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Company / Organization	**UIC ERTMS/GSM-R Operators and Functional Group** **UNITEL Technical Group**

Test specifications for GSM-R MI related requirements
Part 4: Network

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Document Data Sheet

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Evolution Sheet

Revision	Date	Author	Pages	Description of changes
0.1	18/10/2015	Ecaterina Ganga (Nokia)	all	First draft
0.2	18/11/2015	Ecaterina Ganga (Nokia)	all	Updated draft
0.3	30/11/2015	Ola Bergman (Nokia)	all	Executive summary enhanced, TC numbering and descriptions consistent, doc id and footer modified
0.3.4	02/12/2015	Ola Bergman (Nokia)	all	95% consistent and aligned
0.3.5	03/12/2015	Ola Bergman (Nokia)	all	2 % more
0.3.6	04/12/2015	Ola Bergman (Nokia)	all	99,9%, MI-TC Cross Ref table still to be referenced
0.3.7	11/12/2015	Ola Bergman (Nokia)	all	Ulrich Geier review remarks incorporated
0.3.8	05/08/2016	Erich Seitz (Kontron T.)	all	Some Formatting Changes eREC and URNR included
0.3.9	15/09/2016	Ecaterina Ganga (Nokia)	all	Introducing additional chapters to separate TC for MI and O features
0.3.10	16/09/2016	Ecaterina Ganga (Nokia)	all	Including reference to the cross-reference test cases to EIRENE specification excel table
0.4	27/09/2016	M. Lauwers/E. Ganga (Nokia)	all	Including EIRENE 8/16 specific test cases
0.4.1	03/11/2016	Ulrich Geier (Kontron T.)	8	Numbering of references
0.4.2	04/11/2016	Ecaterina Ganga (Nokia)	all	Editorial changes
0.4.3	07/12/2016	Markus Tremp (Nokia)	all	Update based at review comments
0.4.4	10/04/2017	Ulrich Geier (Kontron T.)	all	Comments integrated from Review sheet
0.4.5	18/04/2017	Ulrich Geier (Kontron T.)	all	Comments integrated after internal Review – Front page added
0.4.6	03/05/2017	Ulrich Geier (Kontron T.)	all	Renumbering of test cases
1.0.0	23/05/2017	Ulrich Geier (Kontron T.)	Ch. 6.1	Correction
1.1.0	16/11/2017	Robert Sarfati (UIC)	all	UIC
1.1.1	16.01.2020	Boris Gombač (UIC)	all	Editorial changes
1.1.2	17.02.2020	Boris Gombač (UIC)	all	“MS Dispatcher” replaced with “Controller”
1.1.3	27.07.2020	Boris Gombač (UIC)	121, 123,	Adaption of applicable Change Requests: CR 9249 (ERA 5038),
1.2.0	08.04.2021	UIC	all	Final version

Contents

1 Object

1.1 Purpose of the document

This document defines the test plan and the test cases for GSM-R network, i.e. track side infrastructure, to allow its assessment to prove the fulfilment of EIRENE MI (Mandatory for Interoperability in EU) requirements for GSM-R Baseline 1 release 0, according to reference [1].

It is a guide for the tests to be used to prove a majority of requirements marked as Mandatory for Interoperability (MI) in the EIRENE specification, during the Notified Body process of certification of the GSM-R network elements.

A cross-reference table, mapping the EIRENE specification requirements for the Network towards the test cases identified to verify them, is indicated in Annex A.

The test cases are grouped per MI requirements and each requirement is referred to the necessary test(s) case(s) which verify the corresponding correct implementation.

Some test cases, in particular addressing VBS, for which no corresponding MI requirements exist, are included. Besides representing important functionality and to make the document more useful as well as future proof, this inclusion has been done.

Many of the proposed test cases feasibility were verified by lab tests. These were performed with the purpose to validate that the test cases fulfil the objective of proving the MI requirements in EIRENE and that they can be executed efficiently.

The testing was carried out in the test labs of NOKIA and between 10th of August 2013 and 25th of October 2013 according to [i2] and [i3].

1.2 Abbreviations

AM	Access Matrix
APN	Access Point Name
ATO	Automatic Train Operation
BAIC	Barring Incoming Call
BAOC	Barring Outgoing Call
BCCH	Broadcast Channel
BSC	Base Station Controller
BSS	Base Station Sub-system
BTS	Base Transceiver Station
CDR	Call Data Record
CF	Call Forwarding
CFB	Call Forwarding Busy Subscriber
CFU	Call Forwarding Unconditional
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
COO	Cell of Origin
COR	Class of Right
CT	Call Type
DCH	Dedicated Channel
DISP	Dispatcher

DMI	Driver Machine Interface
DNS	Domain Name Server
EDOR	ETCS Data Only Radio
eMLPP	enhanced Multi-Level Precedence and Pre-emption
ER	Extended Range
eREC	Enhanced Railway Emergency Call
ER-GSM band	Extended Railways GSM band
ETCS	European Train Control Service
EU	European Union
EVEA	Enhanced Very Early Assignment
FA	Functional Addressing
FC	Functional Code
FN	Functional Number
FNN	Follow Me Function Node
FRS	Functional Requirements Specification
GCA	Group Call Area
GCCH	Group Control Channel
GCH	Group Cannel
GCR	Group Call Register
GCRef	Group Call Reference
GGSN	Gateway GPRS Support Node
GID	Group ID
GID	Group Identity
GPRS	General Packet Radio Service
HLR	Home Location Register
HO	Handover
IC	International Code
IF	Interface
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IOT	Interoperability Test
KMS	Key Management System
LDA	Location Dependent Addressing
LU	Location Update
MI	Mandatory for Interoperability in EU
MMC	Mobile to Mobile Call
MPTY	Multi Party
MS	Mobile Station
MSC	Mobile services Switching Centre
MSG	Message

MSISDN	Mobile Station International ISDN Number
MSUB	Mobile Subscriber
MTC	Mobile Terminating Call
NSS	Network Sub-system
ODB	Operator determined barring
OM	Operational Measurement
OTDI	Originator to Dispatcher Information
PCU	Packet Control Unit
PEC	Public Emergency Call
PFN	Presentation of Functional Numbers
PLMN	Public Land Mobile Network
PtP	Point to Point
QoS	Quality of Service
RBC	Radio Block Center
REC	Railway Emergency Call
SA	Service Area
SGSN	Serving GPRS Support Node
SID	Sector ID
SIM	Subscriber Identity Module
SMS	Short Message
SMSC	Short Message Service Center
SRS	System Requirements Specification
SS	Service Subscriber
TCH	Traffic Channel
TCT	Train Controller Terminal
TCU	Transcoding Unit
TRX	Transceiver
UE	User Equipment
UIC	Union Internationale des Chemins de Fer
UL	Uplink
USSD	Unstructured Supplementary Service Data
UUS1	User-to-User Signaling type 1
VBS	Voice Broadcast Service
VGCS	Voice Group Call Service
VLR	Visitor Location Register

1.3 Reference Documents

1.3.1 Normative references

[1] EIRENE FRS 8.0.0 UIC 950-0.0.2 and EIRENE SRS 16.0.0 UIC 951-0.0.2

[2] ETSI EN 301 515 v2.3.0, “Global System for Mobile Communication (GSM); Requirements for GSM operation on railways”

[3] ETSI TS 102 281 v3.0.0 “Railways Telecommunications (RT); Global Systems for Mobile Communication (GSM); Detailed requirements for GSM operation on Railway”

[4] ETSI TS 103 169 ‘Railway Telecommunications (RT); ASCI Options for Interoperability for GSM operation on Railways version 1.1.1 (2011-09)

[5] Opinion on errors ERA/OPI/2020-2

1.3.2 Informative references

[i1] GSM-R Network Assessment Test Plan; UIC document O - 3114 Version 1.0 dated 24.1.2013

[i2] GSM-R IOT test cases as part of the TEN-T 2007-EU-60040-P project – “TP TEN Phase 9.1 v. 1.4 and TP TEN Phase 9.2 and 9.3 v. 1.4/ February 2012”

[i3] GSM-R IOT test results as part of the TEN-T 2007-EU-60040-P project – “IOT 9.1 report v.1.7, IOT 9.2 report v.1.7 and IOT 9.3 report v.1.7 / May 2012”

2 Test Configuration

2.1 Overview

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

- GSM-R Network(s)
- Cab Radio
- General purpose radio (GPH) or operational purpose radio (OPH)
- Shunting radio (OPS)
- Controller terminal
- ISDN termination (RBC)
- SIM Cards

2.2 Equipment required

- GSM-R network(s) operating in the R-GSM 900 band
- GSM Abis-tracer or GSM A-tracer, in order to check the contents on the messages exchanged between mobiles and network when required
- Cab Radio
- Fixed network controller (dispatcher)
- ISDN termination (RBC)
- Enough mobile stations (Cab Radio or handheld) to cover multiparty calls
- GSM-R SIM cards with all the services and features provisioned and configured for the appropriate mobile user and function
- 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

2.3 Network configuration

The GSM-R network needs to be fully compliant to the requirements listed in EIRENE FRS and SRS [1] and to ETSI specifications referenced in [2], [3] and [4].

2.4 Cross-Reference of test cases and EIRENE FRS and SRS

Annex A includes a cross reference between the requirements listed in EIRENE FRS and SRS [1] and the test cases listed in this document. Performing the test for a specific requirement may require several test cases respectively results of a specific test case may be used for several different requirements. The cross-reference tables included in Annex A allow an easy overview about the relation between test and requirement.

The cross-reference is split between EIRENE FRS and SRS [1] and includes the section number, a short description of the requirement, status of the requirement and a list of test cases to be performed to prove the requirement.

A separate table includes information about the sections in the EIRENE FRS and SRS [1] the results of a test case will be used for.

3 Completion of the Functional tests

3.1 Test Cases List for Mandatory for Interoperability (MI) features

3.1.1 Basic and Supplementary GSM Services

This test area covers a set of tests for basic and supplementary GSM voice and data services in a GSM-R system.

This includes

- Location Update and Location Cancellation
- IMSI Attach and Detach
- Mobile Originated and Mobile Terminated Calls
- Data calls
- Subscription, Activation, Deactivation, Interrogation of supplementary services
- Call Hold, Call Waiting, CLIP, CLIR, notification of Call Forwarding
- Multi-Party, MPTY
- Closed user Group, CUG
- Public emergency calls

Test Id	Description
RINF_GSM_1	Successful Location Update after MS Power On
RINF_GSM_2	Supplementary Service Call Hold
RINF_GSM_3	Supplementary Service Call Waiting
RINF_GSM_4	Supplementary Service CLIP – MMC with Call Forwarding Unconditional
RINF_GSM_5	Supplementary Service MPTY
RINF_GSM_6	Establishment of several PtP calls with different priorities
RINF_GSM_7	Public Emergency Call – With SIM
RINF_GSM_8	Short and long SMS
RINF_GSM_9	Mobile subscriber receives a call from Subscriber on other Network

Number of test cases: 9

3.1.2 Handover

This test area verifies the correct functioning of handovers for different services in different scenarios in a GSM-R system.

This is:

- Inter BTS handovers for Point to Point calls

Test id	Title
RINF_HO_1	Inter BTS handover of a point to point voice call
RINF_HO_2	Ongoing point to point voice call in the destination cell preempted by a inter BTS handover inwards of a point to point voice call

Number of test cases: 2

3.1.3 Functional Addressing (FA)

This test area verifies the correct functioning of the FA service in a GSM-R system.

This includes:

- Registration Management
- Calls to Functional Numbers
- Failure cases (e.g. registration failure, party already registered)

Test Id	Description
RINF_FA_1	Registration of an FN Number
RINF_FA_2	Registration of an unknown FN fails
RINF_FA_3	Deregistration of an FN Number
RINF_FA_4	Deregistration of an FN fails
RINF_FA_5	Interrogation of an FA Number
RINF_FA_6	Interrogation of an FN fails
RINF_FA_7	FA Call - Successful Call
RINF_FA_8	FA Call – Call is not completed
RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
RINF_FA_10	Deregistration of CT2 numbers while roaming
RINF_FA_11	Forced Deregistration
RINF_FA_12	Unsuccessful registration with Lead driver number (CT2 FC 01) because of wrong CoR (CT2 FC10 works)
RINF_FA_13	Register 3 function numbers to one user (non-roaming case)
RINF_FA_14	Registration of an FN fails - remote party already registered
RINF_FA_15	FA Call - Successful Call

Number of test cases: 15

3.1.4 Location Dependent Addressing (LDA)

This test area verifies the correct functioning of the LDA service in a GSM-R system

This includes:

- Successful LDA call, correct transfer of the Cell of Origination information
- Failure cases (e.g. LDA destination does not exist)

Test Id	Description
RINF_LDA_1	Successful LDA Call - Verify the cell format is correct
RINF_LDA_2	Unsuccessful LDA Call - Call to invalid Short Code

Number of test cases: 2

3.1.5 Enhanced Multi-Level Precedence and Pre-emption Service (eMLPP)

This test area verifies the correct functioning of the eMLPP service in a GSM-R system.

This includes:

- Pre-emption of PtP, VBS, VGCS, data calls by PtP, VBS, VGCS, data calls of higher priority and REC calls
- Assigning and handling of priorities to different resources and passing the priority information through the system
- Interaction of eMLPP with handovers
- Failure scenarios

Test Id	Description
RINF_eMLPP_1	MS in VGCS call on DCH, pre-emption on Air IF by higher prio PtP call
RINF_eMLPP_2	MS in VBS call as listener, pre-emption on Air IF by higher prio VBS call.
RINF_eMLPP_3	MS in VGCS call having the UL of the GCH, pre-emption on Air IF by higher prio VBS call.
RINF_eMLPP_4	MS in PtP call, pre-emption on MS by higher prio VGCS call (REC)
RINF_eMLPP_5	MS in VBS call as originator, pre-emption on Air IF by higher prio VGCS call (REC)
RINF_eMLPP_6	MS in VGCS call having the UL of the GCH, pre-emption on MS by higher prio VGCS call (REC)
RINF_eMLPP_7	MS in data call, pre-emption on Air IF by higher prio VGCS call (REC)
RINF_eMLPP_8	MS in PtP call, pre-emption on Air IF by higher prio data call (4800 baud, transparent)
RINF_eMLPP_9	eMLPP priority is preserved during CFU (Call Forwarding Unconditionally)
RINF_eMLPP_10	eMLPP prio is preserved during CFB (Call Forwarding Busy)

Number of test cases: 10

3.1.6 Voice Group Call Service (VGCS)

This test area verifies the correct functioning of the VGCS service in a GSM-R system.

This includes:

- Uplink management between BSSs.
- Muting/Unmuting

Test Id	Description
RINF_VGCS_1	SS originates VGCS call
RINF_VGCS_2	Controller originates VGCS call and takes it down with the kill Sequence
RINF_VGCS_3	SS originates VGCS call, leaves, rejoins and ends it.
RINF_VGCS_4	SS enters into VGCS broadcast area with ongoing VGCS call and is notified of it
RINF_VGCS_5	Controller joins ongoing VGCS call
RINF_VGCS_6	Parallel group calls are possible in the same cell.
RINF_VGCS_7	GID delivered correctly to terminating SS in SS originated VGCS call

Number of test cases: 7

3.1.7 Voice Broadcast Service (VBS)

This test area verifies the correct functioning of the VBS service in a GSM-R system

Test Id	Description
RINF_VBS_1	SS originates VBS call
RINF_VBS_2	SS originates prio0 VBS call
RINF_VBS_3	Controller originates VBS call and takes down the call by disconnecting
RINF_VBS_4	Controller originates VBS call and takes down the call with the kill sequence
RINF_VBS_5	Controller joins ongoing VBS call
RINF_VBS_6	SS enters into VBS broadcast area with ongoing VBS call and is notified of it, SS joins the VBS call

Number of test cases: 6

3.1.8 Railway Emergency Call (REC)

This test area verifies the REC functionality including the acknowledgement functionality in a GSM-R system

Test Id	Description
RINF_REC_1	SS originates a REC
RINF_REC_2	SS initiated REC (no talker change, normal clear down of call)
RINF_REC_3	SS accepts an incoming REC
RINF_REC_4	Controller originates a REC
RINF_REC_5	SS originates Acknowledgement Call
RINF_REC_6	REC in a GCA with a locked cell

Number of test cases: 6

3.1.9 Originator to Dispatcher Information (OTDI)

This test area verifies the correct functioning of the OTDI feature in a GSM-R system

This test will be performed using Mobile Subscriber as Mobile dispatcher. This only allow to show the functionality in the traces from protocol analyzers.

Test Id	Description
RINF_OTDI_1	SS originates VGCS call, terminating Controller receives the OTDI
RINF_OTDI_2	SS originates VGCS Immediate Setup 2 call, terminating Controller receives the OTDI

Number of test cases: 2

3.1.10 Late Entry

This test area verifies the correct functioning of the Late Entry feature in a GSM-R system

Test Id	Description
RINF_LE_1	SS active in a PtP (P4) call move in a cell with ongoing REC call
RINF_LE_2	Orig. SS active in a VBS (P4) call move in a cell with ongoing REC call
RINF_LE_3	Orig. SS active in a VGCS (P4) call on GCH (talker) move in a cell with ongoing REC call

Number of test cases: 3

3.1.11 Access Matrix

Test Id	Description
RINF_AM_1	National call - AM allows call
RINF_AM_2	National call - AM denies call

Number of test cases: 2

3.1.12 GPRS

Test Id	Description
RINF_GPRS_1	GPRS Connection Setup
RINF_GPRS_2	Contact an RBC in the ETCS domain
RINF_GPRS_3	QOS and priority test between ETCS and Background traffic

Number of test cases: 3

3.2 Test Cases List for Optional (O) features (testing MI Requirements for O features)

3.2.1 Uplink Reply/Notification response

This test area verifies the correct functioning of the feature uplink reply/notification response.

This includes:

- Allocation of a GCH when a subscriber involved in a VGCS call moves into the empty cell
- Allocation of a GCH when a subscriber involved in a VBS call moves into the empty cell
- Allocation of a GCH in all cells (even empty ones) when a subscriber originates a REC call

Test Id	Description
RINF_URNR_1	SS active in a VGCS call moves in empty cell
RINF_URNR_2	SS active in a VBS call moves in empty cell
RINF_URNR_3	SS active in a REC call moves in empty cell

Number of test cases: 3

3.2.2 Enhanced Railway Emergency Call (eREC)

This test area verifies the correct functioning of the eREC feature.

This includes:

- Verify eREC terminals are joining an eREC call if the SID is same and eREC terminals are not joining an eREC call if the registered SID is different
- Verify eREC call and REC call are both joined by eREC capable (and registered) and non eREC capable terminals

Test Id	Description
RINF_eREC_1	eREC call with correct SID – eREC MS with same SID are joining, eREC MS with different SID will not be alerted
RINF_eREC_2	eREC call which involve with eREC capable and non eREC capable terminals

Number of test cases: 2

3.2.3 ER-GSM

Verify basic GSM functionality when the network utilizes the ER-GSM frequency band. Both types of UE with and without ER-GSM capability should be capable to accede to the network.

Test Id	Description
RINF_ER-GSM	Establishment of a PtP call in a ER-GSM network (Test case description moved to chapter 5)

Number of test cases: 1

4 Test Cases Description for Mandatory for Interoperability (MI) features

4.1 Basic and Supplementary GSM Services

4.1.1 Successful Update Location after MS Power On

Test case ID: **RINF_GSM_1**

Purpose: Verify the correct data are inserted to VLR during LU

Precondition: MS subscribed to Basic and Supplementary Services

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / Effect
1	Power on the MS	Location Update (LU) is performed
2	Verify the service subscriber data is inserted correctly to VLR	Subscriber data is inserted correctly into the VLR

4.1.2 Supplementary Service Call Hold

Test case ID: **RINF_GSM_2**

Purpose: Verify the Supplementary Service Call Hold.

Precondition: Subscriber A is provisioned to the Call Hold supplementary service and has it activate
Subscriber A has an ongoing call with Subscriber B.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / Effect
1	Subscriber A puts Subscriber B on hold.	Subscriber B is put on hold, no speech path between Subscriber A and B. Subscriber A gets dial tone.
2	Subscriber A calls Subscriber C.	Call between Subscriber A and C is setup successfully.
3	Subscriber A toggles between Subscriber B and C by putting them on hold and retrieving them.	The subscriber that is on hold has no speech path to Subscriber A. The subscriber that is not on hold is able to communicate with Subscriber A.

4.1.3 Supplementary Service Call Waiting

Test case ID: **RINF_GSM_3**

Purpose: Verify the Supplementary Service Call Waiting.

Precondition: Subscriber A is provisioned to the Call Waiting supplementary service.
Subscriber A has an ongoing communication with Subscriber B.
Higher priority than the default priority should be used.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / Effect
1	Subscriber C calls Subscriber A.	Subscriber A is notified of the incoming call from Subscriber C. Subscriber C gets ringing tone. Paging message have to be checked that the priority is included – priority to be reported.

4.1.4 Supplementary Service CLIP – MMC with Call Forwarding Unconditional

Test case ID: **RINF_GSM_4**

Purpose: Verify the Supplementary Service Calling Line Identification Presentation (CLIP) with activated Call Forwarding Unconditional (CFU).

Precondition: Subscriber B is provisioned to the CLIP and the CFU supplementary service and has his calls forwarded to Subscriber C.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / Effect
1	Subscriber A calls Subscriber B.	Subscriber A is forwarded to Subscriber C. Subscriber A's MSISDN is presented to Subscriber C.

4.1.5 Supplementary Service MPTY

Test case ID: **RINF_GSM_5**

Purpose: Verify the Supplementary Service Multiparty (MPTY).

Precondition: Subscriber A is provisioned to the MPTY supplementary service.

Subscriber B is provisioned with the HOLD supplementary service.

Subscribers A, B, C, D, E, F are registered with function codes FC01, FC02, FC03, FC04, FC05, FC10 respectively.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / Effect
1	Subscriber A builds MPTY call involving 6 subscribers.	MPTY call is setup to 6 subscribers.
2	Conferee Leaves and is joined back into the MPTY call for some subscribers.	The call is stable during the leaving and joining of the conferees of MPTY.
3	Subscriber B puts the call on HOLD and resumes the call later on.	Hold notification is available for the conference controller, other conferees are still able to communicate. After resuming the call, all conferees can communicate.
4	Subscriber A drops a conferee from the MPTY call	Dropped conferee is successfully removed from the MPTY call and communication is not possible..
5	Subscriber A closes the MPTY call.	Call is taken down successfully, all resources are freed.

4.1.6 Establishment of several PtP calls with different priorities

Test case ID: **RINF_GSM_6**

Purpose: Verify basic GSM functionality.

Precondition: Subscriber A and B are provisioned to the eMLPP service.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / Effect
1	Subscriber A calls Subscriber B with priority 0, 2, 3, 4 dialling *75<Priority>#<MSISDN>.	The calls are setup correctly and the priorities are transferred correctly through the network.

4.1.7 Public Emergency Call – With SIM

Test case ID: **RINF_GSM_7**

Purpose: Verify Public Emergency Call – With SIM.

Precondition: MS has a SIM.

Proper termination point for the 112 Emergency call is available.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / Effect
1	Make the 112 Public Emergency Call.	Call is established. No error logs.

4.1.8 Short and long SMS

Test case ID: **RINF_GSM_8**

Purpose: Verify that users can use the radio while receiving SMS the following requirements. Sending SMS with 160 characters.

Precondition: 3 GSM-R mobiles (MS A, MS B, MS C) with standard options, datafill and routing.

GSM-R mobiles support long text message.

1 BTS.

1 BSC.

1 MSC.

SMSC available.

MS B is in active call with Primary Controller.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / Effect
1	MS A sends a SMS to MS B using a message text with 160 characters.	MS B receives the SMS including the message text with 160 characters. Ongoing call with the controller is maintained.
2	MS C sends a SMS to MS B using a message text with 300 characters.	MS B receives the SMS including the message text with 300 characters. Ongoing call with the controller is maintained

4.1.9 Mobile subscriber receives a call from Subscriber on other Network

Test case ID: **RINF_GSM_9**

Purpose: Verify Mandatory Requirement - Point-to-Point voice call external network.

Precondition: 1 GSM-R mobiles (MS-A) with standard options, datafill and routing.
1 BTS.
1 BSC.
1 MSC.
1 Fixed Line phone on external Network.
1 MS on external network.
Routing established to route from external network subscriber.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / Effect
1	Fixed line dials the MS A number.	MS A answers the call.
2	MS A releases the call.	The call is released properly.
3	External MS dials the MS A number	MS A answers the call.
4	MS A releases the call.	The call is released properly.

4.2 Handover

4.2.1 Inter BTS handover of a point to point voice call

Test case ID: **RINF_HO_1**

Purpose: To verify that an Inter BTS handover of a point to point voice call functions as expected.

Precondition: The BSS network is fully functional with correct reselection and handover datafill created.

Analyzers are configured and capturing messaging for the duration of the test.

A test mobile MS A is used to decode and display the BCCH information of the serving and neighbor cells.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS A establishes a point to point call to MS B.	Verify that the MS A is engaged in a point to point voice call with MS B.
2	Move MS A from one cell of a BTS to a different BTS – the destination cell - on the same BSC.	Ensure that MS A camps onto the BCCH of the destination cell and that the call with MS B remains connected.
3		The recorded message flow is analyzed and checked for correctness.

Further Handover Test cases are part of the O-2875 Version 2.0.0 Specification

4.2.2 Ongoing point to point voice call in the destination cell preempted by a inter BTS handover inwards of a point to point voice call

Test case ID: **RINF_HO_2**

Purpose: To verify that an ongoing point to point voice call in the destination cell is preempted by a inter BTS handover inwards of a point to point voice call that has a higher priority.

Precondition: The BSS network is fully functional with correct reselection and handover datafill created.

Analyzers are configured and capturing messaging for the duration of the test.

A debug mobile is used to decode and display the BCCH information of the serving and neighbor cells.

Lock all traffic channels except 2 TCH in the Destination Cell.

Originating and destination cells are located in different BTSs.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS A establishes a point to point call – Call A - to MS B, both camping in the destination cell.	1. Ensure that there is an ongoing point to point call in the destination cell (Call A). 2. Ensure that Call A is the only call in the destination cell and that there are no free traffic channels on the Um interface of the destination cell.
3	MS C establishes a point to point call - Call B - to MS D, both camping in the originating cell. Ensure that this Call B has a higher eMLPP priority level than Call A.	Call B is established.
4	Move MS C from the originating cell to the destination cell.	MS C handovers to the destination cell, Call B is maintained, Call A is preempted.
5		The recorded message flow is analyzed and checked for correctness.

Further Handover Test cases are part of the O-2875 Version 2.0.0 Specification

4.3 Functional Addressing (FA)

4.3.1 Registration of an FN Number

Test case ID: **RINF_FA_1**

Purpose: Verify the registration of an FN.

Precondition: FN is in not registered.

Subscriber A is provisioned to the FA service.

Subscriber A can register/deregister COR A, B or C numbers.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Subscriber A initiates a registration.	The network response for a successful registration. The FN is activated and displayed.
2	Query FNN for the FN.	The MSISDN of Subscriber A is registered to the FN and the FN is in registered state.
3	Verify OMs Verify ERs	The correct OMs and ERs have been generated.

4.3.2 Registration of an unknown FN fails

Test case ID: **RINF_FA_2**

Purpose: Verify a scenario for the registration of an invalid FN.

Precondition: FN is not registered.

Subscriber A is provisioned to the FA service.

Subscriber A can register/deregister COR A, B and C numbers.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Subscriber A initiates a registration to an FN that does not exist.	The request fails and the FN is neither activated nor displayed on the mobile.
2	Verify OMs Verify Event Records Verify the system for possible error logs	The correct OMs, Event Records have been generated. No error logs have been generated.

4.3.3 Deregistration of an FN Number

Test case ID: **RINF_FA_3**

Purpose: Verify the deregistration of a FN.

Precondition: FN is registered and is assigned to the MSISDN of Subscriber A.
Subscriber A is provisioned to the FA service.
Subscriber A can register/deregister COR A, B or C numbers.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Subscriber A initiates a deregistration.	The network response for a successful deregistration. The FN is deactivated and is NOT displayed on the mobile anymore.
2	Query FNN for the FN.	The MSISDN of Subscriber A is NOT registered to the FN and the FN is not registered.
3	Verify OMs Verify ERs	The correct OMs, ERs have been generated. No error logs have been generated.

4.3.4 Deregistration of a FN fails

Test case ID: **RINF_FA_4**

Purpose: Verify a failed deregistration scenario of a FN

Precondition: Subscriber A is not registered to any functional number Subscriber A is allowed to use Functional Addressing (provisioning) Subscriber A can register/deregister COR A, B and C numbers.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Subscriber A initiates a deregistration.	The request fails and Subscriber A is notified of the failed deregistration.
2	Verify OMs Verify ERs Verify the system for possible error logs and alarms.	The correct OMs, ERs have been generated. No error logs have been generated.

4.3.5 Interrogation of an FA Number

Test case ID: **RINF_FA_5**

Purpose: Verify the interrogation of an FN.

Precondition: FN is registered and is assigned to the MSISDN of Subscriber A.
Subscriber A and Subscriber B are provisioned to the FA service.
Subscriber A can register/deregister COR A, B and C numbers.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Subscriber A initiates an interrogation.	The network response for a successful interrogation. The FN is still activated and displayed on the mobile.
2	Query FNN for the FN.	The MSISDN of Subscriber A is registered to the FN and the FN is still in the registered state.
3	Subscriber B initiates an interrogation.	The network response for a successful interrogation. The FN is still activated and displayed on the mobile.
4	Query FNN for the FN.	The MSISDN of Subscriber A is registered to the FN and the FN is still in the registered state.
5	Verify OMs Verify ERs Verify the system for possible error logs and alarms.	The correct OMs, ERs have been generated. No error logs have been generated.

4.3.6 Interrogation of a FN fails

Test case ID: **RINF_FA_6**

Purpose: Verify a failed scenario of an interrogation of an FN.

Precondition: The FA service is not allowed to use this functional number (this specific FN is not provisioned in the system) Subscriber A is provisioned to the FA service.

Subscriber A can register/deregister COR A, B and C numbers.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Subscriber A initiates an interrogation for the non-existing functional number.	The network response for a failed interrogation.
2	Query FNN for the FN.	The FN is still not provisioned in the system.
3	Verify OMs Verify ERs Verify the system for possible error logs and alarms.	The correct OMs, ERs have been generated. No error logs have been generated.

4.3.7 FA Call - Successful Call

Test case ID: **RINF_FA_7**

Purpose: Verify a successful basic FA scenario.

Precondition: Subscriber A is registered to $FN_{A.}$

Subscriber B is registered to $FN_{B.}$

Subsribers can be of any type: mobile, fixed in any combinations of calls.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Action	Result
1	Subscriber A dials $FN_{B.}$	The call is established between Subscriber A and Subscriber B.
2	Check the number, which is displayed at Subscriber A.	FN_B is displayed in the display of Subscriber A.
3	Check the number, which is displayed at Subscriber B.	FN_A is displayed in the display of Subscriber B.
4	Verify OMs Verify ERs Verify the system for possible error logs and alarms.	The correct OMs, ERs have been generated. No error logs have been generated.

4.3.8 FA Call – Call is not completed

Test case ID: **RINF_FA_8**

Purpose: Verify that a call to an inactive FN is released.

Precondition: Subscriber A is provisioned to the FA service.

Subscriber A is registered to $FN_{A.}$

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Subscriber A dials an FN that does not exist.	No call will be established. Subscriber A returns to idle.
2	Verify OMs Verify ERs Verify the system for possible error logs and alarms.	The correct OMs, ERs have been generated. No error logs have been generated.

4.3.9 Verification of Functional Numbers previously registered in HPLMN

Test case ID: **RINF_FA_9**

Purpose: This test case is to verify that the functional numbers previously registered in the HPLMN can be used in the VPLMN to receive calls.

