency call participants			
		MS-B receives and accepts call automatically Caller can be heard on MS-B's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
5	Release PTT on CR-A	Indication to use PTT to talk is given to the driver on the HMI			
6	Press PTT button on MS-B (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			
7	Hang up handset of CR-A	Call can be heard on loudspeaker at normal volume.			
8	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Call is activated on the HS of the CR-A			
9	Release PTT on MS-B	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-A			
10	Press PTT on CR-A	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			
11	CR-A terminates group call Using the HMI menu	Group call „shunting emergency call" is terminated CR-A in default shunting idle status			

17.2.4 Basic Operation with incoming ptp call

Purpose: This test is to show that during an ongoing common shunting group call an incoming call can be signalled.

Precondition of this test is that the network shall be prepared in order to support in band paging for ptp calls. CR-A shall be in shunting mode, Group 500 is activated on the SIM.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

Note: If a call other than a ptp call is used, for example a VGCS/VBS with priority 3 or priority 4 this call may not be received by CR-A which is active in the shunting group call as the new VGCS/VBS call will not be indicated with in-band signalling on the group call channel. It is recommended to clarify the EIRENE SRS 5A.1 requirement. The test below assumes the use of a ptp call as the new incoming call.

- MS-B initiates a shunting group call Group Id 500
- CR-A receives the shunting group call
- CR-A joins the shunting group call automatically
- CR-A listens to the shunting group call
- MS-A initiates a ptp call to CR-A FN or MSISDN
- CR-A indicates the incoming ptp call on the HMI
- MS-A terminates the waiting call
- CR-A removes the waiting indication
- MS-B terminates the group call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual MS-B initiates shunting group call Group Id 500 and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI including group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Shunting group call communication is activated on the HS of the CR-A			
3	MS-A setup a ptp call to driver's MSISDN	A visual indication is displayed on the HMI Shunting group call is continued as before			

Step	Procedure	Effects			
4	MS-A cancels the call	The 'waiting' indication is removed on the HMI The group call is continued as before.			
5	MS-B terminates group call	Group call "all drivers in same area" is terminated CR-A in default idle status			

17.2.5 Moving out of shunting area

Purpose: This test is to show that the cab radio drops the group call after moving out of the group call area and an audible and visual indication is given to the driver. The Cab Radio returns to idle mode. After re-entering the shunting group call area the group call is automatically re-entered.

Preconditions for the test: CR-A shall be in shunting mode.

Reference: **FRS §, 5.2.2.55**

- MS-B initiates common shunting group call Gld 500
- CR-A receives and joins shunting group call Gld 500
- Cell change of CR-A during ongoing shunting group call to out of the shunting group call area [this test may be executed dynamic in the field or in the test lab using a handover machine]
- CR-A returns to default shunting idle status
- Shunting group call Gld 500 keeps ongoing in the shunting group call area
- Cell change of CR-A during ongoing shunting group call into the shunting group call area [this test may be executed dynamic in the field or in the test lab using a handover machine]
- CR-A receives and joins shunting group call Gld 500
- CR-A terminates shunting group call Gld 500

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual	According CR User Manual CR-A in default shunting idle status			
2	MS-B initiates shunting group call Gld 500	CR-A indicates call progress on the HMI			
		Shunting group call Gld 500 is established in the network			
		CR-A updates call status on the HMI An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI. MS-B user talks and can be heard at CR-A.			

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
3	Change of attenuation at the handover machine to initiate a cell change or Wait for moving out of the shunting group call area during dynamic test	Audio connection disturbed on the CR-A Shunting Group Call loss on CR-A An audible indication is given on the loudspeaker A visual indication is displayed on the HMI CR-A returns in default shunting idle status			
		Common shunting group call remains ongoing			
4	Change of attenuation at the handover machine to initiate a cell change back to the original cell where the shunting group call Gld 500 continues or Wait for moving into the shunting group call area during dynamic test	CR-A receives shunting group call Gld 500 and accepts the call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Indication to use PTT to talk is given to the driver on the HMI			
5	Pick up handset of CR-A Press PTT on CR-A	Driver's loudspeaker set to reduced volume Group call communication is activated on the HS of the CR-A An audible indication is given on the loudspeaker of the CR-A "You can talk" indication is displayed on the HMI CR-A talker can be heard by MS-B's user			
6	CR-A terminates shunting group call Using the HMI menu	Shunting group call Gld 500 is terminated CR-A in default shunting idle status			

17.2.6 Lose network

Purpose: This test is to show that when a loss of network is detected in shunting mode an audible and visual indication will be provided to the user.

Preconditions for the test: CR-A shall be in shunting mode.

Reference: **FRS § 5.4.16** .

The antenna cable shall be removed of the GSM-MT antenna connector or the network coverage of the BTS shall be switched off (Radio Signal < -110dBm).

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3

1	According CR User Manual	According CR User Manual CR-A in default shunting idle status			
2	MS-B initiates shunting group call Gld 500	CR-A indicates call progress on the HMI			
		Shunting group call Gld 500 is established in the network			
		CR-A updates call status on the HMI An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI. MS-B user talks and can be heard at CR-A.			
3	Network coverage is lost	An audible indication is given on the loudspeaker Indications relating to the call are removed. A visual indication about loss of network is displayed on the HMI.			

17.3 OPERATION IN IDLE MODE

17.3.1 Incoming Emergency

Purpose: This test is to show that after entering shunting mode the shunting emergency group Id 599 is activated. An incoming shunting emergency call will be received, indicated and accepted automatically.

Preconditions for the test: CR-A shall be in shunting mode.

Reference: **FRS § , 14.2.12;**

- CR-B initiates a shunting emergency call
- CR-A receives the shunting emergency call
- CR-A joins the shunting emergency call automatically
- CR-A listens to the shunting emergency call
- CR-A talks in shunting emergency call
- CR-A tries to leave the shunting emergency call, not permitted
- CR-B terminates the shunting emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR-B initiates „ shunting emergency call" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity (599 or textual translation of 599) Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume „shunting emergency call" communication is activated on the HS of the CR-A			
3	Release PTT on CR-B	Indication to use PTT to talk is given to the driver on the HMI of the CR-A			
4	Press PTT button on CR-A (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			
5	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
6	Press PTT on CR-B	An audible indication is given on the loudspeaker			
7a	Hang-up handset on CR-A	Call continues. A visual indication is displayed on the HMI Talker CR-B can be heard on driver's loudspeaker at normal volume			
7b	Pick up handset of CR-A	Call continues. A visual indication is displayed on the HMI Talker CR-B can be heard on driver's loudspeaker at reduced volume and on the handset			
8	Attempt to leave group call by CR-A: Using the HMI menu	CR-A can not leave the „shunting emergency call"			
9a	Hang-up handset on CR-B	Call continues A visual indication is displayed on the HMI Talker CR-A can be heard on driver's loudspeaker at normal volume			

Step	Procedure	Effects			
9b	Pick up handset on CR-B	Call continues A visual indication is displayed on the HMI Talker CR-A can be heard on driver's loudspeaker at reduced volume and on the handset			
9	CR-A attempts to terminate the group call	CR-A can not terminate the „shunting emergency call"			
10	CR-B terminates group call	Group call „shunting emergency call" is terminated CR-A in default shunting idle status CR-B in default shunting idle status			

17.3.2 Outgoing Emergency

Purpose: This test is to show that after entering shunting mode the shunting emergency group Id 599 is activated. A train emergency call is initiated and managed by the Cab Radio using emergency access as shunting emergency call in shunting mode.

Preconditions for the test: CR-A shall be in shunting mode.

Reference: **FRS § 13.1.4, 13.1.5, 13.1.7, 14.2.11; SRS § 13.3.1**

- CR-A initiates a shunting emergency call
- MS-B receives and indicates the shunting emergency call
- MS-B joins the shunting emergency call automatically
- CR-A talks in the shunting emergency call
- MS-B listens to the shunting emergency call
- CR-A and MS-B talker change
- CR-A terminates the shunting emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual	According CR User Manual CR-A in default shunting idle status			
2	CR-A initiates „shunting emergency call" using emergency access "Emergency button"	An short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI incl. group identity			
	(Call established in the network)	Indication to use PTT to talk is given to the driver on the HMI			

3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume			
4	Press PTT on CR-A (CR-A talk)	CR-A takes the uplink „ shunting emergency call" communication is activated on the HS of the CR-A to all shunting emergency call participants			
		MS-B receives and accepts call automatically MS-B listens to shunting emergency call			
5	Release PTT on CR-A	Indication to use PTT to talk is given to the driver on the HMI			
6	Press PTT button on MS-B (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			
7	Release PTT on MS-B	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-A			
8	Press PTT on CR-A	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			
9	CR-A terminates shunting emergency call Using the HMI menu	Group call „ shunting emergency call" is terminated CR-A in default shunting idle status			

17.3.3 Incoming PTP call

Purpose: This test is to check the procedures while in shunting mode concerning accepting PTP calls, conducting calls and terminating calls. The call has to be automatically accepted due to its priority.

Reference: **FRS § 14.2.2i (O)**

This feature is currently optional within EIRENE SRS. It is included here for completeness.

- Call received from MS-A
- The call is accepted by the CR automatically i.e. without user action

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3

				Result Test1	Result Test2	Result Test3
1	According CR User Manual Incoming ptp call (Priority 3) from MS-A	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Identification of the caller Automatic acceptance of the call by the CR The communication MS-A is established For the ongoing ptp call: A visual indication is displayed on the HMI Identification of the caller is displayed on the HMI Caller can be heard on driver's loudspeaker				
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to MS-A is activated on the HS of the CR-A				
4a	Terminate call by CR-A: Using the HMI menu	Ongoing ptp call terminated. CR-A in default idle status				
4b	Terminate call by CR-A: Hang-up handset	Ongoing ptp call terminated. CR-A in default idle status				
4c	Terminate call by MS-A: MS-A hangs up	Ongoing ptp call terminated. CR-A in default idle status				

17.3.4 Outgoing PTP call

Purpose: This test is to show that while in shunting mode the cab radio is capable to initiate a call dialling a ISDN or MSISDN number and that this is set up at Priority 4 (railway information).

