Test Plan

for Multi-Vendor Interoperability Testing
based on EIRENE FRS v7, SRS v15
for GSM-R networks in mixed Configuration
between

Nokia Siemens Networks NSS Release 99 and
Kapsch CarrierCom BSS

or

Kapsch CarrierCom NSS Release 4 and
Nokia Siemens Networks BSS

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Modification History

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0.1	26/5/2010	All	**Initial draft**	**KCC**
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0.3	01/12/10	All	**Update after Comments Field test markings Allocation of TC to Network Configurations**	**KCC**
0.4	22/12/10	All	**Version Change after Review; Release Name correction**	**KCC**
0.5	21/01/11		**Removed EVEA and HR TCs, Corrected Release for NSN BSS, Some Wording changes**	**KCC**
0.6	21/03/11		**Wording change on TC IOT4_GSM21 Added information into Appendix A**	**KCC**
0.7	08/04/11		**Clarification for TC IOT4_eMLPP12**	**KCC**
1.1	22/12/2011	All	**Review**	**NSN/KCC**
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Table of Contents

1 Scope

This document defines the test suite to be used for Multi-Vendor Interoperability Test (MV-IOT) between NSS and BSS from either Nokia Siemens Networks (NSN) or Kapsch CarrierCom (KCC) at the A interface to evaluate/validate on a global level the integration of the two vendors equipment within one GSM-R network, both configured to support EIRENE FRS v.7. SRS v.15.

The focus of testing in this test plan will be directed towards real-life system functionality testing, which can be executed without the use of simulators.

2 References

2.1 Applicable Documents

[1]   Network Vendors IOT Forum - IOT Methodology

[2]   GSM-R Infra IOT Global agreement

2.2 Standards

[3]   **3GPP TS 22.067** – enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 1

[4]   **3GPP TS 23.067** – enhanced Multi-Level Precedence and Pre-emption Service (EMLPP); Stage 2

[5]   **3GPP TS 42.068** – Voice Group Call Service (VGCS); Stage 1

[6]   **3GPP TS 42.069** – Voice Broadcast Service (VBS); Stage 1

[7]   **3GPP TS 43.068** – Voice Group Call Service (VGCS); Stage 2

[8]   **3GPP TS 43.069** – Voice Broadcast Service (VBS); Stage 2

[9]   **3GPP TS 44.068** – Group Call Control (GCC) Protocol

[10]   **3GPP TS 44.069** – Broadcast Call Control (BCC) Protocol

[11]   **3GPP TS 23.003** – Numbering, addressing and identification

[12]   **3GPP TS 24.008** – Mobile radio interface Layer 3 specification; Core network protocols; Stage 3

[13]   **3GPP TS 48.008** – Mobile Switching Centre - Base Station system (MSC-BSS) Interface Layer 3 Specification

[14]   **"EIRENE - Functional Requirements Specification, PSA167D005".** Railway Radio Enhanced Network -UIC Project EIRENE.

[15]   **"EIRENE - System Requirements Specification, PSA167D006".** Railway Radio Enhanced Network - UIC Project EIRENE.

[16]   **"ASCI options for Interoperability, A 01 T 0004 1".** MORANE Project

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3 Abbreviations

BSC   Base Station Controller

BSS   Base Station Sub-system

BTS   Base Transceiver Station

CLIP   Calling Line Identification Presentation

CLIR   Calling Line Identification Restriction

DCH   Dedicated Channel

eMLPP enhanced Multi-Level Precedence and Pre-emption

EVEA   Enhanced Very Early Assignment

FA   Functional Addressing

FN   Functional Number

FNN   Functional Number Node

GCA   Group Call Area

GCH   Group Cannel

GCR   Group Call Register

GCRef   Group Call Reference

GID   Group Identity

HLR   Home Location Register

IMEI   International Mobile Equipment Identity

IMSI   International Mobile Subscriber Identity

IOT   Interoperability Test

LDA   Location Dependent Addressing

MS   Mobile Station

MSC   Mobile Switching Centre

NSS   Network Sub-system

OTDI   Originator to Dispatcher Information

PEC   Public Emergency Call

REC   Railway Emergency Call

SS   Service Subscriber

TCU   TransCoding Unit

VLR   Visitor Location Register

VBS   Voice Broadcast Service

VGCS   Voice Group Call Service

4   Overview

This MV-IOT test plan describes the tests that are to be executed with either network configuration Phase 9.3

- KCC BSS
- NSN NSS

or network configuration Phase 9.2

- KCC NSS
- NSN BSS

all supporting EIRENE FRS v.7, SRS v.15.

4.1   Test Coverage

The following list summarizes the content.

- Basic and Supplementary GSM Services for voice and data (GSM regression)
- Handover scenarios
- Cell reselection scenarios
- Functional Addressing (FA)
- Location Dependant Addressing (LDA)
- Enhanced Multi-level Precedence and Pre-emption Service (eMLPP)
- Voice Group Call Service (VGCS)
- Voice Broadcast Service (VBS)
- Railway Emergency Call (REC)
- Originator to Dispatcher Information (OTDI)
- Late Entry

The most significant changes with impacts on GSM-R Infrastructure (or track side) in EIRENE FRS version 7 and SRS version 15 compared with previous documents EIRENE FRS version 6 and SRS version 14 are as follows:

Nr	Change EIRENE 6/14 → 7/15	Chapter	FRS ref	SRS ref	Test Phase 9.2	Test Phase 9.3
1	Alerting duration	Network Req		2.6.1	7.1	7.1
2	Automatic reception of railway emergency calls by mobiles	Network Config	3.5.6		7.2, 7.8, 7.10	7.2, 7.8, 7.10
3	Automatic reception of railway emergency calls by cab-radios	Network Config	3.5.7		7.2, 7.5, 7.8, 7.10	7.2, 7.5, 7.8, 7.10
4	Termination of ongoing VGCS/VBS by the network	Network Config		3.7.1	7.6, 7.7	7.6, 7.7
5	Muting and unmuting for VGCS	Network Config		3.8.1	7.6	7.6
				3.8.2		
				3.8.3		
				3.8.4		
				3.8.5 & 8.3.5		
		Controller		8.3.3		
				8.3.4		
6	Access to external networks, usage of specific codes	Numbering Plan		9.10	7.1	7.1
7	Revised Function Codes	Numbering Plan		Table 9A-1	7.1, 7.3	7.1, 7.3
8	Organisation of SIM card content, selection of networks in certain order	Subscriber Mgmnt		10.5.1	7.1	7.1
9	MS to prefer GSM-R Frequencies	Subscriber Mgmnt		10.5.1i	7.1	7.1
10	Operator's removal of functional number relationship	FN and LDA		11.3.8	7.3	7.3
11	Forced deregistration followed by registration, sequence of actions	FN and LDA		11.3.9i, ii, iii,iv	7.3, 7.4	7.3, 7.4
12	Global Title, SCCP msg	FN and LDA		11.6.5	7.3, 7.4	7.3, 7.4
13	Location info from train based systems	FN and LDA		11.7.6	7.3, 7.4	7.3, 7.4
14	Extension of the predefined areas for emergency calls	REC	13.1.6		7.4, 7.8	7.4, 7.8
15	Extension of the configuration types for emergency group call areas	REC		13.2.3	7.8	7.8
16	Recommendations concerning Anchor MSCs	REC		13.2.4-5	7.8	7.8
17	Compressed OTDI	REC		13.4.6	7.8, 7.9	7.8, 7.9
18	MSC Release bit, Rel 99, immediate set-up 2	REC		13.4.7	7.8	7.8
19	EN 301 515			References	2, 7.6	2, 7.6
20	TR 102 281			References	2.0	2.0