Precondition: MS_A#1 being a subscriber of PLMN A has registrations to CT2, CT3 in PLMN A.
MS_B#1 being a subscriber of PLMN B has registrations to CT2, CT3 in PLMN B.

	PLMN A	**PLMN B**
Train number - CT2	TBD	TBD
Engine number - CT3	TBD	TBD

MS_A#1 is located in its Home PLMN A,
MS_B#1 is roaming in PLMN A

PLMN A	**PLMN B**
MSa #1	
MSb #1 ←	

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS_A #1 calls MS_B #1 on all his functional numbers.	MS_B #1 receives all calls correctly Correct Presentation of the FN to be checked.
2	MS_B #1 calls MS_A #1 on all its functional numbers.	MS_A #1 receives all calls correctly Correct Presentation of the FN to be checked.

4.3.10 Deregistration of CT2 numbers while roaming

Test case ID: **RINF_FA_10**

Purpose: Verify that the Mobile Station can deregister the functional numbers when roaming in a VPLMN.

Precondition:

PLMN A	PLMN B
MSb #1 ←	

MSb #1 is roaming into the visited PLMN A from its home PLMN B
MSb #1 registered to CT2 number 2-xxxxx xx in both networks.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Using the DMI MSb#1 deregisters from the CT2 number registered in the HPLMN.	MSb#1 is de-registered and receives a confirmation message. MSb #1 is still registered for the VPLMN CT2 number.

4.3.11 Forced Deregistration

Test case ID: **RINF_FA_11**

Purpose: Verify that a MS can perform a forded deregistration procedure and the network informs the mobile which has been deregistered.

Precondition: Subscriber A is provisioned to the FA service.

Subscriber A is registered to $FN_{A.}$

Subscriber B is not registered to a Functional Number.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Subscriber B initiates a forced deregistration notification procedure.	Procedure completes successfully and Mobile of Subscriber B is registered to the FN previously held by Subscriber A.
2	Mobile Station of Subscriber A is notified of the forced deregistration and performs an interrogation procedure.	After the interrogation procedure the MS informs the user that the status of the FN has changed (i.e. starts to let the FN blink on the screen).

4.3.12 Class of Registration (CoR) for CT2 FC01 not allowed, CT2 FC10 allowed

Test case ID: **RINF_FA_12**

Purpose: Verify that a subscriber, MS A#1 can be restricted from registration of defined functional numbers.

Precondition: Class of Registration (CoR) is set with CT2 FC01 not allowed, CT2 FC10 allowed for MS A#1 in the HLR of PLMN, i.e.

- MS A#1 has no permission to register to CT2 number with function code 01
- MS A#1 has permission to register to CT2 number with function code 10

MS A#1 is not registered to any CT2 number
MS A#1 is located in its Home PLMN A

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS A#1tries to register with a functional CT2number with FC=01 (CT2 FC01) in PLMN B.	MS A#1 is not allowed to register to CT2 FC01 and receives an error message.
2	MS A#1 tries to register with a functional CT2 number with FC=10 (CT2 FC 10) in PLMN B.	MS A#1 is successfully registered to CT2 FC10 and receives a confirmation message.

4.3.13 Register 3 functional numbers to one user (non-roaming case)

Test case ID: **RINF_FA_13**

Purpose: Verify the registration of 3 Functional Numbers (FN) to one and the same user.

Precondition: Subscriber MS_A#1 is located in its Home PLMN A. MS_A#1 is not registered to any FN. All FN to register are unregistered.

References: See Annex A – Cross-reference tables.

Test procedure:

Step	Procedure	Result / effect
1	MS_A1 registers a FN_1, CT3, FC01 by sending an USSD string "**214*<IC_A+FN_1>***#".	The USSD outcome code "01" which means "FollowMe activated" is displayed on MS A1. Alternatively MS converts the outcome code in an appropriate text message.
2	MS_A1 registers a FN_2, CT2, FC01 by sending an USSD string "**214*<IC_A+FN_2>***#".	The USSD outcome code "01" which means "Follow Me activated" is displayed on MS_A1. Alternatively MS converts the outcome code in an appropriate text message.
3	MS_A1 registers a FN_3, CT2, FC08 by sending an USSD string "**214*<IC_A+FN_3>***#".	The USSD outcome code "01" which means "Follow Me activated" is displayed on MS_A1. Alternatively MS converts the outcome code in an appropriate text message.
4		MS_A#1 is registered to 3 FN.

4.3.14 Registration of an FN fails - remote party already registered

Test case ID: **RINF_FA_14**

Purpose: Verify that a MS cannot register to a FN which is already registered.

Precondition: Subscriber A is provisioned to the FA service.

Subscriber B is registered to $FN_{A.}$

Subscriber A is not registered to a Functional Number.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Subscriber A initiates a registration to FN_A.	The request fails and the FN is neither activated nor displayed on the mobile.
2	Verify OMs Verify ERs Verify the system for possible error logs.	The correct OMs, ERs have been generated. No error logs have been generated.

4.3.15 Call - Successful Call

Test case ID: **RINF_FA_15**

Purpose: Verify a successful basic FA scenario.

Precondition: Select any FN_A and FN_B available in the Network.

Network restrictions are set to allow calls between FN_A and FN_B (e.g. Access Matrix).

Subscriber A is registered to FN_A.

Subscriber B is registered to FN_B.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Subscriber A dials FN_B.	The call is established between Subscriber A and Subscriber B.
2	Check the number, which is displayed at Subscriber A.	FN_B is displayed in the display of Subscriber A.
3	Check the number, which is displayed at Subscriber B.	FN_A is displayed in the display of Subscriber B.
4	Verify OMs Verify ERs Verify the system for possible error logs and alarms. Verify subaddressing information.	The correct OMs, ERs have been generated. No error logs have been generated. Subaddressing information is correct.

4.4 Location Dependent Addressing (LDA)

4.4.1 Successful LDA Call - Verify the cell format is correct

Test case ID: **RINF_LDA_1**

Purpose: Verify Short Code call is setup correctly and the format of the COO is transferred correctly.

Precondition: Subscriber A is located in cell #1.

The MSISDN of Subscriber B is assigned to Short Code 1200 for calls originated in cell #1.

The MSISDN of Subscriber C is assigned to Short Code 1300 for calls originated in cell #1.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Subscriber A dials the 'Short Code' 1200 and 1300.	The call with short code 1200 is connected to Subscriber B. The call with short code 1300 is connected to Subscriber C.
2	Verify OMs Verify ERs Verify the cell format is correct.	The correct OMs, ERs have been generated. No error logs have been generated.

4.4.2 Unsuccessful LDA Call-Call to invalid Short Code

Test case ID: **RINF_LDA_2**

Purpose: Verify Short Code call with unknown Short Code is released.

Precondition: Subscriber A is located in cell #1.

1299 is a not valid SC number.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Subscriber A dials the 'Short Code' 1299.	The call is released.
2	Verify OMs Verify ERs Verify the system for possible error logs and alarms.	The correct OMs, ERs have been generated. No error logs have been generated.

4.5 Enhanced Multi-Level Precedence and Pre-emption Service (eMLPP)

4.5.1 MS in VGCS call on DCH, pre-emption on Air IF by higher prio PtP call

Test case ID: **RINF_eMLPP_1**

Purpose: Verify preemption of the Air-Interface channel of MS in VGCS call on DCH by higher prio PtP call.

Precondition: 1 NSS Provider's MSC/HLR, 2 BSS Provider's for BTS (BTS1 and BTS2).

5 GSM-R mobiles (MS-A, MS-B, MS-C, MS-D, MS-E) with standard features. MS-A, MS-B and MS-E have the GID activated.

MS-A, MS-B, MS-C and MS-D are in BTS1-Cell.

MS-E is on BTS-2 Cell.

All but 2 TCH are locked on BTS1.

All cells are in same GCA.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Serv. Subs. MS-A establishes a prio 3 VGCS in cell A. MS-B and MS-E joins the VGCS call. MS-A keeps the Uplink on dedicated channel.	A prio 3 VGCS call is established and MS A has the Uplink of the DCH.
2	From the same Cell A originate prio 2 PtP call between (MS-C <-> MS-D).	The origination of the prio 2 PtP call causes Air-Interface pre-emption upon the resource being used by VGCS call in cell A. -The DCH and GCH are released. - A prio 2 PtP call (MS-C<-> MS-D) is established. - Verify correct prio 2 is seen in the CALL PROCEEDING message from the BSS. - Group call is still on air in Cell B.

4.5.2 MS in VBS call as listener, pre-emption on Air IF by higher prio VBS call

Test case ID: **RINF_eMLPP_2**

Purpose: Service Subscriber in a VBS call as a listener can be preempted from the VBS call on Air IF by a higher prio VBS call. However, the VBS call stays up.

Precondition: 4 GSM-R mobiles with standard features.

2 cell (Cell-A and Cell-B).

1 BSS Provider's BSC.

1 MSC.

2 mobiles MS-A, MS –B in BSC1/BTS1/Cell-A.

2 mobiles MS-C, MS-D in BSC1/BTS2/Cell-B.

All but 2 TCH on the Air IF to Cell-B are locked.

All Cells are in same GCA.

MS-A, MS-B, MS-C subscribe to GID1, but not GID2.

MS-D subscribe to GID2 and not to GID1.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS-A originates a prio 4 VBS call (Cell A and B). MS-B, MS-C join the VBS call.	VBS call is established.
2	MS-D originates a prio 2 VBS (Cell B only).	MS-C is pre-empted of the prio 4 VBS call. But MS-A and MS-B remain on call.
3	MS-D closes the prio 2 VBS call.	VBS call is released properly.
4	MS-A closes the prio 4 VBS call.	VBS call is released properly.

4.5.3 MS in VGCS call having the UL of the GCH, pre-emption on Air IF by higher prio VBS call

Test case ID: **RINF_eMLPP_3**

Purpose: Verify preemption of MS in VGCS call in (Group Mode) by higher prio VBS call.

Precondition: 1 NSS Provider's MSC/HLR, 1 BSS Provider's BSC, 1 BSS Provider's BTS.

5 GSM-R mobiles (MS-A, MS-B, MS-C, MS-D, MS-E) with standard features. MS-A and MS-B have the Broadcast GID activated. MS-E is in a different cell than the other MSs.

All but 2 TCHs are blocked in the Air IF.

2 BSS Provider's BTS (BTS1, BTS2).

All but 2 TCH are locked on BTS1.

MS-A, MS-B, MS-C, MS-D are in BTS1-Cell.

MS-E is on BTS2-Cell.

all Cells are in the same GCA.

GID1 (VGCS) is only activated on MS-A, MS-B, MS-E.

GID2 (VBS) is only activated on MS-C, MS-D.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Serv. Subs. MS-A establishes a prio 3 VGCS MS-B and MS-E join the VGCS call. MS-A takes the Uplink on group channel.	A prio 3 VGCS call is established and MS A has the Uplink of the Group Call Channel.
2	From the same Cell originate prio 2 VBS call from MS-C.	MS-A and MS-B are pre-empted. A prio 2 VBS call is established. - Verify correct prio 2 is seen in the CALL PROCEEDING message from the BSS.
3	MS-E grabs the GCH UL.	MS-E is granted the UL.
4	MS C ends the prio 2 VBS call.	VBS call is ended and all resource are freed.

4.5.4 MS in PtP call, pre-emption on A IF by higher prio VGCS call (REC)

Test case ID: **RINF_ eMLPP_4**

Purpose: Verify preemption of an A-Interface SCCP connection with a PtP call due to activation of a REC group call channel.

Precondition: 1 MSC/HLR, 2 BSC, 2 BTS, 2 Cells.

The 2 BSC/BTS/Cells will be labeled BSC/BTS/Cell-A and BSC/BTS/Cell-B.

4 GSM-R mobiles (MS-A, MS-C, MS-D, MS-E) with standard features.

MS-A and MS-B are on BSC/BTS/Cell-A.

MS-C and MS-D are on BSC/BTS/Cell-B.

All but 2 TCH on the A IF to Cell-A are locked.

All Cells are in same GCA.

All MS subscribe to REC.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS-A calls (p4 – PTP) MS-D.	A prio 4 PtP call (MS-A <-> MS-D) is established. Correct prio 4 is seen in the outgoing CALL PROCEEDING message from the BSS.
2	MS-B establishes a REC.	MS-A and MS-C are automatically pre-empted. The REC is established and MS-A, MS-C and MS-D join.
3	MS-B closes the REC.	REC call is released correctly.

4.5.5 MS in VBS call as originator, pre-emption on Air IF by higher prio VGCS call (REC)

Test case ID: **RINF_eMLPP_5**

Purpose: Verify preemption on the Air-Interface of MS in VBS call as originator due to a VGCS (REC) call setup.

Precondition: 1 MSC/HLR, 1 BSC, 2 BTS.

The 2 BTS will be labelled BTS-A and BTS-B.

4 GSM-R mobiles (MS-A, MS-B, MS-C, MS-D) with standard features.

MS-A, MS-B, and MS-C are on BTS-A.

MS-D is on BTS-B.

MS-A and MS-D are subscribed to the VBS call.

All but 2 Air IF timeslots to Cell-A and Cell-B are locked.

Cells are Cell-A and Cell-B.

All Cells are in same GCA.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS-A establishes a prio 2 VBS call.	A prio 2 VBS call (MS-D <-> MS-A) is established. MS-D joins as listener. - Verify correct prio 2 is seen in the NOTIFICATION message from the BSS.
2	MS-B establishes a REC.	MS-A and MS-D are automatically pre-empted. The VBS call is released. The REC is established and MS-A, MS-C and MS-D join.
3	MS-B closes the REC.	REC call is released correctly.

4.5.6 MS in VGCS call having the UL of the GCH, pre-emption on MS by higher prio VGCS call (REC)

Test case ID: **RINF_eMLPP_6**

Purpose: Verify preemption of a VGCS call with subsequent talker due to another higher priority VGCS call (REC).

Precondition: 1 MSC/HLR, 1 BSC, 1 BTS.

3 GSM-R mobiles (MS-A, MS-B, MS-C) with standard features.

MS-A, MS-B – are subscribed to the VGCS call. MS –A is not subscribed to REC call.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Service Subscriber MS-A establishes a prio 4 VGCS call on GID-1. MS-B accepts the call.	A prio 4 VGCS call (MS-A <-> MS-B) is established. - Verify correct prio 4 is seen in the NOTIFICATION message from the BSS.
2	MS-B grabs the GCH UL.	The GCH UL is granted to MS-B.
3	Service Subscriber MS-C establishes a VGCS call (REC).	MS-B is leaving the VGCS call and join the REC call.
4	MS A grabs the uplink.	Uplink is granted.
5	MS A releases uplink.	Uplink is released.
6	MS-C closes the REC.	The REC is taken down. MS-B is re-notified of the VGCS call.
7	MS B takes the UL.	The GCH UL is granted to MS-B.
8	MS B releases uplink.	Uplink is released.
9	MS-A takes down the VGCS call.	The VGCS call is released and all resources are freed.

4.5.7 MS in data call, pre-emption on Air IF by higher prio VGCS call (REC)

Test case ID: **RINF_eMLPP_7**

Purpose: Verify that a PTP- Data Call Protocol = transparent, Speed = 4800, preempted on Air interface by high Priority VGCS call (REC).

Precondition: 2 GSM-R mobiles (MS-A, MS-B,) with standard features, 2 mobiles for data call (MS-C, MS–D).

1 cell.

1 BSC.

1 MSC.

Lock all but 2 Air IF timeslots.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS-C establishes a prio 3 - Data Call to MS-D.	A prio 3 DataCall (MS-C <-> MS-D) is established. - Verify correct prio 3 in the PAGING message, transparent service and Data Rate 4.8 Kbits/s are seen in the Assignment Request Message from the BSS.
2	MS-A establishes a REC call.	The origination of the REC causes Air Interface preemption upon the resources being used by the prio 3 -Data Call. - Data call is released.
3	MS-A closes the REC.	REC is ends and all resource are free.

4.5.8 MS in PtP call, pre-emption on Air IF by higher prio data call (4800 baud, transparent)

Test case ID: **RINF_eMLPP_8**

Purpose: Verify pre-emption MS in PtP call on Air IF by higher prio data call (4800 baud, transparent).

Precondition: 4 GSM-R mobiles (MS-A, MS-B, MS-C, MS–D) with standard features.

MS-A and MS B for PtP call.

MS-C and MS-D for data call (4800 baud, transparent).

1 cell.

1 BSC.

1 MSC.

Lock all but 2 Air IF timeslots.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS A establishes a priority 2 PtP call to MS –B.	MS B answers the call.
2	MS C makes prio 0 data call to MS D.	The origination of the prio 0 data call causes Air Interface preemption upon the resources being used by the prio 2 PTP. - PtP voice call is released.
3	MS C releases the data call.	The call is released properly.

4.5.9 eMLPP prio is preserved during CFU (Call Forwarding Unconditional)

Test case ID: **RINF_eMLPP_9**

Purpose: When an eMLPP subscriber with CFU feature receives a call, verify the priority is preserved when the call is forwarded unconditionally.

Precondition: 1 MSC/HLR, 1 BSC, 1 BTS.

3 GSM-R Terminals (MS-A, MS-B, MS-C) with standard features.

MS-B has CFU feature with the call being forwarded to MS-C.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS-A calls (p2 – PTP) MS-B.	- MS-B remains idle since the call is forwarded to MS-C. - MS-C is alerting.
2	MS-C answers the call.	- A prio 2 PtP call (MS-A <-> MS-C) is established. - Verify the correct prio 2 is seen in the outgoing CALL PROCEEDING message from the BSS to MS-C.
3	MS-A drops the prio 2 PtP call.	The PtP call call ends. The CDR contains the correct eMLPP information.

4.5.10 eMLPP prio is preserved during CFB (Call Forwarding Busy)

Test case ID: **RINF_eMLPP_10**

Purpose: When an eMLPP subscriber with CFB feature is in a call and receives another call, verify the priority is preserved when the call is forwarded.

Precondition: 1 MSC/HLR, 1 BSC, 1 BTS.

3 GSM-R Terminals (MS-A, MS-B, MS-C, MS-D) with standard features.

MS-B has no CW, CFB is provisioned with calls being forwarded to MS-C.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS-D calls (p4 – PTP) to MS-B.	PtP call (MS-D <-> MS-B) is established.
2	MS-A calls (prio 3 – PtP) MS-B.	MS-B being busy and forwards the call to MS-C MS-C is alerting. A prio 3 PtP call (MS-A <-> MS-C) is established. - The call between MS-D and MS-B remains connected. - Verify the correct prio 3 is seen in the outgoing. PAGING message from the BSS to MS-C.
3	MS-C answers the call.	The PtP call is established.
4	MS-A drops the PtP call.	The PtP call between MS-A and MS-C ends. The CDR contains the correct eMLPP information.
5	MS-D closes the PtP call with MS-B.	The PtP call between MS-D and MS-B ends.

4.6 Voice Group Call Service (VGCS)

4.6.1 Service Subscriber originates VGCS Call

Test case ID: **RINF_VGCS_1**

Purpose: Verify that a Service Subscriber is able to originate a VGCS call.

Precondition: 2 GSM-R subscribers (MS A, MS B) with standard options, data fill and routing.
MS-A and MS-B are SS of the VGCS, they are located in the GCA in 2 different cells.
2 cells on BSS Provider's BSS on 1 BSC.
1 MSC in NSS Provider's NSS.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS A originates a VGCS call as a service subscriber.	• Origination is successful, DCH and GCH allocated in cell of originator, GCH allocated in cell of terminator. • MS B is notified of the VGCS call. • MS A has two way voice path until the dedicated channel is released.
2	MS B joins the VGCS call.	• MS B is able to join the VGCS call. • MS B is in listening mode all the time.
3	MS A closes the call.	The VGCS call is released properly and all resources are deallocated correctly.

4.6.2 Controller originates VGCS call and takes it down with the Kill Sequence

Test case ID: **RINF_VGCS_2**

Purpose: Verify that Controller can originate the VGCS call and end the call by pressing the kill Sequence.

Precondition: 2 GSM-R subscribers (MS A, MS B) with standard options, data fill and routing.

MS-A is a controller that is allowed to originate the VGCS call. MS-B is SS of the VGCS call, MS-B is located in the GCA.

2 cells in BSS Provider's BSS on 1 BSC.

1 MSC in NSS Provider's NSS.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS A as a controller originates Voice Group call by dialing 50 + < GCA > + <GID>.	• Origination is successful, DCH allocated in cell of originator, GCH allocated in cell of terminator. The DCH of the Controller stays allocated for the duration of the call. • MS A as a controller has two way voice path during the whole duration of the call. • MS B is notified of the VGCS call.
2	MS B joins the VGCS call.	• MS B is able to join the VGCS call. • MS B is in listening mode.
3	MS B takes the Uplink.	MS B has two-way voice path.
4	MS A as a controller closes the call by entering the killing sequence.	The VGCS call is released properly and all resources are deallocated correctly.

4.6.3 Service Subscriber originates VGCS call, leaves, rejoins and ends it.

Test case ID: **RINF_VGCS_3**

Purpose: Verify SS can originate VGCS call, later leave the group call and rejoin.

Precondition: 2 GSM-R subscribers (MS A, MS B) with standard options, data fill and routing.
MS A and MS B are SS of the VGCS, they are located in the GCA in 2 different cells.
2 cells on BSS Provider's BSS on 1BSC.
1 MSC in NSS Provider's NSS.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS A originates VGCS call as a service subscriber.	• Origination is successful, DCH and GCH allocated in cell of originator, GCH allocated in cell of terminator. • MS B is notified of the VGCS call. • MS A has two way voice path until the dedicated channel is released.
2	MS B joins the VGCS call.	MS B is able to join and is in listening mode all the time.
3	MS A leaves the group call.	The VGCS call stays up.
4	MS A rejoins the group call.	MS A is in listening mode in the VGCS call.
5	MS A takes the Uplink.	MS A has two way voice path after obtaining the GCH UL.
6	MS A closes the group call.	The VGCS call is released properly and all resources are de-allocated correctly.

4.6.4 Service Subscriber enters into VGCS broadcast area with ongoing VGCS call and is notified of it

Test case ID: **RINF_VGCS_4**

Purpose: Verify Mobiles which enter the group call area after the call has been established shall get notification.

Precondition: 2 GSM-R subscribers (MS A, MS B) with standard options, data fill and routing.

MS-A is a controller that is allowed to originate the VGCS, MS-A is located outside of the GCA. MS-B is SS of the VGCS, MS-B is located outside the GCA.

2 cells on BSS Provider's BSS, one on each of 2 BSCs 1 MSC in NSS Provider's NSS.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Establish voice group call from MS A as a controller by dialing 5+0+<SA>+<GID>.	• Origination is successful, DCH allocated in cell of originator, GCH allocated in cell of terminator. The DCH of the Controller stays allocated for the duration of the call. • MS B is so far not notified of the VGCS call • MS A as a controller has two way voice path during the whole duration of the call.
2	MS B moves into the GCA, where the VGCS call is ongoing.	MS B is notified of the ongoing VGCS call.
3	MS B joins the VGCS call.	• MS B is able to join the VGCS call. • MS B is in listening mode.
4	MS B takes the Uplink.	MS B has two-way voice path.
5	MS A as a controller closes the VGCS call by dialing the killing sequence.	The VGCS call is released properly and all resources are deallocated correctly.

4.6.5 Controller joins ongoing VGCS call

Test case ID: **RINF_VGCS_5**

Purpose: Verify controller is able to join ongoing VGCS (only) when he is entitled to.

Precondition: 1 Controller MS A that is entitled to originate and to kill the VGCS call,

1 controller MS B that is not entitled to originate the VGCS call, located outside the GCA.

1 service subscribers: MS C, located in the GCA.

2 cells in BSS Provider's BSS on 1 BSC.

1 MSC in NSS Provider's NSS.

MS A is configured as an originating controller and is allowed to terminate (kill-sequence) the VGCS.

MS B is configured as an terminating controller only.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Establish voice group call from MS C as SS.	Origination is successful, DCH allocated in cell of originator, GCH allocated in cell of terminator. MS C is in listening mode after losing the UL on the DCH.
2	MS A joins the VGCS call by dialing 5+0+<SA>+<GID>.	MS A is able to join VGCS call and has two way voice path during the whole duration of the call.
3	MS B tries to join the VGCS call by dialing 5+0+<SA>+<GID>.	VGCS origination/joining of MS B is rejected by the NSS.
4	MS A closes the call by dialing the killing sequence.	VGCS calls get released properly. All resources are free.

4.6.6 Parallel group calls are possible to the same cell

Test case ID: **RINF_VGCS_6**

Purpose: Verify whether it is possible to have parallel VGCS calls in the same cell.

Precondition: 2 service subscribers with GID A: MS A, MS B.

2 service subscribers with GID B: MS D, MS E.

1 BSS Provider's cell.

1 BSC.

1 MSC.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS A originates VGCS call to GID A. MS B takes call.	VGCS call is established between MS A and MS B.VGCS call up.
2	MS A request the DCH UL.	MS A has two way voice path, MS B is in listening mode.
3	MS D originates VGCS call to GID B. MS E takes call.	VGCS call is established between MS D and MS E.VGCS call up.
4	MS E request the GCH UL.	MS E has two way voice path, MS D is in listening mode.
5	MS A releases UL and MS B requests the GCH UL.	MS B have speech path to MS A.
6	MS B releases UL and MS A requests the GCH UL.	MS A have speech path again to MS B.
7	MS A and MS D close the VGCS calls.	Both VGCS calls get released properly. All resources are idle.

4.6.7 GID delivered correctly to terminating SS in SS originated VGCS call

Test case ID: **RINF_VGCS_7**

Purpose: Verify correct GID is shown on the display of the terminating SS.

Precondition: 2 service subscribers: MS A, MS B activated for GID<xxx> with standard options, datafill and routing.

1 cell.

1 BSC.

1 MSC.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS A originates VGCS call with GIDxxx as a service subscriber.	MS B is paged for the call and on its display GID<xxx> is displayed correctly.
2	MS B answers the call.	
3	MS A closes the call.	VGCS calls is released and all resources are deallocated.

4.7 Voice Broadcast Service (VBS)

4.7.1 Service Subscriber originates Voice Broadcast (VBS) Call

Test case ID: **RINF_VBS_1**

Purpose: Verify SS can originates Voice Broadcast (VBS) Call

Precondition: 2 GSM-R mobiles with standard options, datafill and routing, (MS A present in BSS Provider's BSS and MS B present in NSS Provider's BSS).

2 cell (Cell-A present in BSS Provider's BSS and Cell-B present in NSS Provider's BSS).

2 BSC (BSC-A present in BSS Provider's BSS and BSC- B present in NSS Provider's BSS).

1 MSC in NSS Provider's NSS.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS A originates prio 2 Voice broadcast call as a service subscriber.	• Origination is successful, DCH and GCH allocated in cell of originator, GCH allocated in cell of terminator. • The DCH UL stays allocated during the duration of the VBS call. • MS B is notified of the VBS call.
2	MS B joins the call.	MS A has two way voice path while MS B is in listening mode.
3	MS A closes the call.	VBS calls is released and all resources are deallocated.

4.7.2 Service Subscriber originates prio0 VBS call

Test case ID: **RINF_VBS_2**

Purpose: Verify SS can originates prio0 Voice Broadcast (VBS) Call

Precondition: 2 GSM-R mobiles with standard options, datafill and routing, (MS-A present in Cell-A and MS-B in Cell-B).

2 cell (Cell-A and Cell-B present in BSS Provider's BSS).

1 BSC (BSS Provider's BSC).

1 MSC in NSS Provider's NSS.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS A originates prio 0 Voice broadcast call as a service subscriber	• Origination is successful, DCH and GCH allocated in cell of originator, GCH allocated in cell of terminator. • MS B is notified of the VBS call
2	MS B joins the call	MS A has two way voice path while MS B is in listening mode
3	MS A closes the call	VBS calls is released and all resources are deallocated

4.7.3 Controller originates VBS call and takes down the call by disconnecting

Test case ID: **RINF_VBS_3**

Purpose: Controller can Originates VBS call and terminate the call by disconnecting from the call.

Precondition: 2 GSM-R mobiles (MS A present in BSS Provider's BSS and MS B present in NSS Provider's BSS) with standard options, datafill and routing.

2 cell (Cell-A present in BSS Provider's BSS and Cell-B present in NSS Provider's BSS).

2 BSC (BSC-A present in BSS Provider's BSS and BSC B present in NSS Provider's BSS).

1 MSC in NSS Provider's NSS.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Controller originates voice broadcast call (<51>+<GCA>+<GID>)	• Origination is successful, DCH allocated in cell of originator, GCH allocated in cell of terminator. • MS B is notified of the VBS call
2	MS B joins the call	MS A has two way voice path while MS B is in listening mode
3	Contoller closes the call	VBS calls is released and all resources are deallocated

4.7.4 Controller originates VBS call and takes down call with the kill sequence

Test case ID: **RINF_VBS_4**

Purpose: Controller can Originates VBS call and terminate the call with the killing Sequence

Precondition: 2 GSM-R mobiles (MS A present in BSS Provider's BSS and MS B present in NSS Provider's BSS) with standard options, datafill and routing.

2 cell (Cell-A present in BSS Provider's BSS and Cell-B present in NSS Provider's BSS).

2 BSC (BSC-A present in BSS Provider's BSS and BSC B present in NSS Provider's BSS).

1 MSC in NSS Provider's NSS.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Controller originates voice broadcast call	Origination is successful, DCH allocated in cell of originator, GCH allocated in cell of terminator. • MS B is notified of the VBS call
2	MS B joins the call	MS A has two way voice path while MS B is in listening mode
3	Controller closes the call by sending the kill sequence	VBS call is released and all resources are deallocated.

4.7.5 Controller joins ongoing VBS call

Test case ID: **RINF_VBS_5**

Purpose: Verify VBS Controller can join the ongoing VBS call.

Precondition: 2 GSM-R mobiles with standard options, datafill and routing , (MSA present in BSS Provider's BSS and MS B present in NSS Provider's BSS).

Controller (present in BSS Provider's BSS).

Controller is configured as an originating controller for the VBS.

2 cell (Cell-A present in BSS Provider's BSS and Cell-B present in NSS Provider's BSS).

2 BSC (BSC-A present in BSS Provider's BSS and BSC B present in NSS Provider's BSS).

1 MSC in NSS Provider's NSS.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS A originates Voice broadcast call as a service subscriber	Origination is successful, DCH and GCH allocated in cell of originator, GCH allocated in cell of terminator. • MS B is notified of the VBS call
2	MS B joins the call	MS A has two way voice path while MS B is in listening mode.
3	Controller joins ongoing VBS call by dialing 51+<GCA>+<GID>	Controller joins ongoing VBS and is in the listening mode.
4	MS A closes the call	VBS calls is released and all resources are deallocated.

4.7.6 Service Subscriber enters into VBS broadcast area with ongoing VBS call and is notified of it, Service Subscriber joins the VBS call

Test case ID: **RINF_VBS_6**

Purpose: Verify Mobile Subscriber is paged/notified about the ongoing VBS call when enters in to the broadcast call area.

Precondition: 3 GSM-R mobiles (MS A and MS C present in BSS Provider's BSS and MS B present in NSS Provider's BSS) with standard options, datafill and routing.

2 cell (Cell-A present in BSS Provider's BSS and Cell-B present in NSS Provider's BSS).

2 BSC (BSC A present in BSS Provider's BSS and BSC B present in NSS Provider's BSS).

1 MSC in NSS Provider's NSS.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS A originates Voice broadcast call as a service subscriber	• Origination is successful, DCH and GCH allocated in cell of originator, GCH allocated in cell of terminator. • MS B is notified of the VBS call
2	Turn on MS C. MS C join ongoing VBS call.	MS C perform LOCATION_UPDATE and receive notifications on ongoing VBS calls. VBS call up, MS A is able to talk, MS B and MS C are in listening mode.
3	MS A close the call	The call gets released properly. VBS resources are free.