Reference: **FRS § 4.2.1, 5.2.1.2, 5.2.2.42, 10.2.1, 10.2.2 SRS § 5.3.11, 5.5.4, 5.5.14,5.5.15, 5.5.17, 5.5.18, 10.2.1, 14.2.2i**

- CR-A initiates a call dialling MSISDN of MS-A
- CR-A initiates a call dialling telephone number of fixed network user, called B-Party
- The call to MS-A is established
- The call to dialled user is established
- CR-A terminates the call
- MS-A terminates the call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3

Step	Procedure	Effects			
1a	According CR User Manual CR-A initiates call to MS-A dialling its MSISDN	According CR User Manual An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call establishment to MS-A Check that the call was set up at Priority 4			
2a	MS-A accepts the call	The communication CR-A MS-A is established A visual indication is displayed on the HMI Identification of the connected party is displayed on the HMI MS-A can be heard on driver's loudspeaker			
3a	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to MS-A is activated on the HS of the CR-A			
4a	Terminate call by CR-A: Using the HMI menu	Ongoing call terminated. CR-A in default idle status			
4b	Terminate call by MS-A: MS-A hangs up	Ongoing call terminated. CR-A in default idle status			

17.3.5 Lose network

Purpose: This test is to show that when a loss of network is detected in shunting mode an audible and visual indication will be provided to the user.

Preconditions for the test: CR-A shall be in shunting mode.

Reference: **FRS § 5.4.16** .

The antenna cable shall be removed of the GSM-MT antenna connector or the network coverage of the BTS shall be switched off (Radio Signal < -110dBm).

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual CR is in default shunting idle mode,	According CR User Manual CR shunting idle status displayed on the HMI			
2	Network coverage is lost	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI.			

17.4 USE OF DEDICATED SHUNTING GROUPS

17.4.1 Entering a Dedicated Shunting Group

Purpose: This test is to show that after entering shunting mode a dedicated shunting group can be activated.

Preconditions for the test: CR-A shall be in shunting mode.

Reference: **SRS § 14.4.5, 14.4.9**

- CR-A selects menu for shunting data
- Driver enters dedicated group number 01
- CR-A de-activates the dedicated shunting group Id 501 and de-activates the common shunting group Id 500
- MS-A initiates shunting group call 501
- CR-A receives and indicates shunting group call 501 and joins automatically
- CR-A listens to shunting group call 501
- MS-A terminates shunting group call 501
- CR-A leaves shunting group call 501

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual	According CR User Manual CR-A in default shunting idle status			
2	Select HMI menu for shunting data	Shunting data menu is displayed on the HMI including group number			
3	Enter group number 01 and confirm entry using HMI menu	Update of visual indication is displayed on the HMI			
		Activate dedicated group Id according selected group number in the CR-A CR-A HMI display according shunting mode including dedicated group number CR-A in default shunting idle status Check logs to confirm only one group Id			

4	MS-A initiates shunting group call Gld 501 and takes the uplink, press PTT	Shunting group is displayed CR-A receives shunting group call Gld 501 and accepts the call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
5	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Group call communication is activated on the HS of the CR-A			
6	Press PTT button (uplink is in use by MS-A)	An audible indication is given on the loudspeaker "Uplink busy" indication is displayed on the HMI			
7	Release PTT on MS-A	Indication to use PTT to talk is given to the driver on the HMI of the CR-A			
8	Press PTT button on CR-A (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			
9	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-A "			
10	Press PTT on MS-A	An audible indication is given on the loudspeaker			
11	Hang-up handset on CR-A	A visual indication is displayed on the HMI Talker can be heard on driver's loudspeaker			
12a	MS-A terminates group call	Shunting group call 501 is terminated CR-A in default shunting idle status			
12b	Leave shunting group call by CR-A: Using the HMI menu	CR-A leaves shunting group call 501 CR-A in default shunting idle status			

17.4.2 Pre-emption of the shunting group call 501 by an incoming shunting emergency call

Purpose:

This test is to show that the cab radio is able to receive and join an incoming shunting emergency call at any time. The ongoing shunting group call 501 will be pre-empted.

Preconditions for the test: CR-A shall be in shunting mode and with Group 501 activated on the SIM.

Reference: **FRS § 4.2.4, 5.2.2.56, 13.3.1; SRS § 4.3.4, 5.5.19, 5.5.20, 5.5.21, 5.5.22, 5.5.23, 5.5.24, 5.5.26, 5A.1**

- MS-A initiates shunting group call GId 501
- CR-A receives shunting group call GId 501 and joins automatically
- MS-B initiates a shunting emergency call
- CR-A receives the shunting emergency call
- CR-A leaves the ongoing shunting group call and joins the shunting emergency call automatically
- CR-A listens to the shunting emergency call
- MS-B terminates the shunting emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual	According CR User Manual			
		CR-A in default shunting idle status			
	MS-A initiates shunting group call GId 501 and takes the uplink, press PTT	Area number and shunting group are displayed			
		CR-A receives shunting group call GId 501 and accepts the call automatically			
		An audible indication is given on the loudspeaker			
		A visual indication is displayed on the HMI incl. group identity			
		Caller can be heard on driver's loudspeaker			
		Indication to use PTT to talk is given to the driver on the HMI			
2	MS-B initiates „shunting emergency call" and takes the uplink, press PTT	CR-A receives and accepts call automatically			
		CR-A leaves the ongoing shunting group call 501			
		An audible indication is given on the loudspeaker			
		A visual indication is displayed on the HMI incl. group identity			
		MS-B can be heard on driver's loudspeaker			
		Indication to use PTT to talk is given to the driver on the HMI			
3	MS-B terminates group call	Group call „shunting emergency call" is terminated			
		CR-A in default shunting idle status			

17.4.3 Pre-emption of incoming shunting group call 501 by an outgoing shunting emergency call

Purpose: This test is to show that a shunting emergency call can be initiated at any time i.e. also during an ongoing shunting group call Gld 501.

Preconditions for the test: CR-A shall be in shunting mode and with Group 501 activated on the SIM.

Reference: **FRS § 4.2.4, 5.2.1.2, 5.2.2.18, 5.2.2.20, 5.2.2.21, 5.2.2.22, 5.2.2.24, 5.2.2.60, 13.2.2.1, 13.2.2.4, 13.2.2.6, 13.2.3.1, 13.2.3.3, 13.2.4.1; SRS § 4.3.4, 5.3.5, 5.3.6, 5.5.4, 5.5.5, 5A.1 13.3.1**

- MS-A initiates shunting group call Gld 501
- CR-A receives shunting group call Gld 501 and joins automatically
- CR-A initiates a shunting emergency call 599
- CR-A leaves shunting group call 501
- MS-B receives and indicates the shunting emergency call
- MS-B joins the shunting emergency call automatically
- CR-A talks in the shunting emergency call
- MS-B listens to the shunting emergency call
- CR-A and MS-B talker change
- CR-A terminates the shunting emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual	According CR User Manual			
		CR-A in default shunting idle status			
	MS-A initiates shunting group call Gld 501 and takes the uplink, press PTT	Area number and shunting group are displayed			
		CR-A receives shunting group call Gld 501 and accepts the call automatically			
		An audible indication is given on the loudspeaker			
		A visual indication is displayed on the HMI incl. group identity			
		Caller can be heard on driver's loudspeaker			
		Indication to use PTT to talk is given to the driver on the HMI			

2	CR-A initiates „shunting emergency call" using emergency access "Emergency button"	CR-A leaves the ongoing shunting group call 501 An short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI incl. group identity			
	(Call established in the network)	Indication to use PTT to talk is given to the driver on the HMI			
3	Press PTT on CR-A (CR-A talk)	CR-A takes the uplink „ shunting emergency call" communication is activated on the HS of the CR-A to all train emergency call participants			
		MS-B receives and accepts call automatically Caller can be heard on MS-B's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
4	Release PTT on CR-A	Indication to use PTT to talk is given to the driver on the HMI			
5	Press PTT button on MS-B (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			
6	Release PTT on MS-B	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-A			
7	Press PTT on CR-A	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			
8	CR-A terminates group call Using the HMI menu	Group call „shunting emergency call" is terminated CR-A in default shunting idle status			

17.4.4 Basic operation plus incoming PTP call

Purpose: This test is to show that during an ongoing dedicated shunting group call an incoming call can be signalled.

Precondition of this test is that the network shall be prepared in order to support in band paging for ptp calls. CR-A shall be in shunting mode, Group 501 is activated on the SIM.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

Note: If a call other than a ptp call is used, for example a VGCS/VBS with priority 3 or priority 4 this call may not be received by CR-A which is active in the shunting group call as the new VGCS/VBS call will not be indicated with in-band signalling on the group call channel. It is recommended to clarify the EIRENE SRS 5A.1 requirement. The test below assumes the use of a ptp call as the new incoming call.

- MS-B initiates a shunting group call Group Id 501
- CR-A receives the shunting group call
- CR-A joins the shunting group call automatically
- CR-A listens to the shunting group call
- MS-A initiates a ptp call to CR-A FN or MSISDN
- CR-A indicates the incoming ptp call on the HMI
- MS-A terminates the waiting call
- CR-A removes the waiting indication
- MS-B terminates the group call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual MS-B initiates shunting group call Group Id 501 and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI including group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Shunting group call communication is activated on the HS of the CR-A			
3	MS-A setup a ptp call to driver's MSISDN	A visual indication is displayed on the HMI Shunting group call is continued as before			
4	MS-A cancels the call	The 'waiting' indication is removed on the HMI The group call is continued as before.			
5	MS-B terminates group call	Group call "all drivers in same area" is terminated CR-A in default idle status			

17.4.5 Change dedicated shunting group

Purpose: This test is to show that after entering shunting mode and activation of a dedicated shunting group the driver may change to another dedicated shunting group.

Preconditions for the test: CR-A shall be in shunting mode and with Group 501 activated on the SIM.