These changes require the update of GSM-R infrastructure to a significantly modified and improved software version – this applies equally to both involved suppliers (the Beneficiaries). Furthermore such an update may also whenever that makes sense from supplier and user perspectives be paired with a concurrent hardware upgrade/modification. The main objective of the test campaign described herein is to validate that already validated interoperability is maintained using software and hardware including all these updates/upgrades. For this purpose the test plan includes a selection of test cases broadly covering the entire functional spectrum of EIRENE to test as many parts of the new software as reasonably possible.

5 Test Configuration

This section details the network elements and the network configurations that will be used to perform the test cases listed in this document, together with the equipment to be used to trigger test cases and verify the results.

5.1 Test Equipment

The following test equipment will be required in order to carry out the tests defined in this document and verify the results.

5.1.1 Equipment in the NSS location

5.1.1.1 NSS vendor's Equipment

- GSM-R NSS core (1 x MSC/VLR/HLR/AC, IN-System)

- GSM-R RAN (BSC/TCU, BTS, OMCR)

- RAD box for the test lab connection

- K15xx Protocol Analyzer, running on A interface

- PABX with dispatcher

5.1.2 Equipment in BSS location

5.1.2.1 BSS vendor's Equipment

- GSM-R RAN (1 x BSC/TCU, 2 x BTS, OMCR).

- RAD box for the test lab connection

- K15xx Protocol Analyzer, running on all involved A-bis and A interfaces

- GSM-R handsets (5) for system validation

5.1.2.2 NSS vendor's Equipment

- SIM Cards for subscribers registered in the NSS vendor's HLR with subscription to the services to be tested.

5.2 Network Configuration

The diagrams below show the network configurations to be used to perform the tests during this IOT session.:
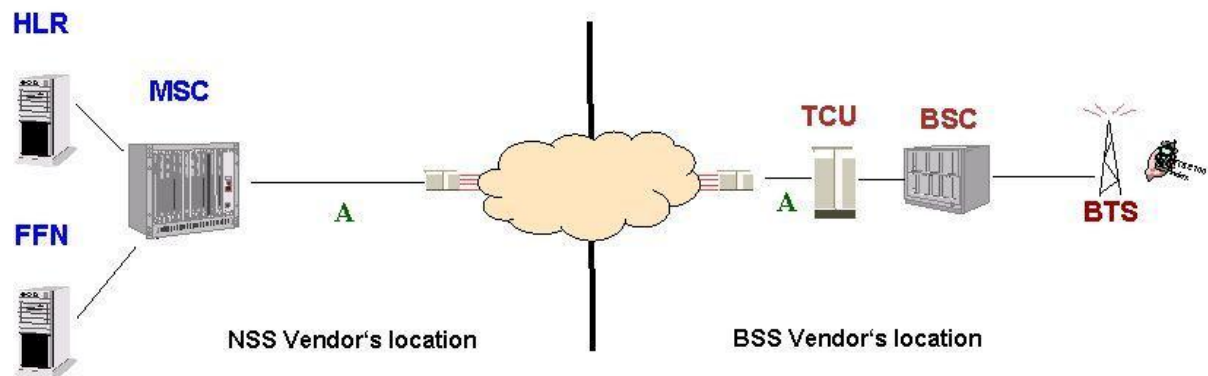
Network Configuration 1
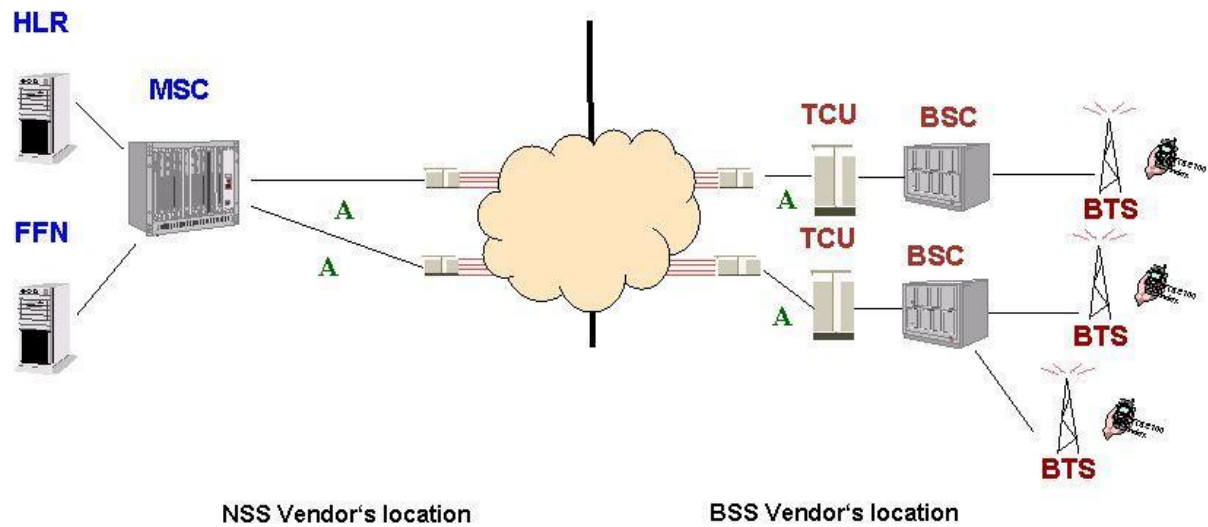
Network Configuration 2
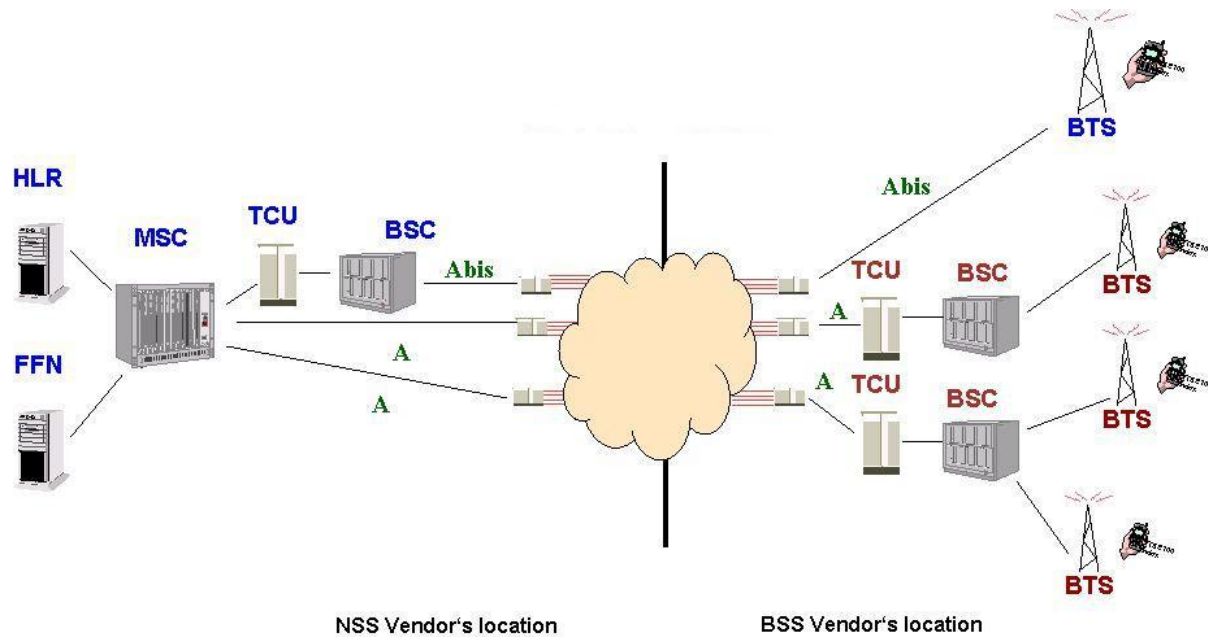
Network Configuration 3