4.8 Railway Emergency Call (REC)

4.8.1 Service Subscriber originates a REC

Test case ID: **RINF_REC_1**

Purpose: Verify SS can originate Railway Emergency Call.

Precondition: 1 cell (BSS Provider's BSS).

1 BSC (BSS Provider's BSS).

1 MSC in NSS Provider's NSS.

3 GSM-R mobiles (MS A, MS B and MS C) with standard options, datafill and routing.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS A originates emergency call as service subscriber and releases the UL on the DCH	• Origination is successful, DCH and GCH allocated in cell of originator, GCH allocated in cell of terminator. • MS B and MS C is notified of the REC call • MS B and MS C join the call automatically. • MS A has two way voice path until the dedicated channel is released
2	MS A request the uplink on GCH	MS A has speech path, MS B and MS C are in listening mode.
3	MS A release the call	The call gets released properly.
4	Check the signaling msg's.	Immediate SETUP is used by MS A (configured on the SIM) ISETUP (= Immediate Setup (BCC/GCC) is used by MS A

4.8.2 Service Subscriber initiated REC (no talker change, normal clear down of call)

Test case ID: **RINF_REC_2**

Purpose: MSa #1 initiates a REC, MSa #2, MSb #1, MSb #2 and the Controllers A and B join. MSa #1 releases the call.

Precondition: All subscribers are members of the REC group and are in the correct area

PLMN A	PLMN B
Anchor	Relay
Controller A	Controller B
MSa #1/2	
MSb #1/2	

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MSa #1 initiates a REC	Call is offered to all subscribers. They auto connect.
2	MSa #1 releases the call.	The call is cleared down.
3	Verify that acknowledgements are send and received.	Records are sent from the Mobiles

4.8.3 Service Subscriber accepts an incoming REC

Test case ID: **RINF_REC_3**

Purpose: Verify SS can accept an incoming REC.

Precondition: 3 GSM-R subscribers (MS A, MS B and MS C) with standard options, data fill and routing.

MS A, MS B and MS C are SS of the REC call, they are located in the GCA in 2 different cells (MS A in Cell A and MS B, MS C in Cell-B).

2 cells on BSS Provider's BSS, one on each of 2 BSCs Voice Inactivity timer is set long enough in order to execute steps 1-4 before the timer expires.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS A originates emergency call as service subscriber	• Origination is successful, DCH and GCH allocated in cell of originator, GCH allocated in cell of terminator. • MS B is notified of the REC call • MS B join the call automatically. • MS A has two way voice path until the dedicated channel is released
2	MS C moves into the GCA, where the REC call is ongoing	MS C is notified of the ongoing REC call
3	MS C joins the REC call	• MS C is able to join the VGCS call. • MS C is in listening mode
4	MS C takes the Uplink	MS C has two-way voice path
5	MS C releases the uplink	Uplink is released
6	MS A closes the REC call	The REC call is released properly and all resources are deallocated correctly

4.8.4 Controller originates a REC

Test case ID: **RINF_REC_4**

Purpose: Verify that Controller can originate the **Railway Emergency Call** and end the call by pressing the kill Sequence.

Precondition: 2 GSM-R subscribers (MS A, MS B) with standard options, data fill and routing.

MS A is a controller that is allowed to originate the VGCS call, MS A is located outside of the GCA. MS B is SS of the VGCS call, MS B is located in the GCA.

2 cells on BSS Provider's BSS, one on each of 2 BSCs 1 MSC in NSS Provider's NSS.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS A as a controller originates Voice Group call by dialing 50 + < GCA > + <GID>	• Origination is successful, DCH allocated in cell of originator, GCH allocated in cell of terminator. The DCH of the Controller stays allocated for the duration of the call. • MS A has two way voice path during the whole duration of the call • MS B is notified of the Railway Emergency call
2	MS B joins the Railway Emergency Call	• MS B is able to join the call • MS B is in listening mode
3	MS B takes the Uplink	MS B has two-way voice path
4	MS A as a controller closes the call by entering the killing sequence.	The REC is released properly and all resources are deallocated correctly

4.8.5 Service Subscriber originates Acknowledgement Call

Test case ID: **RINF_REC_5**

Purpose: This test case is to verify if the Acknowledgement Call setup and the release complete message is generated after an emergency call and that the content is correct.

Precondition: 1 cell (BSS Supplier).

1 BSC (BSS Supplier).

1 MSC in NSS (NSS Supplier).

3 service subscribers: MS A, MS B, MS C.

A and A-bis monitoring links set up.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS A originates emergency call as service subscriber	• Origination is successful, DCH and GCH allocated in cell of originator, GCH allocated in cell of terminator. • MS B and MS C is notified of the REC call • MS B and MS C join the call automatically. • MS A has two way voice path until the dedicated channel is released
2	MS A request the uplink on GCH	MS A has speech path, MS B and MS C are in listening mode.
3	MS A releases the Uplink. MS A release the call	MS A isn't able to talk. The call gets released properly.
4	Acknowledgement calls are automatically initiated by all mobiles	Acknowledgement calls are successful
5	Verify the content of the USS1 information element of the RELEASE COMPLETE message.	Verify User to User info: Protocol discriminator = 00000000; originator tag; listener tag; T_DUR; T_REL; priority level 0 =01, termination cause = 000; GCRef.

4.8.6 REC in a GCA with a locked cell

Test case ID: **RINF_REC_6**

Purpose: Verify that a Railway Emergency Call can be established, even if not all cells in the GCA are active. The call should be established after the Timer Txx has expired.

→In case of a dispatcher originated Railway Emergency Call, the call is successful if it was established in any cell.

→ In case of a service subscriber originated REC, the call is successful, if it was established at least in the Cell Of Origin

Precondition: 2 NSS Provider's cell.

GCA with all available cells.

2 SS MSA, MS B and mobile dispatcher DISP A at least in COO.

Second cell locked.

1 MSC in Provider's NSS.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Lock a cell	One of the cells inside of GCA is locked.
2	DISP A dials 50+<GCAREA>+<Emergency GID> The call is accepted by the participants DISP A release the call by sending the disconnect sequence "***"	Call is established to all cells in service DISP A has two-way voice path. The remaining participants are in listening mode. The REC call gets terminated. All resources are idle.
3	MS A originates a REC call. The call is accepted by the participants MS A release the VGCS call.	Call is established to all cells in service The REC call gets terminated. All resources are idle. REC establishment is possible, when one or more of the cells belonging to the GCA are locked.

4.9 Originator to Dispatcher Information (OTDI)

4.9.1 Service Subscriber originates VGCS call, terminating Controller receives the OTDI

Test case ID: **RINF_OTDI_1**

Purpose: Verify that the terminating controller receives the OTDI from the originating SS.

Precondition: 1 cell (BSS Provider's BSS).

1 SS (Registered to a Functional Number.

1 MSC in NSS Provider's NSS.

5 terminating controllers of a VGCS call.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	SS originates a prio 2 VGCS call and sends the OTDI IE	VGCS getting established -> dispatcher included in VGCS -> GCC/BCC_SETUP contains OTDI IE
2	Verify that the terminating controller got OTDI from originating SS	Controller receives the uncompressed OTDI in UUS IE of the call setup message
3	Originator takes the VGCS call down	VGCS call is taken down, all resources are released properly

4.9.2 Service Subscriber originates VGCS Immediate Setup 2 call, MSC uncompresses the OTDI info and terminating Controller receives the uncompressed OTDI

Test case ID: **RINF_OTDI_2**

Purpose: Verify that the VGCS Immediate Setup 2 message contains the compressed OTDI info and that the terminating controller receives the uncompressed OTDI.

Precondition: 1 cell (BSS Provider's BSS).

1 SS (Registered to Functional Number).

1 MSC in NSS Provider's NSS.

5 terminating controllers of a VGCS call.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	SS originates a prio 0 VGCS call	VGCS getting established -> controller included in GC -> GCC/BCC_IMMEDIATE_SETUP 2 contains compressed OTDI IE
2	Verify that the terminating controller got OTDI from originating SS	Controller receives the uncompressed OTDI in UUS IE of the call setup message
3	Originator takes the VGCS call down	VGCS call is taken down, all resources are released properly

4.10 Late Entry

4.10.1 Service Subscriber active in a PtP call move in a cell with ongoing REC call

Test case ID: **RINF_LE_1**

Purpose: Verify that a SS which is active in a PtP call and move in a cell with an ongoing REC call, getting a notification, that there is an ongoing Railway Emergency call.

Precondition: 2 cell at least

4 Mobiles

3 SS at least

Emergency Threshold (Signalling Point Object) = Priority 0

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	A Mobile SS which is member of the REC group establishing a PtP call to another Mobile/fixed call in a cell A what is not part of the REC group call area.	PtP call getting established -> has voice path
2	In the second cell B a SS establishing a REC.	REC call getting established -> has voice path
3	Mobile SS which has established PtP call moves from cell A -> B ->Verify on the Abis Interface that the Mobile SS getting notified with a GCCH Notification Request message.	->Handover successful ->Mobile getting Notification of the ongoing REC ->PtP (ends) call getting preempted and SS getting the REC call
4	In the new cell B the SS request the uplink of the REC call.	SS get the uplink and has voice path
5	Originating SS takes down the call.	The REC call getting properly closed

4.10.2 Orig. SS active in a VBS call move in a cell with ongoing REC call

Test case ID: **RINF_LE_2**

Purpose: Verify that a SS which is active in a VBS call and move in a cell with an ongoing REC call, getting a notification, that there is an ongoing Railway Emergency call.

Precondition: 2 cell at least

4 Mobiles

3 SS at least

Emergency Threshold (Signalling Point Object) = Priority 0

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	A Mobile SS which is member of the REC group establishing a VBS (P4) call in a cell A what is not part of the REC group call area.	VBS (P4) call getting established -> has voice path
2	In the second cell B a SS establishing a REC.	REC call getting established -> has voice path
3	Mobile SS which has established VBS call moves from cell A -> B ->Verify on the Abis Interface that the Mobile SS getting notified with a GCCH Notification Request message.	->Handover successful ->Mobile getting Notification of the ongoing REC ->VBS (ends) call getting preempted and SS getting the REC call
4	In the new cell B the SS request the uplink of the REC call.	SS get the uplink and has voice path.
5	Originating SS takes down the call.	The REC call getting properly closed.

4.10.3 Service Subscriber active in a VGCS (GCH) call move in a cell with ongoing REC call

Test case ID: **RINF_LE_3**

Purpose: Verify that a SS which is active in a VGCS call (GCH) and move in a cell with an ongoing REC call, getting a notification, that there is an ongoing Railway Emergency call.

Precondition: 2 cell at least

4 Mobiles

3 SS at least

Emergency Threshold (Signalling Point Object) = Priority 0

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	A Mobile SS which is member of the REC group establishing a VGCS call (p4) in a cell A what is not part of the REC group call area and going on a GCH.	VGCS call (P4) getting established -> has voice path
2	In the second cell B a SS establishing a REC.	REC call getting established -> has voice path
3	Mobile SS with pressed Uplink in the VGCS call moves from cell A -> B ->Verify on the Abis Interface that the Mobile SS getting notified with a GCCH Notification Request message.	->Handover successful ->Mobile getting Notification of the ongoing REC -> Ongoing VGCS call is left and SS going to the REC call
4	In the new cell B the SS request the uplink of the REC call.	SS get the uplink and has voice path
5	originating SS takes down the call	The REC call getting properly closed.

4.11 Access Matrix

4.11.1 National call - AM allows call

Test case ID: **RINF_AM_1**

Purpose: Verify the Access matrix configuration works.

Precondition: Access Matrix AM configured to allow for following:

Case 1: CT2 / FC 01 calls CT7 /FC01.

Case 2: CT2 / FC 02 calls CT7 /FC02.

Case 3: CT2 / FC 01 calls CT2 /FC10.

Case 4: CT2 /FC10 calls CT2 /FC01.

Functional numbers have been registered in PLMN A as follows:

MS_A1 reg with FN_1

MS_A2 reg with FN_5

MS_A3 reg with FN_7

TCT_A1 (FN_11)

TCT_A2 (FN_13)

(TCT=Train Controller Terminal, also sometimes called Dispatcher Terminal))MS_A3 has the Follow Me subscription ABCD.

References: See Annex A – Cross-reference tables.

Test Procedure:

Case 1: CT2 / FC 01 calls CT7 /FC01.

Step	Procedure	Result / effect
1	MS_A1 calls FN_11.	AM allows the call, the incoming call is displayed on TCT_A1.
2	MS_A1 accepts the call	The PtP call between TCT_A1 and MS_A1 is successfully established
3	Verify PFN and check the number displayed on both calling- and called party.	TCT_A1 displays the function of the connected MS_A1 and MS_A1 displays the function of TCT_A1.
4	One of the calling- and called party closes the call.	Call is released.

Case 2: CT2 / FC 02 calls CT7 /FC02.

Step	Procedure	Result / effect
1	MS_A2 calls FN_13.	AM allows the call, the incoming call is displayed on TCT_A2.
2	CT_A2 accepts the call.	The PtP call between TCT_A2 and MS_A2 is successfully established
3	Verify PFN and check the number displayed on both calling- and called party.	TCT_A2 displays the function of the connected MS_A2 and MS_A2 displays the function of TCT_A2.
4	One of the calling- and called party closes the call.	Call is released

Case 3: CT2 / FC 01 calls CT2 /FC10.

Step	Procedure	Result / effect
1	MS_A1 calls FN_7.	AM allows the call, the incoming call is displayed on MS_A3.
2	MS_A3 accepts the call.	The PtP call between MS_A3 and MS_A1 is successfully established.
3	Verify PFN and check the number displayed on both calling- and called party.	MS_A3 displays the function of the connected MS_A1 and MS_A1 displays the function of MS_A3.
4	One of the calling- and called party closes the call.	Call is released.

Case 4: CT2 /FC10 calls CT2 /FC01.

Step	Procedure	Result / effect
1	MS_A3 calls FN_1.	AM allows the call, the incoming call is displayed on MS_A1.
2	MS_A1 accepts the call.	The PtP call between MS_A3 and MS_A1 is successfully established
3	Verify PFN and check the number displayed on both calling- and called party.	MS_A3 displays the function of the connected MS_A1 and MS_A1 displays the function of MS_A3.
4	One of the calling- and called party closes the call.	Call is released.

4.11.2 National call - AM denies call

Test case ID: **RINF_AM_2**

Purpose: Verify the Access matrix check on call processing.

Precondition: This test case has been divided into the following subcases:

Case 1: CT7 /FC 01 calls CT2 /FC02.

Case 2: CT7 /FC02 calls CT2 /FC10.

Case 3: CT7 /FC02 calls CT2 /FC08.

Case 4: CT2 /FC10 calls CT7 /FC02.

Access Matrix is enabled and configured with the cells marked with “Open” in EIRENE set to “No”.

Functional numbers have been registered in PLMN A as follows:

MS_A1 reg with FN_1

MS_A2 reg with FN_5

MS_A3 reg with FN_7

TCT_A1 (FN_11)

TCT_A2 (FN_13)

(TCT=Train Controller Terminal, also sometimes called Dispatcher Terminal)

MS_A3 has the Follow Me subscription ABCD.

References: See Annex A – Cross-reference tables.

Test procedure:

Case 1: CT7 /FC 01 calls CT2 /FC02.

Step	Procedure	Result / effect
1	TCT_A1 calls FN_5	AM does not allow the call. Release cause indicating a disallowed call by AM to be checked.
2	Change the according entry of AM to allow the call (“yes”) temporarily.	The affected call is configured to be allowed.
3	TCT_A1 calls FN_5.	AM now allows the call, the incoming call is displayed on MS_A2.
4		The PtP call between MS_A2 and TCT_A1 is successfully established.
5	Verify PFN and check the number displayed on both calling- and called party	MS_A2 displays the function of the connected TCT_A1 and TCT_A1 displays the function of MS_A2.
6	One of the calling- and called party closes the call.	Call is released.
7	Undo the above temporary change.	The affected cell of AM is configured to “No”.

Case 2: CT7 /FC02 calls CT2 /FC10.

Step	Procedure	Result / effect
1	TCT_A2 calls FN_7.	1) AM does not allow the call. Check release cause indicating a disallowed call by AM.
2	Change the according entry of AM to allow the call (“yes”) temporarily.	The affected call is configured to be allowed.
3	TCT_A2 calls FN_7.	AM now allows the call, the incoming call is displayed on MS_A3.
4		The PtP call between MS_A3 and TCT_A2 is successfully established.
5	Verify PFN and check the number displayed on both calling- and called party.	MS_A3 displays the function of the connected TCT_A2 and TCT_A2 displays the function of MS_A3.
6	One of the calling- and called party closes the call.	Call is released.
7	Undo the above temporary change	The affected cell of AM is configured to “No”.

Case 3: CT7 /FC02 calls CT2 /FC08.

Step	Procedure	Result / effect
1	MS_A2 registers to IC_A, FN_6.	The USSD outcome code “01” or corresponding message which means “Follow Me activated” is displayed on MS_A2.
2	2) TCT_A2 calls FN_6.	2) AM does not allow the call. Check release cause indicating a disallowed call by AM
3	Change the according entry of AM to allow the call (“yes”) temporarily.	The affected call is configured to be allowed.
4	TCT_A2 calls FN_6.	AM now allows the call, the incoming call is displayed on MS_A2.
5		The PtP call between MS_A2 and TCT_A2 is successfully established
6	Verify PFN and check the number displayed on both calling- and called party.	MS_A2 displays the function of the connected TCT_A2 and TCT_A2 displays the function of MS_A2.
7	One of the calling- and called party closes the call.	Call is released.
8	Undo the above temporary change.	The affected cell of AM is configured to “No”.

Case 4: CT2 /FC10 calls CT7 /FC02.

Step	Procedure	Result / effect
1	MS_A3 calls FN_13.	AM does not allow the call. Check release cause indicating a disallowed call by AM.
2	Change the according entry of AM to allow the call (“yes”) temporarily.	The affected call is configured to be allowed.
3	MS_A3 calls FN_13.	AM now allows the call, the incoming call is displayed on TCT_A2.
4	TCT_A2 accepts the call.	The PtP call between MS_A3 and TCT_A2 is successfully established.
5	Verify PFN and check the number displayed on both calling- and called party.	MS_A3 displays the function of the connected TCT_A2 and TCT_A2 displays the function of MS_A3.
6	One of the calling- and called party closes the call.	Call is released.
7	Undo the above temporary change.	The affected cell of AM is configured to “No”.
8	Undo the subscription change for MS_A3.	MS_A3 has no more Follow Me subscription.

4.12 GPRS

4.12.1 GPRS Connection Setup

Test case ID: **RINF_GPRS_1**

Purpose: This test case will create and test 3 GPRS service connections:
1: Set-up a GPRS session for an ETCS user.
2: Set-up a GPRS session for a KMS user (except for countries where included in ETCS)
3: Set-up a GPRS session for "other traffic (office, internet, etc…)
4: Optional: ATO

- test GPRS connection (and indirectly test the APN naming conventions)
- test data connection
- test IPV4 for ETCS
- test that no cross connections (ETCS mobile cannot access other traffic and vice versa)

Precondition: 1 cell (BSS Provider's BSS)
1 PCU (BSS Provider's BSS)
1 packet core SGSN-GGSN (NSS Provider's NSS)
2-3 servers (servers in fixed IP network)
2-3 GSM-R mobiles (PC + module, supporting GPRS).

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Create APN's for each service ETCS, KMS and background traffic. Country specific: ETCS and KMS might use same APN.	APN for different service should lead to correct server in dedicated IP network with own address space: at least ETCS server (IPV4 network) and Background server (IPV4 allowed).
2	Setup data connection and send data over each connection a. ETCS mobile to ETCS server b. KMS mobile to KMS(ETCS) server c. Background mobile to background server	Successful data path for each APN
3	Send data from background traffic mobile to ETCS APN	Background traffic should not have access to data or server of the other services (ETCS, ATO and KMS) and vice versa.

It shall be understood, that APN separation may be implemented in different points in the overall network topology.

4.12.2 Contact an RBC in the ETCS domain

Test case ID: **RINF_GPRS_2**

Purpose: Contact an RBC using the DNS service (conversion of RBC number into IP address).

Precondition: 1 cell (BSS Provider's BSS).

1 BSC (BSS Provider's BSS).

1 packet core SGSN-GGSN (NSS Provider's NSS).

1 RBC, 1 DNS (servers in fixed IP network) (access/connectivity available to those servers).

1 GSM-R mobiles (PC + module, supporting GPRS).

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Use ETCS APN of RINF_GPRS_1	
2	On DNS server, create Domain name(s) for at least one RBC.	Domain name should be linked to valid ip address.
3	Set up data path to an RBC a. Look up IP address using full text domain name of RBC b. Start data transfer to RBC	Successful request of IP address, a data transfer can be started.

4.12.3 QOS and priority test between ETCS and Background traffic

Test case ID: **RINF_GPRS_3**

Purpose: Verify that an ETCS user (using the ETCS APN with QOS) can setup session with sufficient bandwidth if other service is running (Background traffic, fully loaded Cell (GPRS timeslots) on radio interface).

Precondition: 1 cell (BSS Provider's BSS).

1 BSC (BSS Provider's BSS).

1 packet core SGSN-GGSN (NSS Provider's NSS).

1 RBC, 1 DNS (servers in fixed IP network) (access/connectivity available to those servers).

1 GSM-R mobiles (PC + module, supporting GPRS).

Traffic generation for the Background traffic APN: for example a typical handset can generate traffic for 2 UL 2DL timeslots with a (massive) file upload and download.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Start GPRS session with back ground traffic.	GPRS timeslots should be loaded with traffic.
2	Set up GPRS session (with ETCS APN) and transmit data.	Session should establish without noticeable delay and receive the minimum of 4kbps (corresponding QOS profile).

5 Test Cases Description for O (Optional) features (testing MI Requirements for O features)

5.1 Uplink reply/Notification Response

5.1.1 Service Subscriber active in a VGCS call moves in empty cell

Test case ID: **RINF_URNR_1**

Purpose: Verify that GCH is allocated in a previously empty cell when a SS which was active in a VGCS call moves in that cell.

Precondition:
2 cells (cell_A, cell_B).
Both cells in the same group call area and have handover relationship to each other.
Activate the uplink reply timer/notification response on on both cells.
3 mobiles (MS_1, MS_2, MS_3).
VGCS GID is defined.
MS_1 (cell_A, VGCS GID active).
MS_2 (cell_A, VGCS GID active).
MS_3 (cell_B, VGCS GID not active).
In cell_B, no other mobile with activated VGCS GID.
General: Status of the TCH should be checked by an O&M System.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS_1 initiates VGCS call.	Call established. MS_2 is listener MS_3 in cell_B is not notified
2	MS_1 takes the GCH for a period greater than uplink timer value configured in BSS	Due to lack of uplink reply (on air interface “Uplink access burst - absence of MS with the activated VGCS GID) in cell_B the GCH get de-allocated
3	MS_2 moves from cell_A to cell_B	The GCH in cell_B gets re-allocated because of the new presence of MS_2 having the VGCS GID activated. Re-allocation is based on notication response
4	MS_1 takes down the call.	The call is properly released

5.1.2 Service Subscriber active in a VBS call moves in empty cell

Test case ID: **RINF_URNR_2**

Purpose: Verify that GCH is allocated in a previously empty cell when a SS which was active in a VBS call moves in that cell.

Precondition: 2 cells (cell_A, cell_B).

Both cells in the same group call area and have handover relationship to each other.

Both cells: uplinkReplyTimer >= 6s.

3 mobiles (MS_1, MS_2, MS_3).

VGCS GID is defined.

MS_1 (cell_A, VBS GID active).

MS_2 (cell_A, VBS GID active).

MS_3 (cell_B, VBS GID not active).

In cell_B, no other mobile with activated VBS GID.

General: Status of the TCH should be checked by an O&M System.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS_1 initiates VGCS call.	Call established. MS_2 is listener MS_3 in cell_B is not notified Due to lack of uplink reply (on air interface “Uplink access burst - absence of MS with the activated VBS GID) in Cell_B the GCH get de-allocated.
2	MS_2 moves from cell_A to cell_B	MS_2 makes location update and gets notified of the VBS call as the GCH gets re-allocated because of the new presence of MS_2 having the VBS GID activated.
3	MS_1 takes down the call	The call is properly released.

5.1.3 Service Subscriber active in a REC call moves in empty cell

Test case ID: **RINF_URNR_3**

Purpose: Verify that TCH is allocated in a cell, no matter if the cell.is empty or not

Precondition:
2 cells (cell_A, cell_B)
Both cells in the same group call area and have handover relationship to each other
Both cells: uplinkReplyTimer >= 6s
2 mobiles (MS_1, MS_2)
MS_1 (cell_A)
MS_2 (cell_A)
No mobile in cell_B
REC GID is active on all mobiles
Handset for MS_2 either

- Supports tracing of Cell-ID or
- Supports display of Cell-broadcast information

If handset for MS_2 supports only Cell-broadcast information, the network shall provide unique cell broadcast information for cell_B

General: Status of the TCH should be checked by an O&M System.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	MS_1 initiates REC call.	Call established. MS_2 is listener A GCH is allocated in cell_B despite the absence of subscribers
2	MS_1 takes the uplink for a period greater than uplink timer value configured in BSS	A GCH is still allocated in cell_B despite the absence of subscribers
3	As listener MS_2 moves from cell_A to cell_B	MS_A2 ~~makes a location update and gets notified of the REC call~~ does a cell reselection to cell_B and continues to listen to the REC. Information about current cell can be checked on the handset.
4	MS_1 takes down the call.	The call is properly released

5.2 Enhanced Railway Emergency Call (eREC)

5.2.1 eREC call with correct SID – eREC MS with same SID are joining, eREC MS with different SID will not be alerted

Test case ID: **RINF_eREC_1**

Purpose: Verify eREC terminals are joining an eREC call if the SID is same and eREC terminals are not joining an eREC call if the registered SID is different.

Precondition: eREC is activated in the network

At least 4 eREC devices

LAC_1 and CID_1 for which eREC is used are defined in the network

LAC_2 and CID_2 for which eREC is used are defined in the network

2 sectors (SID_1, SID_2) are defined

eREC GIDs are defined: 299

A controller

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Using 2 eREC devices, perform a registration on the concerned defined LAC and CID with SID_1	Registration is performed, no error is returned to the eREC device.
2	Using 2 other eREC devices, perform a registration on the concerned defined LAC and CID with SID_2	Registration is performed, no error is returned to the eREC device.
3	Perform an eREC call with an existing SID defined.	All eREC terminals with same SID are alerted and join the eREC call. The terminal registered with a different SID will not be alerted
4	Verify the correct controller is alerted.	Controller number is according to the one defined for this SID.

5.2.2 eREC call which involve with eREC capable and non eREC capable terminals

Test case ID: **RINF_eREC_2**

Purpose: Verify eREC call and REC call are both joined by eREC capable (and registered) and non eREC capable terminals.

Precondition: eREC is activated in the network

1 terminal capable and supporting eREC is available (registered to eREC): MS_1

1 non capable eREC terminal: MS_2

LAC and CID for which eREC is used are defined in the network

eREC GIDs are defined: 299

Sector ID (SID_1) is defined

A Controller

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Perform a 299 REC call.	Call is generated all concerned terminals and controller are alerted. The eREC terminals are joining.
2	Use a eREC terminal which is registered to eREC.	Registration is performed.
3	Perform a 299 eREC call with SID_1	eREC call is established. The eREC terminal are joining. The non eREC capable terminal is joining.
4	Perform a 299 REC call.	Call is generated all concerned terminals and controller are alerted. The eREC terminals and the non eREC capable terminals are joining.

5.3 ER-GSM

5.3.1 Establishment of a PtP call in an ER-GSM network

Test case ID: **RINF_ER_GSM**

Purpose: Verify basic GSM functionality when the network utilizes the ER-GSM frequency band. Both types of UE with and without ER-GSM capability should be capable to accede to the network.

Precondition: A cell with more than one TRX, the BCCH TRX must belong to the UIC GSM-R Band (without the E-Band) and the second TRX to the ER-GSM band.

Subscriber A has a UE in ER-GSM band. Subscriber B has an UE in the GSM-R band.

References: See Annex A – Cross-reference tables.

Test Procedure:

Step	Procedure	Result / effect
1	Subscriber B calls Subscriber A	- The system allocates TCH in the TRX configured with ER-GSM frequency for Subscriber A. - The system allocates TCH in the TRX configured with UIC GSM-R frequency for Subscriber B. - The call is setup correctly.