Reference: **SRS § 14.4.5**

- MS-A initiates shunting group call 501
- CR-A receives and indicates shunting group call 501, and joins automatically
- CR-A listens to shunting group call 501
- CR-A leaves call
- CR-A selects menu for shunting data
- Driver enters dedicated group number 03
- CR-A de-activates the dedicated shunting group Id 501 and activates the shunting group Id 503
- MS-B initiates shunting group call 503
- CR-A receives and indicates shunting group call 503, and joins automatically
- CR-A listens to shunting group call 503
- MS-A terminates shunting group call 501
- MS-B terminates shunting group call 503

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual	According CR User Manual			
		CR-A in default shunting idle status			
	MS-A initiates shunting group call GId 501 and takes the uplink, press PTT	Area number and shunting group are displayed			
		CR-A receives shunting group call GId 501 and accepts the call automatically			
		An audible indication is given on the loudspeaker			
		A visual indication is displayed on the HMI incl. group identity			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume			
		Group call communication is activated on the HS of the CR-A			
3	Leave shunting group call by CR-A: Using the HMI menu	CR-A leaves shunting group call 501			
		CR-A in default shunting idle status			
4	Select HMI menu for shunting data	Shunting data menu is displayed on the HMI including group number			

5	Enter group number 03 and confirm entry using HMI menu	Update of visual indication is displayed on the HMI ~~Automatic de-registration 01 and registration 03 to the related FN is executed in the background.~~ ~~(De-registration and Registration in the network is successful!)~~			
		Deactivate group Id 501. Activate dedicated group Id 503 according selected group number in the CR-A CR-A HMI display according shunting mode incl. dedicated group number			
6	MS-B initiates shunting group call GId 503 and takes the uplink, press PTT	Shunting group is displayed CR-A receives shunting group call GId 503 and accepts the call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the			
7	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Group call communication is activated on the HS of the CR-A			
8	MS-A terminates group call (Shunting group call 501 is terminated)				
9	MS-B terminates group call	Shunting group call 503 is terminated CR-A in default shunting idle status			
10	MS-A initiates shunting group call GId 501 and takes the uplink, press PTT	Group call 501 is established by MS-B CR-A in default shunting idle status (Group call 501 is not received by the CR-A because the group has been deactivated)			
11	MS-A terminates group call (Shunting group call 501 is terminated))	CR-A in default shunting idle status			

17.4.6 Return to common shunting group 500

Purpose: This test is to show that after entering shunting mode and activation of a dedicated shunting group the driver may change back to the common shunting group.

Preconditions for the test: CR-A shall be in shunting mode and registered to shunting team 03.

Reference: **SRS § 14.4.6**

- MS-A initiates shunting group call 503
- CR-A receives and indicates shunting group call 503, and joins automatically
- CR-A listens to shunting group call 503
- CR-A selects menu for shunting data
- Driver enters common group number 00
- CR-A de-registers 03 related FN in the network
- CR-A de-activates the dedicated shunting group Id 503 and activates the shunting group Id 500
- MS-B initiates shunting group call 500
- CR-A receives and indicates shunting group call 500, and joins automatically
- CR-A listens to shunting group call 500
- MS-A terminates shunting group call 503
- MS-B terminates shunting group call 500

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual	According CR User Manual			
		CR-A in default shunting idle status			
	MS-A initiates shunting group call GId 503 and takes the uplink, press PTT	Shunting group is displayed			
		CR-A receives shunting group call GId 503 and accepts the call automatically			
		An audible indication is given on the loudspeaker			
		A visual indication is displayed on the HMI incl. group identity			
		Caller can be heard on driver's			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume			
		Group call communication is activated on the HS of the CR-A			
3	Leave shunting group call by CR-A: Using the HMI menu	CR-A leaves shunting group call 503			
		CR-A in default shunting idle status			
4	Select HMI menu for shunting data	Shunting data menu is displayed on the HMI including group number			
5	Enter group number 00 and confirm entry using HMI menu	Update of visual indication is displayed on the HMI			

		Activate group Id 00 according selected group number in the CR-A			
		CR-A HMI display according shunting mode including group number			
		CR-A in default shunting idle status			
		Check logs to confirm that only one group Id (plus 599) is active.			
6	MS-B initiates shunting group call GId 500 and takes the uplink, press PTT	Shunting group is displayed			
		CR-A receives shunting group call GId 500 and accepts the call automatically			
		An audible indication is given on the loudspeaker			
		A visual indication is displayed on the HMI including group identity			
		Caller can be heard on driver's loudspeaker			
		Indication to use PTT to talk is given to the driver on the HMI			
7	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume			
		Group call communication is activated on the HS of the CR-A			
8	MS-A terminates group call (Shunting group call 503 is terminated)				
9	MS-B terminates group call	Shunting group call 500 is terminated			
		CR-A in default shunting idle status			

17.4.7 Changing back to common shunting group 500 during simultaneous incoming shunting emergency call 599

Purpose: This test is to show that an incoming shunting emergency call (GID 599) takes automatically priority during changing back from a dedicated shunting group to the common shunting group.

Preconditions for the test: CR-A shall be in shunting mode and registered to shunting team 03.

Reference: **FRS § 14.2.12**

- CR-A selects menu for shunting data
- Driver enters (group) call area and dedicated group number 00
- CR-A de-activates the dedicated shunting group Id 503 and activates the shunting group Id 500
- MS-B initiates a shunting emergency call
- CR-A receives the shunting emergency call
- CR-A joins the shunting emergency call automatically
- CR-A listens to the shunting emergency call
- MS-B terminates the shunting emergency call

- MS-B initiates shunting group call 500
- CR-A receives and indicates shunting group call 500, and joins automatically
- CR-A listens to shunting group call 500
- MS-B terminates shunting group call 500

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual	According CR User Manual CR-A in default shunting idle status			
2	Select HMI menu for shunting data	Shunting data menu is displayed on the HMI including group number			
3	Enter group number 00 and confirm entry using HMI menu	Update of visual indication is displayed on the HMI Automatic deactivation of Group 503 Activation of Group 500			
4	MS-B initiates „shunting emergency call" and takes the uplink, press PTT	CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity MS-B can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
5	MS-B terminates group call	Group call „shunting emergency call" is terminated Activate dedicated group Id according selected group number 500 in the CR-A CR-A HMI display according shunting mode incl. dedicated group number and call area CR-A in default shunting idle status			
6	MS-B initiates shunting group call Gld 500 and takes the uplink, press PTT	Shunting group is displayed CR-A receives shunting group call Gld 500 and accepts the call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI including group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			

7	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume			
		Group call communication is activated on the HS of the CR-A			
8	MS-B terminates group call	Shunting group call 500 is terminated			
		CR-A in default shunting idle status			

17.5 USE OF AREA CODE

The shunting area code may be used for filtering of incoming group calls (EIRENE SRS 14.4.5 and 14.4.6). This section applies only if the filtering option is provided by the cab radio under test.

17.5.1 Entering a Shunting Group Area

Purpose: This test is to show that the CR can filter incoming calls on the basis of group call area.

Preconditions for the test: CR-A shall be in shunting mode with Group Id 00 activated.

Reference: **SRS § 14.4.5**

- CR-A Driver enters (group) call area
- MS-B initiates a group 500 call for the area containing CR-A
- CR-A receives the group 500 call
- CR-A joins the group 500 call
- MS-B terminates the group 500 call
- MS-B initiates a group 500 call for a different area
- CR-A does not join the group call 500
- MS-B terminates shunting group call 500

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Enter group call area and confirm Note – depending on implementation, this may be as part of the procedure for entry into shunting mode	According CR User Manual CR-A display according shunting mode (as documented in the User Manual) including area. CR-A in default shunting idle status			
2	MS-B initiates group call 500 within the same group area as CR-A. MA-B takes the uplink, press PTT	According CR User Manual CR-A in default shunting idle status Area number and shunting group are displayed CR-A receives shunting group call GId 500 and accepts the call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
3	MS-B terminates group call	Shunting group call 500 is terminated An audible indication is given on the loudspeaker CR-A in default shunting idle status			
4	MS-A initiates group call 500 within a different group area from CR-A. MS-A takes the uplink, press PTT	Shunting group call 500 is established by MS-B CR-A in default shunting idle status (Call is not received by the CR-A as it is for a different area)			
5	MS-A terminates group call	Shunting group call 500 is terminated CR-A in default shunting idle status			

17.5.2 Changing a Shunting Group Area

Purpose: This test is to show that the CR user can change shunting group area.

Preconditions for the test: CR-A shall be in shunting mode with Group Id 00 activated and a shunting group area entered.

Reference: **SRS § 14.4.5**

- CR-A Driver enters (group) call area
- MS-B initiates a group 500 call for the area containing CR-A
- CR-A receives the group 500 call
- CR-A joins the group 500 call
- MS-B terminates the group 500 call
- MS-B initiates a group 500 call for a different area
- CR-A does not join the group call 500
- MS-B terminates shunting group call 500

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Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Enter new group call area and confirm	According CR User Manual CR-A display according shunting mode (as documented in the User Manual) including new area. CR-A in default shunting idle status			
2	MS-B initiates group call 500 within the same group area as CR-A. MA-B takes the uplink, press PTT	According CR User Manual CR-A in default shunting idle status Area number and shunting group are displayed CR-A receives shunting group call GId 500 and accepts the call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
3	MS-B terminates group call	Shunting group call 500 is terminated An audible indication is given on the loudspeaker CR-A in default shunting idle status			
4	MS-A initiates group call 500 within the group area which CR-A was in previously MS-A takes the uplink, press PTT	Shunting group call 500 is established by MS-B CR-A in default shunting idle status (Call is not received by the CR-A as it is for a different area)			
5	MS-A terminates group call	Shunting group call 500 is terminated CR-A in default shunting idle status			

17.6 REGISTERING A FUNCTIONAL IDENTITY

A cab radio may register its functional identity. The shunting area code may be used for filtering of incoming group calls (EIRENE SRS 14.4.5 and 14.4.6). This section applies only if the filtering option is provided by the cab radio under test.

When a cab radio user chooses or changes a group ID, the resulting functional identity shall be registered. This is in addition to the activation of the group on the SIM.

It is assumed that a Cab Radio will only ever be the shunting driver within a shunting group. Therefore it is not necessary to provide a means to change the functional identity.

17.6.1 Registering a functional identity

Purpose: This test is to show that after entering shunting mode a dedicated shunting group can be activated. During activation of the dedicated shunting group the related FN, CR-A sends registration information to the network.

Preconditions for the test: CR-A shall be in shunting mode.