5.3   Interface Configurations

The following configuration(s) will be supported in this MV-IOT session:

5.3.1   A Interface Configuration

In the figure below it is outlined the used of the timeslots in the E1 connection between MSC and TCU/BSC.

MSC/VLR/HLR/AC

1xE1

...

TCU
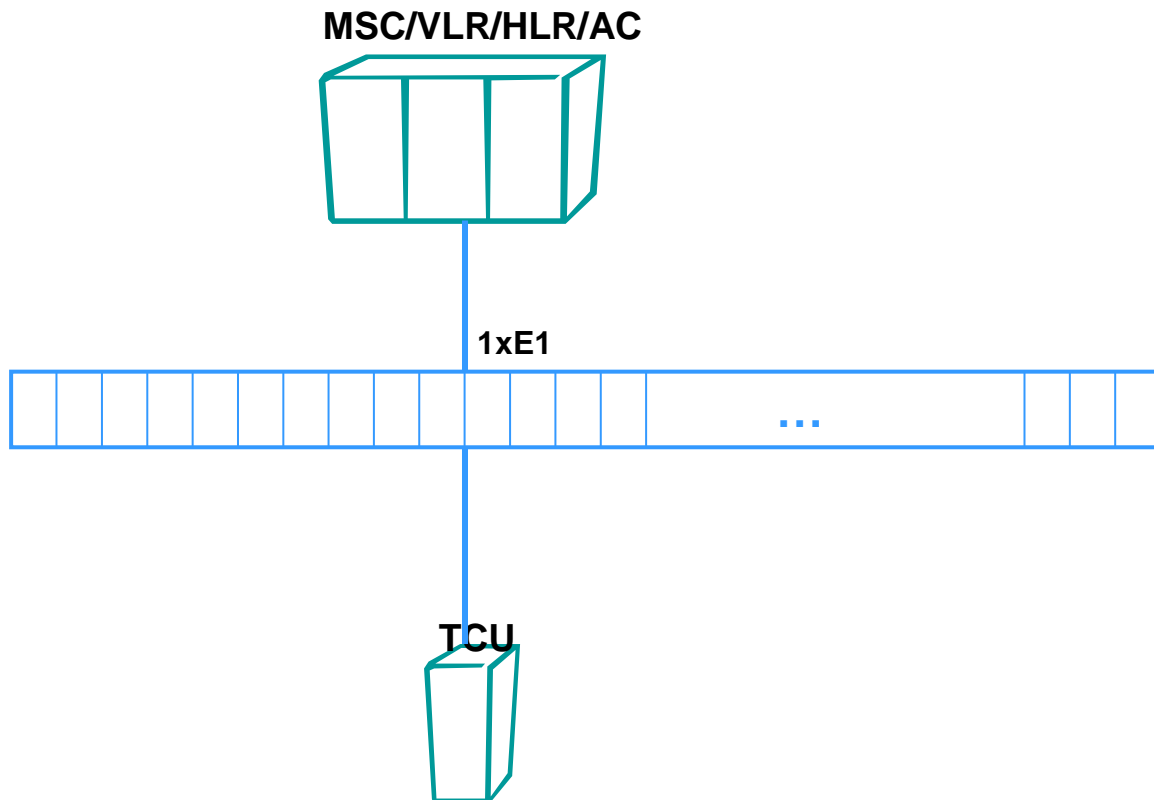
Figure 1: A interface configuration

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5.4   System Parameters

This section details the relevant database parameters, timer and retry counter values that will be used in this MV-IOT session. These parameters are seen as those required in order to successfully set up the configuration for testing.

provide The details to be provided after the tests are performed are listed in ANNEX A and ANNEX B.

6 Test Case List

This section gives a one-line description of each test case.

Total number of test cases: 71

Phase markings:

- NC1 – Testcase executed with Network Configuration 1
- NC2 – Testcase executed with Network Configuration 2
- NC3 – Testcase executed with Network Configuration 3

6.1 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 with NSN NSS and a BSS Providers BSS or vice versa.

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	Phase	Prio	Remarks
IOT4_GSM1	Successful Location Update after MS Power On	NC1	1	
IOT4_GSM15	Supplementary Service Call Hold	NC1	1	
IOT4_GSM17	Supplementary Service Call Waiting	NC1	1	
IOT4_GSM18	Supplementary Service CUG	NC1	1	
IOT4_GSM19	Supplementary Service CLIP – MMC with Call Forwarding Unconditional	NC1	1	
IOT4_GSM20	Supplementary Service CLIR	NC1	1	
IOT4_GSM21	Supplementary Service MPTY	NC1	1	
IOT4_GSM23	Establishment of several MMC Data calls with priority 1	NC1	1	
IOT4_GSM26	Establishment of several PTP calls with different priorities	NC1	1	
IOT4_GSM38	Public Emergency Call – With SIM	NC1	1	
IOT4_GSM39	Public Emergency Call – Without SIM	NC1	1	
IOT4_GSM40	Public Emergency Call – with TMSI and IMSI unknown in VLR	NC1	2	

Number of test cases: 12

6.2 Cell reselection and handover.

This test area verifies the correct functioning of cell reselection and handovers for different services in different scenarios in a GSM-R system with NSS Providers NSS and a BSS Providers BSS.