Annex A – Cross-reference tables

A-1 Cross reference for EIRENE FRS [1]

Section	RequirementText	Requirement Status	TestcaseID	TestcaseHeading
2.2.1	This section describes the generic voice telephony services which shall/should be supported by the EIRENE network:	(I)	RINF_GSM_4	Supplementary Service CLIP – MMC with Call Forwarding Unconditional
	- point-to-point voice calls;	(MI)	RINF_GSM_5	Supplementary Service MPTY
	- public emergency voice calls;	(M)	RINF_GSM_6	Establishment of several PTP calls with different priorities
	- broadcast voice calls;	(M)	RINF_VGCS_1	SS originates VGCS call
	- group voice calls;	(MI)	RINF_VGCS_2	Controller originates VGCS call and takes it down with the kill Sequence
	- multi-party voice calls.	(MI)	RINF_VGCS_3	SS originates VGCS call, leaves, rejoins and ends it.
			RINF_VGCS_4	SS enters into VGCS broadcast area with ongoing VGCS call and is notified of it
			RINF_VGCS_5	Controller joins ongoing VGCS call
			RINF_VGCS_6	Parallel group calls are possible in the same cell.
			RINF_VGCS_7	GID delivered correctly to terminating SS in SS originated VGCS call
			OTDI	SS originates VGCS call, terminating Controller receives the OTDI
			RINF_OTDI_2	SS originates VGCS Immediate Setup 2 call, terminating Controller receives the OTDI
2.2.2	All voice call services shall be able to operate between any combination of fixed and mobile equipment users (excluding specific data terminal equipment).	(MI)	RINF_GSM_4	Supplementary Service CLIP – MMC with Call Forwarding Unconditional
	Point-to-point voice calls	(I)	RINF_GSM_5	Supplementary Service MPTY
			RINF_GSM_6	Establishment of several PTP calls with different priorities
			RINF_VGCS_1	SS originates VGCS call
			RINF_VGCS_2	Controller originates VGCS call and takes it down with the kill Sequence
			RINF_VGCS_3	SS originates VGCS call, leaves, rejoins and ends it.
			RINF_VGCS_4	SS enters into VGCS broadcast area with ongoing VGCS call and is notified of it
			RINF_VGCS_5	Controller joins ongoing VGCS call
			RINF_VGCS_6	Parallel group calls are possible in the same cell.
			RINF_VGCS_7	GID delivered correctly to terminating SS in SS originated VGCS call
			RINF_OTDI_1	SS originates VGCS call, terminating Controller receives the OTDI

			RINF_OTDI_2	SS originates VGCS Immediate Setup 2 call, terminating Controller receives the OTDI
2.2.3	The system shall support point-to-point voice calls between any two call parties.	(MI)	RINF_GSM_4	Supplementary Service CLIP – MMC with Call Forwarding Unconditional
			RINF_GSM_5	Supplementary Service MPTY
			RINF_GSM_6	Establishment of several PTP calls with different priorities
			RINF_HO_1	Inter BTS handover of a point to point voice call
			RINF_FA_7	FA Call - Successful Call
			RINF_AM_1	National call: AM allows call
2.2.4	Such point-to-point calls shall allow both parties to talk simultaneously. Public emergency voice calls	(MI) (I)	RINF_GSM_4	Supplementary Service CLIP – MMC with Call Forwarding Unconditional
			RINF_GSM_5	Supplementary Service MPTY
			RINF_GSM_6	Establishment of several PTP calls with different priorities
			RINF_HO_1	Inter BTS handover of a point to point voice call
			RINF_FA_7	FA Call - Successful Call
			RINF_AM_1	National call: AM allows call
2.2.12	The system shall support group voice calls.	(MI)	RINF_VGCS_1	SS originates VGCS call
			RINF_VGCS_2	Controller originates VGCS call and takes it down with the kill Sequence
			RINF_VGCS_3	SS originates VGCS call, leaves, rejoins and ends it.
			RINF_VGCS_4	SS enters into VGCS broadcast area with ongoing VGCS call and is notified of it
			RINF_VGCS_5	Controller joins ongoing VGCS call
			RINF_VGCS_6	Parallel group calls are possible in the same cell.
			RINF_VGCS_7	GID delivered correctly to terminating SS in SS originated VGCS call
2.2.14	The composition of call groups shall be able to be modified within the network. A single user shall be able to be a member of one or more call groups.	(MI)	RINF_eMLPP_6	MS in VGCS call having the UL of the GCH, pre-emption on MS by higher prio VGCS call (REC)
2.2.16	It is acceptable that only one mobile user involved in the group call may talk at any time. In this case:	(I)	RINF_VGCS_1	SS originates VGCS call
	- It shall be possible for controllers to speak at any time during the call.	(MI)	RINF_VGCS_2	Controller originates VGCS call and takes it down with the kill Sequence
	- A mechanism shall be provided by the system to arbitrate between those users wishing to speak within the group call.	(MI)	RINF_VGCS_3	SS originates VGCS call, leaves, rejoins and ends it.
	Multi-party voice calls	(I)	RINF_VGCS_4	SS enters into VGCS broadcast area with ongoing VGCS call and is notified of it
			RINF_VGCS_5	Controller joins ongoing VGCS call
			RINF_VGCS_6	Parallel group calls are possible in the same cell.
			RINF_VGCS_7	GID delivered correctly to terminating SS in SS originated VGCS call

2.2.17	The system shall support multi-party voice communications between up to six different parties.	(MI)	RINF_GSM_5	Supplementary Service MPTY
2.2.18	Any of the parties involved in a multi-party voice call shall be able to talk simultaneously.	(MI)	RINF_GSM_5	Supplementary Service MPTY
2.3.4	If the text message facility is implemented, it shall not interfere with the ability of users to make or receive calls with a higher priority.	(MI)	RINF_GSM_8	Short and long SMS
	General data applications	(I)		
2.3.12	Where fax functionality is provided, it shall be possible to interrupt the fax to make or receive calls with a higher priority.	(MI)	NoCov_1	FAX use questionable, no known mobiles supporting this
	Train control applications	(I)		
2.3.13	Where ERTMS/ETCS level 2 or 3 is implemented, the network shall be capable of supporting data communications for that train control system with the required quality of service.	(MI)	RINF_eMLPP_8	MS in PtP call, pre-emption on Air IF by higher prio data call (4800 baud, transparent)
2.4.1	The EIRENE network shall/should support the following call related services:	(I)	RINF_GSM_1	Successful Location Update after MS Power On
	- display of identity of called/calling user;	(MI)	RINF_GSM_2	Supplementary Service Call Hold
	- restriction of display of called/calling user;	(O)	RINF_GSM_3	Supplementary Service Call Waiting
	- priority and pre-emption;	(MI)	RINF_GSM_4	Supplementary Service CLIP – MMC with Call Forwarding Unconditional
	- closed user group;	(M)	RINF_GSM_5	Supplementary Service MPTY
	- call forwarding;	(M)	RINF_GSM_6	Establishment of several PTP calls with different priorities
	- call hold;	(MI)	RINF_GSM_7	Public Emergency Call – With SIM
	- call waiting;	(MI)	RINF_FA_1	Registration of an FN Number
	- charging information;	(O)	RINF_FA_2	Registration of an unknown FN fails
	- call barring.	(MI)	RINF_FA_3	Deregistration of an FN Number
	- explicit call transfer	(O)	RINF_FA_4	Deregistration of an FN fails
	Display of identity	(I)	RINF_FA_5	Interrogation of an FA Number
			RINF_FA_6	Interrogation of an FN fails
			RINF_FA_7	FA Call - Successful Call
			RINF_FA_8	FA Call – Call is not completed
			RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
			RINF_FA_10	Deregistration of CT2 numbers while roaming
			RINF_FA_11	Forced Deregistration
			RINF_FA_14	Registration of an FN fails - remote party already registered
2.4.2	It shall be possible to display the identity of the called or calling party in the form of a standard telephone number.	(MI)	RINF_GSM_1	Successful Location Update after MS Power On
			RINF_GSM_2	Supplementary Service Call Hold
			RINF_GSM_3	Supplementary Service Call Waiting

			RINF_GSM_4 RINF_GSM_5	Supplementary Service CLIP – MMC with Call Forwarding Unconditional Supplementary Service MPTY
			RINF_GSM_6	Establishment of several PTP calls with different priorities
			RINF_GSM_7	Public Emergency Call – With SIM
			RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
			RINF_FA_10	Deregistration of CT2 numbers while roaming
2.4.3	It shall be possible to display the identity of the called or calling party as a textual description of their function. Restriction of display of identity	(MI) (I)	RINF_FA_1	Registration of an FN Number
			RINF_FA_2	Registration of an unknown FN fails
			RINF_FA_3	Deregistration of an FN Number
			RINF_FA_4	Deregistration of an FN fails
			RINF_FA_5	Interrogation of an FA Number
			RINF_FA_6	Interrogation of an FN fails
			RINF_FA_7	FA Call - Successful Call
			RINF_FA_8	FA Call – Call is not completed
			RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
			RINF_FA_10	Deregistration of CT2 numbers while roaming
			RINF_FA_11	Forced Deregistration
			RINF_FA_14	Registration of an FN fails - remote party already registered
2.4.5	The network shall provide a mechanism whereby calls may be assigned one of a number of different priority levels.	(MI)	RINF_GSM_4	Supplementary Service CLIP – MMC with Call Forwarding Unconditional
			RINF_eMLPP_1	MS in VGCS call on DCH, pre-emption on Air IF by higher prio PtP call
			RINF_eMLPP_2	MS in VBS call as listener, pre-emption on Air IF by higher prio VBS call.
			RINF_eMLPP_3	MS in VGCS call having the UL of the GCH, pre-emption on Air IF by higher prio VBS call.
			RINF_eMLPP_4	MS in PtP call, pre-emption on MS by higher prio VGCS call (REC)
			RINF_eMLPP_5	MS in VBS call as originator, pre-emption on Air IF by higher prio VGCS call (REC)
			RINF_eMLPP_7	MS in data call, pre-emption on Air IF by higher prio VGCS call (REC)
			RINF_eMLPP_8	MS in PtP call, pre-emption on Air IF by higher prio data call (4800 baud, transparent)

			RINF_LE_2	Orig. SS active in a VBS (P4) call move in a cell with ongoing REC call
			RINF_LE_3	Orig. SS active in a VGCS (P4) call on GCH (talker) move in a cell with ongoing REC call
2.4.6	This mechanism shall allow calls with a higher assigned priority to override (pre-empt) existing calls of a lower priority.	(MI)	RINF_eMLPP_1	MS in VGCS call on DCH, pre-emption on Air IF by higher prio PtP call
			RINF_eMLPP_2	MS in VBS call as listener, pre-emption on Air IF by higher prio VBS call.
			RINF_eMLPP_3	MS in VGCS call having the UL of the GCH, pre-emption on Air IF by higher prio VBS call.
			RINF_eMLPP_4	MS in PtP call, pre-emption on MS by higher prio VGCS call (REC)
			RINF_eMLPP_5	MS in VBS call as originator, pre-emption on Air IF by higher prio VGCS call (REC)
			RINF_eMLPP_7	MS in data call, pre-emption on Air IF by higher prio VGCS call (REC)
			RINF_eMLPP_8	MS in PtP call, pre-emption on Air IF by higher prio data call (4800 baud, transparent)
			RINF_LE_2	Orig. SS active in a VBS (P4) call move in a cell with ongoing REC call
			RINF_LE_3	Orig. SS active in a VGCS (P4) call on GCH (talker) move in a cell with ongoing REC call
2.4.7	Pre-empted calls will be discontinued and the new call of a higher priority shall be connected instead. Closed user group	(MI) (I)	RINF_eMLPP_1	MS in VGCS call on DCH, pre-emption on Air IF by higher prio PtP call
			RINF_eMLPP_2	MS in VBS call as listener, pre-emption on Air IF by higher prio VBS call.
			RINF_eMLPP_3	MS in VGCS call having the UL of the GCH, pre-emption on Air IF by higher prio VBS call.
			RINF_eMLPP_4	MS in PtP call, pre-emption on MS by higher prio VGCS call (REC)
			RINF_eMLPP_5	MS in VBS call as originator, pre-emption on Air IF by higher prio VGCS call (REC)
			RINF_eMLPP_7	MS in data call, pre-emption on Air IF by higher prio VGCS call (REC)
			RINF_eMLPP_8	MS in PtP call, pre-emption on Air IF by higher prio data call (4800 baud, transparent)
			RINF_LE_2	Orig. SS active in a VBS (P4) call move in a cell with ongoing REC call
			RINF_LE_3	Orig. SS active in a VGCS (P4) call on GCH (talker) move in a cell with ongoing REC call
2.4.13	The network shall allow the user to temporarily exit from an existing call by putting the call on hold.	(MI)	RINF_GSM_2	Supplementary Service Call Hold

2.4.14	It shall be possible for the user to re-join the call which is on hold at any time.	(MI)	RINF_GSM_2	Supplementary Service Call Hold
	Call waiting	(I)		
2.4.15	The network shall provide the ability to inform a user, who is involved in an existing call, of attempts by other users to contact them.	(MI)	RINF_GSM_3	Supplementary Service Call Waiting
	Charging information	(I)		
2.5.1	The EIRENE network shall also provide support for the following railway specific services:	(I)	RINF_FA_1	Registration of an FN Number
	- functional addressing including registration/deregistration (see section 11);	(MI)	RINF_FA_2	Registration of an unknown FN fails
	- location dependent addressing (see section 11);	(MI)	RINF_FA_3	Deregistration of an FN Number
	Deleted		RINF_FA_4	Deregistration of an FN fails
	- Railway emergency calls (see section 13).	(MI)	RINF_FA_5	Interrogation of an FA Number
	The EIRENE network should also provide support for shunting mode (see section 14).	(O)	RINF_FA_6	Interrogation of an FN fails
			RINF_FA_7	FA Call - Successful Call
			RINF_FA_8	FA Call – Call is not completed
			RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
			RINF_FA_10	Deregistration of CT2 numbers while roaming
			RINF_FA_11	Forced Deregistration
			RINF_FA_14	Registration of an FN fails - remote party already registered
			RINF_LDA_1	Successful LDA Call - Verify the cell format is correct
			RINF_LDA_2	Unsuccessful LDA Call - Call to invalid Short Code
			RINF_REC_1	SS originates a REC
			RINF_REC_2	Subscriber initiated REC (no talker change, normal clear down of call)
			RINF_REC_4	Controller originates a REC
			RINF_REC_6	REC in a GCA with a locked cell
			RINF_OTDI_1	SS originates VGCS call, terminating Controller receives the OTDI
			RINF_OTDI_2	SS originates VGCS Immediate Setup 2 call, terminating Controller receives the OTDI
2.6.2.1	A High Priority call shall be associated with an internationally harmonised value (such as Short Dialling Code, Group Identity or Functional Number).	(MI)	NoCov_30	Check Documentation of Equipement and Installation
3.2.4	The land-based part of the system shall provide communications for mobiles when stationary and when travelling at speeds up to the maximum allowable line speed or 500 km/h, whichever is the lower.	(MI)	NoCov_2	Drive Test Results to check
3.4.2	The required call set-up times shall be achieved in 95% of cases.	(MI)	NoCov_3	Check Results from Measurement Campaign

3.4.3	Call set-up times for 99% of cases shall not be more than 1.5 times the required call set-up time.	(MI)	NoCov_3	Check Results from Measurement Campaign
3.4.4	Set-up times shall include the time required for any translation of functional numbers internal to the EIRENE network.	(MI)	NoCov_3	Check Results from Measurement Campaign
3.5.2	The group or broadcast call area used will have the effect of determining which mobiles can participate in the call (ie those currently within the area defined). It shall be possible to determine the area over which the call takes place by one, or a combination, of the following:	(I)	RINF_VGCS_1	SS originates VGCS call
	- the location of the call initiator (if mobile-originated);	(MI)	RINF_VGCS_2	Controller originates VGCS call and takes it down with the kill Sequence
	- the identity of the group being called (eg all users, all trains, etc);	(MI)	RINF_VGCS_3	SS originates VGCS call, leaves, rejoins and ends it.
	- a prefix to the group identity specifying the call area (if fixed network-initiated).	(MI)	RINF_VGCS_4	SS enters into VGCS broadcast area with ongoing VGCS call and is notified of it
			RINF_VGCS_5	Controller joins ongoing VGCS call
			RINF_VGCS_6	Parallel group calls are possible in the same cell.
			RINF_VGCS_7	GID delivered correctly to terminating SS in SS originated VGCS call
			RINF_VBS_1	SS originates VBS call
			RINF_VBS_2	SS originates prio0 VBS call
			RINF_VBS_3	Controller originates VBS call and takes down the call by disconnecting
			RINF_VBS_4	Controller originates VBS call and takes down the call with the kill sequence
			RINF_VBS_5	Controller joins ongoing VBS call
			RINF_VBS_6	SS enters into VBS broadcast area with ongoing VBS call and is notified of it, SS joins the VBS call
3.5.3	Any group or broadcast calls initiated in a given location shall be broadcast over an associated area based on the location of the call originator, and also to any fixed network numbers associated with the originating location.	(MI)	RINF_VGCS_1	SS originates VGCS call
			RINF_VGCS_2	Controller originates VGCS call and takes it down with the kill Sequence
			RINF_VGCS_3	SS originates VGCS call, leaves, rejoins and ends it.
			RINF_VGCS_4	SS enters into VGCS broadcast area with ongoing VGCS call and is notified of it
			RINF_VGCS_5	Controller joins ongoing VGCS call
			RINF_VGCS_6	Parallel group calls are possible in the same cell.
			RINF_VGCS_7	GID delivered correctly to terminating SS in SS originated VGCS call

			RINF_VBS_1 RINF_VBS_2	SS originates VBS call SS originates prio0 VBS call
			RINF_VBS_3	Controller originates VBS call and takes down the call by disconnecting
			RINF_VBS_4	Controller originates VBS call and takes down the call with the kill sequence
			RINF_VBS_5	Controller joins ongoing VBS call
			RINF_VBS_6	SS enters into VBS broadcast area with ongoing VBS call and is notified of it, SS joins the VBS call
3.5.6	Mobiles configured for reception of railway emergency calls entering into a call area where a railway emergency call is ongoing shall automatically join this call.	(MI)	NoCov_4	Mobile/Cab requirement + RINF_LE_1, RINF_LE_2, RINF_LE_3
4.1.3i	It shall be possible to operate all EIRENE mobiles in the basic frequency band allocated for use by EIRENE Networks.	(MI)	NoCov_10	Mobile/Cab requirement
4.1.4	Mobile equipment operated in frequency band listed in clause 4.1.3i, 4.1.3ii and 4.1.3iii shall function as specified when travelling at speeds from 0 km/h to 500 km/h.	(MI)	NoCov_10	Mobile/Cab requirement
4.2.1	The following voice telephony services, identified in section 2, shall/should be supported for each type of mobile radio:	(I)	NoCov_10	Mobile/Cab requirement
	Cab radio | Point-to-point voice calls	(MI)		
	Cab radio |Public emergency voice calls	(M)		
	Cab radio | Broadcast voice calls	(MI)		
	Cab radio |Group voice calls	(MI)		
	Cab radio ulti-party voice calls	(MI)		
	ETCS data only radio | Point-to-point voice calls	(NA)		
	ETCS data only radio |Public emergency voice calls	(NA)		
	ETCS data only radio | Broadcast voice calls	(NA)		
	ETCS data only radio |Group voice calls	(NA)		
	ETCS data only radio ulti-party voice call	(NA)		
	General purpose radio | Point-to-point voice calls	(M)		
	General purpose radio |Public emergency voice calls	(M)		
	General purpose radio | Broadcast voice calls	(M)		
	General purpose radio |Group voice calls	(M)		
	General purpose radio ulti-party voice call	(O)		
	Operational radio | Point-to-point voice calls	(M)		
	Operational radio |Public emergency voice calls	(M)		
	Operational radio | Broadcast voice calls	(M)		
	Operational radio |Group voice calls	(M)		
	Operational radio ulti-party voice calls	(O)		
	Shunting radio | Point-to-point voice calls	(M)		
	Shunting radio |Public emergency voice calls	(M)		

	Shunting radio | Broadcast voice calls	(M)		
	Shunting radio |Group voice calls	(M)		
	Shunting radio ulti-party voice calls	(M)		
	Table 4-1: Voice telephony services to be supported	(I)		
4.2.2	The following data applications, identified in section 2, shall/should be supported for each type of mobile radio:	(I)	NoCov_10	Mobile/Cab requirement
	Cab radio | Text message service	(MI)		
	Cab radio | General data applications	(M)		
	Cab radio | Automatic fax	(O)		
	Cab radio | ETCS train control applications	(NA)		
	ETCS data only radio | Text message service	(NA)		
	ETCS data only radio | General data applications	(O)		
	ETCS data only radio | Automatic fax	(NA)		
	ETCS data only radio | ETCS train control applications	(MI)		
	General purpose radio | Text message service	(M)		
	General purpose radio | General data applications	(O)		
	General purpose radio | Automatic fax	(O)		
	General purpose radio | ETCS train control applications	(NA)		
	Operational radio | Text message service	(M)		
	Operational radio | General data applications	(O)		
	Operational radio | Automatic fax	(O)		
	Operational radio | ETCS train control applications	(NA)		
	Shunting radio | Text message service	(M)		
	Shunting radio | General data applications	(O)		
	Shunting radio | Automatic fax	(O)		
	Shunting radio | ETCS train control applications	(NA)		
	Table 4-2: Data applications to be supported	(I)		
4.2.3	The following call related services shall/should be supported for each type of mobile radio:	(I)	NoCov_10	Mobile/Cab requirement
	Cab radio | Display of calling user identity	(MI)		
	Cab radio | Display of called user identity	(MI)		
	Cab radio | Restriction of display of user identity	(O)		
	Cab radio | EIRENE closed user group	(M)		
	Cab radio | Call forwarding - unconditional	(M)		
	Cab radio | Call forwarding - if user busy	(O)		
	Cab radio | Call forwarding - if no reply	(O)		
	Cab radio | Call forwarding - if not reachable	(O)		
	Cab radio | Call hold	(MI)		

Cab radio	Call waiting	(MI)		
Cab radio information	Display of call charging	(O)		
Cab radio	Call barring	(MI)		
Cab radio (ECT)	Explicit Call Transfer	(O)		
Cab radio	Auto answer service	(MI)		
Cab radio information	Call supervisory	(MI)		
ETCS data only radio	Display of calling user identity	(NA)		
ETCS data only radio	Display of called user identity	(MI)*		
ETCS data only radio	Restriction of display of user identity	(NA)		
ETCS data only radio	EIRENE closed user group	(NA)		
ETCS data only radio	Call forwarding-unconditional	(NA)		
ETCS data only radio	Call forwarding - if user busy	(NA)		
ETCS data only radio	Call forwarding - if no reply	(NA)		
ETCS data only radio	Call forwarding - if not reachable	(NA)		
ETCS data only radio	Call hold	(NA)		
ETCS data only radio	Call waiting	(NA)		
ETCS data only radio	Display of call charging information	(NA)		
ETCS data only radio	Call barring	(NA)		
ETCS data only radio	Explicit Call Transfer (ECT)	(NA)		
ETCS data only radio	Auto answer service	(NA)		
ETCS data only radio	Call supervisory information	(NA)		
General purpose radio	Display of calling user identity	(M)		
General purpose radio	Display of called user identity	(M)		
General purpose radio	Restriction of display of user identity	(O)		
General purpose radio	EIRENE closed user group	(O)		
General purpose radio	Call forwarding-unconditional	(O)		
General purpose radio	Call forwarding - if user busy	(O)		
General purpose radio	Call forwarding - if no reply	(O)		
General purpose radio	Call forwarding - if not reachable	(O)		
General purpose radio	Call hold	(O)		
General purpose radio	Call waiting	(M)		
General purpose radio	Display of call charging information	(O)		
General purpose radio	Call barring	(O)		
General purpose radio	Explicit Call Transfer (ECT)	(O)		
General purpose radio	Auto answer service	(O)		
General purpose radio	Call supervisory information	(O)		

	Operational radio | Display of calling user identity	(M)		
	Operational radio | Display of called user identity	(M)		
	Operational radio | Restriction of display of user identity	(O)		
	Operational radio | EIRENE closed user group	(M)		
	Operational radio | Call forwarding - unconditional	(O)		
	Operational radio | Call forwarding - if user busy	(O)		
	Operational radio | Call forwarding - if no reply	(O)		
	Operational radio | Call forwarding - if not reachable	(O)		
	Operational radio | Call hold	(O)		
	Operational radio | Call waiting	(M)		
	Operational radio | Display of call charging information	(O)		
	Operational radio | Call barring	(M)		
	Operational radio | Explicit Call Transfer (ECT)	(O)		
	Operational radio | Auto answer service	(M)		
	Operational radio | Call supervisory information	(O)		
	Shunting radio | Display of calling user identity	(M)		
	Shunting radio | Display of called user identity	(M)		
	Shunting radio | Restriction of display of user identity	(O)		
	Shunting radio | EIRENE closed user group	(M)		
	Shunting radio | Call forwarding - unconditional	(O)		
	Shunting radio | Call forwarding - if user busy	(O)		
	Shunting radio | Call forwarding - if no reply	(O)		
	Shunting radio | Call forwarding - if not reachable	(O)		
	Shunting radio | Call hold	(M)		
	Shunting radio | Call waiting	(M)		
	Shunting radio | Display of call charging information	(O)		
	Shunting radio | Call barring	(M)		
	Shunting radio | Explicit Call Transfer (ECT)	(O)		
	Shunting radio | Auto answer service	(M)		
	Shunting radio | Call supervisory information	(O)		
	Table 4-3: Call related features to be supported	(I)		
	* Transferring part of the service only	(I)		
4.2.4	The following EIRENE features shall/should be supported for each type of mobile radio:	(I)	NoCov_10	Mobile/Cab requirement
	Cab radio | Functional addressing (section 11) |	(MI)		
	Cab radio |Location dependent addressing (section 11)|	(MI)		
	Cab radio | Deleted |	NA		

Cab radio | Shunting mode (section 14) |	(MI)		
Cab radio ultiple driver communications within | | the same train (section 5) |	(MI)		
Cab radio | Railway emergency calls (section 13) |	(MI)		
ETCS data only radio|Functional addressing (section 11) |	(NA)		
ETCS data only radio|Location dependent addressing (section 11)|	(M)		
ETCS data only radio|Deleted |N/A	(NA)		
ETCS data only radio|Shunting mode (section 14)) |N/A	(NA)		
ETCS data only radio|Multiple driver communications within | | the same train (section 5) |N/A	(NA)		
ETCS data only radio|Railway emergency calls (section 13) |	(NA)		
General purpose radio|Functional addressing (section 11) |	(M)		
General purpose radio|Location dependent addressing (section 11)|	(O)		
General purpose radio|Deleted |N/A	(NA)		
General purpose radio|Shunting mode (section 14)) |N/A	(NA)		
General purpose radio|Multiple driver communications within | | the same train (section 5) |N/A	(NA)		
General purpose radio|Railway emergency calls (section 13) |	(O)		
Operational radio | Functional addressing (section 11) |	(M)		
Operational radio |Location dependent addressing (section 11)|	(O)		
Operational radio | Deleted |	(NA)		
Operational radio | Shunting mode (section 14) |N/A	(NA)		
Operational radio ultiple driver communications within | | the same train (section 5) |N/A	(NA)		
Operational radio | Railway emergency calls (section 13) |	(M)		
Shunting radio | Functional addressing (section 11) |	(M)		
Shunting radio |Location dependent addressing (section 11)|	(O)		
Shunting radio | Deleted |	(NA)		
Shunting radio | Shunting mode (section 14) |	(M)		
Shunting radio ultiple driver communications within | | the same train (section 5) |N/A	(NA)		
Shunting radio | Railway emergency calls (section 13) |	(M)		

	Table 4-4: EIRENE specific features to be supported	(I)		
5.2.2.3	Once an appropriate destination has been obtained, the radio shall attempt to establish a call to this destination. The functional identity shall be displayed to the controller.	(MI)	RINF_FA_7	FA Call - Successful Call
			RINF_LDA_1	Successful LDA Call - Verify the cell format is correct
			RINF_LDA_2	Unsuccessful LDA Call - Call to invalid Short Code
			RINF_OTDI_1	SS originates VGCS call, terminating Controller receives the OTDI
			RINF_OTDI_2	SS originates VGCS Immediate Setup 2 call, terminating Controller receives the OTDI
5.2.2.3i	The functional identity includes the following:	(I)	RINF_FA_7	FA Call - Successful Call
	- the train number, if available;	(MI)	RINF_LDA_1	Successful LDA Call - Verify the cell format is correct
	- the engine number, if no train number is available;	(MI)	RINF_LDA_2	Unsuccessful LDA Call - Call to invalid Short Code
	- the coach number of the leading cab, if neither a train number nor an engine number is available.	(O)	RINF_OTDI_1	SS originates VGCS call, terminating Controller receives the OTDI
			RINF_OTDI_2	SS originates VGCS Immediate Setup 2 call, terminating Controller receives the OTDI
5.2.2.4	An audible and visual indication shall be provided to the driver that the call is proceeding.	(MI)	RINF_FA_7	FA Call - Successful Call
			RINF_LDA_1	Successful LDA Call - Verify the cell format is correct
			RINF_LDA_2	Unsuccessful LDA Call - Call to invalid Short Code
			RINF_OTDI_1	SS originates VGCS call, terminating Controller receives the OTDI
			RINF_OTDI_2	SS originates VGCS Immediate Setup 2 call, terminating Controller receives the OTDI
5.2.2.6	The functional identity of the connected party, if available, shall be displayed to the driver.	(MI)	RINF_FA_7	FA Call - Successful Call
			RINF_LDA_1	Successful LDA Call - Verify the cell format is correct
			RINF_LDA_2	Unsuccessful LDA Call - Call to invalid Short Code
			RINF_OTDI_1	SS originates VGCS call, terminating Controller receives the OTDI
			RINF_OTDI_2	SS originates VGCS Immediate Setup 2 call, terminating Controller receives the OTDI
5.2.2.7	If the functional identity of the connected party contains an alphanumeric description, this shall also be displayed.	(MI)	RINF_FA_7	FA Call - Successful Call
			RINF_LDA_1	Successful LDA Call - Verify the cell format is correct
			RINF_LDA_2	Unsuccessful LDA Call - Call to invalid Short Code

			RINF_OTDI_1 RINF_OTDI_2	SS originates VGCS call, terminating Controller receives the OTDI SS originates VGCS Immediate Setup 2 call, terminating Controller receives the OTDI
5.2.2.9	It shall be possible for a driver to initiate and participate in group voice calls between drivers in a pre-defined geographical area.	(MI)	RINF_eMLPP_1	MS in VGCS call on DCH, pre-emption on Air IF by higher prio PtP call
			RINF_eMLPP_3	MS in VGCS call having the UL of the GCH, pre-emption on Air IF by higher prio VBS call.
			RINF_eMLPP_4	MS in PtP call, pre-emption on MS by higher prio VGCS call (REC)
			RINF_VGCS_1	SS originates VGCS call
			RINF_VGCS_3	SS originates VGCS call, leaves, rejoins and ends it.
			RINF_VGCS_4	SS enters into VGCS broadcast area with ongoing VGCS call and is notified of it
			RINF_VGCS_7	GID delivered correctly to terminating SS in SS originated VGCS call
			RINF_REC_3	SS accepts an incoming REC
			RINF_REC_4	Controller originates a REC
			RINF_LE_1	SS active in a PTOP (P4) call move in a cell with ongoing REC call
			RINF_LE_3	Orig. SS active in a VGCS (P4) call on GCH (talker) move in a cell with ongoing REC call
5.2.2.15	The call shall continue until terminated by the calling driver, an authorised controller or the network.	(MI)	RINF_eMLPP_1	MS in VGCS call on DCH, pre-emption on Air IF by higher prio PtP call
			RINF_eMLPP_3	MS in VGCS call having the UL of the GCH, pre-emption on Air IF by higher prio VBS call.
			RINF_eMLPP_4	MS in PtP call, pre-emption on MS by higher prio VGCS call (REC)
			RINF_VGCS_1	SS originates VGCS call
			RINF_VGCS_3	SS originates VGCS call, leaves, rejoins and ends it.
			RINF_VGCS_4	SS enters into VGCS broadcast area with ongoing VGCS call and is notified of it
			RINF_VGCS_7	GID delivered correctly to terminating SS in SS originated VGCS call
			RINF_REC_3	SS accepts an incoming REC
			RINF_REC_4	Controller originates a REC
			RINF_LE_1	SS active in a PTOP (P4) call move in a cell with ongoing REC call
			RINF_LE_3	Orig. SS active in a VGCS (P4) call on GCH (talker) move in a cell with ongoing REC call
5.2.2.18	It shall be possible for a driver to initiate Railway emergency calls (see section 13).	(MI)	RINF_REC_1	SS originates a REC

			RINF_REC_2	Subscriber initiated REC (no talker change, normal clear down of call)
			RINF_REC_4	Controller originates a REC
			RINF_REC_6	REC in a GCA with a locked cell
5.2.2.26	Many trains employ multiple active traction vehicles. Where these vehicles are not connected by on-train wire connections, it shall be possible for the lead driver to establish a permanent radio connection between each of the active cabs.	(MI)	RINF_GSM_5	Supplementary Service MPTY
5.2.2.29	The lead driver shall be notified if a member of the group has placed the call on hold, although this shall not affect communications between the remaining members of the group.	(MI)	RINF_GSM_5	Supplementary Service MPTY
5.2.2.30	At any time during the call, the lead driver shall be able to remove a member of the group.	(MI)	RINF_GSM_5	Supplementary Service MPTY
5.2.2.31	The lead driver shall be able to terminate the entire call.	(MI)	RINF_GSM_5	Supplementary Service MPTY
5.2.2.32	If a driver is disconnected from the multi-driver call, a clear indication shall be given.	(MI)	RINF_GSM_5	Supplementary Service MPTY
5.2.2.37	For calls between a controller and the lead cab, it shall be possible to add the controller to the multi-driver call. Either the lead driver calls the controller or the controller calls the lead driver. In the latter case, the controller is automatically added into the multi-driver call. Functional identity of the controller shall be displayed in the leading cab.	(MI)	RINF_GSM_5	Supplementary Service MPTY
	Call train staff	(I)		
5.2.2.38	It shall be possible for the driver to contact members of on-board train staff using a point-to-point voice call.	(MI)	RINF_GSM_5	Supplementary Service MPTY
5.2.2.42	The Cab radio shall be capable of being used as a standard telephone, such that the driver is able to call any valid number subject to pre-defined call restrictions. The call may be initiated by:	(MI)	RINF_GSM_5	Supplementary Service MPTY
	- selection from a pre-defined list (up to 99 entries);	(MI)		
	- direct dialling a subscriber number;	(MI)		
	- calling a functional number.	(MI)		
	Receive incoming point-to-point voice call	(I)		
5.2.2.43	An audible and visual indication of an incoming call shall be provided.	(MI)	RINF_VGCS_1	SS originates VGCS call
			RINF_VGCS_2	Controller originates VGCS call and takes it down with the kill Sequence
			RINF_VGCS_3	SS originates VGCS call, leaves, rejoins and ends it.
			RINF_VGCS_4	SS enters into VGCS broadcast area with ongoing VGCS call and is notified of it
			RINF_VGCS_5	Controller joins ongoing VGCS call
			RINF_VGCS_6	Parallel group calls are possible in the same cell.