Reference: **SRS § 14.4.6**

- CR-A selects menu for shunting data
- Driver enters (group) call area and dedicated group number 01
- CR-A registers related FN in the network
- CR-A de-activates the common shunting group Id 500 and activates the dedicated shunting group Id 501
- MS-A initiates shunting group call 501
- CR-A receives and indicates shunting group call 501, and joins automatically
- CR-A listens to shunting group call 501
- MS-A terminates shunting group call 501
- CR-A leaves shunting group call 501
- MS-A calls CR-A by functional number (PTP call)
- MS-A terminates PTP call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual	According CR User Manual CR-A in default shunting idle status			
2	Select HMI menu for shunting data	Shunting data menu is displayed on the HMI including group number			
3	Enter call area and group number 01 and confirm entry using HMI menu Note – Depending on implementation, the area may already be entered such that it is not necessary to re-enter it.	Update of visual indication is displayed on the HMI Automatic registration to the related FN is executed in the background. (Registration in the network is successful)			

		De-activate common group Id 500. Activate dedicated group Id according selected group number in the CR-A CR-A HMI display according shunting mode including dedicated group number and call area CR-A in default shunting idle status Check logs to ensure that the registration message was sent correctly.			
4	MS-A initiates shunting group call GId 501 and takes the uplink, press PTT	Area number and shunting group are displayed CR-A receives shunting group call GId 501 and accepts the call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
5	Release PTT on MS-A	Indication to use PTT to talk is given to the driver on the HMI of the CR-A			
6	MS-A terminates group call	Shunting group call 501 is terminated CR-A in default shunting idle status			
7	MS-A calls CR-A with a PTP call using functional identity of CR-A	CR-A receives call. An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Caller can be heard on driver's loudspeaker			
8	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume PTP communication is activated on the HS of the CR-A			
9	MS-A terminates PTP call	PTP call is terminated CR-A in default shunting idle status			

17.6.2 Changing a functional identity

Purpose: This test is to show that after entering shunting mode it is possible to change functional identity.

Preconditions for the test: CR-A shall be in shunting mode in a defined group area with a registered functional identity (shunting

driver, group 01).

Reference: **SRS § 14.4.6**

- CR-A selects menu for shunting data
- Driver enters (group) call area and dedicated group number 02
- CR-A deregisters FN related to group number 01 in the network
- CR-A de-activates the dedicated shunting group Id 501
- CR-A registers FN related to group number 02 in the network
- CR-A activates the dedicated shunting group Id 502
- MS-A initiates shunting group call 502
- CR-A receives and indicates shunting group call 502, and joins automatically
- CR-A listens to shunting group call 502
- MS-A terminates shunting group call 502

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual	According CR User Manual CR-A in default shunting idle status			
2	Select HMI menu for shunting data	Shunting data menu is displayed on the HMI including group number			
3	Enter call area and group number 02 and confirm entry using HMI menu Note – Depending on implementation, the area may already be entered such that it is not necessary to re-enter it.	Automatic deregistration of the FN for group number 01. (Deregistration in the network is successful) Deactivate dedicated group Id for group number 01.			
		Update of visual indication is displayed on the HMI Automatic registration to the related FN for group number 02 is executed in the background. (Registration in the network is successful)			
		Activate dedicated group Id for group number 02 in the CR-A CR-A HMI display according shunting mode including dedicated group number and call area CR-A in default shunting idle status			

Step	Procedure	Effects		
4	MS-A initiates shunting group call Gld 502 and takes the uplink, press PTT	Area number and shunting group are displayed		
		CR-A receives shunting group call Gld 501 and accepts the call automatically		
		An audible indication is given on the loudspeaker		
		A visual indication is displayed on the HMI incl. group identity		
		Caller can be heard on driver's loudspeaker		
		Indication to use PTT to talk is given to the driver on the HMI		
5	MS-A terminates group call	Shunting group call 502 is terminated		
		CR-A in default shunting idle status		

17.6.3 Changing a functional identity – failed registration

Purpose: This test is to show that a failed registration is indicated to the user.

Preconditions for the test: CR-A shall be in shunting mode in a defined group area with a registered functional identity (shunting driver, group 01).

Reference: **SRS § 14.4.7**

- CR-A selects menu for shunting data
- Driver enters (group) call area and dedicated group number 02
- CR-A deregisters FN related to group number 01 in the network
- CR-A de-activates the dedicated shunting group Id 501
- CR-A tries to register FN related to group number 02 in the network
- Registration fails
- Failure is indicated to the user

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual	According CR User Manual CR-A in default shunting idle status			
2	Select HMI menu for shunting data	Shunting data menu is displayed on the HMI including group number			

| 3 | Enter call area and group number 02 and confirm entry using HMI menu

Note – Depending on implementation, the area may already be entered such that it is not necessary to re-enter it. | Automatic deregistration of the FN for group number 01 is attempted.

(Deregistration in the network is NOT successful)

Indication is given to user of the failure | | | |
| 4 | User acknowledges the failure | What happens next is implementation dependent. | | | |

17.6.4 Storage of Shunting Data

Purpose: This test is to show that shunting data is stored for use in the next start-up procedure.

Preconditions for the test: CR-A shall be in shunting mode with activated Group Id 01, Lead Driver Function Code (Cab Radio always has this) and a known area code.

Reference: **SRS § 14.4.11**

- Switch off cab radio
- Switch on cab radio
- HMI shows the same settings as at the start of the test
- MS-A initiates shunting group call 501
- CR-A receives and indicates shunting group call 501, and joins automatically
- CR-A listens to shunting group call 501
- MS-A terminates shunting group call 501
- CR-A leaves shunting group call 501

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual	According CR User Manual CR-A in default shunting idle status. Area Code and Group Id can be seen.			
2	Switch off cab radio	HMI is blank			
3	Switch on cab radio	Cab radio performs its normal self tests After completion of self tests, CR-A is in default shunting idle status. Area Code and Group Id can be seen – these are the same as in Step 1.			

Step	Procedure	Effects			
4	MS-A initiates shunting group call GId 501 and takes the uplink, press PTT	Area number and shunting group are displayed			
		CR-A receives shunting group call GId 501 and accepts the call automatically			
		An audible indication is given on the loudspeaker			
		A visual indication is displayed on the HMI incl. group identity			
		Caller can be heard on driver's loudspeaker			
		Indication to use PTT to talk is given to the driver on the HMI			
5	MS-A terminates group call	Shunting group call 501 is terminated			
		CR-A in default shunting idle status			
		Area Code and Group Id can be seen.			

17.7 LINK ASSURANCE SIGNAL

17.7.1 Receiving the Link Assurance Signal

Purpose: This test is to show that the Link Assurance Signal (LAS) can be received by the CR-A during a shunting group call.

Preconditions for the test: CR-A shall be in shunting mode and with Group 501 activated on the SIM1. MS-A is an OPS that supports link assurance signal (LAS).

Reference: **FRS § 5.2.2.63, 5.2.2.66, 14.2.9**

- MS-A initiates shunting group call GId 501
- CR-A receives and indicates shunting group call 501
- CR-A joins the shunting group call GId 501 automatically
- CR-A listens to shunting group call 501
- MS-A starts LAS
- CR-A receives LAS
- LAS can be heard on CR-A loudspeaker
- MS-A terminates shunting group call 501

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3

1	According CR User Manual MS-A initiates shunting group call GId 501 and takes the uplink, press PTT	According CR User Manual CR-A in default shunting idle status Shunting group is displayed CR-A receives shunting group call GId 501 and accepts the call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Start LAS transmission on MS-A	LAS can be heard on CR-A's loudspeaker Shunting group call 501 ongoing …			
3	MS-A terminates group call	Shunting group call 501 is terminated CR-A in default shunting idle status			

17.7.2 Pre-emption of the link assurance signal by an incoming shunting emergency call 599

Purpose: This test is to show that the Link Assurance Signal (LAS) can be received by the CR-A during shunting group call and an incoming shunting emergency call automatically takes priority over the link assurance signal

Preconditions for the test: CR-A shall be in shunting mode and with Group 501 activated on the SIM. MS-A is an OPS that supports link assurance signal (LAS).

Reference: **FRS § 5.2.2.63, 5.2.2.66, 13.1.8, 14.2.9, 14.2.12, 14.4.5;**

- MS-A initiates shunting group call GId 501
- CR-A receives and indicates shunting group call 501
- CR-A joins the shunting group call GId 501 automatically
- CR-A listens to shunting group call 501
- MS-A starts LAS
- CR-A receives LAS
- LAS can be heard on CR-A loudspeaker
- MS-B initiates a shunting emergency call
- CR-A receives the shunting emergency call
- CR-A leaves the ongoing shunting group call and joins the shunting emergency call automatically
- CR-A listens to the shunting emergency call
- MS-B terminates the shunting emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual MS-A initiates shunting group call GId 501 and takes the uplink, press PTT	According CR User Manual CR-A in default shunting idle status Shunting group is displayed CR-A receives shunting group call GId 501 and accepts the call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Start LAS transmission on MS-A	LAS can be heard on CR-A's loudspeaker Shunting group call 501 ongoing			
3	MS-B initiates „shunting emergency call" and takes the uplink, press PTT	CR-A receives and accepts call automatically CR-A leaves the ongoing shunting group call 501 An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity MS-B can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
4	MS-B terminates group call	Group call „shunting emergency call" is terminated CR-A in default shunting idle status			

17.7.3 Pre-emption of the link assurance signal by an outgoing shunting emergency call 599

Purpose: This test is to show that the Link Assurance Signal (LAS) can be received by the CR-A during shunting group call and an outgoing shunting emergency call takes automatically priority over the link assurance signal

Preconditions for the test: CR-A shall be in shunting mode and with Group 501 activated on the SIM. MS-A is an OPS that supports link assurance signal LAS.