This includes:
- Intra and Inter BTS cell reselection and handovers
- Intra LA and Inter LA cell reselection and handovers

for
- Cell reselection of MS in idle mode, listeners in VBS, VGCS calls and RECs
- Handovers for Point to Point calls, VBS and VGCS (HO of dedicated channel and group channel) calls and RECs.
- Uplink release management
- Cell reselection failures
- Handover failures

Test id	Title	Phase	Prio	Remarks
IOT4_HO6	Inter BTS cell reselection of a VGCS listener	NC2	1	
IOT4_HO16	Inter BTS handover of a point to point voice call	NC2	2	
IOT4_HO17	Inter BTS handover of a circuit switched data call	NC2	2	
IOT4_HO18	Inter BTS handover of a railway emergency call originator	NC2	1	
IOT4_HO19	Inter BTS handover of a VGCS call uplink	NC2	1	
IOT4_HO25	Inter BSC handover of a VGCS call uplink	NC2 or NC3	2	
IOT4_HO30	Ongoing point to point voice call in the destination cell preempted by a intra BTS handover inwards of a railway emergency call originator	NC1	1	
IOT4_HO33	Ongoing point to point voice call in the destination cell preempted by a inter BTS handover inwards of a point to point voice call	NC2	1	
IOT4_HO34	Ongoing point to point voice call in the destination cell preempted by a inter BTS handover inwards of a circuit switched data call	NC2	1	
IOT4_HO45	Intra BTS handover failure of a railway emergency call originator	NC1	1	
IOT4_HO51	Inter BTS handover failure of a VGCS call uplink	NC2	1	
IOT4_HO52	Inter BTS handover failure of a VGCS dedicated channel	NC2	1	

	Handover of a mobile dispatcher originator outside the GCA	NC2	1	
IOT4_HO59				
IOT4_HO60	Handover of a mobile dispatcher originator to a different GCA within the same BSC	NC2	1	
IOT4_ITAHO01	InterBSC HO with preemption of radio resources in full loaded cell (BSC BSS Provider/BSC NSS PROVIDER)	NC3	1	
IOT4_ITAHO02	InterBSC HO failure of a VGCS	NC3	1	

Number of test cases: 15

6.3 Functional Addressing (FA)

This test area verifies the correct functioning of the FA service in a GSM-R system with NSS PROVIDERS NSS and a BSS Providers BSS.

This includes:
- Registration Management
- Calls to Functional Numbers
- Failure cases (e.g. registration failure, link failure)

Test Id	Description	Phase	Prio	Remarks
IOT4_FA1	Registration of an FN Number	NC1	1	
IOT4_FA2	Registration of an unknown FN fails	NC1	2	
IOT4_FA3	Registration fails because of link failure	NC1	2	
IOT4_FA4	Deregistration of an FN Number	NC1	1	
IOT4_FA5	Deregistration of an FN fails	NC1	2	
IOT4_FA6	Interrogation of an FA Number	NC1	1	
IOT4_FA7	Interrogation of an FN fails	NC1	2	
IOT4_FA8	FA Call - Successful Call	NC1	1	
IOT4_FA9	FA Call – Call is not completed	NC1	2	
IOT4_ITAFA 01	Forced Deregistration	NC1	2	

Number of test cases: 10

6.4 Location Dependent Addressing (LDA)

This test area verifies the correct functioning of the LDA service in a GSM-R system with NSS PROVIDERS NSS and a BSS Providers BSS.

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	Phase	Prio	Remarks
IOT4_LA1	Successful LDA Call - Verify the cell format is correct	NC1	1	
IOT4_LA2	Unsuccessful LDA Call - Call to invalid Short Code	NC1	2	

Number of test cases: 2

6.5 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 with NSS Providers NSS and a BSS Providers BSS.

This includes:
- Pre-emption of P2P, VBS, VGCS, data calls by P2P, 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	Phase	Prio	Remarks
IOT4_eMLPP2	MS in VGCS call on DCH, pre-emption on Air IF by higher prio PtP call	NC1	1	
IOT4_eMLPP5	MS in VBS call as originating MS Dispatcher, pre-emption on Air IF by higher prio PtP call	NC1	1	
IOT4_eMLPP8	MS in VBS call as listener, pre-emption on Air IF by higher prio VBS call.	NC1	1	
IOT4_eMLPP10	MS in VGCS call having the UL of the GCH, pre-emption on Air IF by higher prio VBS call.	NC1	1	
IOT4_eMLPP12	MS in PEC, pre-emption on Air IF by higher prio VBS call.	NC1	1	
IOT4_eMLPP14	MS in PtP call, pre-emption on MS by higher prio VGCS call (REC)	NC1	1	
IOT4_eMLPP15	MS in VBS call as originator, pre-emption on Air IF by higher prio VGCS call (REC)	NC1	1	
IOT4_eMLPP19	MS in data call, pre-emption on Air IF by higher prio VGCS call (REC)	NC1	1	
IOT4_eMLPP20	MS in PtP call, pre-emption on Air IF by higher prio data call (4800 baud, transparent)	NC1	1	

Number of test cases: 8

6.6 Voice Group Call Service (VGCS)

This test area verifies the correct functioning of the VGCS service in a GSM-R system with   NSS Providers NSS and a BSS Providers BSS.

This includes:
- Uplink management between BSSs.
- Muting/Unmuting

Test Id	Description	Phase	Prio	Remarks
IOT4_VGCS1	SS originates VGCS call	NC2	1	
IOT4_VGCS3	MS Dispatcher originates VGCS call and takes it down with the kill Sequence	NC2	1	
IOT4_VGCS4	SS originates VGCS call, leaves, rejoins and ends it.	NC2	1	
IOT4_VGCS5	SS enters into VGCS broadcast area with ongoing VGCS call and is notified of it	NC2	1	
IOT4_VGCS6	MS Dispatcher joins ongoing VGCS call	NC2	1	
IOT4_VGCS13	Mute sequence for originating MS Dispatcher	NC1	2	
IOT4_VGCS14	Un mute sequence for originating MS Dispatcher	NC1	2	
IOT4_VGCS17	Parallel group calls are possible in the same cell.	NC1	2	
IOT4_VGCS44	GID delivered correctly to terminating SS in SS originated VGCS call	NC1	2	
IOT4_VGCS51	VGCS talker leaves GCA	NC2	1	
IOT4_VGCS52	VGCS originator leaves GCA	NC2	1	
ADD_SRS_1	Service Subscriber originates Voice Group (VGCS) Call, Joining Dispatcher, Mute and Un-Mute	NC1	1	

Number of test cases: 12

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6.7 Voice Broadcast Service (VBS)

This test area verifies the correct functioning of the VBS service in a GSM-R system with NSS Providers NSS and a BSS Providers BSS.