			RINF_VGCS_7	GID delivered correctly to terminating SS in SS originated VGCS call
			RINF_VBS_1	SS originates VBS call
			RINF_VBS_2	SS originates prio0 VBS call
			RINF_VBS_3	Controller originates VBS call and takes down the call by disconnecting
			RINF_VBS_4	Controller originates VBS call and takes down the call with the kill sequence
			RINF_VBS_5	Controller joins ongoing VBS call
			RINF_VBS_6	SS enters into VBS broadcast area with ongoing VBS call and is notified of it, SS joins the VBS call
5.2.2.47	An audible and visual indication of the incoming call shall be provided when a Cab radio receives a group or broadcast call.	(MI)	RINF_VGCS_1	SS originates VGCS call
			RINF_VGCS_2	Controller originates VGCS call and takes it down with the kill Sequence
			RINF_VGCS_3	SS originates VGCS call, leaves, rejoins and ends it.
			RINF_VGCS_4	SS enters into VGCS broadcast area with ongoing VGCS call and is notified of it
			RINF_VGCS_5	Controller joins ongoing VGCS call
			RINF_VGCS_6	Parallel group calls are possible in the same cell.
			RINF_VGCS_7	GID delivered correctly to terminating SS in SS originated VGCS call
			RINF_VBS_1	SS originates VBS call
			RINF_VBS_2	SS originates prio0 VBS call
			RINF_VBS_3	Controller originates VBS call and takes down the call by disconnecting
			RINF_VBS_4	Controller originates VBS call and takes down the call with the kill sequence
			RINF_VBS_5	Controller joins ongoing VBS call
			RINF_VBS_6	SS enters into VBS broadcast area with ongoing VBS call and is notified of it, SS joins the VBS call
9.2.1.1	The EIRENE system shall enable users to originate and receive calls by functional number.	(MI)	RINF_FA_1	Registration of an FN Number
			RINF_FA_2	Registration of an unknown FN fails
			RINF_FA_3	Deregistration of an FN Number
			RINF_FA_4	Deregistration of an FN fails
			RINF_FA_5	Interrogation of an FA Number
			RINF_FA_6	Interrogation of an FN fails
			RINF_FA_7	FA Call - Successful Call
			RINF_FA_8	FA Call – Call is not completed

			RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
			RINF_FA_10	Deregistration of CT2 numbers while roaming
			RINF_FA_11	Forced Deregistration
			RINF_FA_14	Registration of an FN fails - remote party already registered
9.2.1.2	Each mobile shall be identified by a unique telephone number.	(MI)	NoCov_5	Network Konfiguration Topic + Basic Call + CLIP
9.2.2.2	Every on-train function shall be identified by a unique standard number.	(MI)	RINF_FA_1	Registration of an FN Number
			RINF_FA_2	Registration of an unknown FN fails
			RINF_FA_3	Deregistration of an FN Number
			RINF_FA_4	Deregistration of an FN fails
			RINF_FA_11	Forced Deregistration
			RINF_FA_14	Registration of an FN fails - remote party already registered
9.2.3.2	Every on-engine/coach function shall be identified by a unique standard number.	(MI)	RINF_FA_1	Registration of an FN Number
			RINF_FA_2	Registration of an unknown FN fails
			RINF_FA_3	Deregistration of an FN Number
			RINF_FA_4	Deregistration of an FN fails
			RINF_FA_11	Forced Deregistration
			RINF_FA_14	Registration of an FN fails - remote party already registered
9.2.4.1	Every shunting team number shall be based on an association of:	(MI)	RINF_FA_1	Registration of an FN Number
	- service area identifier;	(MI)	RINF_FA_2	Registration of an unknown FN fails
	- shunting team identifier.	(MI)	RINF_FA_3	Deregistration of an FN Number
			RINF_FA_4	Deregistration of an FN fails
			RINF_FA_5	Interrogation of an FA Number
			RINF_FA_6	Interrogation of an FN fails
			RINF_FA_7	FA Call - Successful Call
			RINF_FA_8	FA Call – Call is not completed
			RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
			RINF_FA_10	Deregistration of CT2 numbers while roaming
			RINF_FA_11	Forced Deregistration
			RINF_FA_14	Registration of an FN fails - remote party already registered
9.2.4.2	Every maintenance team number shall be based on an association of:	(MI)	RINF_FA_1	Registration of an FN Number
	- service area identifier;	(MI)	RINF_FA_2	Registration of an unknown FN fails
	- type of maintenance team (speciality code);	(MI)	RINF_FA_3	Deregistration of an FN Number
	- maintenance team identifier.	(MI)	RINF_FA_4	Deregistration of an FN fails

			RINF_FA_5 RINF_FA_6	Interrogation of an FA Number Interrogation of an FN fails
			RINF_FA_7	FA Call - Successful Call
			RINF_FA_8	FA Call – Call is not completed
			RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
			RINF_FA_10	Deregistration of CT2 numbers while roaming
			RINF_FA_11	Forced Deregistration
			RINF_FA_14	Registration of an FN fails - remote party already registered
9.2.4.3	Every controller number shall be based on an association of: - controller location; - controller identifier.	(I) (MI) (MI)	RINF_FA_1	Registration of an FN Number
			RINF_FA_2	Registration of an unknown FN fails
			RINF_FA_3	Deregistration of an FN Number
			RINF_FA_4	Deregistration of an FN fails
			RINF_FA_5	Interrogation of an FA Number
			RINF_FA_6	Interrogation of an FN fails
			RINF_FA_7	FA Call - Successful Call
			RINF_FA_8	FA Call – Call is not completed
			RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
			RINF_FA_10	Deregistration of CT2 numbers while roaming
			RINF_FA_11	Forced Deregistration
			RINF_FA_14	Registration of an FN fails - remote party already registered
9.2.4.4	The numbering for other teams shall be treated in the same way as maintenance teams in 9.2.4.2.	(MI)	RINF_FA_1	Registration of an FN Number
			RINF_FA_2	Registration of an unknown FN fails
			RINF_FA_3	Deregistration of an FN Number
			RINF_FA_4	Deregistration of an FN fails
			RINF_FA_5	Interrogation of an FA Number
			RINF_FA_6	Interrogation of an FN fails
			RINF_FA_7	FA Call - Successful Call
			RINF_FA_8	FA Call – Call is not completed
			RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
			RINF_FA_10	Deregistration of CT2 numbers while roaming
			RINF_FA_11	Forced Deregistration
			RINF_FA_14	Registration of an FN fails - remote party already registered

9.3.1	Telephone numbers can be defined on a national basis, but codes for certain functions shall be used on an international basis in order to allow interoperability.	(MI)	NoCov_6	Network Konfiguration Topic + RINF_FA_15
9.3.2	For certain functions, standardised telephone numbers shall be implemented. These functions are:	(I)	RINF_GSM_7	Public Emergency Call – With SIM
	- Route call to most appropriate ERTMS/ETCS RBC;	(MI)	RINF_LDA_1	Successful LDA Call - Verify the cell format is correct
	- Railway emergency call;	(MI)	RINF_LDA_2	Unsuccessful LDA Call - Call to invalid Short Code
	- Route call to primary controller;	(MI)	RINF_REC_1	SS originates a REC
	- Route call to secondary controller;	(MI)	RINF_REC_2	Subscriber initiated REC (no talker change, normal clear down of call)
	- Route call to power supply controller;	(MI)	RINF_REC_4	Controller originates a REC
	- Public emergency call.	(M)	RINF_REC_6	REC in a GCA with a locked cell
9.5.1	Authorised users within the EIRENE network shall be able to receive calls from calling parties outside the EIRENE network.	(MI)	RINF_AM_1	National call: AM allows call
10.2.1	A number of levels of priority shall be required in order to offer different grades of service to different users and calls. Five levels of priority shall be defined:	(I)	RINF_REC_1	SS originates a REC
	- Railway emergency;	(MI)	RINF_REC_2	Subscriber initiated REC (no talker change, normal clear down of call)
	- control-command (safety);	(MI)	RINF_REC_4	Controller originates a REC
	- public emergency and high priority calls;	(MI)	RINF_REC_6	REC in a GCA with a locked cell
	- railway operation;	(MI)		
	- railway information.	(MI)		
10.2.2	In order to provide interoperability, priorities shall be allocated consistently across all EIRENE networks, as shown in the following table.	(I)	RINF_HO_2	Ongoing point to point voice call in the destination cell preempted by a inter BTS handover inwards of a point to point voice call
	| Automatic | UIC Priority | answering*| Pre-emption (of)	(I)	RINF_eMLPP_1	MS in VGCS call on DCH, pre-emption on Air IF by higher prio PtP call
	Railway emergency | Y * | Control-command (safety) | | and below	(MI)	RINF_eMLPP_2	MS in VBS call as listener, pre-emption on Air IF by higher prio VBS call.
	| | Public emergency, and high-Control-command (safety) | NA | priority calls and below	(MI)	RINF_eMLPP_3	MS in VGCS call having the UL of the GCH, pre-emption on Air IF by higher prio VBS call.
	Public emergency, and high-| | Railway operation, priority calls | | | Y * | Control-command (information) | | and below | |	(MI)	RINF_eMLPP_4	MS in PtP call, pre-emption on MS by higher prio VGCS call (REC)
	Railway operation | | (eg calls from or for | | All low priority calls drivers and controllers | Y** | including group calls | | between drivers in the same| | area that have been | | initiated by a controller) | | and Control-command | | (information) | |	(MI)	RINF_eMLPP_5	MS in VBS call as originator, pre-emption on Air IF by higher prio VGCS call (REC)

	All low priority calls | | | N | -	(MI)	RINF_eMLPP_7	MS in data call, pre-emption on Air IF by higher prio VGCS call (REC)
	* Y: Automatic call answering applies	(I)	RINF_eMLPP_8	MS in PtP call, pre-emption on Air IF by higher prio data call (4800 baud, transparent)
	Y**Mandatory for Cab radio, optional for other user equipment	(I)	RINF_REC_1	SS originates a REC
	Table 10-1: Allocation of priorities	(I)	RINF_REC_2	Subscriber initiated REC (no talker change, normal clear down of call)
			RINF_REC_4	Controller originates a REC
			RINF_REC_6	REC in a GCA with a locked cell
			RINF_LE_2	Orig. SS active in a VBS (P4) call move in a cell with ongoing REC call
			RINF_LE_3	Orig. SS active in a VGCS (P4) call on GCH (talker) move in a cell with ongoing REC call
10.2.3	The lowest priority ongoing call shall be pre-empted before that of a higher priority.	(MI)	RINF_eMLPP_1	MS in VGCS call on DCH, pre-emption on Air IF by higher prio PtP call
			RINF_eMLPP_2	MS in VBS call as listener, pre-emption on Air IF by higher prio VBS call.
			RINF_eMLPP_3	MS in VGCS call having the UL of the GCH, pre-emption on Air IF by higher prio VBS call.
			RINF_eMLPP_4	MS in PtP call, pre-emption on MS by higher prio VGCS call (REC)
			RINF_eMLPP_5	MS in VBS call as originator, pre-emption on Air IF by higher prio VGCS call (REC)
			RINF_eMLPP_7	MS in data call, pre-emption on Air IF by higher prio VGCS call (REC)
			RINF_eMLPP_8	MS in PtP call, pre-emption on Air IF by higher prio data call (4800 baud, transparent)
			RINF_LE_2	Orig. SS active in a VBS (P4) call move in a cell with ongoing REC call
			RINF_LE_3	Orig. SS active in a VGCS (P4) call on GCH (talker) move in a cell with ongoing REC call
10.3.2	Any implementation of such call restrictions shall not affect international interoperability.	(MI)	RINF_AM_1	National call: AM allows call
			RINF_AM_2	National call: AM denies call
10.4.1	A mobile may be a member of a number of groups. It shall be possible to 'activate' or 'deactivate' the mobile's subscription to these groups.	(MI)	RINF_eMLPP_5	MS in VBS call as originator, pre-emption on Air IF by higher prio VGCS call (REC)
10.4.2	Activating a group on the mobile shall allow a user to receive a call from that group.	(MI)	NoCov_10	Mobile/Cab requirement
10.4.3	Deactivating a group on the mobile shall prevent a user receiving calls from that group.	(MI)	NoCov_10	Mobile/Cab requirement
10.4.4	In order to provide interoperability, Cab radios shall/should be members of a number of standard groups:	(I)	NoCov_11	Mobile/Cab requirement + Configuration

	- Railway emergency call; - High priority group call between drivers in the same area; - shunting group call; - Operational group call to drivers in the same area.	(MI) (MI) (MI) (O)		
10.4.5	All mobiles with Railway emergency group call subscription(s) shall be prevented from deactivating the emergency group(s) whilst operational.	(MI)	NoCov_10	Mobile/Cab requirement
10.5.1	Authorised networks shall be listed in the following order: - home EIRENE network; - 'foreign' EIRENE networks; - public networks.	(I) (MI) (MI) (MI)	NoCov_10	Mobile/Cab requirement
10.5.2	Where EIRENE facilities are not available within the currently selected network, the user shall be given a visible indication.	(MI)	NoCov_10	Mobile/Cab requirement
10.6.2	Yes indicates that the network shall allow a call from the stated initiating party to the stated receiving party. "Yes*" indicates that the call shall be allowed at least for users on the same train. "Open" indicates that permissions for calls of this type are to be assigned by the implementing railway according to their specific communication requirements. Shaded cells on the access matrix mean that this call is outside the scope of the EIRENE specifications. The access matrix is shown in table 10-2.	(I)	RINF_AM_1	National call: AM allows call
	Initiating Party -> Receiving Party: Allow Call	(I)	RINF_AM_2	National call: AM denies call
	Primary Controller -> Primary Controller: Out of scope	(I)		
	Secondary Controller -> Primary Controller: Out of scope	(I)		
	Power Controller -> Primary Controller: Out of scope	(I)		
	Lead Driver -> Primary Controller: Yes	(MI)		
	Other Driver -> Primary Controller: Yes	(MI)		
	Chief Conductor -> Primary Controller: Open	(I)		
	Public Address -> Primary Controller : Out of scope	(I)		
	Initiating Party -> Receiving Party: Allow Call	(I)		
	Primary Controller -> Secondary Controller: Out of scope	(I)		
	Secondary Controller -> Secondary Controller: Out of scope	(I)		
	Power Controller -> Secondary Controller: Out of scope	(I)		
	Lead Driver -> Secondary Controller: Yes	(MI)		
	Other Driver -> Secondary Controller: Yes	(MI)		
	Chief Conductor -> Secondary Controller: Open	(I)		
	Public Address -> Secondary Controller: Out of scope	(I)		

Initiating Party -> Receiving Party: Allow Call	(I)		
Primary Controller -> Power Controller: Out of scope	(I)		
Secondary Controller -> Power Controller: Out of scope	(I)		
Power Controller -> Power Controller: Out of scope	(I)		
Lead Driver -> Power Controller Yes	(MI)		
Other Driver -> Power Controller: Yes	(MI)		
Chief Conductor -> Power Controller: Open	(I)		
Public Address -> Power Controller: Out of scope	(I)		
Initiating Party -> Receiving Party: Allow Call	(I)		
Primary Controller -> Lead Driver: Yes	(MI)		
Secondary Controller -> Lead Driver: Yes	(MI)		
Power Controller -> Lead Driver: Yes	(MI)		
Lead Driver -> Lead Driver: Open	(I)		
Other Driver -> Lead Driver: Yes*	(MI)		
Chief Conductor -> Lead Driver: Yes	(MI)		
Public Address -> Lead Driver: Out of scope	(I)		
Initiating Party -> Receiving Party: Allow Call	(I)		
Primary Controller -> Other Driver: Yes	(MI)		
Secondary Controller -> Other Driver: Open	(I)		
Power Controller -> Other Driver: Open	(I)		
Lead Driver -> Other Driver: Open	(I)		
Other Driver -> Other Driver: Yes*	(MI)		
Chief Conductor -> Other Driver: Yes*	(MI)		
Public Address -> Other Driver: Out of scope	(I)		
Initiating Party -> Receiving Party: Allow Call	(I)		
Primary Controller -> Chief Conductor: Open	(I)		
Secondary Controller -> Chief Conductor: Open	(I)		
Power Controller -> Chief Conductor: Open	(I)		
Lead Driver -> Chief Conductor: Yes*	(MI)		
Other Driver -> Chief Conductor: Yes*	(MI)		
Chief Conductor -> Chief Conductor: Yes*	(MI)		

	Public Address -> Chief Conductor: Out of scope	(I)		
	Initiating Party -> Receiving Party: Allow Call	(I)		
	Primary Controller -> Public Address: Open	(I)		
	Secondary Controller -> Public Address: Open	(I)		
	Power Controller -> Public Address: Open	(I)		
	Lead Driver -> Public Address: Yes*	(MI)		
	Other Driver -> Public Address: Yes*	(MI)		
	Chief Conductor -> Public Address: Yes*	(MI)		
	Public Address -> Public Address: Out of scope	(I)		
	* At least for persons on the same train	(I)		
	Table 10-2: Access matrix	(I)		
11.2.1.1	An addressing scheme shall be provided which permits users to be identified by numbers corresponding to their functional roles rather than by numbers tied to the terminal equipment that they are using.	(MI)	RINF_FA_1	Registration of an FN Number
			RINF_FA_2	Registration of an unknown FN fails
			RINF_FA_3	Deregistration of an FN Number
			RINF_FA_4	Deregistration of an FN fails
			RINF_FA_5	Interrogation of an FA Number
			RINF_FA_6	Interrogation of an FN fails
			RINF_FA_7	FA Call - Successful Call
			RINF_FA_8	FA Call – Call is not completed
			RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
			RINF_FA_10	Deregistration of CT2 numbers while roaming
			RINF_FA_11	Forced Deregistration
			RINF_FA_14	Registration of an FN fails - remote party already registered
11.2.1.4	It shall be possible to assign up to a minimum of 3 functional numbers to an EIRENE user at any one time.	(MI)	RINF_FA_13	Register 3 function numbers to one user (non-roaming case)
11.2.1.5	Only one EIRENE user shall be assigned to a given functional number at any one time.	(MI)	RINF_FA_2	Registration of an unknown FN fails
11.2.1.7	A user shall be able to set up a functional number on one network, and cancel the number from another network.	(MI)	NoCov_9	Mobile/Cab requirement + 2 NW needed + RINF_REC_16
11.2.1.8	The functional number shall remain valid as a user roams from one network to another.	(MI)	NoCov_9	Mobile/Cab requirement + 2 NW needed + RINF_REC_16
11.2.1.9	The functional addressing scheme shall be independent of specific configurations of mobile and terminal equipment. For example, the functional number of a conductor on board a particular train shall be the same irrespective of whether the	(MI)	NoCov_12	Mobile/Cab requirement + NW Configuration + RINF_FA_15

	conductor accesses the network through the Cab radio or has a separate dedicated EIRENE mobile.			
11.2.1.10	It shall be possible to call EIRENE users by functional numbers from a wide range of terminals (EIRENE and non-EIRENE). Examples include EIRENE mobiles, controller terminals, railway fixed network telephones and public telephones. (All such calls will be subject to any access restrictions - see section 10.3.)	(MI)	NoCov_12	Mobile/Cab requirement + NW Configuration + RINF_FA_15
11.2.2.1	Functional numbers must be unique within the domain of operation. Since the number must be independent of networks, each number must be unique across all networks (including implementation of EIRENE facilities on public networks).	(MI)	RINF_FA_2	Registration of an unknown FN fails
11.2.2.2	The functional number shall consist of numeric characters only.	(MI)	NoCov_12	Mobile/Cab requirement + NW Configuration + RINF_FA_15
11.2.3.1	The functional identity of the called user shall be presented to the user initiating a call and the functional identity of the initiator shall be presented to the user receiving a call.	(MI)	NoCov_13	Mobile/Cab requirement + RINF_GSM_4, RINF_GSM_6
11.2.3.2	For broadcast and group voice communications, the functional identity provided shall be that of the broadcast or group identity.	(MI)	RINF_VGCS_2	Controller originates VGCS call and takes it down with the kill Sequence
			RINF_VGCS_3	SS originates VGCS call, leaves, rejoins and ends it.
			RINF_VGCS_4	SS enters into VGCS broadcast area with ongoing VGCS call and is notified of it
			RINF_VGCS_5	Controller joins ongoing VGCS call
			RINF_VGCS_6	Parallel group calls are possible in the same cell.
			RINF_VGCS_7	GID delivered correctly to terminating SS in SS originated VGCS call
			RINF_VBS_1	SS originates VBS call
			RINF_VBS_2	SS originates prio0 VBS call
			RINF_VBS_3	Controller originates VBS call and takes down the call by disconnecting
			RINF_VBS_4	Controller originates VBS call and takes down the call with the kill sequence
			RINF_VBS_5	Controller joins ongoing VBS call
			RINF_VBS_6	SS enters into VBS broadcast area with ongoing VBS call and is notified of it, SS joins the VBS call
11.2.3.3	If the user initiating the call has more than one functional identity, the user shall be able to select, prior to call establishment, which functional identity is presented to the receiving user.	(MI)	NoCov_13	Mobile/Cab requirement + RINF_GSM_4, RINF_GSM_6
11.2.3.4	In the case of Cab radio, when a train number is assigned as a functional	(MI)	NoCov_13	Mobile/Cab requirement + RINF_GSM_4, RINF_GSM_6

	identity, this shall take priority over other Cab radio functional identities, and shall be the functional identity for the Cab radio to be displayed to other users.			
11.2.3.5	The functional identity shall be presented to the user in a form which can be readily understood (eg 'driver of train abcd' rather than 'abcd01' or 'xyz shunting team 3' rather than 'xyz03').	(MI)	NoCov_13	Mobile/Cab requirement + RINF_GSM_4, RINF_GSM_6
11.3.2.1	The functional addressing scheme shall be supported by a straightforward procedure for registration of functional numbers. This procedure shall be carried out by the user on commencement of the functional role.	(MI)	NoCov_14	Mobile/Cab requirement + RINF_FA_1, RINF_FA_3
11.3.2.2	The functional number registration facility shall be supported by all EIRENE user equipment.	(MI)	NoCov_14	Mobile/Cab requirement + RINF_FA_1, RINF_FA_3
11.3.2.3	It shall be possible to register up to five functional numbers to items of equipment physically connected to the Cab radio within 30 seconds.	(MI)	RINF_FA_1	Registration of an FN Number
			RINF_FA_2	Registration of an unknown FN fails
			RINF_FA_3	Deregistration of an FN Number
			RINF_FA_4	Deregistration of an FN fails
			RINF_FA_5	Interrogation of an FA Number
			RINF_FA_6	Interrogation of an FN fails
			RINF_FA_7	FA Call - Successful Call
			RINF_FA_8	FA Call – Call is not completed
			RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
			RINF_FA_10	Deregistration of CT2 numbers while roaming
			RINF_FA_11	Forced Deregistration
			RINF_FA_14	Registration of an FN fails - remote party already registered
11.3.2.4i	In the event of a failure during the registration of functional numbers, an indication shall be provided.	(MI)	NoCov_16	Mobile/Cab requirement + RINF_FA_2, RINF_FA_14
11.3.2.5	Duplicate functional numbers (eg two trains with the same train number) shall be prevented.	(MI)	RINF_FA_12	Unsuccessful registration with Lead driver number (CT2 FC 01) because of wrong CoR (CT2 FC10 works)
11.3.2.6	The system shall provide a means to recover consistent data sets following a system failure during which functional addressing facilities are lost. During this recovery period, the system shall not permit the use of unverified functional numbers.	(MI)	NoCov_15	Backup/Restore Procedures for FN-Node to check
11.3.3.1	The functional addressing scheme shall be supported by a straightforward procedure for deregistration of functional numbers. This procedure shall be carried out by the user at the end of the functional role.	(MI)	RINF_FA_1	Registration of an FN Number
			RINF_FA_2	Registration of an unknown FN fails

			RINF_FA_3 RINF_FA_4	Deregistration of an FN Number Deregistration of an FN fails
			RINF_FA_5	Interrogation of an FA Number
			RINF_FA_6	Interrogation of an FN fails
			RINF_FA_7	FA Call - Successful Call
			RINF_FA_8	FA Call – Call is not completed
			RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
			RINF_FA_10	Deregistration of CT2 numbers while roaming
			RINF_FA_11	Forced Deregistration
			RINF_FA_14	Registration of an FN fails - remote party already registered
11.3.3.2	The functional number deregistration facility shall be supported by all EIRENE user equipment.	(MI)	NoCov_14	Mobile/Cab requirement + RINF_FA_1, RINF_FA_3
11.3.3.3	It shall be possible to deregister up to five functional numbers to items of equipment physically connected to the Cab radio within 30 seconds.	(MI)	RINF_FA_1	Registration of an FN Number
			RINF_FA_2	Registration of an unknown FN fails
			RINF_FA_3	Deregistration of an FN Number
			RINF_FA_4	Deregistration of an FN fails
			RINF_FA_5	Interrogation of an FA Number
			RINF_FA_6	Interrogation of an FN fails
			RINF_FA_7	FA Call - Successful Call
			RINF_FA_8	FA Call – Call is not completed
			RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
			RINF_FA_10	Deregistration of CT2 numbers while roaming
			RINF_FA_11	Forced Deregistration
			RINF_FA_14	Registration of an FN fails - remote party already registered
11.3.3.4	In addition, a given set of users shall also be allowed to:	(I)	RINF_FA_3	Deregistration of an FN Number
	- deregister a functional number which is no longer valid but which has not been deregistered by the user;	(MI)	RINF_FA_4	Deregistration of an FN fails
	- deregister, by overriding, another user of the same type (eg a driver can deregister a train number that another driver has forgotten to deregister);	(MI)	RINF_FA_11	Forced Deregistration
	- deregister, with one action, all functional numbers associated with the same mobile (eg the driver deregisters all functions at the end of the journey).	(MI)		
11.3.3.5	An EIRENE mobile shall remove the displayed functional number and provide an indication to the user that deregistration has taken place.	(MI)	RINF_FA_1	Registration of an FN Number

			RINF_FA_2	Registration of an unknown FN fails
			RINF_FA_3	Deregistration of an FN Number
			RINF_FA_4	Deregistration of an FN fails
			RINF_FA_5	Interrogation of an FA Number
			RINF_FA_6	Interrogation of an FN fails
			RINF_FA_7	FA Call - Successful Call
			RINF_FA_8	FA Call – Call is not completed
			RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
			RINF_FA_10	Deregistration of CT2 numbers while roaming
			RINF_FA_11	Forced Deregistration
			RINF_FA_14	Registration of an FN fails - remote party already registered
11.3.4.1	To allow roaming between EIRENE networks, the system shall support a procedure for the re-registration of functional numbers after selection of a new network.	(MI)	NoCov_17	Cab/mobile Requirement + Two NW Required + RINF_FA_1
11.3.4.2	This procedure initiated by the Cab Radio shall be carried out without manual intervention.	(MI)	NoCov_17	Cab/mobile Requirement + Two Networks Required
11.3.4.3	After automatic re-registration is performed, the new registration details shall be displayed to the user.	(MI)	NoCov_18	Cab/mobile Requirement + Two Networks Required
11.4.1	Location dependent addressing shall be provided to route calls for a given function to a destination number that is dependent upon the user's location.	(MI)	RINF_LDA_1	Successful LDA Call - Verify the cell format is correct
			RINF_LDA_2	Unsuccessful LDA Call - Call to invalid Short Code
11.4.2	The functions to which calls shall be routed based upon the location of the mobile shall include:	(I)	NoCov_19	NW Configuration + RINF_FA_15
	- Primary controller;	(MI)		
	- Secondary controller;	(MI)		
	- Power supply controller;	(MI)		
	- Train management centre (eg RBC, CTS).	(MI)		
11.4.4	When operating with location dependent addressing, no manual action shall be required to update the system when a mobile moves between locations except at border crossing.	(MI)	RINF_LDA_1	Successful LDA Call - Verify the cell format is correct
			RINF_LDA_2	Unsuccessful LDA Call - Call to invalid Short Code
11.4.5	The location dependent addressing scheme shall be available to all mobiles.	(MI)	RINF_LDA_1	Successful LDA Call - Verify the cell format is correct
			RINF_LDA_2	Unsuccessful LDA Call - Call to invalid Short Code
12.2.2	In order to ensure interoperability, the service is optional for the ground and mandatory for the Cab radio.	(MI)	NoCov_10	Mobile/Cab requirement
12.3.3	The text message facility shall not interfere with the ability of users to use the radio.	(MI)	NoCov_10	Mobile/Cab requirement