Reference: **FRS § 5.2.2.63, 5.2.2.66, 13.1.8, 14.2.9, 14.2.12, 14.4.5;**

- MS-A initiates shunting group call GId 501
- CR-A receives and indicates shunting group call 501

- CR-A joins the shunting group call Gld 501 automatically
- CR-A listens to shunting group call 501
- MS-A starts LAS
- CR-A receives LAS and transmit on the loudspeaker
- CR-A initiates a shunting emergency call and leaves the shunting group call Gld 501
- MS-B receives and indicates the shunting emergency call
- MS-B joins the shunting emergency call automatically
- CR-A talks in the shunting emergency call
- MS-B listens to the shunting emergency call
- CR-A terminates the shunting emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual MS-A initiates shunting group call Gld 501 and takes the uplink, press PTT	According CR User Manual CR-A in default shunting idle status Area number and shunting group are displayed CR-A receives shunting group call Gld 501 and accepts the call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Start LAS transmission on MS-A	LAS can be heard on CR-A's loudspeaker Shunting group call 501 ongoing …			
3	CR-A initiates „shunting emergency call" using emergency access "Emergency button"	CR-A leaves ongoing shunting group call 501 An short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI incl. group identity			
	(Call established in the network)	Indication to use PTT to talk is given to the driver on the HMI			
4	Press PTT on CR-A (CR-A talk)	CR-A takes the uplink „shunting emergency call" communication is activated on the HS of the CR-A to all train emergency call participants			
		MS-B receives and accepts call automatically Caller can be heard on MS-B's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			

| 5 | CR-A terminates group call

Using the HMI menu | Group call „shunting emergency call" is terminated

CR-A in default shunting idle status | | | |

17.8 CALL ARBITRATION IN SHUNTING MODE

17.8.1 Outgoing emergency call during an ongoing shunting group call

See 17.4.3

17.8.2 Call to PA system during an ongoing shunting group call

Applicable if the CR provides an interface to Public Address.

Reference: **SRS § 5A.1**

Purpose: This test is to show that during an ongoing shunting group call, the PA system can be used by the driver for an announcement.

Preconditions for the test: CR-A shall be in shunting mode with Group Id 501 activated on the SIM.

- MS-B initiates group call 501
- CR-A receives and indicates shunting group call 501
- CR-A joins the shunting group call GId 501 automatically
- CR-A listens to the shunting group call GId 501
- CR-A initiates an announcement to the PA system
- Shunting group call GId 501 continues on the loudspeaker of the CR-A, call to PA system is connected to the HS of CR-A
- CR-A terminates the PA call
- CR-B terminates the shunting group call GId 501

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3

1	According CR User Manual CR-B initiates "shunting group call GId 501" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to minimal volume shunting group call GId 501 communication is activated on the HS of the CR-A			
3	CR-A initiates call to PA system	Call establishment to PA system Update of visual indication is displayed on the HMI PA system is connected to CR-A on the HS Shunting group call GId 501 is continued on the CR-A loudspeaker			
4	(Implementation option) Use PTT to talk on the PA system	Announcement on the PA system			
5	CR-A terminates call to PA system	Ongoing PA call terminated Update of visual indication is displayed on the HMI "shunting group call GId 501" communication is activated on the HS of the CR-A and continued			
6	CR-B terminates group call	"shunting group call GId 501" is terminated CR-A in default shunting idle status			

17.8.3 Call to chief conductor during an ongoing shunting group call

Applicable if the CR provides an interface to UIC Intercom.

Reference: **SRS § 5A.1**

Purpose: This test is to show that during an ongoing shunting group call, a call to the chief conductor via UIC intercom (gong) can be initiated.

Preconditions for the test: CR-A shall be in shunting mode with Group Id 501 activated on the SIM.

- MS-B initiates group call 501
- CR-A receives the shunting group call 501

- CR-A joins the shunting group call Gld 501 automatically
- CR-A listens to the shunting group call Gld 501
- CR-A initiates call to chief conductor via UIC intercom
- Shunting group call Gld 501 continues on the loudspeaker of the CR-A, chief conductor is connected to the HS of CR-A
- CR-B terminates the shunting group call Gld 501

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual MS-B initiates shunting group call Gld 501 and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to minimal volume shunting group call Gld 501 communication is activated on the HS of the CR-A			
3	CR-A initiates call to the chief conductor via UIC intercom	A visual indication is displayed on the HMI Audio signal (e.g. GONG) on the PA system			
4	Chief conductor calls back CR-A	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI			
5	CR-A accepts call from chief conductor	A visual indication is displayed on the HMI Chief conductor is connected to CR-A via UIC intercom on the HS Shunting group call Gld 501 call is continued on the CR-A loudspeaker			
6	Chief conductor hangs up the HS	Connection Chief conductor to CR-A via UIC intercom on the HS is released Shunting group call Gld 501 communication is activated on the HS of the CR-A and continued			
7	MS-B terminates group call	Shunting group call Gld 501 is terminated CR-A in default shunting idle status			

17.8.4 Intercom call to other engine during an ongoing shunting group call

Applicable if the CR provides an interface to UIC Intercom.

Reference: **SRS § 5A.1**

Purpose: This test is to show that during an ongoing shunting group call, the UIC intercom can be used by the driver for intercom call to other engine.

Preconditions for the test: CR-A shall be in shunting mode with Group Id 501 activated on the SIM.

- MS-B initiates group call 501
- CR-A receives and indicates shunting group call 501
- CR-A joins the shunting group call GId 501 automatically
- CR-A listens to the shunting group call GId 501
- CR-A initiates intercom call via UIC intercom
- The shunting group call GId 501 continues on the loudspeaker of the CR-A, intercom call is connected to the HS of CR-A
- CR-A terminates the intercom call
- CR-B terminates the shunting group call GId 501

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual MS-B initiates shunting group call GId 501 and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to minimal volume shunting group call GId 501 communication is activated on the HS of the CR-A			
3	CR-A initiates intercom call via UIC intercom	A visual indication is displayed on the HMI An audible indication is given on the loudspeaker (implementation option) Intercom call is established on the HS via UIC intercom The shunting group call GId 501 call is continued on the CR-A loudspeaker			
4	CR-A terminates intercom call	The visual indication displayed on the HMI is updated The shunting group call GId 501 communication is activated on the HS of the CR-A and continued			

Step	Procedure	Effects			
5	CR-A terminates the intercom call	Intercom call is released			
		Shunting group call Gld 501 communication is activated on the HS of the CR-A and continued			
6	MS-B terminates group call	Shunting group call Gld 501 is terminated			
		CR-A in default shunting idle status			

17.8.5 Incoming shunting emergency call during an ongoing shunting group call

See 17.4.2

17.8.6 Incoming "all drivers in same area" call during an ongoing shunting group call

Purpose: This test is to show that an "all drivers in same area" call " has no effect on a cab radio which is active in a shunting

call.

Preconditions for the test: CR-A shall be in shunting mode with Group Id 501 activated on the SIM.

Reference: **SRS § 5A.1**

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual	According CR User Manual			
	MS-B initiates shunting group call Gld 501 and takes the uplink, press PTT	CR-A receives and accepts call automatically			
		An audible indication is given on the loudspeaker			
		A visual indication is displayed on the HMI incl. group identity			
		Caller can be heard on driver's loudspeaker			
		Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to minimal volume			
		shunting group call Gld 501 communication is activated on the HS of the CR-A			
3	CR-B initiates an "all drivers in same area" call	No change – Group Id 200 is de-activated while in shunting mode			

17.8.7 Other outgoing call during an ongoing shunting group call

Purpose: This test is to show that it is not possible to initiate a non-emergency call wile active in a shunting group call.

Preconditions for the test: CR-A shall be in shunting mode with Group Id 501 activated on the SIM.

Reference: **SRS § 5A.1**

- MS-B initiates group call 501
- CR-A receives the shunting group call 501
- CR-A joins the shunting group call Gld 501 automatically
- CR-A listens to the shunting group call Gld 501
- CR-A tries to initiate a call to primary controller
- Attempt fails - shunting group call Gld 501 continues

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual MS-B initiates shunting group call Gld 501 and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to minimal volume Shunting group call Gld 501 communication is activated on the HS of the CR-A			
3	CR-A tries to initiate a call to primary controller	Call to primary controller fails. Shunting group call Gld 501 communication continues			

17.8.8 Other incoming call during an ongoing shunting group call

See 17.2.4

17.9 CALL ARBITRATION DURING AN ONGOING CONTROLLER CALL

17.9.1 Outgoing train emergency call during an ongoing PTP call in shunting mode

Purpose: This test is to show that during an ongoing ptp call in shunting mode, an outgoing train emergency call can be initiated by the driver.

Preconditions for the test: CR-A shall be in shunting mode with Group Id 501 activated on the SIM. CR-B is in shunting mode.

Reference: **SRS § 5A.1**

- MS-A initiates a PTP call to CR-A
- CR-A receives and accepts ptp call
- CR-A initiates a train emergency call
- Ptp call is terminated
- CR-B receives and indicates the train emergency call
- CR-B joins the train emergency call automatically
- Controller receives and indicates the train emergency call incl. FN of the originator
- Controller joins the train emergency call
- CR-A talks in the train emergency call
- CR-B listens to the train emergency call
- CR-A and CR-B talker change
- CR-A terminates the train emergency call
- Controller terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	MS-A initiate a PTP call to CR-A	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Caller can be heard on driver's loudspeaker			
2		The communication MS-A to CR-A is established A visual indication is displayed on the HMI Identification of the calling party is displayed on the HMI			
3	CR-A initiates „train emergency call" using emergency access "Emergency button"	Ongoing ptp call is terminated by CR-A A short audible indication (up to 20 secs.) is given on the loudspeaker A continuous visual indication is displayed on the HMI including group identity			
	(Call established in the network)	Indication to use PTT to talk is given to the driver on the HMI			
3	Press PTT on CR-A (CR-A talk)	CR-A takes the uplink „shunting emergency call" communication is activated on the HS of the CR-A to all train emergency call participants			
		CR-B receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker			

		Indication to use PTT to talk is given to the driver on the HMI			
		Controller receives and accepts call The visual indication displayed on the HMI incl. FN of CR-A as the originator of the call Caller CR-A can be heard on driver's loudspeaker			
4	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-A and CR-B			
5	Press PTT button on CR-B (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI of CR-B			
6	Release PTT on CR-B	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-A and CR-B			
7	Press PTT on CR-A	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			
8	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-A and CR-B			
9	Hang-up handset on CR-A	A visual indication is displayed on the HMI Driver's loudspeaker set to default volume (Talker e.g. controller may be heard on driver's loudspeaker)			
10	CR-A terminates group call Using the HMI menu	Group call „shunting emergency call" is terminated CR-A in default shunting idle status			

17.9.2 Call to the PA system during an ongoing PTP call in shunting mode

Applicable if the CR provides an interface to Public Address.