Test Id	Description	Phase	Prio	Remarks
IOT4_VBS1	SS originates VBS call	NC3	1	
IOT4_VBS2	SS originates prio0 VBS call	NC2	1	
IOT4_VBS8	MS Dispatcher originates VBS call and takes down the call by disconnecting	NC3	1	
IOT4_VBS9	MS Dispatcher originates VBS call and takes down the call with the kill sequence	NC3	1	
IOT4_VBS10	MS Dispatcher joins ongoing VBS call	NC3	1	
IOT4_VBS11	SS enters into VBS broadcast area with ongoing VBS call and is notified of it, SS joins the VBS call	NC3	1	

Number of test cases: 6

6.8 Railway Emergency Call (REC)

This test area verifies the REC functionality including the acknowledgement functionality in a GSM-R system with NSS Providers NSS and a BSS Providers BSS.

Test Id	Description	Phase	Prio	Remarks
IOT4_REC1	SS originates a REC	NC1	1	
IOT4_REC3	SS accepts an incoming REC	NC2	1	
IOT4_REC4	MS Dispatcher originates a REC	NC1	1	
IOT4_REC8	REC in a GCA with a locked cell	NC2	2	

Number of test cases: 4

6.9   Originator to Dispatcher Information (OTDI)

This test area verifies the correct functioning of the OTDI feature in a GSM-R system with   NSS Providers NSS and a BSS Providers BSS.

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

Test Id	Description	Phase	Prio	Remarks
IOT4_OTDI 1	SS originates VGCS call, terminating MS dispatcher receives the OTDI	NC3	1	
IOT4_OTDI 5	SS originates VGCS Immediate Setup 2 call, terminating MS dispatcher receives the OTDI	NC3	1	

Number of test cases: 2

6.10 Late Entry

This test area verifies the correct functioning of the Late Entry feature in a GSM-R system with   NSS Providers NSS and a BSS Providers BSS.

Test Id	Description	Phase	Prio	Remarks
IOT4_LE 1	SS active in a PTOP (P4) call move in a cell with ongoing REC call	NC3	1	
IOT4_LE 2	Orig. SS active in a VBS (P4) call move in a cell with ongoing REC call	NC3	1	
IOT4_LE 3	Orig. SS active in a VGCS (P4) call on GCH (talker) move in a cell with ongoing REC call	NC3	1	

Number of test cases: 3

7 Test Case Descriptions

7.1 Basic and Supplementary GSM Services

IOT4_GSM_1 Successful Update Location after MS Power On

Purpose:

Verify the correct data are inserted to VLR during LU

Initial conditions:

MS subscribed to Basic and Supplementary Services

Test description:

ACTION	RESULT
1) Power on the MS	1) Location Update (LU) is performed
2) Verify the service subscriber data is inserted correctly to VLR	2) Subscriber data is inserted correctly into the VLR

IOT4_GSM_15 Supplementary Service Call Hold

Purpose:

Verify the Supplementary Service Call Hold

Initial conditions:

Subscriber A is provisioned to the Call Hold supplementary service and has it activated

Subscriber A has an ongoing call with Subscriber B

Test description:

ACTION	RESULT
1) Subscriber A puts Subscriber B on hold	1) 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	2) 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.	3) 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.

IOT4_GSM_17 Supplementary Service Call Waiting

Purpose:

Verify the Supplementary Service Call Waiting

Initial conditions:

Subscriber A is provisioned to the Call Waiting supplementary service

Subscriber A has an ongoing communication with Subscriber B

Test description:

ACTION	RESULT
1) Subscriber C calls Subscriber A	1) Subscriber A is notified of the incoming call from Subscriber C. Subscriber C gets ringing tone.

IOT4_GSM_18 Supplementary Service CUG

Purpose:

Verify the Supplementary Service Closed User Group (CUG)

Initial conditions:

Subscriber A and Subscriber B have supplementary service CUG provisioned and belong to the same closed user group with incoming and outgoing access restricted to the group

Test description:

ACTION	RESULT
1) Subscriber A calls subscriber B	1) The call is setup successfully.
2) Subscriber A calls Subscriber C	2) The call cannot be setup
3) Subscriber C calls Subscriber B	3) The call cannot be setup

IOT4_GSM_19 Supplementary Service CLIP – MMC with Call Forwarding Unconditional

Purpose:

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

Initial conditions:

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

Test description:

ACTION	RESULT
1) Subscriber A calls Subscriber B.	1) Subscriber A is forwarded to Subscriber C. Subscriber A's MSISDN is presented to Subscriber C

IOT4_GSM_20 Supplementary Service CLIR

Purpose:

Verify the Supplementary Service Calling Line Identification Restriction (CLIR)

Initial conditions:

Subscriber A is provisioned to the CLIR supplementary service

Subscriber B has CLIP provisioned

Test description:

ACTION	RESULT
1) Subscriber A calls Subscriber B	1) The call is established to Subscriber B but the Subscriber A's MSISDN is not presented to Subscriber B.

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IOT4_GSM_21 Supplementary Service MPTY

Purpose:

Verify the Supplementary Service Multiparty (MPTY)

Initial conditions:

Subscriber A is provisioned to the MPTY supplementary service

Test description:

ACTION	RESULT
1) Subscriber A builds MPTY call involving 6 subscribers	1) MPTY call is setup to 6 subscribers
2) Conferee Leaves and is joined back into the MPTY call for some subscribers	2) The call is stable during the leaving and joining of the conferees of MPTY
3) Subscriber A closes the MPTY call	3) Call is taken down successfully, all resources are freed.

IOT4_GSM_23 Establishment of several MMC Data calls with priority 1

Purpose:

Verify basic MMC data calls with priority 1

Initial conditions:

Subscriber A and B have subscription to all kind of data calls

Test description:

ACTION	RESULT
1) Establish data calls of 2400, 4800, 9600 bauds transparent and non transparent with priority 1	1) Data calls are successful
2) Transfer data (e.g. text file) in both directions	2) Data calls are stable. The data transfer is successful.

IOT4_GSM_26 Establishment of several PTP calls with different priorities

Purpose:

Verify basic GSM functionality

Initial conditions:

Subscriber A and B are provisioned to the eMLPP service

Test description:

ACTION	RESULT
1) Subscriber A calls Subscriber B with priority 0, 1, 2, 3, 4 dialling *75<Priority>#<MSISDN>	1) The calls are setup correctly and the priorities are transferred correctly through the network.

IOT4_GSM_38 Public Emergency Call – With SIM

Purpose:

Verify Public Emergency Call – With SIM

Initial conditions:

MS has a SIM

Test description:

ACTION	RESULT
1) Make the 112 Public Emergency Call	Call is established. No error logs.

IOT4_GSM_39 Public Emergency Call – Without SIM

Purpose:

Verify Public Emergency Call – Without SIM

Initial conditions:

MS is without a SIM

Test description:

ACTION	RESULT
1) Make the 112 Public Emergency Call	Call is established. No error logs.

IOT4_GSM_40 Public Emergency Call – with TMSI and IMSI unknown in VLR

Purpose:

Verify Public Emergency Call – With SIM, but TMSI and IMSI are unknown in VLR

Initial conditions:

MS is with a SIM, but TMSI and IMSI are unknown in VLR

Test description:

ACTION	RESULT
1) Make the 112 Public Emergency Call	Call is established. No error logs.