13.1.4	The type of call initiated shall be determined automatically, based upon the mode of operation of the radio.	(MI)	NoCov_10	Mobile/Cab requirement
13.1.5	If the mobile is in shunting mode, the emergency call button shall initiate a shunting emergency call, otherwise the call shall be a Train emergency call.	(MI)	NoCov_10	Mobile/Cab requirement
	Train emergency call	(I)		
13.1.6	The Train emergency call shall be sent to all drivers and controller(s) within an area, which is pre-defined to meet operational requirements. The predefined areas for emergency calls shall include, where necessary, parts of one or more network(s).	(MI)	RINF_REC_1	SS originates a REC
			RINF_REC_2	Subscriber initiated REC (no talker change, normal clear down of call)
			RINF_REC_4	Controller originates a REC
			RINF_REC_6	REC in a GCA with a locked cell
13.1.7	The Shunting emergency call shall be sent to all users involved in shunting operations in the shunting area.	(MI)	NoCov_8	Network Konfiguration + RINF_VGCS_1
13.1.8	The Shunting emergency call shall automatically take priority over the link assurance signal.	(MI)	NoCov_10	Mobile/Cab requirement
	Railway emergency call area			
13.1.9	The predefined areas for emergency calls shall include, where necessary, parts of one or more network(s).	(MI)	NoCov_8	Network Konfiguration + RINF_VGCS_1
13.2.2.1	A Railway emergency call shall be able to be initiated by using a simple MMI action (eg a single MMI action for the Cab and Operational radios).	(MI)	NoCov_10	Mobile/Cab requirement
13.2.2.2	A connection of Railway emergency priority (see section 10.2) shall be established to a pre-determined set of receiving mobiles and controller(s).	(MI)	RINF_REC_1	SS originates a REC
			RINF_REC_2	Subscriber initiated REC (no talker change, normal clear down of call)
			RINF_REC_4	Controller originates a REC
			RINF_REC_6	REC in a GCA with a locked cell
13.2.2.3	If the system is not able to connect the call, the originating terminal shall automatically keep trying to connect the call for 30 seconds.	(MI)	RINF_REC_1	SS originates a REC
			RINF_REC_2	Subscriber initiated REC (no talker change, normal clear down of call)
			RINF_REC_4	Controller originates a REC
			RINF_REC_6	REC in a GCA with a locked cell
13.2.2.3i	During this period the user shall be provided with an audible and visual indication that the system is trying to connect the call.	(MI)	NoCov_10	Mobile/Cab requirement
13.2.2.4	An audible indication of 5 seconds shall be provided to originating and receiving users that the emergency function has been activated.	(MI)	NoCov_10	Mobile/Cab requirement
13.2.2.6	A continuous visual indication that the emergency function has been activated	(MI)	NoCov_10	Mobile/Cab requirement

	shall be provided at the originating and all receiving terminals.			
13.2.2.7	In the event that a train enters the affected area after the warning stage is complete, the same audible and visual indications shall be provided.	(MI)	RINF_LE_1	SS active in a PTOP (P4) call move in a cell with ongoing REC call
			RINF_LE_2	Orig. SS active in a VBS (P4) call move in a cell with ongoing REC call
			RINF_LE_3	Orig. SS active in a VGCS (P4) call on GCH (talker) move in a cell with ongoing REC call
13.2.2.3ii	After the 30 second period, if the connection was unsuccessful, the originating terminal shall provide another audible and visual indication that it was unable to connect the call.	(MI)	NoCov_10	Mobile/Cab requirement
13.2.3.1	A speech connection shall be established immediately following the warning tone, to allow the originator of the emergency call, to give information concerning the nature of the emergency.	(MI)	RINF_REC_1	SS originates a REC
			RINF_REC_2	Subscriber initiated REC (no talker change, normal clear down of call)
			RINF_REC_4	Controller originates a REC
			RINF_REC_6	REC in a GCA with a locked cell
			RINF_LE_1	SS active in a PTOP (P4) call move in a cell with ongoing REC call
			RINF_LE_2	Orig. SS active in a VBS (P4) call move in a cell with ongoing REC call
			RINF_LE_3	Orig. SS active in a VGCS (P4) call on GCH (talker) move in a cell with ongoing REC call
13.2.3.3	The information shall be received by the same set of users who received the warning tone.	(MI)	RINF_REC_1	SS originates a REC
			RINF_REC_2	Subscriber initiated REC (no talker change, normal clear down of call)
			RINF_REC_4	Controller originates a REC
			RINF_REC_6	REC in a GCA with a locked cell
			RINF_LE_1	SS active in a PTOP (P4) call move in a cell with ongoing REC call
			RINF_LE_2	Orig. SS active in a VBS (P4) call move in a cell with ongoing REC call
			RINF_LE_3	Orig. SS active in a VGCS (P4) call on GCH (talker) move in a cell with ongoing REC call
13.2.4.1	A Railway emergency call may only be terminated by:	(I)	RINF_REC_1	SS originates a REC
	- the originator of the call;	(MI)	RINF_REC_2	Subscriber initiated REC (no talker change, normal clear down of call)
	- a controller participating in the call;	(MI)	RINF_REC_4	Controller originates a REC
	- the network following a (nationally determined) period of no speech.	(MI)	RINF_REC_6	REC in a GCA with a locked cell
13.2.4.2	If the radio moves out of the area whilst the emergency call is in progress, an	(MI)	NoCov_10	Mobile/Cab requirement

	audible and visual indication of the loss of the call shall be provided to the user.			
13.3.1	Authorised EIRENE mobiles shall be able to receive a Railway emergency call at any time while the mobile is powered up.	(MI)	RINF_REC_1	SS originates a REC
			RINF_REC_2	Subscriber initiated REC (no talker change, normal clear down of call)
			RINF_REC_4	Controller originates a REC
			RINF_REC_6	REC in a GCA with a locked cell
13.3.2	For Railway emergency calls initiated by a mobile, the controller's display will indicate:	(I)	RINF_OTDI_1	SS originates VGCS call, terminating Controller receives the OTDI
	- location;	(O)	RINF_OTDI_2	SS originates VGCS Immediate Setup 2 call, terminating Controller receives the OTDI
	- the functional identity of the originating mobile, which includes the following:	(I)		
	- the train number, if allocated;	(MI)		
	- the engine number, if no train number is available;	(MI)		
	- the coach number of the leading cab, if neither a train number nor an engine number is available.	(O)		
13.4.2	The confirmation shall be generated automatically without input from the user.	(MI)	NoCov_20	Mobile/Cab requirement + RINF_REC_5
13.4.3	The confirmation message shall commence at the end of the call or if the radio moves out of the call area.	(MI)	NoCov_20	Mobile/Cab requirement + RINF_REC_5
13.4.4	If the radio loses contact with the network, the mechanism shall commence as soon as possible on regaining communications, for up to a maximum of 5 minutes without achieving contact.	(MI)	NoCov_20	Mobile/Cab requirement + RINF_REC_5
13.4.5	For Railway emergency calls initiated by a mobile, the automatic confirmation message of the initiating mobile shall contain:	(I)	RINF_REC_1	SS originates a REC
	- the time at call establishment;	(MI)	RINF_REC_2	Subscriber initiated REC (no talker change, normal clear down of call)
	- the time at clear down;	(MI)	RINF_OTDI_2	SS originates VGCS Immediate Setup 2 call, terminating Controller receives the OTDI
	- the functional number of the call originator;	(MI)		
	- the train number and engine number of the call originator, if a train.	(MI)		
13.4.6	For Railway emergency calls received by a mobile, the automatic confirmation message of the receiving mobile shall contain:	(I)	RINF_eMLPP_4	MS in PtP call, pre-emption on MS by higher prio VGCS call (REC)
	- the time at which the call was first received;	(MI)	RINF_eMLPP_5	MS in VBS call as originator, pre-emption on Air IF by higher prio VGCS call (REC)
	the time at which the call was lost (or terminated);	(MI)	RINF_eMLPP_7	MS in data call, pre-emption on Air IF by higher prio VGCS call (REC)
	- the group identity of the sender;	(MI)	RINF_REC_2	Subscriber initiated REC (no talker change, normal clear down of call)
	- the functional number of the recipient;	(MI)	RINF_REC_4	Controller originates a REC

	- the train number and engine number of the recipient, if a train.	(MI)	RINF_REC_6	REC in a GCA with a locked cell
			RINF_OTDI_2	SS originates VGCS Immediate Setup 2 call, terminating Controller receives the OTDI
			RINF_LE_1	SS active in a PTOP (P4) call move in a cell with ongoing REC call
			RINF_LE_2	Orig. SS active in a VBS (P4) call move in a cell with ongoing REC call
			RINF_LE_3	Orig. SS active in a VGCS (P4) call on GCH (talker) move in a cell with ongoing REC call
13.4.9	The data used for confirmation of Railway emergency calls shall be protected from modification by the user.	(MI)	NoCov_30	Check Documentation of Equipement and Installation

A-2 Cross reference for EIRENE SRS [1]

Section	RequirementText	Requirement Status	TestcaseID	TestcaseHeading
2.2.1	The GSM teleservices [EN 301 515, Index [24]] to be supported are indicated in table 2-1.		RINF_GSM_1	Successful Location Update after MS Power On
			RINF_GSM_2	Supplementary Service Call Hold
	11 Telephony	(MI)	RINF_GSM_3	Supplementary Service Call Waiting
	12 Emergency calls	(M)	RINF_GSM_4	Supplementary Service CLIP – MMC with Call Forwarding Unconditional
	21 Short mes.MT/PP.	(O)	RINF_GSM_5	Supplementary Service MPTY
	22 Short mes.MO/PP	(O)	RINF_GSM_6	Establishment of several PTP calls with different priorities
	23 Short mes.cell broadcast	(O)	RINF_GSM_7	Public Emergency Call – With SIM
	61 Alternate speech and fax group 3	(O)	RINF_VGCS_1	SS originates VGCS call
	62 Automatic fax group 3	(O)	RINF_VGCS_2	Controller originates VGCS call and takes it down with the kill Sequence
	91 Voice Group Call Service (VGCS)	(MI)	RINF_VGCS_3	SS originates VGCS call, leaves, rejoins and ends it.
	92 Voice Broadcast Service (VBS)	(M)	RINF_VGCS_4	SS enters into VGCS broadcast area with ongoing VGCS call and is notified of it
			RINF_OTDI_1	SS originates VGCS call, terminating Controller receives the OTDI
			RINF_OTDI_2	SS originates VGCS Immediate Setup 2 call, terminating Controller receives the OTDI
2.3.1	The bearer services [EN 301 515, Index [23]] to be supported are listed in table 2-2.		RINF_eMLPP_7	MS in data call, pre-emption on Air IF by higher prio VGCS call (REC)
			RINF_eMLPP_8	MS in PtP call, pre-emption on Air IF by higher prio data call (4800 baud, transparent)
	20. Asynchronous General Bearer Service	(O)		
	21. Asynchronous 300 bps T	(O)		
	21. Asynchronous 300 bps NT	(O)		
	22. Asynchronous 1.2 kbps T	(O)		
	22. Asynchronous 1.2 kbps NT	(O)		
	23. Asynchronous 1200/75 bps T	(O)		
	23. Asynchronous 1200/75 bps NT	(O)		
	24. Asynchronous 2.4 kbps T	(MI)		
	24. Asynchronous 2.4 kbps NT	(O)		
	25. Asynchronous 4.8 kbps T	(MI)		
	25. Asynchronous 4.8 kbps NT	(O)		
	26. Asynchronous 9.6 kbps T	(MI)		
	26. Asynchronous 9.6 kbps NT	(O)		
	30. Synchronous General Bearer Service	(O)		
	31. Synchronous 1.2 kbps T	(O)		
	31. Synchronous 1.2 kbps NT	(O)		
	32. Synchronous 2.4 kbps T	(O)		
	32. Synchronous 2.4 kbps NT	(O)		
	33. Synchronous 4.8 kbps T	(O)		
	33. Synchronous 4.8 kbps NT	(O)		
	34. Synchronous 9.6 kbps T	(O)		
	34. Synchronous 9.6 kbps NT	(O)		
	40. General PAD Access Bearer Service	(O)		

	41. PAD access 300 bps T	(O)		
	41. PAD access 300 bps NT	(O)		
	42. PAD access 1.2 kbps T	(O)		
	42. PAD access 1.2 kbps NT	(O)		
	43. PAD access 1200/75 bps T	(O)		
	43. PAD access 1200/75 bps NT	(O)		
	44. PAD access 2.4 kbps T	(O)		
	44. PAD access 2.4 kbps NT	(O)		
	45. PAD access 4.8 kbps T	(O)		
	45. PAD access 4.8 kbps NT	(O)		
	46. PAD access 9.6 kbps T	(O)		
	46. PAD access 9.6 kbps NT	(O)		
	61. Alternate speech/data	(O)		
	70. GPRS	(O)		
	71. EGPRS	(O)		
	81. Speech followed by data	(O)		
	T - Transparent; NT - Non-transparent			
	Table 2-2: Bearer services to be supported			
2.4.1	The GSM supplementary services [EN 301 515] and [SUPP SERVICES] to be supported and their applicability are listed in table 2-3.	(I)	RINF_GSM_2	Supplementary Service Call Hold
			RINF_GSM_3	Supplementary Service Call Waiting
	Calling Line Identification Presentation (CLIP)	(MI)	RINF_GSM_4	Supplementary Service CLIP – MMC with Call Forwarding Unconditional
	Calling Line Identification Restriction (CLIR)	(O)	RINF_GSM_5	Supplementary Service MPTY
	Connected Line Identification Presentation (CoLP)	(MI)	RINF_FA_3	Deregistration of an FN Number
	Connected Line Identification Restriction (CoLR)	(O)	RINF_FA_4	Deregistration of an FN fails
	Call Forwarding Unconditional (CFU)	(M)	RINF_FA_5	Interrogation of an FA Number
	Call Forwarding on Mobile Subscriber Busy (CFB)	(M)	RINF_FA_6	Interrogation of an FN fails
	Call Forwarding on No Reply (CFNRy)	(O)	RINF_FA_7	FA Call - Successful Call
	Call forwarding on Mobile Subscriber NotReachable(CFNRc)	(O)	RINF_FA_8	FA Call – Call is not completed
	Call waiting (CW)	(MI)	RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
	Call hold (HOLD)	(MI)	RINF_FA_10	Deregistration of CT2 numbers while roaming
	Multi Party Service (MPTY)	(MI)	RINF_FA_13	Register 3 function numbers to one user (non-roaming case)
	Closed User Group (CUG)	(O)	RINF_eMLPP_1	MS in VGCS call on DCH, pre-emption on Air IF by higher prio PtP call
	Advice of Charge (Information) (AoCI)	(O)	RINF_eMLPP_2	MS in VBS call as listener, pre-emption on Air IF by higher prio VBS call.
	Advice of Charge (Charging) (AoCC)	(O)	RINF_eMLPP_3	MS in VGCS call having the UL of the GCH, pre-emption on Air IF by higher prio VBS call.
	Barring of All Outgoing Calls (BAOC)	(O)	RINF_eMLPP_4	MS in PtP call, pre-emption on MS by higher prio VGCS call (REC)
	Barring of Outgoing International Calls (BOIC)	(O)	RINF_eMLPP_5	MS in VBS call as originator, pre-emption on Air IF by higher prio VGCS call (REC)
	BOIC except those to Home PLMN Country (BOIC-exHC)	(M)	RINF_eMLPP_7	MS in data call, pre-emption on Air IF by higher prio VGCS call (REC)

	Barring of All Incoming Calls (BAIC) /M |	(M)	RINF_eMLPP_8	MS in PtP call, pre-emption on Air IF by higher prio data call (4800 baud, transparent)
	Barring of Incoming Calls when Roaming Outside the Home PLMN Country (BIC-Roam)	(M)	RINF_eMLPP_9	eMLPP priority is preserved during CFU (Call Forwarding Unconditionally)
	Unstructured Supplementary Service Data (USSD)	(MI)	RINF_eMLPP_10	eMLPP prio. is preserved during CFB (Call Forwarding Busy)
	Follow me	(MI)	RINF_REC_1	SS originates a REC
	Sub-addressing*	(MI)	RINF_REC_3	SS accepts an incoming REC
	Enhanced Multi-Level Precedence and Pre-emption (eMLPP)	(MI)	RINF_REC_4	Controller originates a REC
	Explicit Call Transfer (ECT)	(O)	RINF_OTDI_2	SS originates VGCS Immediate Setup 2 call, terminating Controller receives the OTDI
	Completion of Calls to Busy Subscribers (CCBS)	(O)		
	User-to-User Signalling 1 (UUS1) Note 4	(MI)		
2.5.1	The railway specific services to be supported are listed in table 2-4.		RINF_GSM_5	Supplementary Service MPTY
			RINF_GSM_6	Establishment of several PTP calls with different priorities
	Functional addressing (section 11)	(MI)	RINF_FA_1	Registration of an FN Number
	Location dependent addressing (section 11)	(MI)	RINF_FA_14	Registration of an FN fails - remote party already registered
	Shunting mode (section 14)	(MI)	RINF_LDA_1	Successful LDA Call - Verify the cell format is correct
	Multiple driver communications (section 5)	(MI)	RINF_LDA_2	Unsuccessful LDA Call - Call to invalid Short Code
	Emergency calls (section 13)	(MI)	RINF_VGCS_1	SS originates VGCS call
	enhanced Railway Emergency Calls (section 13A)	(O)	RINF_VGCS_2	Controller originates VGCS call and takes it down with the kill Sequence
			RINF_VGCS_3	SS originates VGCS call, leaves, rejoins and ends it.
			RINF_VGCS_4	SS enters into VGCS broadcast area with ongoing VGCS call and is notified of it
			RINF_REC_1	SS originates a REC
			RINF_REC_3	SS accepts an incoming REC
			RINF_REC_4	Controller originates a REC
			RINF_OTDI_1	SS originates VGCS call, terminating Controller receives the OTDI
			RINF_OTDI_2	SS originates VGCS Immediate Setup 2 call, terminating Controller receives the OTDI
2.7.3	"Uplink Reply" and "Notification Response" procedures shall not be applied in an EIRENE network for any function required for interoperability (e.g. REC and call to drivers in the area).	(MI)	RINF_URNR_1 (*)	SS active in a VGCS call moves in empty cell
			RINF_URNR_2 (*)	SS active in a VBS call moves in empty cell
			RINF_GSM_5 (*)	SS active in a REC call moves in empty cell
2.11.2	Where ERTMS/ETCS level 2 or 3 is implemented, the Interface requirements as specified in document [MORANE EURO FFFIS] are applicable.	(MI)	NoCov_12	Mobile/Cab requirement for ERTMS

2.11.3	Where ERTMS/ETCS level 2 or 3 is operated in PS-mode using GPRS/EGPRS bearer services, the network shall comply with ETSI specification [ETSI TS 103 328].	(MI)	RINF_GPRS_3 (*)	QOS and priority test between ETCS and Background traffic
3.2.2	The following minimum values shall apply:	(MI)	NoCov_2	Check Results from Measurement Campaign
	- coverage probability of 95% based on a coverage level of 38.5 dBµV/m (-98 dBm) for voice and non-safety critical data;			
	- coverage probability of 95% based on a coverage level of 41.5 dBµV/m (-95 dBm) on lines with ETCS levels 2/3 for speeds lower than or equal to 220km/h.			
3.2.3	The following minimum values shall apply:	(MI)	NoCov_2	Check Results from Measurement Campaign
	- coverage probability of 95% based on a coverage level of 44.5 dBµV/m (-92 dBm) on lines with ETCS levels 2/3 for speeds above 280km/h;			
	- coverage probability of 95% based on a coverage level between 41.5 dBµV/m and 44.5 dBµV/m (-95 dBm and -92 dBm) on lines with ETCS levels 2/3 for speeds above 220km/h and lower than or equal to 280km/h.			
3.2.4	The EIRENE mobile installation shall be designed to operate in a network meeting the criteria in 3.2.2 and 3.2.3.	(MI)	NoCov_2	Check Results from Measurement Campaign
3.4.2	Call setup times as defined in the EIRENE FRS shall be achieved with authentication and ciphering procedures enabled.	(MI)	NoCov_2	NotCovered
3.4.5	The requirements for Railway Emergency Call and 'All drivers in area' set-up performance are indicated in table 3-0 according to the measurement method defined in [QoS VOICE TEST SPEC].	(I)	NoCov_10	Mobile/Cab requirement
	System Element | Call Processing time (REC) | Call Processing time (All drivers in area)			
	Network | <2.5 s | < 3 s	(M)		
	Cab radio | <750ms | < 1 s	(MI)		
	Controller | <500ms | < 500 ms	(M)		
3.5.1	For applications of EIRENE Systems which are relevant to interoperability of the rail system within the European Community, in particular according to the Directive 2008/57/EC, the network shall operate in a sub-band, or combination of sub-bands, of the R-GSM band as defined in [EN 301 515, Index [35]] according to the table 3-A below:	(I)	NoCov_30	Check Documentation of Equipement and Installation
	| Sub-Band | Frequencies (MHz)			
	R - GSM band | UIC frequency band | 876-880 / 921-925	(MI)		
	| Extended GSM (E-GSM) band | 880-915 / 925-960	(M)		
	| Primary GSM (P-GSM) band | 890-915 / 935-960	(M)		

3.5.5	For applications of EIRENE Systems which are relevant to interoperability of the rail system within the European Community, in particular according to the Directive 2008/57/EC, the System Information in the BCCH shall be broadcast in the UIC frequency band to enable EIRENE mobiles not supporting the ER-GSM band the access to the GSM-R network.	(MI)	RINF_ER-GSM (*)	Establishment of a PTP call in a ER-GSM network
4.1.3.1	GSM-MT air interface is mandatory for interoperability and shall conform with GSM specifications;	(MI)	NoCov_10	Mobile/Cab requirement
4.1.3.7	Bearer services are mandatory for CS-mode and PS-mode of ETCS data only radio operation.	(MI)	NoCov_10	Mobile/Cab requirement
4.1.5	All SIM cards used in EIRENE mobiles shall comply with the requirements of the MORANE FFFIS for GSM-R SIM Cards [MORANE SIM].	(MI)	NoCov_31	SIM Card / Mobile Requirement
4.2.1	For applications of EIRENE Systems which are relevant to interoperability of the rail system within the European Community, in particular according to the Directive 2008/57/EC, all mobiles, except ETCS data only radio for which 16.3.5 and 16.3.6 apply, shall be capable of operation in any sub-band, or combination of sub-bands, of the R-GSM band which includes the frequency bands listed in Table 4-1		NoCov_10	Mobile/Cab requirement
4.2.2	The mobile radio antenna installation on vehicles shall be designed so as to ensure that mobiles operate correctly in networks which conform to the design criteria defined in section 3.	(MI)	NoCov_10	Mobile/Cab requirement
4.2.3	For frequency bands listed in Table 4-1, mobile radios shall be of the following power classes:		NoCov_10	Mobile/Cab requirement
4.2.2ii	The mobile radio referred as Cab radio and EDOR within Chapter 5 and 16 shall be capable of receiving a GSM-R wanted signal together with interfering signals according to the conditions specified in [TS 102 933]	(MI)	NoCov_10	Mobile/Cab requirement
4.3.1	The following GSM teleservices, identified in section 2, are to be supported for each type of mobile radio:		RINF_eMLPP_1	MS in VGCS call on DCH, pre-emption on Air IF by higher prio PtP call
	Cab radio		RINF_eMLPP_2	MS in VBS call as listener, pre-emption on Air IF by higher prio VBS call.
	11 Telephony	(MI)	RINF_eMLPP_3	MS in VGCS call having the UL of the GCH, pre-emption on Air IF by higher prio VBS call.
	12 Emergency calls	(M)	RINF_eMLPP_4	MS in PtP call, pre-emption on MS by higher prio VGCS call (REC)
	21 Short message MT/PP	(MI)	RINF_eMLPP_5	MS in VBS call as originator, pre-emption on Air IF by higher prio VGCS call (REC)
	22 Short messsage MO/PP	(MI)	RINF_eMLPP_7	MS in data call, pre-emption on Air IF by higher prio VGCS call (REC)
	23 Short message cell broadcast	(MI)	RINF_eMLPP_8	MS in PtP call, pre-emption on Air IF by higher prio data call (4800 baud, transparent)
	61 Alternate speech and fax group 3	(O)	RINF_VGCS_1	SS originates VGCS call
	62 Automatic fax group 3	(O)	RINF_VGCS_2	Controller originates VGCS call and takes it down with the kill Sequence

91 Voice Group Call Service (VGCS)	(MI)	RINF_VGCS_3	SS originates VGCS call, leaves, rejoins and ends it.
92 Voice Broadcast Service (VBS)	(MI)	RINF_VGCS_4	SS enters into VGCS broadcast area with ongoing VGCS call and is notified of it
General purpose radio		RINF_VGCS_5	Controller joins ongoing VGCS call
		RINF_VGCS_6	Parallel group calls are possible in the same cell.
11 Telephony	(M)	RINF_VGCS_7	GID delivered correctly to terminating SS in SS originated VGCS call
12 Emergency calls	(M)	RINF_VBS_1	SS originates VBS call
21 Short message MT/PP	(M)	RINF_VBS_2	SS originates prio0 VBS call
22 Short messsage MO/PP	(M)	RINF_VBS_3	Controller originates VBS call and takes down the call by disconnecting
23 Short message cell broadcast	(M)	RINF_VBS_4	Controller originates VBS call and takes down the call with the kill sequence
61 Alternate speech and fax group 3	(O)	RINF_VBS_5	Controller joins ongoing VBS call
62 Automatic fax group 3	(O)	RINF_VBS_6	SS enters into VBS broadcast area with ongoing VBS call and is notified of it, SS joins the VBS call
91 Voice Group Call Service (VGCS)	(M)	RINF_LE_2	Orig. SS active in a VBS (P4) call move in a cell with ongoing REC call
92 Voice Broadcast Service (VBS)	(M)	RINF_LE_3	Orig. SS active in a VGCS (P4) call on GCH (talker) move in a cell with ongoing REC call
Operational radio			
11 Telephony	(M)		
12 Emergency calls	(M)		
21 Short message MT/PP	(M)		
22 Short messsage MO/PP	(M)		
23 Short message cell broadcast	(M)		
61 Alternate speech and fax group 3	(O)		
62 Automatic fax group 3	(O)		
91 Voice Group Call Service (VGCS)	(M)		
92 Voice Broadcast Service (VBS)	(M)		
Shunting radio			
11 Telephony	(M)		
12 Emergency calls	(M)		
21 Short message MT/PP	(M)		
22 Short messsage MO/PP	(M)		
23 Short message cell broadcast	(M)		
61 Alternate speech and fax group 3	(O)		
62 Automatic fax group 3	(O)		
91 Voice Group Call Service (VGCS)	(M)		
92 Voice Broadcast Service (VBS)	(M)		
ETCS data only radio			
11 Telephony	(N/A)		
12 Emergency calls	(N/A)		
21 Short message MT/PP	(N/A)		
22 Short messsage MO/PP	(N/A)		
23 Short message cell broadcast	(N/A)		
61 Alternate speech and fax group 3	(N/A)		

	62 Automatic fax group 3 91 Voice Group Call Service (VGCS) 92 Voice Broadcast Service (VBS)	(N/A) (N/A) (N/A)		
4.3.2	The following bearer services, identified in section 2, are to be supported for each type of mobile radio:		NoCov_10	Mobile/Cab requirement
4.3.3	The following supplementary services, identified in section 2, are to be supported for each type of mobile radio:		NoCov_10	Mobile/Cab requirement
4.3.4	The following EIRENE features are to be supported for each type of mobile radio:		NoCov_10	Mobile/Cab requirement
4.3.5	If a Railway emergency call set up from an EIRENE radio is unsuccessful, the radio shall automatically re-attempt the call setup until the call setup is successful, a retry timer expires (duration 30 seconds, as specified in the [EIRENE FRS]) or the user abandons the call.	(MI)	NoCov_10	Mobile/Cab requirement
4.3.6	In compliance with the related layer 3 procedures, the EIRENE radio shall automatically repeat setup requests to the layer 3 GCC or BCC entity as soon as an indication is given from the layer 3 GCC or BCC entity on an abort of the establishment procedure without the service being explicitly rejected by the network.	(MI)	NoCov_10	Mobile/Cab requirement
4.4.1	A service availability indication shall be provided to radio users, as defined in [EN 301 515, Index [26]].	(MI)	NoCov_10	Mobile/Cab requirement
4.4.3	If the attempt to establish a Railway emergency call is not successful after 2 seconds, an indication shall be provided to the user of the status of the establishment request procedure.	(MI)	NoCov_10	Mobile/Cab requirement
4.8.1	When operating outside the home country, national functions that use non- internationally harmonised national values shall be disabled.	(MI)	NoCov_10	Mobile/Cab requirement
5.4.4	Upon registration, the mobile shall be accessible by calling the MSISDN or the Engine or Coach number with which it is associated. This shall require the home network database to maintain this correlation.	(MI)	RINF_GSM_6	Establishment of several PTP calls with different priorities
			RINF_FA_7	FA Call - Successful Call
9.2.2	Every On-Train Function shall be identified by a standard code and shall conform to the list of functions given in Appendix 9A of this section.	(MI)	RINF_FA_15	FA Call - Successful Call
9.2.3	All Train Function Numbers and their associated MSISDN numbers shall be stored in the same routing database, which is the database of the GSM-R network in which the train is currently operating.	(MI)	RINF_FA_15	FA Call - Successful Call
9.2.4	Use of Engine Number Every On-Engine Function shall be identified by a standard code and shall conform to the list of functions given in Appendix 9A of this section.	(MI)	RINF_FA_15	FA Call - Successful Call
9.2.5	The Engine Function Number(s) and associated MSISDN numbers shall at any time be stored as an entry in the routing database of the home GSM-R network (*6) of the engine. Note (*6) The home GSM-R network is the mobile network to which the mobile on the engine is subscribed.	(MI)	RINF_FA_15	FA Call - Successful Call
9.2.6	Use of Coach Number The Coach Function Number(s) and associated MSISDN number(s) shall at any time be stored	(MI)	RINF_FA_15	FA Call - Successful Call

	as an entry in the routing database of the home GSM-R network of the coach.			
9.2.7	Use of Shunting Team, Maintenance Team or Train Controller Number Every Function shall be identified by a standard code and shall conform to the list of functions given in Appendix 9A of this section.	(MI)	RINF_FA_15	FA Call - Successful Call
9.2.8	The functional numbers of the Shunting Team Members, Maintenance Team Members and Train Controller (and any associated MSISDN numbers) shall be stored as entries in the routing database of the home GSM-R network.	(MI)	RINF_FA_15	FA Call - Successful Call
9.2.9	Use of MSISDN number Implementation of the EIRENE numbering plan shall not prohibit any authorised caller from using the MSISDN number where known, thus enabling mobiles to be assigned to particular personnel where this is appropriate.	(MI)	RINF_FA_15	FA Call - Successful Call
9.2.10	Use of group call Service Areas Service areas shall be defined within each railway network.	(MI)	RINF_FA_15	FA Call - Successful Call
9.2.11	The numbering of Service Areas for group calls and broadcast calls shall be made in accordance with GSM Technical Specifications [EN 301 515, Index [21] & [4]] and [EN 301 515, Index [22] & [5]] respectively. Use of Maintenance and shunting group ID's	(MI)	RINF_FA_15	FA Call - Successful Call
9.4.1	Within the GSM-R network, the user shall be able to dial the following types of numbers: - National EIRENE Number (NEN): this number is used to route a call from the calling party to a called party registered within the same GSM-R network; - International EIRENE Number (IEN): this number is used to route a call from the calling party to a called party registered within another GSM-R network; - MSISDN numbers: the number used by a subscriber of a public fixed (or mobile) network for calling a mobile station of a GSM PLMN; - Short Dialling Code (SDC): this number is used to allow 'speed dialling' functionality.	(MI)	NoCov_31	Network Configuration Topic + RINF_GSM_6, RINF_FA_15, RINF_LDA_1
9.4.2	In addition, Breakout Codes (BCs) shall be used to allow users within the GSM-R network to access external numbers.	(MI)	NoCov_31	Network Configuration Topic + RINF_GSM_6, RINF_FA_15, RINF_LDA_1
9.4.3	Access from the GSM-R network to external networks shall be as detailed in section 9.10.	(MI)	NoCov_32	See referenced Section
9.5.2	Every railway network shall consider a number as a National EIRENE Number (NEN) unless the number is preceded by an International Code, identifying another GSM-R network.	(MI)	RINF_FA_7	FA Call - Successful Call
9.5.3	Structure of National EIRENE Number The National EIRENE Number shall consist of three distinct parts, as shown in figure 9-1: |_CT_||_____U I N_____||__FC__| |<----- User Number ----->| |<-- National EIRENE Number -->| CT .... Call Type	(MI)	RINF_FA_7	FA Call - Successful Call

UIN ... User Identifier Number FC .... Function Code			
Figure 9-1: National EIRENE Number structure			
1) Call Type:			
The Call Type (CT) prefix is used to distinguish between the different types of User Numbers that are allowed within the national EIRENE numbering plan. It is an indication to the network of how to interpret the number dialled.	(I)		
2) User Identifier Number:			
The User Identifier Number (UIN) shall be one of the following numbers (as identified by the CT):	(MI)		
- Train Number (TN): a number given to a train by operational staff for a particular journey. This number shall be unique for the duration of the journey.			
- Note. For certain Train Numbers (e.g. 1234 and 123), a risk exists when dialling a number by keying in individual digits e.g. by the controller. In this circumstance the risk of connecting to an un-intended train exists if there is a delay between keyed-in digits. There is no risk of ambiguity if block dialling is employed.			
- Engine Number (EN): a unique number given to a tractive unit to identify it permanently. The UIC has introduced a uniform identification marking system for tractive stock crossing frontiers [UIC 438-3]. In order to call a particular locomotive, it shall be possible to call a number associated with the tractive unit's stock number. The actual number of the unit, which shall be used as the EN, is based on the complete identification number.			
- Coach Number (CN): a unique number given to a coach (which is not a tractive unit) to identify it permanently. The UIC has introduced a uniform identification marking for passenger rolling stock [UIC 438-1]. In order to call a particular coach it shall be possible to call a number associated with the vehicle marking. The total vehicle marking consists of 12 digits. The actual number of the coach is denoted by seven digits (positions 5 to 11 of the complete vehicle marking), which shall be used as the CN (*7).			
Note (*7): In order to prevent duplication of numbering, as each railway is free to allocate the coach number leading to number uniqueness per country only, the Owning or registering Railway code should be added as the first digits.			
- Shunting Team Location Number (STLN)			
- Maintenance Team Location Number (MTLN)			
- Train Controller Location Number (TCLN)			
- Group Location Number (GLN)			
- Mobile Subscriber Number (MSN)			
3) Function Code:			
The Function Code (FC) is used as an identification of, for example, the person or	(I)		

	equipment on a particular train, or a particular team within a given area.			
9.5.4	National EIRENE Numbering Plan		RINF_FA_7	FA Call - Successful Call
	The contents of the fields of a National EIRENE Number shall be as defined below:	(MI)		
	1) Call Type (CT)			
	This prefix defines how to interpret the User Number that follows. It shall consist of one or two digits as defined in table 9-1.			
	Digit | Use			
	1 | Reserved for short codes (see section 9.8)			
	2 | Train Function Number (ie TN + FC)			
	3 | Engine Function Number (ie EN + FC)			
	4 | Coach Number (ie CN + FC)			
	50 | Group calls			
	51 | Broadcast calls			
	52-55 | Reserved for international use			
	56-57 | Reserved for national use			
	58 | Reserved for system use (Group call signalling)			
	59 | Reserved for system use (Broadcast call signalling)			
	6 aintenance and shunting team members			
	7 | Train controllers			
	8 obile Subscriber Number			
	9 | Reserved for breakout codes			
	| (see section 9.10) and national use			
	0 | Reserved for access to public or			
	| to other GSM-R networks (see section 9.10)			
	Table 9-1: Call Type field format			
	2) User Number (UN)			
	The UN is variable in length and depends on the information on which it is based. The following formats are defined:			
	- Train Function Numbers (TFN) shall take one of the forms as defined in _____table 9-2. Leading zeros shall be used in those situations where the train _____number is less than five digits.			
	Train Number| Use			
	0000XFF | train number with one significant digit			
	000YXFF | train number with two significant digits			
	00YXXFF | train number with three significant digits			
	0YXXXFF | train number with four significant digits			
	YXXXXFF | train number with five significant digits			
	XXXXXXFF | train number with six significant digits			
	XXXXXXXFF | train number with seven significant digits			
	XXXXXXXXFF | train number with eight significant digits			
	| FF - Function Code as defined in			
	| Appendix A table 9A-1			
	| Y not equal to 0			
	Table 9-2: UN - Train Function Number field format			

- Engine Function Numbers (EFN) shall take the format as defined in table 9 3.