Purpose: This test is to show that during an ongoing PTP call in shunting mode, the PA system can be used by the driver for an announcement. The PTP call is transferred to the loudspeaker.

NOTE – This behaviour is different from the same scenario when the radio is in train mode.

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Reference: **SRS § 5.A.1**

- MS-A initiates a PTP call to CR-A
- CR-A receives and accepts ptp call
- CR-A initiates an announcement to the PA system
- PTP call is transferred to the loudspeaker
- The call to PA system is established
- CR-A terminates the PA call
- PTP call is re-connected to the handset
- CR-A-terminates the PTP call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	MS-A initiates a PTP call to CR-A	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Caller can be heard on driver's loudspeaker			
		The communication MS-A to CR-A is established A visual indication is displayed on the HMI Identification of the calling party is displayed on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to Controller is activated on the HS of the CR-A			
3	Initiate call to CR-A PA system	Ongoing PTP call is transferred to the loudspeaker A visual indication is displayed on the HMI Call establishment to PA system			
4	Press "Push-to-Talk" button (Implementation Option)	Update of visual indication is displayed on the HMI Drivers voice will be transmitted on the PA system			
5	Release "Push-to-Talk" button (Implementation Option)	Update of visual indication is displayed on the HMI Drivers voice is not transmitted on the PA system			
6	Terminate PA call by CR-A: Using the HMI menu	Ongoing PA call terminated. PTP call is re-connected to handset.			

7	Terminate call by CR-A:	PTP call is terminated.			
		CR-A in default shunting idle status			

17.9.3 Call to chief conductor during an ongoing PTP call in shunting mode

Applicable if the CR provides an interface to UIC Intercom.

Reference: **SRS § 5.8.1(O)**

Purpose: This test is to show that during an ongoing ptp call in shunting mode, a call to the chief conductor using UIC intercom can be initiated and there is audible indication on the PA system via "gong".

NOTE – This behaviour is different from the same scenario when the radio is in train mode.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- MS-A initiates a PTP call to CR-A
- CR-A receives and accepts ptp call
- CR-A initiate call to chief conductor via UIC intercom
- PTP call is continued, chief conductor is alarmed on the PA system via audio signal "gong"
- Chief conductor calls back and connected to the drivers' CR-A
- Call to controller terminated by CR-A
- Call to chief conductor terminated by CR-A

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	MS-A initiates a PTP call to CR-A	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Caller can be heard on driver's			
		The communication MS-A to CR-A is established A visual indication is displayed on the HMI Identification of the calling party is displayed on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to Controller is activated on the HS of the CR-A			
3	CR-A initiates call to the chief conductor via UIC intercom	A visual indication is displayed on the HMI Audio signal (e.g. GONG) on the PA system			
4	Chief conductor calls back CR-A	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI			

5	CR-A accepts call from chief conductor	Ongoing PTP call is transferred to the loudspeaker			
		A visual indication is displayed on the HMI			
		Chief conductor is connected to CR-A handset via UIC intercom			
6	Chief conductor terminates call	Ongoing call to chief conductor is terminated.			
		PTP call is re-connected to handset			
7	MS-A terminates call	PTP call is terminated.			
		CR-A in default shunting idle status			

17.9.4 Intercom call to other engine during an ongoing PTP call in shunting mode

Applicable if the CR provides an interface to UIC Intercom.

Reference: **SRS § 5.8.1(O)**

Purpose: This test is to show that during an ongoing PTP call in shunting mode, the intercom can be used by the driver for an outgoing intercom call to other engine. The PTP call is transferred to the loudspeaker.

NOTE – This behaviour is different from the same scenario when the radio is in train mode.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- MS-A initiates a PTP call to CR-A
- CR-A receives and accepts ptp call
- CR-A initiates call to other engine via UIC intercom
- PTP call is transferred to loudspeaker
- The call to other engine via UIC intercom is established
- CR-A terminates the call to other engine
- PTP call is re-connected to the handset
- CR-A-terminates the PTP call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	MS-A initiates a PTP call to CR-A	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Caller can be heard on driver's loudspeaker			
		The communication MS-A to CR-A is established A visual indication is displayed on the HMI Identification of the calling party is displayed on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to Controller is activated on the HS of the CR-A			
3	CR-A initiates call to other engine via UIC intercom	Ongoing PTP call is transferred to the loudspeaker A visual indication is displayed on the HMI Call to other engine is established via UIC intercom			

4	CR-A terminates call to other engine	Ongoing intercom call terminated. PTP call is re-connected to handset			
5	Terminate call by CR-A:	PTP call is terminated. CR-A in default shunting idle status			

17.9.5 Other outgoing calls during an ongoing PTP call in shunting mode

Purpose: This test is to show that during an ongoing ptp call in shunting mode an additional ptp call can be initiated. The ongoing call will be put on hold.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- MS-A initiates a PTP call to CR-An
- CR-A receives and accepts ptp call
- CR-A initiates call to other user e.g. MS-B using MDISDN
- Call from MS-A is put on hold
- CR-A terminates the call to MS-B
- Call from MS-A is retrieved i.e. active
- CR-A terminates the call from MS-A

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	MS-A initiates a PTP call to CR-A	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Caller can be heard on driver's loudspeaker			
		The communication MS-A to CR-A is established A visual indication is displayed on the HMI Identification of the calling party is displayed on the HMI			
2	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to Controller is activated on the HS of the CR-A			
3	According CR User Manual CR-A initiates call to MS-B using MSISDN	Ongoing call from MS-A is put on hold An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call to MS-A is ringing			
4	MS-B accepts call from CR-A	An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Communication to MS-B is activated on the HS of the CR-A			

5	CR-A terminates call to MS-B	Ongoing call to MS-A is terminated. An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Call from MS-B is retrieved Communication CR-A from MS-A is activated on the HS of the CR-A			
6	CR-A terminates call from MS-A	Call from MS-A is terminated. CR-A in default shunting idle status			

17.9.6 Incoming train emergency call during an ongoing PTP call in shunting mode

Purpose: This test is to show that during an ongoing ptp call in shunting mode, the cab radio is able to receive and join an incoming train emergency call. The ongoing ptp call is pre-empted and terminated.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- MS-A initiates a PTP call to CR-A
- CR-A receives and accepts ptp call
- Controller accepts the ptp call
- CR-B initiates a train emergency call
- CR-A receives the train emergency call
- CR-A release the outgoing ptp call and joins the train emergency call automatically
- CR-A listens to the train emergency call
- CR-B terminates the train emergency call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	MS-A initiate a PTP call to CR-A	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Caller can be heard on driver's			
2		The communication MS-A to CR-A is established A visual indication is displayed on the HMI Identification of the calling party is displayed on the HMI			
3	CR-B initiates „shunting emergency call" and takes the uplink, press PTT	CR-A receives and accepts call automatically The ongoing ptp call is released An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
4	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume „shunting emergency call" communication is activated on the HS of the CR-A			
5	Release PTT on CR-B	Indication to use PTT to talk is given to the driver on the HMI of the CR-A			
6	Press PTT button on CR-A (uplink free)	An audible indication is given on the loudspeaker "You can talk" indication is displayed on the HMI			
7	Release PTT on CR-A	An audible indication is given on the loudspeaker Indication to use PTT to talk is given to the driver on the HMI of the CR-B			
8	Press PTT on CR-B	An audible indication is given on the loudspeaker			
9	Hang-up handset on CR-A	Talker CR-B can be heard on driver's loudspeaker			
10	CR-A terminates shunting emergency call	Group call „shunting emergency call" is terminated CR-A in default shunting idle status			

17.9.7 Incoming group call "all drivers in same area" during an ongoing call to a controller

Purpose: This test is to show that an "all drivers in same area" call " has no effect on a cab radio which is active in a PTP call while in shunting mode.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- MS-A initiates a PTP call to CR-A
- CR-A receives and accepts ptp call
- CR-B initiates an "all driver in same area" group call
- No change at CR-A

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	MS-A initiate a PTP call to CR-A	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Caller can be heard on driver's loudspeaker			
2		The communication MS-A to CR-A is established A visual indication is displayed on the HMI Identification of the calling party is displayed on the HMI			
3	CR-B initiates "all drivers in same area" call	No change – Group Id 200 is de-activated while in shunting mode			
4	MS-A terminates PTP call	PTP call is terminated CR-A in default shunting idle status			

17.9.8 Other incoming calls during ongoing PTP call in shunting mode

Purpose: This test is to show that during an ongoing ptp call in shunting mode, an incoming call is received and indicated clearly to the driver.

Reference: **SRS § 5.5.21, 5.5.23, 5.5.25, 5.5.26, 5A.1**

- MS-A initiates a PTP call to CR-A
- CR-A receives and accepts ptp call
- MS-B initiates a PTP call to CR-A DN
- CR-A indicates ptp call from MS-B and maintain the call from MS-A
- MS-A terminates the call to CR-A
- CR-A receives the call fro MS-B
- MS-B terminates the ptp call

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3

1	MS-A initiates a PTP call to CR-A	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI Caller can be heard on driver's loudspeaker			
2		The communication MS-A to CR-A is established A visual indication is displayed on the HMI Identification of the calling party is displayed on the HMI			
3	Pick up handset of CR-A	Driver's loudspeaker set to reduced volume Communication to MS-A is activated on the HS of the CR-A			
4	MS-B initiates a PTP call to CR-A	New call is indicated. Call with MS-A continues.			
5	MS-A terminates call to CR-A	An audible indication is given on the loudspeaker The visual indication displayed on the HMI is updated According CR User Manual CR-A accepts the call from MS-B			
6		Communication to MS-B is activated on the HS of the CR-A			
6	CR-A terminates call to controller	Call to controller is terminated. CR-A in default shunting idle status			

17.10 RETURNING TO TRAIN MODE

17.10.1 Basic operation

Purpose: This test is to show that leaving shunting mode and entering train radio is supported by the CR. After entering train mode the train emergency group Id 299 and other train group Id's are activated, the common shunting group Ids and shunting emergency group Id 599 are de-activated.

Preconditions for the test: CR-A shall be in shunting mode with Group Id 500 activated.