7.2 Cell Reselection and Handover

IOT4_HO6: Inter BTS cell reselection of a VGCS listener

Test purpose:

To verify that an Inter BTS cell reselection of a VGCS listener functions as expected

Pre-requisites:

•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 neighbour cells.

Test procedure:

 •Ensure that the mobile is engaged in a VGCS call as a listener.

•Move the debug mobile phone from one cell of a BTS to another cell on a the same BSC.

•Ensure that the mobile camps onto the BCCH of the destination cell.

•Ensure the call stays connected.

Test verification:

•The message flow is recorded and presented on the analyzers and is as expected.

•The call proceeds as expected.

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IOT4_HO16: Inter BTS handover of a point to point voice call

Test purpose:

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

Pre-requisites:

•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 neighbour cells.

Test procedure:

•Ensure that the mobile is engaged in a point to point voice call.

•Move the debug mobile phone from one cell of a BTS to a different BTS on the same BSC.

•Ensure that the mobile camps onto the BCCH of the destination cell.

•Ensure the call stays connected.

Test verification:

•The message flow is recorded and presented on the analyzers and is as expected.

•The call proceeds as expected.

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IOT4_HO17: Inter BTS handover of a circuit switched data call

Test purpose:

To verify that an Inter BTS handover of a circuit switched data call functions as expected

Pre-requisites:

•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 neighbour cells.

Test procedure:

•Ensure that the mobile is engaged in a point circuit switched data call.

•Move the debug mobile phone from one cell of a BTS to a different BTS on the same BSC.

•Ensure that the mobile camps onto the BCCH of the destination cell.

•Ensure the call stays connected.

Test verification:

•The message flow is recorded and presented on the analyzers and is as expected.

•The call proceeds as expected.

Remarks:

IOT4_HO18: Inter BTS handover of a railway emergency call originator

Test purpose:

To verify that an Inter BTS handover of a railway emergency call originator functions as expected

Pre-requisites:

•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 neighbour cells.

Test procedure:

 •Ensure that the mobile is the originator of a railway emergency call.

•Move the debug mobile phone from one cell of a BTS to a different BTS on the same BSC.

•Ensure that the mobile camps onto the BCCH of the destination cell.

•Ensure the call stays connected.

Test verification:

•The message flow is recorded and presented on the analyzers and is as expected.

•The call proceeds as expected.

Remarks:

IOT4_HO19: Inter BTS handover of a VGCS call uplink

Test purpose:

To verify that an Inter BTS handover of a VGCS call uplink (subsequent talker) functions as expected

Pre-requisites:

•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 neighbour cells.

Test procedure:

•Ensure that the mobile is engaged in a VGCS call as a subsequent talker.

•Move the debug mobile phone from one cell of a BTS to a different BTS on the same BSC.

•Ensure that the mobile camps onto the BCCH of the destination cell.

•Ensure the call stays connected.

Test verification:

•The message flow is recorded and presented on the analyzers and is as expected.

•The call proceeds as expected.

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IOT4_HO25: Inter BSC handover of a VGCS call uplink

Test purpose:

To verify that an Inter BSC handover of a VGCS call uplink (subsequent talker) functions as expected

Pre-requisites:

•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 neighbour cells.

Test procedure:

•Ensure that the mobile is engaged in a VGCS call as a subsequent talker.

•Move the debug mobile phone from one cell of a BTS to another cell on a different BSC.

•Ensure that the mobile camps onto the BCCH of the destination cell.

•Ensure the call stays connected.

Test verification:

•The message flow is recorded and presented on the analyzers and is as expected.

•The call proceeds as expected.

Remarks:

IOT4_HO30: Ongoing point to point voice call in the destination cell preempted by a intra BTS handover inwards of a railway emergency call originator

Test purpose:

To verify that an ongoing point to point voice call in the destination cell is preempted by a intra BTS handover inwards of a railway emergency call originator **(first talker)** that has a higher priority

Pre-requisites:

•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 neighbour cells.

Lock all traffic channels except 3 TCH in the Destination Cell.

Test procedure:

•Ensure that there is an ongoing point to point call in the destination cell (Call A).

•Ensure that the point to point call is the only call on the destination cell and there are is **only one additional traffic channel** on the Um interface provided by the destination cell.

•Establish a railway emergency call (Call B), in the originating cell. Ensure that this call has a higher priority than Call A. Move the debug mobile phone (Call B) from one cell of the BTS to another cell on the BTS.

•Call B should pre-empt Call A.

Test verification:

•The message flow is recorded and presented on the analyzers and is as expected.

•The call proceeds as expected.

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IOT4_HO33: 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 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

Pre-requisites:

•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 neighbour cells.

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

Test procedure:

•Ensure that there is an ongoing point to point call in the destination cell (Call A).

•Ensure that the point to point call is the only call on the destination cell and there are no other available traffic channels on the Um interface provided by the destination cell.

•Establish a point to point call (Call B), in the originating cell. Ensure that this call has a higher priority than Call A. Move the debug mobile phone (Call B) from one cell of the BTS to another cell on a different BTS (where Call A is ongoing).

•Call B should pre-empt Call A.

Test verification:

•The message flow is recorded and presented on the analyzers and is as expected.

•The call proceeds as expected.

Remarks:

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IOT4_HO34: Ongoing point to point voice call in the destination cell preempted by a inter BTS handover inwards of a circuit switched data call

Test 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 circuit switched data call that has a higher priority

Pre-requisites:

•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 neighbour cells.

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

Test procedure:

•Ensure that there is an ongoing point to point call in the destination cell (Call A).

•Ensure that the point to point call is the only call on the destination cell and there are no other available traffic channels on the Um interface provided by the destination cell.

•Establish a circuit switched data call (Call B), in the originating cell. Ensure that this call has a higher priority than Call A. Move the debug mobile phone (Call B) from one cell of the BTS to another cell on a different BTS (where Call A is ongoing).

•Call B should pre-empt Call A.

Test verification:

•The message flow is recorded and presented on the analyzers and is as expected.

•The call proceeds as expected.

Remarks:

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IOT4_HO45: Intra BTS handover failure of a railway emergency call originator

Test purpose:

To verify that an intra BTS handover of a railway emergency call originator fails when there is no capacitiy at the same or lower priority in the new cell

Pre-requisites:

•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 neighbour cells.

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

Test procedure:

•Ensure that there is an ongoing point to point call in the destination cell (Call A).

•Ensure that the point to point call is the only call on the destination cell and there are no other available traffic channels on the Um interface provided by the destination cell.

•Establish a railway emergency call (Call B), in the originating cell. Ensure that this call has the same priority as Call A. Move the debug mobile phone (Call B) from one cell of the BTS to another cell the BTS (where Call A is ongoing).

•Call B should not pre-empt Call A, the handover should not happen.

Test verification:

•The message flow is recorded and presented on the analyzers and is as expected.