Engine Number | Use
XXXXXXXXFF | XXXXXXXX : number of powered unit
| allocated by each Railway
| FF : Function Code as defined in
| Appendix A table 9A-1

Table 9-3: UN - Engine Function Number field format

- Coach Function Numbers (CFN) shall take the format as defined in table 9-4.

Coach Number | Use
XXXXXXXXXFF |
| XXXXXXXXX : vehicle number allocated
| by each Railway
| FF : Function Code as defined in
| Appendix A table 9A-1

Table 9-4: UN - Coach Function Number field format

- Maintenance and Shunting Team Members. The UIN field format for calls to shunting teams and maintenance teams shall consist of a Location Number (LN), which identifies the location where the called party is registered, followed by a Function Code (FC). The Location Number shall consist of 5 digits and shall be assigned on a national basis. The Function Code shall consist of 4 digits. The first digit of the FC is related to the Team Type (TT) and is specified by table 9-5.

Team Type | Description
1 – 3 | Reserved for international use
4 | Reserved for national use
5 | Shunting Team
6 – 9 | Reserved for national use
0 | Reserved for international use

Table 9-5: UIN – Team Type field format

The composition of the Function Code field for calls to shunting teams and maintenance teams shall be as defined in table 9-6.

FC | Function description
TT,Y,XX | Team type, team member function
| and team number
| TT : team type
| Y : team member function
| XX : team number
| As defined in Appendix 9A table 9A-2

Table 9-6: Function Code field format for CT=6

- Train Controllers. The UIN field for calls to train controllers shall be a Location Number (LN) which identifies the location where the called party is registered. The Location Number shall consist of 5 digits and shall be assigned on a national basis.

The FC field for calls to train controllers shall consist of two digits and be as defined in table 9-7.

FC | Function description
01 | Primary controller
02 | Secondary controller
03 | Power supply controller
04 | Switchman

05 | Platform inspector 06 | Railway Undertaking controller 07 | Technical Inspector 08 | Trein preparation 09 | Emergency manager 10 | Reserved for international use 11-99 | Reserved for internationally harmonised national use Table 9-7: Function Code field format for CT=7			
- Mobile Subscriber Number (MSN). The UN of the MSN shall consist of the Subscriber Number.			
- Group and broadcast calls. The UIN field format for group and broadcast calls shall be a Service Area (SA) indicator, which identifies the area in which the group or broadcast call is to be active. Each Service Area shall be allocated on a national basis. In network boundary areas, the Service Area shall be allocated on a bilateral basis. (See also subsection 9.9.)			
The group ID field format for group and broadcast calls shall consist of three digits and be as defined in table 9-8 and table 9-8i.			
Group IDs required for national applications shall be harmonised.	(M)		
Group ID | Function Description (VGCS) 1xx | Reserved for national use 200 |High priority group call in the context of group calls |between drivers in the same area (section 5.3.3)/ |involving drivers and controllers in the same area 201 - 249 | Reserved for internationally harmonised national use 250 - 269 |Local Operational Communication 270 - 279 |Train Preparation 280 - 298 |Reserved for internationally harmonised national use 299 | Train groups: Emergency call 3xx | Reserved for internationally harmonised national use 4xx | Reserved for internationally harmonised national use 500 | Shunting groups: Default group 501– 529| Shunting groups: Dedicated shunting groups 530 | Station and security staff: Default group 531 - 538 | Station and security staff: Reserved for international use 539 | Station and security staff: High-priority call 54x | Reserved for international use 550-554 | Reserved for international use 555 perational group call to drivers in the same area1 |involving drivers and controllers in the same area 556-559 | Reserved for international use			

	560 | Trackside maintenance groups: | Default group			
	561 - 568 | Trackside maintenance groups: | Reserved for international use			
	569 | Trackside maintenance groups: High-priority call			
	570 | Controller groups: Default group			
	571 - 578 | Controller groups: | Reserved for international use			
	579 | Controller groups: High-priority call			
	58x | Reserved for international use			
	590 - 598 | Reserved for international use			
	599 | Shunting groups: Emergency call			
	6xx | Reserved for internationally harmonised national use			
	7xx | Reserved for internationally harmonised national use			
	8xx | Reserved for internationally harmonised national use			
	9xx | Reserved for internationally harmonised national use			
	0xx | Reserved for national use			
	Notes:			
	Internationally specified eMLPP priorities will be allocated to group IDs belonging to the class “Reserved for international use” as and when functional requirements are defined.			
	Nationally specified eMLPP priorities allocated to group IDs belonging to the class “Reserved for national use”, if used, shall have no impact on interoperability and on Railway emergency calls 299 and 599 including the handling on all terminals.			
	Table 9-8: Group ID field format for CT=5			
9.6.2	GSM-R networks shall recognise International EIRENE Numbers starting with the IC of the GSM-R network in which the calling party is currently operating as National EIRENE Numbers.	(MI)	NoCov_34	Network Konfiguration Topic + RINF_GSM_6, RINF_GSM_4
9.6.3	Structure of International EIRENE Number		NoCov_6	Network Konfiguration Topic + RINF_FA_15
	The International EIRENE Number shall consist of three distinct parts, as shown in figure 9-2:	(MI)		
	|_IC_||_CT_||_____U N_____|			
	|<-- National EIRENE Number -->|			
	|<-- International EIRENE Number -->|			
	IC ... International Code			
	CT .... Call Type			
	UN ... User Number			
	Figure 9-2: International EIRENE Number structure			
	- International Code (IC), which shall be used to route calls to the appropriate GSM R network;			
	- National EIRENE Number (NEN), which consists of the combination of Call Type and User Number and which is used to identify the called party.			
	Figure 9-3: Number structure of MSISDN number			

9.6.4	International EIRENE Numbering plan		NoCov_6	Network Konfiguration Topic + RINF_FA_15
	The fields of an International Functional Number shall be defined as follows:	(MI)		
	1) International Code (IC)			
	The International Code field shall consist of three digits and shall be based on the [ITU-T E.164] country code (XCC or CCC), allocated by the UIC on a network-by-network basis.			
	2) National EIRENE Number (NEN)			
	The format of the National EIRENE Number field shall be as defined in subsection 9.5.			
9.7.1	At least one MSISDN number shall be allocated to each mobile station.	(MI)	RINF_GSM_6	Establishment of several PTP calls with different priorities
9.7.2	The structure of the MSISDN numbers shall comply with GSM Technical Specification [GSM NUMBERING].	(MI)	RINF_GSM_6	Establishment of several PTP calls with different priorities
	|_CC_||_NDC_|_____ S N _____|			
	|<-- National (significant)mobile Number -->|			
	|<-- Mobile station international ISDN Number --> |			
	CC ..... Country Code			
	NDC .... National destination codeCall Type			
	SN ..... Subscriber number			
9.7.3.1	The MSISDN Subscriber Number shall be equal to the National EIRENE Number for Call Type = 8.	(MI)	NoCov_7	Network Konfiguration Topic + RINF_GSM_4 with properly selected A Party
9.7.4	It shall be possible for authorised subscribers of fixed and mobile networks to call mobiles using the appropriate MSISDN number.	(MI)	RINF_GSM_9	Mobile subscriber receives a call from Subscriber on other Network
9.8.1	For certain functions, standardised short codes shall be implemented for mobile originated calls.	(MI)	NoCov_10	Mobile/Cab requirement
9.8.2	Each short dialling code shall consist of four digits.	(MI)	RINF_LDA_1	Successful LDA Call - Verify the cell format is correct
9.8.3	Short dialling codes shall start with the first digit equal to 1 (ie CT=1).	(MI)	RINF_LDA_1	Successful LDA Call - Verify the cell format is correct
9.8.4	The short dialling codes can be defined on a national basis, but it is essential that certain codes be used on an international basis in order to achieve interoperability. These codes, when used, shall be as given in table 9-10.	(MI)	RINF_LDA_1	Successful LDA Call - Verify the cell format is correct
	Code | Description		RINF_LDA_2	Unsuccessful LDA Call - Call to invalid Short Code
	10(00-99) | Reserved for internationally harmonised national use			
	11(00-19) | Reserved for internationally harmonised national use			
	112X | Not used			
	| (note: 112 reserved for public emergency)			
	11(30-98) | Reserved for internationally harmonised national use			
	1199 | Emergency Manager			
	12XX* | Route to most appropriate			
	| primary controller			
	13XX* | Route to most appropriate			
	| secondary controller			
	14XX* | Route to most appropriate			

	| power supply controller			
	15XX* | Route to most appropriate			
	| ERTMS/ETCS RBC (CS-mode only)			
	1600 | Railway Security Staff			
	16(01-11) | Reserved for international use			
	1612 | Confirmation call for high priority calls			
	| and railway emergency calls (see section 13)			
	16(13-19) | Reserved for international use			
	16(20-29) | Technical Inspector			
	16(30-39) | Train Preparation			
	16(40-99) | Reserved for international use			
	1700 | Driver Safety Device			
	17(01-20) | Controller originated VGCS			
	17(11-76) | Reserved for international use			
	1777 | Train Ready			
	17(78-99) | Reserved for international use			
	18(00-99) | Reserved for internationally harmonised national use			
	19(00-99) | Reserved for internationally harmonised national use			
	* XX may be used only in CS-mode to provide supplementary location information within a cell. Where no additional information is available the default value shall be 00.			
	***This use is optional. The SDC number is harmonized for all railways in EU			
	Table 9-10: Internationally defined short codes			
9.9.1	Standardisation of UIC group addresses is required to provide interoperability between the fixed railway networks within the GSM-R network.	(MI)	NoCov_39	Network Configuration + RINF_VGCS_1
9.9.2	The group address consists of a Service Area (5 digits) and a Function Code (3 digits) and has a Call Type 5 (see table 9-1).	(MI)	NoCov_39	Network Configuration + RINF_VGCS_1
9.9.3	The Service Area shall be defined on a national basis.	(MI)	NoCov_39	Network Configuration + RINF_VGCS_1
9.9.4	In network boundary areas, the Service Area shall be allocated on a bilateral basis.	(MI)	NoCov_40	Network Configuration + 2 NW + RINF_VGCS_1
9.9.5	Function Codes shall be defined within the framework given in table 9-8 on an international basis.	(MI)	NoCov_6	Network Konfiguration Topic + RINF_FA_15
9.10.1	Access to other GSM-R networks shall be possible by using a Breakout Code (BC) as part of the dialled number.	(MI)	NoCov_6	Network Konfiguration Topic + RINF_FA_15
9.10.1ii	The BC for access to other GSM-R networks is defined in table 9-12a, and is followed by the full international EIRENE number of the called party.	(MI)	RINF_FA_12	Unsuccessful registration with Lead driver number (CT2 FC 01) because of wrong CoR (CT2 FC10 works)
	Breakout Code | Network			
	ther GSM-R network			
	900 | International EIRENE Numbering plan			
	| as defined in subsection 9.6)			
	Table 9-12a: Breakout Code (other GSM-R Networks)			
9.10.1v	Access to private networks shall be performed by using a BC, defined in table 9-12c.	(MI)	NoCov_6	Network Konfiguration Topic + RINF_FA_15
	Breakout Code | Network			
	901 | Gateway to private railway network			
	| (private numbering plan)			

	902 – 909 | Reserved for national breakout codes Table 9-12c: Breakout Codes (private networks)			
9.13.3	The APN structure to be used for the dedicated operation of ETCS in PS-mode shall be of the format {<network id>.<operator id>.gprs} (MI) where: § network id = “etcs” § operator id = “mncXXX.mccYYY” whereas: · XXX=MNC Mobile Network Code 3 digits* · YYY=MCC Mobile Country Code 3 digits Example : “etcs.mncXXX.mccYYY.gprs” * MNC can have 2 or 3 digits. In case of 2 digits MNC the format used in the APN operator id shall be 0XX.	(MI)	RINF_GPRS_1 (*)	GPRS Connection Setup
9.13.4	The APN used for the operation of ETCS in PS-mode shall be linked to the QoS-Profile “ETCS application” according to chapter 10.8.5.2.	(MI)	RINF_GPRS_1 (*)	GPRS Connection Setup
9.13.8	The subscription of the APN used for ETCS shall grant access to the GGSN of the Home-EIRENE network and/or to the Visited-EIRENE network (VPLMN=Yes).	(MI)	NoCov_21	Border Crossing (ENIR)
9.13.9	The APN structure to be used for the dedicated operation of online key management in PS-mode shall be of the format {<network id>.<operator id>.gprs} where: § network id = “kms” § operator id = “mncXXX.mccYYY” whereas: · XXX=MNC Mobile Network Code 3 digits* · YYY=MCC Mobile Country Code 3 digits Example: “kms.mncXXX.mccYYY.gprs” * MNC can have 2 or 3 digits. In case of 2 digits MNC the format used in the APN operator id shall be 0XX.	(MI)	RINF_GPRS_1 (*)	GPRS Connection Setup
9.13.10	The APN used for the operation of online key management in PS-mode shall be linked to QoS-Profile “non-ETCS application” according to chapter 10.8.5.1.	(MI)	RINF_GPRS_1 (*)	GPRS Connection Setup
9.13.12	The subscription of the APN used for online key management shall grant access to the GGSN of the Home-EIRENE network (VPLMN=No).	(MI)	RINF_GPRS_1 (*)	GPRS Connection Setup
9.14.3	The top level domain “etcs” shall only be used for the operation of following ERTMS applications: o ETCS o KMC as part of KMS	(MI)	RINF_GPRS_1 (*)	GPRS Connection Setup
9.14.4	The FQDN, used to identify RBC (ETCS trackside) equipment, shall comply with the following format:		RINF_GPRS_1 (*)	GPRS Connection Setup
	o “id<ETCS-ID>.ty<ETCS-ID Type>.etcs”	(MI)		
	o ETCS ID shall be according to [Subset-037]	(MI)		
	o ETCS ID Type shall be according to [Subset-037]	(MI)		
	o e.g. “id031123. ty01.etcs”	(I)		
9.14.5	The FQDN, used to identify the online key management centre, shall comply with the following format:		RINF_GPRS_2 (*)	Contact an RBC in the ETCS domain
	o “id<ETCS-ID>.ty<ETCS-ID Type>.etcs” (MI)	(MI)		
	o ETCS ID shall be according to [Subset-037] (MI)	(MI)		
	o ETCS ID Type shall be according to [Subset-037] (MI)	(MI)		

	o e.g. “id031123. ty05.etcs” (I) Note: Registration Authority-RA FQDN and the Certification Authority-CA FQDN are not part of the “etcs” top level domain.	(I)		
9.15.4	For the operation of ETCS as well as other ERTMS applications in PS-mode, IPv4 address space according to [RFC 791] shall be used to allocate IP addresses to an OBU or RBC.	(MI)	RINF_GPRS_1 (*)	GPRS Connection Setup
9.15.5	The allocation of the OBU IP address shall be temporary during the active communication session/primary PDP context.	(MI)	RINF_GPRS_1 (*)	GPRS Connection Setup
9A.2	The Function Codes used in association with the Train Function Number (CT=2), Engine Function Number (CT=3) and Coach Function Number (CT=4) shall conform to table 9A-1.	(MI)	NoCov_6	Network Konfiguration Topic + RINF_FA_15
	Function | Function description			
	Code |			
	00 | Spare alarm			
	01 | Leading driver			
	02 | Driver 2			
	03 | Driver 3			
	04 | Driver 4			
	05 | Driver 5 – reserved for Banking			
	06 | Fax			
	07 | Intercom			
	08 | Public address			
	09 | Reserved for international use			
	10 | Chief conductor			
	11 | Second conductor			
	12 | Third conductor			
	13 | Fourth conductor			
	14 – 19 | Train crew international use			
	20 | Catering staff chief			
	21 – 29 | Reserved for international use (catering staff)			
	30 | Railway security services chief			
	31 – 39 | Reserved for international use (security services)			
	40 | ERTMS/ETCS			
	41 - 49 | Reserved for international use (ERTMS/ETCS)			
	50 | Train-borne recorder			
	51 | Diagnostics			
	52 | Train data bus			
	53 | Train location system			
	54 - 59 | Reserved for international applications			
	| for on train equipment			
	60 | Pre-recorded passenger info			
	61 | Displayed passenger information unit			
	62 – 69 | Reserved for international use (passenger services)			
	70 – 79 | Reserved for international use			
	80 – 99 | Reserved for internationally harmonised national use			
	Note: Function Codes are reserved for international applications except when shown as “Reserved for internationally harmonised national use”.			
	Table 9A-1: Function Code field for CT=2, 3 and 4			

9A.3	The Function Codes used in association with Maintenance and Shunting Services Team Numbers (CT=6) shall conform to table 9A-2. Function | Code | Function description TT,y,xx | TT=1-3 | Reserved for international use TT,y,xx | TT=4 | Reserved for national use TT,y,xx | TT=5 | y = 0 Shunting leader | 1 – 3 Shunting team member | 4 Train driver | 5 – 9 Reserved for national use | xx = 00 Default shunting group | 01 – 29 Dedicated shunting groups (*) | 30 – 99 Reserved TT,y,xx | TT=6-9 | Reserved for national use TT,y,xx | TT=0 | Reserved for international use (*): As defined in table 9-8, FCs 5y01 – 5y29 provide dedicated shunting groups 01 – 29 Table 9A-2: Function Code field for CT=6	(MI)	NoCov_6	Network Konfiguration Topic + RINF_FA_15
10.2.1	In order to provide a consistent international service, it is necessary to ensure that priorities are allocated consistently across all railways. The following allocation of UIC priority levels to eMLPP priority codes is mandatory: See: EIRENE SRS Table 10-1: Allocation of priorities	(MI)	RINF_GSM_6	Establishment of several PTP calls with different priorities
			RINF_GSM_7	Public Emergency Call – With SIM
			RINF_FA_7	FA Call - Successful Call
			RINF_eMLPP_1	MS in VGCS call on DCH, pre-emption on Air IF by higher prio PtP call
			RINF_eMLPP_2	MS in VBS call as listener, pre-emption on Air IF by higher prio VBS call.
			RINF_eMLPP_3	MS in VGCS call having the UL of the GCH, pre-emption on Air IF by higher prio VBS call.
			RINF_eMLPP_4	MS in PtP call, pre-emption on MS by higher prio VGCS call (REC)
			RINF_eMLPP_5	MS in VBS call as originator, pre-emption on Air IF by higher prio VGCS call (REC)
			RINF_eMLPP_7	MS in data call, pre-emption on Air IF by higher prio VGCS call (REC)
			RINF_eMLPP_8	MS in PtP call, pre-emption on Air IF by higher prio data call (4800 baud, transparent)
			RINF_VGCS_2	Controller originates VGCS call and takes it down with the kill Sequence
			RINF_VGCS_5	Controller joins ongoing VGCS call
			RINF_REC_1	SS originates a REC
			RINF_REC_3	SS accepts an incoming REC
			RINF_REC_4	Controller originates a REC

			RINF_OTDI_2	SS originates VGCS Immediate Setup 2 call, terminating Controller receives the OTDI
			RINF_LE_2	Orig. SS active in a VBS (P4) call move in a cell with ongoing REC call
			RINF_LE_3	Orig. SS active in a VGCS (P4) call on GCH (talker) move in a cell with ongoing REC call
10.5.1	SIM cards shall contain a list of authorised networks so that networks shall be displayed (or automatically selected if automatic network selection has been enabled) in the following order of priority (see [MORANE SIM] for more details): - home EIRENE network; - 'foreign' EIRENE networks; - non-EIRENE networks (with order of priority predetermined by virtue of international subscriptions and roaming agreements).	(MI)	RINF_GSM_1	Successful Location Update after MS Power On
			RINF_GSM_2	Supplementary Service Call Hold
			RINF_GSM_3	Supplementary Service Call Waiting
			RINF_GSM_4	Supplementary Service CLIP – MMC with Call Forwarding Unconditional
			RINF_GSM_5	Supplementary Service MPTY
			RINF_GSM_6	Establishment of several PTP calls with different priorities
			RINF_GSM_7	Public Emergency Call – With SIM
10.5.1i	In order to shorten the duration of the network selection procedure, Mobile Stations designed for use in EIRENE networks shall give preference to the GSM frequency band allocated for railway use (see 3.5.2).	(MI)	NoCov_10	Mobile/Cab requirement
10.7.1i	In case of encryption, ciphering/deciphering algorithms referenced in [EN 301 515, Index [3]] shall be used.	(MI)	NoCov_10	Mobile/Cab requirement
11.2.3	The numbering plan to be used with functional addressing shall be in accordance with the numbering plan given in section 9.	(MI)	NoCov_6	Network Konfiguration Topic + RINF_FA_15
11.3.2	Mobile access to the functional numbering scheme for registration, deregistration and re-registration shall apply the USSD messages and protocols over the air interface as specified in the GSM Follow-me service.	(MI)	RINF_FA_1	Registration of an FN Number
			RINF_FA_2	Registration of an unknown FN fails
			RINF_FA_3	Deregistration of an FN Number
			RINF_FA_4	Deregistration of an FN fails
			RINF_FA_5	Interrogation of an FA Number
			RINF_FA_6	Interrogation of an FN fails
			RINF_FA_7	FA Call - Successful Call
			RINF_FA_8	FA Call – Call is not completed
			RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
			RINF_FA_10	Deregistration of CT2 numbers while roaming
			RINF_FA_11	Forced Deregistration
			RINF_FA_13	Register 3 function numbers to one user (non-roaming case)

			RINF_FA_14	Registration of an FN fails - remote party already registered
11.3.5	Functional number management For communication over the (Um) air interface, the USSD messages and protocols as specified in the GSM Follow-me service shall be used to manage the following types of functional numbers: - Train number; - Engine number; - Coach number; - Shunting team number; - Maintenance team number.	(MI)	RINF_FA_1	Registration of an FN Number
			RINF_FA_2	Registration of an unknown FN fails
			RINF_FA_3	Deregistration of an FN Number
			RINF_FA_4	Deregistration of an FN fails
			RINF_FA_5	Interrogation of an FA Number
			RINF_FA_6	Interrogation of an FN fails
			RINF_FA_7	FA Call - Successful Call
			RINF_FA_8	FA Call – Call is not completed
			RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
			RINF_FA_10	Deregistration of CT2 numbers while roaming
			RINF_FA_11	Forced Deregistration
			RINF_FA_14	Registration of an FN fails - remote party already registered
11.3.6	It shall be possible to limit user access to functional number registration and deregistration facilities based on each of the types of functional number identified in 11.3.5.	(MI)	RINF_FA_12	Unsuccessful registration with Lead driver number (CT2 FC 01) because of wrong CoR (CT2 FC10 works)
			RINF_AM_1	National call: AM allows call
			RINF_AM_2	National call: AM denies call
11.3.7	Mobile stations shall use the following sequences for the control of the functional number management: Procedure | Sequence Interrogation | *#214*SI***# Registration | **214*SI***# Deregistration | ##214*SI***# Re-registration | **214*SI***# followed by ##214*SI***# Definition in section 11.3.14 | Forced De-registration | ##214*SI*88*MSISDN*# Where SI Supplementary Information represents the International Functional Number (also called the International EIRENE Number), as defined in section 9.6.3. Note: This table is for information only. The Follow Me service control sequences are based on the USSD specified in [EN 301 515, Index [15]].	(MI)	RINF_FA_1	Registration of an FN Number
			RINF_FA_2	Registration of an unknown FN fails
			RINF_FA_3	Deregistration of an FN Number
			RINF_FA_4	Deregistration of an FN fails
			RINF_FA_5	Interrogation of an FA Number
			RINF_FA_6	Interrogation of an FN fails
			RINF_FA_7	FA Call - Successful Call
			RINF_FA_8	FA Call – Call is not completed
			RINF_FA_11	Forced Deregistration
			RINF_FA_14	Registration of an FN fails - remote party already registered
11.3.7i	The Sub-System Number (SSN) to be used and set for Follow-Me Functional Number management shall be SSN=6.	(MI)	NoCov_41	Network Setup documentation + RINF_FA_15
11.3.9	Registration The result of the registration procedure shall be sent back to the mobile. In the event of a failure, an indication of the cause shall be	(MI)	RINF_FA_1	Registration of an FN Number
			RINF_FA_2	Registration of an unknown FN fails

	provided. Information on the outcome shall be provided to the mobile according to [EN 301 515, Index [17]] and [EN 301 515, Index [34]].			
			RINF_FA_3	Deregistration of an FN Number
			RINF_FA_4	Deregistration of an FN fails
			RINF_FA_5	Interrogation of an FA Number
			RINF_FA_6	Interrogation of an FN fails
			RINF_FA_7	FA Call - Successful Call
			RINF_FA_8	FA Call – Call is not completed
			RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
			RINF_FA_10	Deregistration of CT2 numbers while roaming
			RINF_FA_11	Forced Deregistration
			RINF_FA_14	Registration of an FN fails - remote party already registered
11.3.9i	In the event of a registration procedure failing owing to the functional number already being registered to another mobile, the Cab radio shall be capable of providing the user with the ability to perform automatically the forced de registration of the previously registered mobile and the registration of this functional number to the user's mobile. This shall result in the following sequence of actions being performed by the user's Cab radio (see 11.3.7 for details of message structure):	(MI)	RINF_FA_1	Registration of an FN Number
	1. | Send interrogation message (from mobile to network).		RINF_FA_2	Registration of an unknown FN fails
	2. | Receive MSISDN (from network to mobile).		RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
	3. | Send a forced de-registration message (from mobile to network).		RINF_FA_10	Deregistration of CT2 numbers while roaming
	4. | Receive the answer (from network to mobile).		RINF_FA_14	Registration of an FN fails - remote party already registered
	5. | Send a registration message (from mobile to network).			
	6. | Receive the answer (from network to mobile).			
	7. | Inform the user whether the registration of the functional number to the user's mobile was successful (performed by the mobile).			
11.3.10	Deregistration Deregistration shall only be performed by the subscription identified by the MSISDN number which is associated with the functional number.	(MI)	RINF_FA_3	Deregistration of an FN Number
			RINF_FA_4	Deregistration of an FN fails
			RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
			RINF_FA_10	Deregistration of CT2 numbers while roaming
			RINF_FA_11	Forced Deregistration
11.3.12	The result of the deregistration procedure shall be sent back to the mobile. In the event of a failure, an indication of the cause shall be provided. Information on the outcome shall be	(MI)	RINF_FA_3	Deregistration of an FN Number

	provided to the mobile according to [EN 301 515, Index [17]] and [EN 301 515, Index [34]].			
			RINF_FA_4	Deregistration of an FN fails
			RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)
			RINF_FA_10	Deregistration of CT2 numbers while roaming
			RINF_FA_11	Forced Deregistration
11.3.14	Re-registration of on-train functional numbers based on the train number shall be performed every time a train leaves one EIRENE network and enters into another EIRENE network.	(MI)	NoCov_14	Mobile/Cab requirement + RINF_FA_1, RINF_FA_3
11.3.15	Deregistration of a functional number shall not be carried out until registration of the functional number has been carried out and confirmed as being successful.	(MI)	NoCov_14	Mobile/Cab requirement + RINF_FA_1, RINF_FA_3
11.5.1	The called party functional identity shall be presented to the user initiating a call and the calling party functional identity shall be presented to the user receiving a call.	(MI)	NoCov_19	NW Configuration + RINF_FA_15
11.5.2	The calling party functional number shall be passed to the receiving mobile using the User to User Signalling supplementary service (UUS1) during call setup.	(MI)	NoCov_19	NW Configuration + RINF_FA_15
11.5.3	If the calling party functional number is not available or if the calling party is not registered then the CLI of the calling party shall be displayed on the receiving mobile's display.	(MI)	NoCov_19	NW Configuration + RINF_FA_15
11.5.4	The user-to-user information element in the SETUP, ALERT or CONNECT messages, as defined in [EN 301 515, Index [16]], shall be used to transfer the functional number of the calling party to the called party.	(MI)	NoCov_19	NW Configuration + RINF_FA_15
11.5.5	The user-to-user information element shall use the following format: 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 ctet | |User-User Information Element Identifier | 1 | Length of User-User contents | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | | User-User protocol discriminator | 3 |Binary 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | Tag defines presentation of Functional Identity| 4 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | | | | Length of Numeric FN | 5 | Numeric FN | 6 | Digit 2 | Digit 1 | | BCD Digit m | Digit m-1 | n |	(MI)	NoCov_19	NW Configuration + RINF_FA_15
11.5.6	If no valid functional number is available, a fixed length User-to-User Information Element shall be used with the following format: 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 ctet | |User-User Information Element Identifier | 1 | Length of User-User contents | 2 |	(MI)	NoCov_45	NW Configuration + RINF_GSM_6

	0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | |			
	User-User protocol discriminator | 3 |Binary			
	0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |			
	Tag defines presentation of Functional Identity| 4 |			
	0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | | | |			
	Functional number | 5 | BCD			
	0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |			
11.7.2	Cell dependent routing		RINF_LDA_1	Successful LDA Call - Verify the cell format is correct
	As a minimum, call routing using location dependent addressing shall be based on the use of short codes in conjunction with cell dependent routing.	(MI)	RINF_LDA_2	Unsuccessful LDA Call - Call to invalid Short Code
11.8.1	Facilities shall be provided to prevent unauthorised calls to mobiles either by functional number or MSISDN number from outside the EIRENE network.	(MI)	RINF_AM_2	National call: AM denies call
12.2.1	Where text messaging is implemented in the network, the Short Message Service (SMS) shall be used.	(MI)	RINF_GSM_8	Short and long SMS
12.2.2	The maximum length of an un-concatenated message segment shall be 160 characters. A message can include several segments, in which case the maximum limit is 153 characters per segment(*9).	(MI)	RINF_GSM_8	FAX use questionable, no known mobiles supporting this
	Note (*9): Message length assumes uncompressed GSM default 7 bit alphabet is used. See 3GPP 23.040 section 9.2.3.24.1 and 3GPP 23.038 section 4.	(I)		
13.2.2	All Railway emergency calls shall be implemented and shall be considered established as specified in GSM VGCS (Specifications [EN 301 515, Index [21] & [4]]).	(MI)	RINF_REC_1	SS originates a REC
			RINF_REC_2	Subscriber initiated REC (no talker change, normal clear down of call)
			RINF_REC_4	Controller originates a REC
			RINF_REC_6	REC in a GCA with a locked cell
13.3.1	A Railway emergency call shall be initiated by using the appropriate function code for the required type of Railway emergency call (see Table 9-8).	(MI)	RINF_REC_1	SS originates a REC
			RINF_REC_2	Subscriber initiated REC (no talker change, normal clear down of call)
			RINF_REC_4	Controller originates a REC
			RINF_REC_6	REC in a GCA with a locked cell
13.3.3	The Railway emergency group IDs required for interoperability are defined in section 9.5. The composition of each group is a matter for national implementation, although all areas shall have a group defined for all mandated Group IDs.	(MI)	RINF_REC_1	SS originates a REC
			RINF_REC_2	Subscriber initiated REC (no talker change, normal clear down of call)
			RINF_REC_4	Controller originates a REC
			RINF_REC_6	REC in a GCA with a locked cell