Reference: **FRS § 5.2.2.64; SRS § 14.4.15**

- CR-A selects menu for train mode
- CR-A enters train mode
- Shunting group Id's are de-activated, train group Id's 200 and 299 are activated, shunting emergency group Id is de-

activated.

- MS-B initiates group call 500, CR-A does not receive and indicate group call 500
- MS-B initiates shunting emergency call 599, CR-A does not receive and indicate shunting emergency call 599

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Activate train mode on the CR-A using menu options	According CR User Manual CR-A changes mode to train radio			
2		All shunting Group Ids except emergency group Id 599 are de-activated Group Id 200 and train emergency group Id 299 are activated Emergency group Id 599 is de-activated CR-A display according train mode (as documented in the User Manual) CR-A in default idle status			
3	MS-B initiates group call 500 and takes the uplink, press PTT	Group call 500 is established by MS-B CR-A in default idle status (Group call 500 is not received by the CR-A in train radio mode)			
4	MS-B terminates group call 500				
5	MS-B initiates shunting emergency call 599 and takes the uplink, press PTT	Shunting emergency call 599 is established by MS-B CR-A in default idle status (Shunting emergency call 599 is not received by the CR-A in train radio mode)			
6	MS-B terminates shunting emergency call 599				
7	According CR User Manual CR-B initiates group call "other drivers in the area" and takes the uplink, press PTT	According CR User Manual CR-A receives group call "other drivers in the area" and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
8	CR-B terminates group call By HMI action	Group call "other drivers in the area" is terminated CR-A in default idle status			

9	According CR User Manual CR-B initiates „train emergency call" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity (299 or textual translation of 299) Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
10	CR-B terminates group call	Group call „train emergency call" is terminated CR-A in default idle status CR-B in default idle status			

17.10.2 Leaving shunting mode, transfer to train radio during simultaneous incoming shunting emergency call 599

Purpose: This test is to show that during the transition leaving shunting mode and entering train radio the CR is capable to receive shunting emergency call (if the GId 599 is not yet deactivated).

Preconditions for the test: CR-A shall be in shunting mode and registered to shunting team 03.

Reference: **FRS § 5.2.2.64; SRS § 14.4.15**

- CR-A selects menu for train mode
- CR-A starts procedure to enter train mode
- MS-B initiates a shunting emergency call
- CR-A receives*) the shunting emergency call
- CR-A joins the shunting emergency call automatically
- CR-A listens to the shunting emergency call
- MS-B terminates the shunting emergency call

- *) Depending on timing.

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Activate train mode on the CR-A using menu options	According CR User Manual CR-A starts procedure to change mode to train radio CR-A display indicating the transition procedure			
2	MS-B initiates shunting emergency call 599 and takes the uplink, press PTT	If shunting emergency call 599 is set up quickly enough: CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity MS-B can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
3	MS-B terminates shunting emergency call 599	Group call „shunting emergency call" is terminated CR-A in default shunting idle status or CR-A in default idle status			

17.10.3 Leaving shunting mode during a shunting call

Purpose: This test is to show that during the transition leaving shunting mode and entering train radio is possible without the driver explicitly leaving an active call

Preconditions for the test: CR-A shall be in shunting mode and registered to shunting team 03. A shunting group call to Group 03 is active (initiated by MS-B).

Reference: **FRS § 5.2.2.64; SRS §, 14.4.13 (O), 14.4.14, 14.4.15**

- CR-A selects menu for train mode
- CR-A starts procedure to enter train mode
- CR-A leaves on-going group call – the call continues for other participants
- CR-A enters train mode

Step	Procedure	Effects	Result Test1	Result Test2	Result Test3
1	According CR User Manual Activate train mode on the CR-A using menu options	According CR User Manual CR-A starts procedure to change mode to train radio CR-A display indicating the transition procedure			
		CR-A leaves the shunting group call for Group Id 503. All shunting Group Ids except emergency group Id 599 are de-activated Group Id 200 and train emergency group Id 299 are activated Emergency group Id 599 is de-activated CR-A display according train mode (as documented in the User Manual)			
2	MS-B initiates terminates shunting group call for Group Id 503	CR-A in default idle status			
3	MS-B initiates group call 500 and takes the uplink, press PTT	Group call 500 is established by MS-B CR-A in default idle status (Group call 500 is not received by the CR-A in train radio mode)			
4	MS-B terminates group call 500				
5	MS-B initiates shunting emergency call 599 and takes the uplink, press PTT	Shunting emergency call 599 is established by MS-B CR-A in default idle status (Shunting emergency call 599 is not received by the CR-A in train radio mode)			
6	MS-B terminates shunting emergency call 599				

7	According CR User Manual CR-B initiates group call "other drivers in the area" and takes the uplink, press PTT	According CR User Manual CR-A receives group call "other drivers in the area" and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
8	CR-B terminates group call By HMI action	Group call "other drivers in the area" is terminated CR-A in default idle status			
9	According CR User Manual CR-B initiates „train emergency call" and takes the uplink, press PTT	According CR User Manual CR-A receives and accepts call automatically An audible indication is given on the loudspeaker A visual indication is displayed on the HMI incl. group identity (299 or textual translation of 299) Caller can be heard on driver's loudspeaker Indication to use PTT to talk is given to the driver on the HMI			
10	CR-B terminates group call	Group call „train emergency call" is terminated CR-A in default idle status CR-B in default idle status			

18. EIRENE SIM

At the moment no explicit SIM test cases foreseen in this specification. The following sections cover implicit SIM tests at a user functional level:

Switching on the Cab Radio

Registration / De-registration of Cab Radio and it's interfaces

Numbering scheme

Using eMLPP Priorities

Automatic answering

Using GIDs for VGC and VBC

Railway Emergency calls

Confirmation of high priority calls

Text Messaging

Network selection

Self Test

Shunting Operation

Note: In future releases of this specification explicit EIRENE SIM test cases may be included.

19. ANNEX 1 – PRODUCT ACCEPTANCE FORM

The GSM-R product referenced hereafter, tested with the software referenced _____, was tested according to the test procedure included in the Cab Radio Functional Test Specification V_____ .

The results of the tests are listed in the Annex .

Product:

Reference of the Cab Radio: _ _ _ _ _ _

Serial numbers of the tested mobile(s):

Tested in (location):

On the network:

The product described above is declared as:

«ACCEPTED »   « REJECTED»

With the following remarks:

Date: Date:

Suppliers   Customer

20. ANNEX 2 – PRODUCT DECLARATION

21. ANNEX 3 – TEST RESULTS

Sect.	Test Case	Test1	Test2	Test3	Result	Remark
4.	SWITCHING ON THE CAB RADIO					
4.1	System boot with error-free device					
4.2	System boot with faulty device					
5.	OPERATION IN IDLE MODE					
5.1	No GSM-R Network Coverage Indication					
5.2	Manual settings of the Cab Radio HMI					
5.2.3	Loudspeaker Volume					
6.	ENTRY OF TRAIN DATA / REGISTRATION					
6.1	Registration of the Train number					
6.1.1	Registration of train number to Cab Radio					
6.1.2	Registration of functional address to other driver (non-leading driver)					
6.1.3	Incoming Voice Call during Functional Number Registration					
6.2	Correction of registration error					
6.2.1	Correction of train data					
6.2.2	Forced de-registration					
6.3	Deregistration					
6.3.1	Deregistration of train number					
6.3.2	Incoming Voice Call during Functional Number Deregistration					
6.3.3	Deregistration after entering another GSM-R Network					
7.	POINT-TO-POINT CALL					
7.1	Incoming PTP call					
7.1.1	Incoming ptp call to driver with priority 4					
7.1.2	Incoming call to driver with priority higher than 4 (automatic answering)					
7.1.3	Incoming PA call from Primary Controller					
7.1.4	Incoming call to Intercom					
7.1.5	Incoming call from Conductor via UIC Intercom system					
7.1.6	Call hold for incoming ptp calls					
7.1.7	Handover during incoming call (cell change in the same location area)					
7.1.8	Handover during incoming call (cell change to different location area)					
7.2	Outgoing calls (point-to-point call, MOC)					
7.2.1	Call to Controller (Primary, Secondary, Power Supply)					
7.2.2	Call to busy Controller (Primary, Secondary, Power Supply)					
7.2.3.1	Call chief conductor using ptp voice call					
7.2.4	Call cab radio's public address system					
7.2.7	Initiate call dialling a functional number					
7.2.8	Initiate call dialling MSISDN or number of fixed network user					

7.2.9	Point-to-point call using train staff list to catering staff					
7.2.10	Presentation of functional number of the Cab Radio, no train number is registered					
7.2.11	Handover during outgoing call (cell change in the same location area)					
7.2.12	Handover during outgoing call (cell change different location area)					
7.3	Pre-emption of a PTP Call					
7.5	Conference calls					
7.5.1	Multiple driver communications within the same train by the leading driver					
7.5.2	Multiple driver communications within the same train by the other drivers					
7.5.3	Incoming call from controller during multiple driver communications					
8.	GROUP CALLS					
8.1	Incoming group calls					
8.1.1	Incoming group call "All drivers in same area"					
8.1.2	Incoming other group call					
8.1.3	Cell change of the group call listener (same location area)					
8.1.4	Cell change of the group call listener (different location area)					
8.1.5	Moving out of the group call area of the group call listener					
8.1.6	Switching on the Cab Radio during an ongoing group call					
8.2	Outgoing group calls					
8.2.1	Outgoing group call "All drivers in same area"					
8.2.2	Terminating outgoing group call "All drivers in same area", uplink busy					
8.2.3	Group call talking Cab Radio downlink mute / unmute procedure					
8.2.4	Handover of the talking CR during Outgoing group call "All drivers in same area"					
8.2.5	Terminating outgoing group call "All drivers in same area", originator after cell change					
8.2.6	Moving out of the group call area of the group call talker					
8.3	Pre-emption of group calls					