•The call proceeds as expected.

Remarks:

IOT4_HO51: Inter BTS handover failure of a VGCS call uplink

Test purpose:

To verify that an inter BTS handover of a VGCS call uplink fails when there is no capacitiy at the same or lower priority in the new cell

Pre-requisites:

•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 neighbour cells.

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

Test procedure:

•Ensure that there is an ongoing point to point call in the destination cell (Call A).

•Ensure that the point to point call is the only call on the destination cell and there are no other available traffic channels on the Um interface provided by the destination cell.

•Establish a VGCS call, subsequent talker (Call B), in the originating cell. Ensure that this call has the same priority as Call A. Move the debug mobile phone (Call B) from one cell of the BTS to another cell on a different BTS (where Call A is ongoing).

•Call B should not pre-empt Call A, the handover should not happen.

Test verification:

•The message flow is recorded and presented on the analyzers and is as expected.

•The call proceeds as expected.

Remarks:

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IOT4_HO52: Inter BTS handover failure of a VGCS dedicated channel

Test purpose:

To verify that an inter BTS handover of a VGCS dedicated channel fails when there is no capacitiy at the same or lower priority in the new cell

Pre-requisites:

•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 neighbour cells.

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

Test procedure:

 •Ensure that there is an ongoing point to point call in the destination cell (Call A).

•Ensure that the point to point call is the only call on the destination cell and there are no other available traffic channels on the Um interface provided by the destination cell.

•Establish a VGCS call, first talker (Call B), in the originating cell. Ensure that this call has the same priority as Call A. Move the debug mobile phone (Call B) from one cell of the BTS to another cell on a different BTS (where Call A is ongoing).

•Call B should not pre-empt Call A, the handover should not happen.

Test verification:

•The message flow is recorded and presented on the analyzers and is as expected.

•The call proceeds as expected.

Remarks:

IOT4_HO59: Handover of a mobile dispatcher originator outside the GCA

Test purpose:

Handover of a mobile dispatcher originator outside the GCA

Pre-requisites:

•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 neighbour cells.

Test procedure:

•The mobile dispatcher originates a group call

•The mobile dispatcher hands over to a cell outside the group call area

•The call stays connected

Test verification:

•The message flow is recorded and presented on the analyzers and is as expected.

•The call proceeds as expected.

Remarks:

IOT4_HO60: Handover of a mobile dispatcher originator to a different GCA within the same BSC

Test purpose:

Handover of a mobile dispatcher originator to a different GCA within the same BSC

Pre-requisites:

•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 neighbour cells.

Test procedure:

•The mobile dispatcher originates a group call

•The mobile dispatcher hands over to a cell outside the group call area but on the same BSC

•The call stays connected

Test verification:

•The message flow is recorded and presented on the analyzers and is as expected.

•The call proceeds as expected.

Remarks:

IOT4_ITAHO01: Inter BSC HO with preemption of radio res. In full loaded cell

Test purpose:

A VGCS call is ongoing in a cell, only one more timeslot is available, all other resources are blocked. A point to point call with a higher priority than the VGCS call with 2 mobiles is handed over into this cell. The group call is pre-empted and the point to point call is successfully handed over.

Pre-requisites:

•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.

Test procedure:

• A service subscriber initiates a VGCS call in a BSS Providers cell

• A p2p call between two mobiles is established in a   NSS Providers cell

• A handover of the P2P call from the Siemens cell to the BSS Providers cell is triggered

• The VGCS call is preempted to make room for both p2p call parties

• verify that the call has been handed over successfully and that the voice path is o.k.

• Execute the same procedure with the BSS Providers/ NSS Providers cells in the opposite role

Test verification:

•The message flow is recorded and presented on the analyzers and is as expected.

•The call proceeds as expected.

Remarks:

IOT4_ITAHO02: Inter BSC handover failure of a VGCS call

Test purpose:

To verify that an inter BSC handover of a VGCS call uplink fails when there is no capacitiy at the same or lower priority in the new cell

Pre-requisites:

•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 neighbour cells.

•Lock all traffic channels except 1 TCH in the Destination Cell.

Test procedure:

•Ensure that there is an ongoing point to point call in the destination cell (Call A).

•Ensure that the point to point call is the only call on the destination cell and there are no other available traffic channels on the Um interface provided by the destination cell.

•Establish a VGCS call, subsequent talker (Call B), in the originating cell. Ensure that this call has the same priority as Call A. Move the debug mobile phone (Call B) from the cell to another cell on a different BSC (where Call A is ongoing).

•Call B should not pre-empt Call A, the handover should not happen.

Test verification:

•The message flow is recorded and presented on the analyzers and is as expected.

•The call proceeds as expected.

Remarks:

7.3 Functional Addressing (FA)

IOT4_FA1 Registration of an FN Number

Purpose:

Verify the registration of an FN

Initial conditions:

FN is in not registered.

Subscriber A is provisioned to the FA service.

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

Test description:

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

IOT4_FA2 Registration of an unknown FN fails

Purpose:

Verify a scenario for the registration of an unknown FN

Initial conditions:

FN is not registered.

Subscriber A is provisioned to the FA service.

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

Test description:

ACTION	RESULT
1) Subscriber A initiates a registration to an FN that does not exist..	1) 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	2) The correct OMs, ERs have been generated. No error logs have been generated.

IOT4_FA3 Registration fails because of link failure

Purpose:

Verify a failed registration scenario of a FN due to a link failure

Initial conditions:

Subscriber A is provisioned to FM.

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

Link between the FNN and MSC/HLR is down

Test description:

ACTION	RESULT
1) Subscriber A initiates a registration.	1) 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 and alarms.	2) The correct OMs and ERs have been generated. No error logs or alarms have been generated.

IOT4_FA4 Deregistration of an FN Number

Purpose:

Verify the deregistration of a FN

Initial conditions:

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.

Test description:

ACTION	RESULT
1) Subscriber A initiates a deregistration.	1) 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.	2) The MSISDN of Subscriber A is NOT registered to the FN and the FN is not registered.
3) Verify OMs Verify ERs	3) The correct OMs, ERs have been generated. No error logs have been generated.

IOT4_FA5 Deregistration of an FN fails

Purpose:

Verify a failed deregistration scenario of a FN

Initial conditions:

FN is not registered.

Subscriber A is provisioned to FM.

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

Test description:

ACTION	RESULT
1) Subscriber A initiates a deregistration.	1) 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.	2) The correct OMs, ERs have been generated. No error logs have been generated.

IOT4_FA6 Interrogation of an FA Number

Purpose:

Verify the interrogation of an FN

Initial conditions:

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.

Test description:

ACTION	RESULT
1) Subscriber A initiates an interrogation.	1) The network response for a successful interrogation. The FN is still activated and displayed on the mobile.
2) Query FNN for the FN.	2) 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.	3) The network response for a successful interrogation. The FN is still activated and displayed on the mobile.
4) Query FNN for the FN.	4) 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.	5) The correct OMs, ERs have been generated. No error logs have been generated.