13.4.1	Each mobile shall store a list of emergency Group IDs in the SIM appropriate to its function (the Cab radio will store Group ID 299 and 599 - see table 9-8).	(MI)	NoCov_10	Mobile/Cab requirement
13.4.2	All Railway emergency group IDs required for interoperability and appropriate to the operation of the mobile shall maintain active status whilst the mobile is powered up.	(MI)	NoCov_10	Mobile/Cab requirement
13.4.7	If the GSM Release 99 capability and the Immediate Setup 2 feature defined in [EN 301 515, Index [6], Release 4] are supported by the network, the network shall set the MSC Release bit in the "Control Channel Description" information element to "1". Otherwise, the MSC Release bit in the "Control Channel Description" information element shall be set to "0" (zero) [EN 301 515, Index [41]].	(MI)	RINF_REC_1	SS originates a REC
			RINF_REC_2	Subscriber initiated REC (no talker change, normal clear down of call)
			RINF_REC_4	Controller originates a REC
			RINF_REC_6	REC in a GCA with a locked cell
			RINF_OTDI_1	SS originates VGCS call, terminating Controller receives the OTDI
			RINF_OTDI_2	SS originates VGCS Immediate Setup 2 call, terminating Controller receives the OTDI
13.5.2	The application shall be able to deduce that a confirmation is necessary from the call priority, as all calls of 'Railway emergency' priority must be confirmed.	(MI)	NoCov_10	Mobile/Cab requirement
13.5.3	Confirmation of Railway emergency calls shall be implemented using the User to User Signalling supplementary service (UUS1).	(MI)	RINF_REC_5	SS originates Acknowledgement Call
13.5.4	After clear down of the Railway Emergency call, the mobile application shall start the confirmation process by automatically originating a call. In order to avoid network congestion the call set up shall be delayed by a random offset.	(MI)	NoCov_10	Mobile/Cab requirement
13.5.5	Railway Emergency call confirmation messages shall be of eMLPP priority 4 - "Railway information and all other calls" (see section 10.2).	(MI)	NoCov_10	Mobile/Cab requirement
13.5.6	The user information contained in the confirmation message shall be: - Cab radio: the engine number or train number (if registered); - other mobiles: the user's functional number (if registered).	(MI)	NoCov_10	Mobile/Cab requirement
13.5.7	Confirmation messages shall be sent to a confirmation centre using a defined short code (see table 9-10), which shall be associated with the GSM network.	(MI)	RINF_REC_5	SS originates Acknowledgement Call
13.5.8	In the case of Cab radio, details of the confirmation shall be passed to the train borne recorder if a train borne recorder is connected to the Cab radio.	(MI)	NoCov_10	Mobile/Cab requirement
13.5.9	The user-to-user information elements in the following messages, as defined in [EN 301 515, Index [16]], shall be used for the confirmation of Railway Emergency calls:	(MI)	NoCov_10	Mobile/Cab requirement

	- SETUP: transfer of confirmation message to confirmation centre; - RELEASE COMPLETE: acknowledgement of the confirmation message.			
13.5.10	The SETUP and RELEASE COMPLETE user-to-user information element shall be as specified in the [TS 102 610].	(MI)	NoCov_10	Mobile/Cab requirement
13.5.10i	Confirmation centres shall be capable of decoding messages in either format A or B.	(MI)	RINF_REC_5	SS originates Acknowledgement Call
13A.2.1	An eREC capable network shall be able to simultaneously provide service to eREC and non-eREC capable mobiles.	(MI)	RINF_eREC_1 (*)	eREC call with correct SID – eREC MS with same SID are joining, eREC MS with different SID will not be alerted
			RINF_eREC_2 (*)	eREC call which involve with eREC capable and non eREC capable terminals
13A.2.2	An eREC capable mobile shall be able to operate in either eREC or non-eREC capable network.	(MI)	RINF_eREC_1 (*)	eREC call with correct SID – eREC MS with same SID are joining, eREC MS with different SID will not be alerted
			RINF_eREC_2 (*)	eREC call which involve with eREC capable and non eREC capable terminals
17.1.1	To enable interoperable international train traffic, the respective EIRENE networks shall be interconnected.	(MI)	NoCov_21	Border Crossing (ENIR)
17.2.1	To enable interoperable international train traffic, the respective EIRENE networks shall support Roaming.	(MI)	NoCov_21	Border Crossing (ENIR)
17.3.1	To enable interoperable international train traffic, the respective EIRENE networks shall be able to be configured to support Border Crossing.	(MI)	NoCov_21	Border Crossing (ENIR)

A-3 Cross reference Test Cases to Requirements

TCID	TCTitle	EireneDoc	Section
RINF_GSM_1	Successful Location Update after MS Power On	FRS	2.4.1
		FRS	2.4.2
		SRS	2.2.1
		SRS	10.5.1
RINF_GSM_2	Supplementary Service Call Hold	FRS	2.4.1
		FRS	2.4.2
		FRS	2.4.13
		FRS	2.4.14
		SRS	2.2.1
		SRS	2.4.1
		SRS	10.5.1
RINF_GSM_3	Supplementary Service Call Waiting	FRS	2.4.1
		FRS	2.4.2
		FRS	2.4.15
		SRS	2.2.1
		SRS	2.4.1
		SRS	10.5.1
RINF_GSM_4	Supplementary Service CLIP – MMC with Call Forwarding Unconditional	FRS	2.2.1
		FRS	2.2.2
		FRS	2.2.3
		FRS	2.2.4
		FRS	2.4.1
		FRS	2.4.2
		FRS	2.4.5
		SRS	2.2.1
		SRS	2.4.1
		SRS	10.5.1
RINF_GSM_5	Supplementary Service MPTY	FRS	2.2.1
		FRS	2.2.2
		FRS	2.2.3
		FRS	2.2.4
		FRS	2.2.17
		FRS	2.2.18
		FRS	2.4.1
		FRS	2.4.2
		FRS	5.2.2.26
		FRS	5.2.2.29
		FRS	5.2.2.30
		FRS	5.2.2.31
		FRS	5.2.2.32
		FRS	5.2.2.37
		FRS	5.2.2.38
		FRS	5.2.2.42
		SRS	2.2.1
		SRS	2.4.1
		SRS	2.5.1
		SRS	10.5.1
RINF_GSM_6	Establishment of several PTP calls with different priorities	FRS	2.2.1
		FRS	2.2.2
		FRS	2.2.3
		FRS	2.2.4
		FRS	2.4.1
		FRS	2.4.2
		SRS	2.2.1
		SRS	2.5.1
		SRS	5.4.4
		SRS	9.7.1
		SRS	9.7.2

		SRS	10.2.1
		SRS	10.5.1
RINF_GSM_7	Public Emergency Call – With SIM	FRS	2.4.1
		FRS	2.4.2
		FRS	9.3.2
		SRS	2.2.1
		SRS	10.2.1
		SRS	10.5.1
RINF_GSM_8	Short and long SMS	FRS	2.3.4
		SRS	12.2.1 12.2.2
RINF_GSM_9	Mobile subscriber receives a call from Subscriber on other Network	SRS	9.7.4
RINF_ER-GSM	Establishment of a PTP call in a ER-GSM network	SRS	3.5.5
RINF_HO_1	Inter BTS handover of a point to point voice call	FRS	2.2.3
		FRS	2.2.4
RINF_HO_2	Ongoing point to point voice call in the destination cell preempted by a inter BTS handover inwards of a point to point voice call	FRS	10.2.2
RINF_FA_1	Registration of an FN Number	FRS	2.4.1
		FRS	2.4.3
		FRS	2.5.1
		FRS	9.2.1.1
		FRS	9.2.2.2
		FRS	9.2.3.2
		FRS	9.2.4.1
		FRS	9.2.4.2
		FRS	9.2.4.3
		FRS	9.2.4.4
		FRS	11.2.1.1
		FRS	11.3.2.3
		FRS	11.3.3.1
		FRS	11.3.3.3
		FRS	11.3.3.5
		SRS	2.5.1
		SRS	11.3.2
		SRS	11.3.5
		SRS	11.3.7
		SRS	11.3.9
		SRS	11.3.9i
RINF_FA_2	Registration of an unknown FN fails	FRS	2.4.1
		FRS	2.4.3
		FRS	2.5.1
		FRS	9.2.1.1
		FRS	9.2.2.2
		FRS	9.2.3.2
		FRS	9.2.4.1
		FRS	9.2.4.2
		FRS	9.2.4.3
		FRS	9.2.4.4
		FRS	11.2.1.1
		FRS	11.2.1.5
		FRS	11.2.2.1
		FRS	11.3.2.3
		FRS	11.3.3.1
		FRS	11.3.3.3
		FRS	11.3.3.5
		SRS	11.3.2
		SRS	11.3.5
		SRS	11.3.7
		SRS	11.3.9
		SRS	11.3.9i

RINF_FA_3	Deregistration of an FN Number	FRS	2.4.1
		FRS	2.4.3
		FRS	2.5.1
		FRS	9.2.1.1
		FRS	9.2.2.2
		FRS	9.2.3.2
		FRS	9.2.4.1
		FRS	9.2.4.2
		FRS	9.2.4.3
		FRS	9.2.4.4
		FRS	11.2.1.1
		FRS	11.3.2.3
		FRS	11.3.3.1
		FRS	11.3.3.3
		FRS	11.3.3.4
		FRS	11.3.3.5
		SRS	2.4.1
		SRS	11.3.2
		SRS	11.3.5
		SRS	11.3.7
		SRS	11.3.9
		SRS	11.3.10
		SRS	11.3.12
RINF_FA_4	Deregistration of an FN fails	FRS	2.4.1
		FRS	2.4.3
		FRS	2.5.1
		FRS	9.2.1.1
		FRS	9.2.2.2
		FRS	9.2.3.2
		FRS	9.2.4.1
		FRS	9.2.4.2
		FRS	9.2.4.3
		FRS	9.2.4.4
		FRS	11.2.1.1
		FRS	11.3.2.3
		FRS	11.3.3.1
		FRS	11.3.3.3
		FRS	11.3.3.4
		FRS	11.3.3.5
		SRS	2.4.1
		SRS	11.3.2
		SRS	11.3.5
		SRS	11.3.7
		SRS	11.3.9
		SRS	11.3.10
		SRS	11.3.12
RINF_FA_5	Interrogation of an FA Number	FRS	2.4.1
		FRS	2.4.3
		FRS	2.5.1
		FRS	9.2.1.1
		FRS	9.2.4.1
		FRS	9.2.4.2
		FRS	9.2.4.3
		FRS	9.2.4.4
		FRS	11.2.1.1
		FRS	11.3.2.3
		FRS	11.3.3.1
		FRS	11.3.3.3
		FRS	11.3.3.5
		SRS	2.4.1
		SRS	11.3.2

		SRS	11.3.5
		SRS	11.3.7
		SRS	11.3.9
RINF_FA_6	Interrogation of an FN fails	FRS	2.4.1
		FRS	2.4.3
		FRS	2.5.1
		FRS	9.2.1.1
		FRS	9.2.4.1
		FRS	9.2.4.2
		FRS	9.2.4.3
		FRS	9.2.4.4
		FRS	11.2.1.1
		FRS	11.3.2.3
		FRS	11.3.3.1
		FRS	11.3.3.3
		FRS	11.3.3.5
		SRS	2.4.1
		SRS	11.3.2
		SRS	11.3.5
		SRS	11.3.7
		SRS	11.3.9
RINF_FA_7	FA Call - Successful Call	FRS	2.2.3
		FRS	2.2.4
		FRS	2.4.1
		FRS	2.4.3
		FRS	2.5.1
		FRS	5.2.2.3
		FRS	5.2.2.3i
		FRS	5.2.2.4
		FRS	5.2.2.6
		FRS	5.2.2.7
		FRS	9.2.1.1
		FRS	9.2.4.1
		FRS	9.2.4.2
		FRS	9.2.4.3
		FRS	9.2.4.4
		FRS	11.2.1.1
		FRS	11.3.2.3
		FRS	11.3.3.1
		FRS	11.3.3.3
		FRS	11.3.3.5
		SRS	2.4.1
		SRS	5.4.4
		SRS	9.5.2
		SRS	9.5.3
		SRS	9.5.4
		SRS	10.2.1
		SRS	11.3.2
		SRS	11.3.5
		SRS	11.3.7
		SRS	11.3.9
RINF_FA_8	FA Call – Call is not completed	FRS	2.4.1
		FRS	2.4.3
		FRS	2.5.1
		FRS	9.2.1.1
		FRS	9.2.4.1
		FRS	9.2.4.2
		FRS	9.2.4.3
		FRS	9.2.4.4
		FRS	11.2.1.1
		FRS	11.3.2.3

		FRS	11.3.3.1
		FRS	11.3.3.3
		FRS	11.3.3.5
		SRS	2.4.1
		SRS	11.3.2
		SRS	11.3.5
		SRS	11.3.7
		SRS	11.3.9
RINF_FA_9	Verification of Functional Numbers previously registered in HPLMN (CT2/3/4)	FRS	2.4.1
		FRS	2.4.2
		FRS	2.4.3
		FRS	2.5.1
		FRS	9.2.1.1
		FRS	9.2.4.1
		FRS	9.2.4.2
		FRS	9.2.4.3
		FRS	9.2.4.4
		FRS	11.2.1.1
		FRS	11.3.2.3
		FRS	11.3.3.1
		FRS	11.3.3.3
		FRS	11.3.3.5
		SRS	2.4.1
		SRS	11.3.2
		SRS	11.3.5
		SRS	11.3.9
		SRS	11.3.9i
		SRS	11.3.10
		SRS	11.3.12
RINF_FA_10	Deregistration of CT2 numbers while roaming	FRS	2.4.1
		FRS	2.4.2
		FRS	2.4.3
		FRS	2.5.1
		FRS	9.2.1.1
		FRS	9.2.4.1
		FRS	9.2.4.2
		FRS	9.2.4.3
		FRS	9.2.4.4
		FRS	11.2.1.1
		FRS	11.3.2.3
		FRS	11.3.3.1
		FRS	11.3.3.3
		FRS	11.3.3.5
		SRS	2.4.1
		SRS	11.3.2
		SRS	11.3.5
		SRS	11.3.9
		SRS	11.3.9i
		SRS	11.3.10
		SRS	11.3.12
RINF_FA_11	Forced Deregistration	FRS	2.4.1
		FRS	2.4.3
		FRS	2.5.1
		FRS	9.2.1.1
		FRS	9.2.2.2
		FRS	9.2.3.2
		FRS	9.2.4.1
		FRS	9.2.4.2
		FRS	9.2.4.3
		FRS	9.2.4.4
		FRS	11.2.1.1

		FRS	11.3.2.3
		FRS	11.3.3.1
		FRS	11.3.3.3
		FRS	11.3.3.4
		FRS	11.3.3.5
		SRS	11.3.2
		SRS	11.3.5
		SRS	11.3.7
		SRS	11.3.9
		SRS	11.3.10
		SRS	11.3.12
RINF_FA_12	Unsuccessful registration with Lead driver number (CT2 FC 01) because of wrong CoR (CT2 FC10 works)	FRS	11.3.2.5
		SRS	9.10.1ii
		SRS	11.3.6
RINF_FA_13	Register 3 function numbers to one user (non-roaming case)	FRS	11.2.1.4
		SRS	2.4.1
		SRS	11.3.2
RINF_FA_14	Registration of an FN fails - remote party already registered	FRS	2.4.1
		FRS	2.4.3
		FRS	2.5.1
		FRS	9.2.1.1
		FRS	9.2.2.2
		FRS	9.2.3.2
		FRS	9.2.4.1
		FRS	9.2.4.2
		FRS	9.2.4.3
		FRS	9.2.4.4
		FRS	11.2.1.1
		FRS	11.3.2.3
		FRS	11.3.3.1
		FRS	11.3.3.3
		FRS	11.3.3.5
		SRS	2.5.1
		SRS	11.3.2
		SRS	11.3.5
		SRS	11.3.7
		SRS	11.3.9
		SRS	11.3.9i
RINF_FA_15	FA Call - Successful Call	SRS	9.2.2
		SRS	9.2.3
		SRS	9.2.4
		SRS	9.2.5
		SRS	9.2.6
		SRS	9.2.7
		SRS	9.2.8
		SRS	9.2.9
		SRS	9.2.10
		SRS	9.2.11
RINF_LDA_1	Successful LDA Call - Verify the cell format is correct	FRS	2.5.1
		FRS	5.2.2.3
		FRS	5.2.2.3i
		FRS	5.2.2.4
		FRS	5.2.2.6
		FRS	5.2.2.7
		FRS	9.3.2
		FRS	11.4.1
		FRS	11.4.4
		FRS	11.4.5
		SRS	2.5.1
		SRS	9.8.2

		SRS	9.8.3
		SRS	9.8.4
		SRS	11.7.2
RINF_LDA_2	Unsuccessful LDA Call - Call to invalid Short Code	FRS	2.5.1
		FRS	5.2.2.3
		FRS	5.2.2.3i
		FRS	5.2.2.4
		FRS	5.2.2.6
		FRS	5.2.2.7
		FRS	9.3.2
		FRS	11.4.1
		FRS	11.4.4
		FRS	11.4.5
		SRS	2.5.1
		SRS	9.8.4
		SRS	11.7.2
RINF_eMLPP_1	MS in VGCS call on DCH, pre-emption on Air IF by higher prio PtP call	FRS	2.4.5
		FRS	2.4.6
		FRS	2.4.7
		FRS	5.2.2.9
		FRS	5.2.2.15
		FRS	10.2.2
		FRS	10.2.3
		SRS	2.4.1
		SRS	4.3.1
		SRS	10.2.1
RINF_eMLPP_2	MS in VBS call as listener, pre-emption on Air IF by higher prio VBS call.	FRS	2.4.5
		FRS	2.4.6
		FRS	2.4.7
		FRS	10.2.2
		FRS	10.2.3
		SRS	2.4.1
		SRS	4.3.1
		SRS	10.2.1
RINF_eMLPP_3	MS in VGCS call having the UL of the GCH, pre-emption on Air IF by higher prio VBS call.	FRS	2.4.5
		FRS	2.4.6
		FRS	2.4.7
		FRS	5.2.2.9
		FRS	5.2.2.15
		FRS	10.2.2
		FRS	10.2.3
		SRS	2.4.1
		SRS	4.3.1
		SRS	10.2.1
RINF_eMLPP_4	MS in PtP call, pre-emption on MS by higher prio VGCS call (REC)	FRS	2.4.5
		FRS	2.4.6
		FRS	2.4.7
		FRS	5.2.2.9
		FRS	5.2.2.15
		FRS	10.2.2
		FRS	10.2.3
		FRS	13.4.6
		SRS	2.4.1
		SRS	4.3.1
		SRS	10.2.1
RINF_eMLPP_5	MS in VBS call as originator, pre-emption on Air IF by higher prio VGCS call (REC)	FRS	2.4.5
		FRS	2.4.6
		FRS	2.4.7
		FRS	10.2.2

		FRS	10.2.3
		FRS	10.4.1
		FRS	13.4.6
		SRS	2.4.1
		SRS	4.3.1
		SRS	10.2.1
RINF_eMLPP_6	MS in VGCS call having the UL of the GCH, pre-emption on MS by higher prio VGCS call (REC)	FRS	2.2.14
RINF_eMLPP_7	MS in data call, pre-emption on Air IF by higher prio VGCS call (REC)	FRS	2.4.5
		FRS	2.4.6
		FRS	2.4.7
		FRS	10.2.2
		FRS	10.2.3
		FRS	13.4.6
		SRS	2.3.1
		SRS	2.4.1
		SRS	4.3.1
		SRS	10.2.1
RINF_eMLPP_8	MS in PtP call, pre-emption on Air IF by higher prio data call (4800 baud, transparent)	FRS	2.3.13
		FRS	2.4.5
		FRS	2.4.6
		FRS	2.4.7
		FRS	10.2.2
		FRS	10.2.3
		SRS	2.3.1
		SRS	2.4.1
		SRS	4.3.1
		SRS	10.2.1
RINF_eMLPP_9	eMLPP priority is preserved during CFU (Call Forwarding Unconditionally)	SRS	2.4.1
RINF_eMLPP_10	eMLPP prio. is preserved during CFB (Call Forwarding Busy)	SRS	2.4.1
RINF_VGCS_1	SS originates VGCS call	FRS	2.2.1
		FRS	2.2.2
		FRS	2.2.12
		FRS	2.2.16
		FRS	3.5.2
		FRS	3.5.3
		FRS	5.2.2.9
		FRS	5.2.2.15
		FRS	5.2.2.43
		FRS	5.2.2.47
		SRS	2.2.1
		SRS	2.5.1
		SRS	4.3.1
RINF_VGCS_2	Controller originates VGCS call and takes it down with the kill Sequence	FRS	2.2.1
		FRS	2.2.2
		FRS	2.2.12
		FRS	2.2.16
		FRS	3.5.2
		FRS	3.5.3
		FRS	5.2.2.43
		FRS	5.2.2.47
		FRS	11.2.3.2
		SRS	2.2.1
		SRS	2.5.1
		SRS	4.3.1
		SRS	10.2.1
RINF_VGCS_3	SS originates VGCS call, leaves, rejoins and ends it.	FRS	2.2.1
		FRS	2.2.2
		FRS	2.2.12
		FRS	2.2.16

		FRS	3.5.2
		FRS	3.5.3
		FRS	5.2.2.9
		FRS	5.2.2.15
		FRS	5.2.2.43
		FRS	5.2.2.47
		FRS	11.2.3.2
		SRS	2.2.1
		SRS	2.5.1
		SRS	4.3.1
RINF_VGCS_4	SS enters into VGCS broadcast area with ongoing VGCS call and is notified of it	FRS	2.2.1
		FRS	2.2.2
		FRS	2.2.12
		FRS	2.2.16
		FRS	3.5.2
		FRS	3.5.3
		FRS	5.2.2.9
		FRS	5.2.2.15
		FRS	5.2.2.43
		FRS	5.2.2.47
		FRS	11.2.3.2
		SRS	2.2.1
		SRS	2.5.1
		SRS	4.3.1
RINF_VGCS_5	Controller joins ongoing VGCS call	FRS	2.2.1
		FRS	2.2.2
		FRS	2.2.12
		FRS	2.2.16
		FRS	3.5.2
		FRS	3.5.3
		FRS	5.2.2.43
		FRS	5.2.2.47
		FRS	11.2.3.2
		SRS	4.3.1
		SRS	10.2.1
RINF_VGCS_6	Parallel group calls are possible in the same cell.	FRS	2.2.1
		FRS	2.2.2
		FRS	2.2.12
		FRS	2.2.16
		FRS	3.5.2
		FRS	3.5.3
		FRS	5.2.2.43
		FRS	5.2.2.47
		FRS	11.2.3.2
		SRS	4.3.1
RINF_VGCS_7	GID delivered correctly to terminating SS in SS originated VGCS call	FRS	2.2.1
		FRS	2.2.2
		FRS	2.2.12
		FRS	2.2.16
		FRS	3.5.2
		FRS	3.5.3
		FRS	5.2.2.9
		FRS	5.2.2.15
		FRS	5.2.2.43
		FRS	5.2.2.47
		FRS	11.2.3.2
		SRS	4.3.1
RINF_VBS_1	SS originates VBS call	FRS	3.5.2
		FRS	3.5.3
		FRS	5.2.2.43

		FRS	5.2.2.47
		FRS	11.2.3.2
		SRS	4.3.1
RINF_VBS_2	SS originates prio0 VBS call	FRS	3.5.2
		FRS	3.5.3
		FRS	5.2.2.43
		FRS	5.2.2.47
		FRS	11.2.3.2
		SRS	4.3.1
RINF_VBS_3	Controller originates VBS call and takes down the call by disconnecting	FRS	3.5.2
		FRS	3.5.3
		FRS	5.2.2.43
		FRS	5.2.2.47
		FRS	11.2.3.2
		SRS	4.3.1
RINF_VBS_4	Controller originates VBS call and takes down the call with the kill sequence	FRS	3.5.2
		FRS	3.5.3
		FRS	5.2.2.43
		FRS	5.2.2.47
		FRS	11.2.3.2
		SRS	4.3.1
RINF_VBS_5	Controller joins ongoing VBS call	FRS	3.5.2
		FRS	3.5.3
		FRS	5.2.2.43
		FRS	5.2.2.47
		FRS	11.2.3.2
		SRS	4.3.1
RINF_VBS_6	SS enters into VBS broadcast area with ongoing VBS call and is notified of it, SS joins the VBS call	FRS	3.5.2
		FRS	3.5.3
		FRS	5.2.2.43
		FRS	5.2.2.47
		FRS	11.2.3.2
		SRS	4.3.1
RINF_REC_1	SS originates a REC	FRS	2.5.1
		FRS	5.2.2.18
		FRS	9.3.2
		FRS	10.2.1
		FRS	10.2.2
		FRS	13.1.6
		FRS	13.2.2.2
		FRS	13.2.2.3
		FRS	13.2.3.1
		FRS	13.2.3.3
		FRS	13.2.4.1
		FRS	13.3.1
		FRS	13.4.5
		SRS	2.4.1
		SRS	2.5.1
		SRS	10.2.1
		SRS	13.2.2
		SRS	13.3.1
		SRS	13.3.3
		SRS	13.4.7
RINF_REC_2	Subscriber initiated REC (no talker change, normal clear down of call)	FRS	2.5.1
		FRS	5.2.2.18
		FRS	9.3.2
		FRS	10.2.1
		FRS	10.2.2
		FRS	13.1.6
		FRS	13.2.2.2

		FRS	13.2.2.3
		FRS	13.2.3.1
		FRS	13.2.3.3
		FRS	13.2.4.1
		FRS	13.3.1
		FRS	13.4.5
		FRS	13.4.6
		SRS	13.2.2
		SRS	13.3.1
		SRS	13.3.3
		SRS	13.4.7
RINF_REC_3	SS accepts an incoming REC	FRS	5.2.2.9
		FRS	5.2.2.15
		SRS	2.4.1
		SRS	2.5.1
		SRS	10.2.1
RINF_REC_4	Controller originates a REC	FRS	2.5.1
		FRS	5.2.2.9
		FRS	5.2.2.15
		FRS	5.2.2.18
		FRS	9.3.2
		FRS	10.2.1
		FRS	10.2.2
		FRS	13.1.6
		FRS	13.2.2.2
		FRS	13.2.2.3
		FRS	13.2.3.1
		FRS	13.2.3.3
		FRS	13.2.4.1
		FRS	13.3.1
		FRS	13.4.6
		SRS	2.4.1
		SRS	2.5.1
		SRS	10.2.1
		SRS	13.2.2
		SRS	13.3.1
		SRS	13.3.3
		SRS	13.4.7
RINF_REC_5	SS originates Acknowledgement Call	SRS	13.5.3
		SRS	13.5.7
		SRS	13.5.10i
RINF_REC_6	REC in a GCA with a locked cell	FRS	2.5.1
		FRS	5.2.2.18
		FRS	9.3.2
		FRS	10.2.1
		FRS	10.2.2
		FRS	13.1.6
		FRS	13.2.2.2
		FRS	13.2.2.3
		FRS	13.2.3.1
		FRS	13.2.3.3
		FRS	13.2.4.1
		FRS	13.3.1
		FRS	13.4.6
		SRS	13.2.2
		SRS	13.3.1
		SRS	13.3.3
		SRS	13.4.7
RINF_OTDI_1	SS originates VGCS call, terminating Controller receives the OTDI	FRS	2.2.1
		FRS	2.2.2
		FRS	2.5.1

		FRS	5.2.2.3
		FRS	5.2.2.3i
		FRS	5.2.2.4
		FRS	5.2.2.6
		FRS	5.2.2.7
		FRS	13.3.2
		SRS	2.2.1
		SRS	2.5.1
		SRS	13.4.7
RINF_OTDI_2	SS originates VGCS Immediate Setup 2 call, terminating Controller receives the OTDI	FRS	2.2.1
		FRS	2.2.2
		FRS	2.5.1
		FRS	5.2.2.3
		FRS	5.2.2.3i
		FRS	5.2.2.4
		FRS	5.2.2.6
		FRS	5.2.2.7
		FRS	13.3.2
		FRS	13.4.5
		FRS	13.4.6
		SRS	2.2.1
		SRS	2.4.1
		SRS	2.5.1
		SRS	10.2.1
		SRS	13.4.7
RINF_LE_1	SS active in a PTOP (P4) call move in a cell with ongoing REC call	FRS	5.2.2.9
		FRS	5.2.2.15
		FRS	13.2.2.7
		FRS	13.2.3.1
		FRS	13.2.3.3
		FRS	13.4.6
RINF_LE_2	Orig. SS active in a VBS (P4) call move in a cell with ongoing REC call	FRS	2.4.5
		FRS	2.4.6
		FRS	2.4.7
		FRS	10.2.2
		FRS	10.2.3
		FRS	13.2.2.7
		FRS	13.2.3.1
		FRS	13.2.3.3
		FRS	13.4.6
		SRS	4.3.1
		SRS	10.2.1
RINF_LE_3	Orig. SS active in a VGCS (P4) call on GCH (talker) move in a cell with ongoing REC call	FRS	2.4.5
		FRS	2.4.6
		FRS	2.4.7
		FRS	5.2.2.9
		FRS	5.2.2.15
		FRS	10.2.2
		FRS	10.2.3
		FRS	13.2.2.7
		FRS	13.2.3.1
		FRS	13.2.3.3
		FRS	13.4.6
		SRS	4.3.1
		SRS	10.2.1
RINF_AM_1	National call: AM allows call	FRS	2.2.3
		FRS	2.2.4
		FRS	9.5.1
		FRS	10.3.2

		FRS	10.6.2
		SRS	11.3.6
RINF_AM_2	National call: AM denies call	FRS	10.3.2
		FRS	10.6.2
		SRS	11.3.6
		SRS	11.8.1
RINF_URNR_1 [1)]	SS active in a VGCS call moves in empty cell	SRS	2.7.3
RINF_URNR_2 [1)]	SS active in a VBS call moves in empty cell	SRS	2.7.3
RINF_URNR_3 [1)]	SS active in a REC call moves in empty cell	SRS	2.7.3
RINF_eREC_1 [2)]	eREC call with correct SID – eREC MS with same SID are joining, eREC MS with different SID will not be alerted	SRS	13A.2.1
		SRS	13A.2.2
RINF_eREC_2 [2)]	eREC call which involve with eREC capable and non eREC capable terminals	SRS	13A.2.1
		SRS	13A.2.2
RINF_GPRS_1 [3)]	GPRS Connection Setup	SRS	9.13.3
		SRS	9.13.4
		SRS	9.13.9
		SRS	9.13.10
		SRS	9.13.12
		SRS	9.14.3
		SRS	9.14.4
		SRS	9.15.4
		SRS	9.15.5
RINF_GPRS_2 [3)]	Contact an RBC in the ETCS domain	SRS	9.14.5
RINF_GPRS_3 [3)]	QOS and priority test between ETCS and Background traffic	SRS	2.11.3

[1)] Testcase requires OPTIONAL functionallity 'URNR' deployed in Network

[2)] Testcase requires OPTIONAL functionallity 'eREC' deployed in Network

[3)] Testcase requires OPTIONAL functionallity 'GPRS' deployed in Network