10.	TRAIN EMERGENCY CALL					
10.1	Incoming train emergency call					
10.1.1	Incoming train emergency call in idle mode					
10.1.2	Incoming train emergency call during initiation of a ptp call					
10.1.3	Incoming train emergency call during an ongoing ptp call					
10.1.4	Incoming train emergency call during an ongoing call from the conductor via UIC Intercom system					
10.1.5	Incoming train emergency call during a multi drivers' conference					
10.1.6	Incoming train emergency call during an ongoing group call					
10.1.7	Test removed					
10.1.8	Cell change of the listener in an ongoing train emergency call (different location area)					
10.1.9	Moving out of the group call area of the listener in an ongoing train emergency call					
10.1.10	Switching on the Cab Radio during an ongoing train emergency call					
10.1.11	Late entry into an area with an ongoing train emergency call					
10.2	Outgoing train emergency call					
10.2.1	Outgoing Train emergency call in idle mode					
10.2.2	Outgoing train emergency call during initiation of a PTP call					
10.2.3	Train emergency call during an ongoing ptp call					
10.2.4	Train emergency call during an ongoing multi drivers' conference					
10.2.5	Train emergency call during an ongoing group call					
10.2.6	Test removed					
10.2.7	Handover of the train emergency call originator					
10.2.8	Moving out of the train emergency call area of the originator in an ongoing train emergency call					
10.2.9	Re-entry into train emergency call area as originator					
10.2.10	Re-dial of train emergency call after unsuccessful train emergency call initiation					
10.3	Train emergency call confirmation					
10.3.1	Train emergency call confirmation for incoming train emergency calls					
10.3.2	Train emergency call confirmation for outgoing train emergency calls					
10.3.3	Train emergency call confirmation after loss of network coverage					
10.3.4	Train emergency call confirmation after higher priority (3) outgoing ptp call					
10.3.5	Train emergency call confirmation after an outgoing ptp call same priority (4)					

10.3.6	Train emergency call confirmation after higher priority (3) incoming ptp call					
10.3.7	Train emergency call confirmation after an incoming ptp call same priority (4)					
11.	CALL ARBITRATION					
11.1	Call arbitration during an ongoing train emergency call					
11.1.1	Emergency call during an ongoing train emergency call					
11.1.2	Intercom call during an ongoing train emergency call					
11.1.3	Call to PA system during an ongoing train emergency call					
11.1.4	Call to chief conductor during an ongoing train emergency call					
11.1.5	Incoming calls during an ongoing train emergency call					
11.2	Call arbitration during an ongoing group call "all drivers in same area"					
11.2.1	Outgoing emergency call during an ongoing group call "all drivers in same area"					
11.2.2	Call to PA system during an ongoing group call "all drivers in same area"					
11.2.3	Call to chief conductor during an ongoing group call "all drivers in same area"					
11.2.4	Intercom call to other engine during an ongoing group call "all drivers in same area"					
11.2.5	Incoming train emergency call during an ongoing group call "all drivers in same area"					
11.2.6	Other calls during an ongoing group call "all drivers in same area"					
11.3	Call arbitration during an ongoing controller call					
11.3.1	Outgoing train emergency call during an ongoing call to controller					
11.3.2	Call to the PA system during an ongoing call to controller					
11.3.3	Call to chief conductor during an ongoing call to controller					
11.3.4	Intercom call to other engine during an ongoing call to a controller					
11.3.5	Other outgoing calls during an ongoing call to a controller					
11.3.6	Incoming train emergency call during an ongoing call to a controller					
11.3.7	Incoming group call "all drivers in same area" during an ongoing call to a controller					
11.3.8	Other incoming calls during ongoing call to a controller					
11.4	Call arbitration during an ongoing multiple driver communication					
11.4.1	Train emergency call during an ongoing multi drivers' conference					
11.4.2	Call to PA system during an ongoing multi drivers' conference					
11.4.3	Call to chief conductor during an ongoing multi drivers' conference					

11.4.4	Incoming emergency call during an ongoing multi drivers' conference					
11.4.5	Intercom call to other engine during an ongoing multi drivers' conference					
11.4.6	Other outgoing calls during an ongoing multi drivers' conference					
11.4.7	Call to a controller during an ongoing multi drivers' conference					
11.4.8	Incoming group call "all drivers same area" during an ongoing multi drivers' conference					
11.4.9	Incoming call from controller during an ongoing multi drivers' conference					
11.4.10	Other incoming calls during an ongoing multi drivers' conference					
11.5	**Call arbitration during an ongoing call to the PA system over radio link**					
11.5.1	Outgoing emergency call during an ongoing call to the PA system over radio link					
11.5.2	Call to PA system during an ongoing call to the PA system over radio link					
11.5.3	Call to chief conductor during an ongoing call to the PA system over radio link					
11.5.4	Call to controller during an ongoing call to the PA system over radio link					
11.5.5	Incoming call to intercom during an ongoing call to the PA system over radio link					
11.5.6	Incoming emergency call during an ongoing call to the PA system over radio link					
11.5.7	Incoming group call "all drivers same area" during an ongoing call to the PA system over radio link					
11.5.8	Call from a controller during an ongoing call to the PA system via radio					
11.5.9	Other incoming calls during an ongoing call to the PA system over radio link					
11.6	**Call arbitration during an ongoing call to the PA system by the driver**					
11.6.1	Outgoing emergency call during an ongoing call to the PA system					
11.6.2	Call to controller during an ongoing call to the PA system					
11.6.3	Call to PA system during an ongoing call to the PA system					
11.6.4	Call to chief conductor during an ongoing call to the PA system					
11.6.5	Intercom call to other engine during an ongoing call to the PA system					
11.6.6	Other incoming calls during an ongoing call to the PA system					
11.7	**Call arbitration during an ongoing call to chief conductor over radio link**					
11.7.1	Outgoing emergency call during an ongoing call to chief conductor over radio link					
11.7.2	Call to PA system during an ongoing call to chief conductor over radio link					

11.7.3	Call to chief conductor during an ongoing call to chief conductor over radio link					
11.7.4	Intercom call to other engine during an ongoing call to chief conductor over radio link					
11.7.5	Call to a controller during an ongoing call to chief conductor over radio link					
11.7.6	Other incoming calls during an ongoing call to chief conductor over radio link					
12.	TEXT MESSAGING (SMS)					
12.1	Receiving a text message					
12.1.1	Receive and read a text message using SMS teleservice					
12.1.2	Receiving a text message during an ongoing ptp call					
12.1.3	Incoming text messages with max. length					
12.2	Sending a text message					
13.	LANGUAGE SETTING					
14.	NETWORK SELECTION					
14.1	Manual Network Selection					
14.1.1	Manual network selection in idle mode					
14.1.2	Manual network selection during an ongoing call					
15.	SWITCH CAB RADIO HMI ON/OFF					
15.1	Switch Cab Radio HMI Off					
15.2	Switch Cab Radio HMI On					
16.	MANUAL SELF TEST					
16.1	Manual self test by driver					
16.2	Incoming emergency call during an ongoing manual self test					
17.	SHUNTING					
17.1	Entering shunting mode					
17.1.1	Entering Shunting Mode with auto-activation of Group Id 500					
17.1.2	Entering Shunting Mode with driver confirmation of activation of Group Id 500					
17.1.3	Entering Shunting Mode with driver rejection of activation of Group Id 500					
17.1.4	Entering Shunting Mode with no activation of activation of Group Id 500					
17.1.5	Entering Shunting Mode with auto-activation of Group Id 500 during on-going Group 500 call					
17.1.6	Switching to shunting mode not available during ongoing call					
17.2	Operation during active Call to Group 500					
17.2.1	Basic Operation					
17.2.2	Basic Operation with incoming emergency call					
17.2.3	Basic Operation with outgoing emergency call					
17.2.4	Basic Operation with incoming ptp call					
17.2.5	Moving out of shunting area					
17.2.6	Lose network					
17.3	Operation in idle mode					
17.3.1	Incoming Emergency					

17.3.2	Outgoing Emergency					
17.3.3	Incoming PTP call					
17.3.4	Outgoing PTP call					
17.3.5	Lose network					
17.4	Use of dedicated shunting groups					
17.4.1	Entering a Dedicated Shunting Group					
17.4.2	Pre-emption of the shunting group call 501 by an incoming shunting emergency call					
17.4.3	Pre-emption of incoming shunting group call 501 by an outgoing shunting emergency call					
17.4.4	Basic operation plus incoming PTP call					
17.4.5	Change dedicated shunting group					
17.4.6	Return to common shunting group 500					
17.4.7	Changing back to common shunting group 500 during simultaneous incoming shunting emergency call 599					
17.5	Use of Area Code					
17.5.1	Entering a Shunting Group Area					
17.5.2	Changing a Shunting Group Area					
17.6	Registering a functional identity					
17.6.1	Registering a functional identity					
17.6.2	Changing a functional identity					
17.6.3	Changing a functional identity – failed registration					
17.6.4	Storage of Shunting Data					
17.7	Link Assurance Signal					
17.7.1	Receiving the Link Assurance Signal					
17.7.2	Pre-emption of the link assurance signal by an incoming shunting emergency call 599					
17.7.3	Pre-emption of the link assurance signal by an outgoing shunting emergency call 599					
17.8	Call arbitration in shunting mode					
17.8.1	Outgoing emergency call during an ongoing shunting group call					
17.8.2	Call to PA system during an ongoing shunting group call					
17.8.3	Call to chief conductor during an ongoing shunting group call					
17.8.4	Intercom call to other engine during an ongoing shunting group call					

17.8.5	Incoming shunting emergency call during an ongoing shunting group call					
17.8.6	Incoming "all drivers in same area" call during an ongoing shunting group call					
17.8.7	Other outgoing call during an ongoing shunting group call					
17.8.8	Other incoming call during an ongoing shunting group call					
17.9	Call arbitration during an ongoing controller call					
17.9.1	Outgoing train emergency call during an ongoing PTP call in shunting mode					
17.9.2	Call to the PA system during an ongoing PTP call in shunting mode					
17.9.3	Call to chief conductor during an ongoing PTP call in shunting mode					
17.9.4	Intercom call to other engine during an ongoing PTP call in shunting mode					
17.9.5	Other outgoing calls during an ongoing PTP call in shunting mode					
17.9.6	Incoming train emergency call during an ongoing PTP call in shunting mode					
17.9.7	Incoming group call "all drivers in same area" during an ongoing call to a controller					
17.9.8	Other incoming calls during ongoing PTP call in shunting mode					
17.10	Returning to train mode					
17.10.1	Basic operation					
17.10.2	Leaving shunting mode, transfer to train radio during simultaneous incoming shunting emergency call 599					
17.10.3	Leaving shunting mode during a shunting call					