IOT4_FA7 Interrogation of an FN fails

Purpose:

Verify a failed scenario of an interrogation of an FN

Initial conditions:

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.

Test description:

ACTION	RESULT
1) Subscriber A initiates an interrogation.	1) The network response for a failed interrogation.
2) Query FNN for the FN.	2) The FN is still not provisioned in the system
3) Verify OMs Verify ERs Verify the system for possible error logs and alarms.	3) The correct OMs, ERs have been generated. No error logs have been generated.

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IOT4_FA8 FA Call - Successful Call

Purpose:

Verify a successful basic FA scenario

Initial conditions:

Subscriber A is registered to FN_A

Subscriber B is registered to FN_B

Test description:

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

IOT4_FA9 FA Call – Call is not completed

Purpose:

Verify that a call to an inactive FN is released.

Initial conditions:

Subscriber A is provisioned to the FA service.

Subscriber A is registered to FN_A

Test description:

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

IOT4_ITAFA1 Forced Deregistration

Purpose:

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

Initial conditions:

Subscriber A is provisioned to the FA service.

Subscriber A is registered to FN_A

Subscriber B is not registered to a Functional Number

Test description:

ACTION	RESULT
1) Subscriber B initiates a forced deregistration notification procedure	1) 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	2) After the interrogation procedure the MS informs the user that the status of the FN has changed (i.e. Tigr 150 starts to let the FN blink on the screen)

7.4 Location Dependent Addressing (LDA)

IOT4_LA1 Successful LDA Call - Verify the cell format is correct

Purpose:

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

Initial conditions:

Subscriber A is located in cell #1.

The MSISDN of Subscriber B is assigned to Short Code 1200 and 1300 for calls originated in cell #1

Test description:

ACTION	RESULT
1) Subscriber A dials the 'Short Code' 1200 and 1300	1) The call is connected to Subscriber B.
2) Verify OMs Verify ERs Verify the cell format is correct	2) The correct OMs, ERs have been generated. No error logs have been generated.

IOT4_LA2 Unsuccessful LDA Call-Call to invalid Short Code

Purpose:

Verify Short Code call with unknown Short Code is released.

Initial conditions:

Subscriber A is located in cell #1.

1299 is a not valid SC number.

Test description:

ACTION	RESULT
1) Subscriber A dials the 'Short Code' 1299	1) The call is released.
2) Verify OMs Verify ERs Verify the system for possible error logs and alarms.	2) The correct OMs, ERs have been generated. No error logs have been generated.

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

IOT4_eMLPP2 MS in VGCS call on DCH, pre-emption on Air IF by higher prio PtP call

Test Purpose:

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

Pre-requisites:

- 1 NSS Providers MSC/HLR, 1 BSS Providers BSC, 1 BSS Providers BTS
- 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-E is in a different cell than the other MSs.
- All but 2 TCH are locked on the BTS

Test Procedure and Test Verification:

ACTION	RESULT
1) Serv. Subs. MS-A establishes a prio. 3 VGCS MS-B and MS-E joins the VGCS call. MS-A keeps the Uplink on dedicated channel.	1) A prio. 3 VGCS call is established and MS A has the Uplink of the DCH.
2) From the same Cell originate Prio 2 PTP call between (MS-C <-> MS-D)	2) The origination of the prio. 2 PTP call causes Air-Interface 64re-emption upon the resource being used by VGCS call. -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.

Remarks:

IOT4_eMLPP5 MS in VBS call as originating MS Dispatcher, pre-emption on Air IF by higher prio PtP call

Test Purpose:

Verify VBS call is taken down when originating MS Dispatcher is pre-empted on Air IF by Prio 2 PTP call

Pre-requisites:
- 1 MSC/HLR,
- 1 BSC,
- 1 Cell
- 5 GSM-R Terminals (MS-A as originating Dispatcher and MS-B,) with standard features MS C and MS D (for PTP call) MS-E is a VBS listener on a different BSC.
- All but 2 TCH on the A IF to Cell-A are locked on the Air IF

Test Procedure and Test Verification:

ACTION	RESULT
1) MS-A establishes a VBS (p2) call as Dispatcher. MS-B and MS-E accept the VBS call	1) A prio. 2 VBS call (MS-A -> MS-B, MS-E) is established
2) MS-D calls (p1 - PTP) MS-C	2) 2 TS DCH and GCH which was occupied by VBS call is preempted by prio 1PTP call - The originator Disp MS A, as well as MS-B and MS E drop out of the call and VBS call is released A prio. 1 PTP call (MS-D <-> MS-C) is established
3) MS-C ends the PtP voice call with MS-D	3) The PtP voice call is released and all resources are freed.

Remarks:

IOT4_eMLPP8 MS in VBS call as listener, pre-emption on Air IF by higher prio VBS call.

Test Purpose:

Serv. Subs. 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.

Pre-requisites:
- 4 GSM-R mobiles with standard features.
- 2 cell (Cell-A and Cell-B)
- 1 BSS Providers 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-A are locked

Test Procedure and Test Verification:

ACTION	RESULT
1) MS-A originates a prio 4 VBS call MS-B, MS-C join the VBS call	1) VBS call is established.
2) MS-D originates a prio 1 VBS	2) 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 1 VBS call	3) VBS call is released properly.
4) MS-A closes the prio 4 VBS call	4) VBS call is released properly.

Remarks:

IOT4_eMLPP10 MS in VGCS call having the UL of the GCH, pre-emption on Air IF by higher prio VBS call.

Test Purpose:

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

Pre-requisites:
- 1   NSS Providers MSC/HLR, 1 BSS Providers BSC, 1 BSS Providers 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

Test Procedure and Test Verification:

ACTION	RESULT
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.	1) 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	2) 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	3) MS-E is granted the UL.
4) MS C ends the Prio 2 VBS call	4) VBS call is ended and all resource are freed

Remarks:

IOT4_eMLPP12 MS in PEC, pre-emption on Air IF by higher prio VBS call.

Test Purpose:

Verify MS in Public Emergency call preempted on Air interface by prio 0 VBS call

Pre-requisites:
- 2 GSM-R mobiles (MS-A, MS-B,) with standard features.
- Routing is configured so that a PEC terminates on MS-B
- 2 cell
- 1BSC
- 1 MSC
- MS-A and MS-C in Cell A, both subscribed to VBS call
- MS B in Cell B
- All but 2 TCH on the Air IF to Cell-A are locked

Test Procedure and Test Verification:

ACTION	RESULT
1) MS-A originates PEC	1) PEC is established to MS-B
2) MS-C originates a prio 0 VBS call (by dialing *18*750*<GID>)	2) The origination of the prio.0 VBS call causes Air Interface preemption upon the resources being used by MS-A for Public Emergency Call. →PEC call is preempted by prio 0 VBS call PEC is released VBS call is established. MS-A joins the VBS call
3) MS-C closes the prio 0 VBS call	3) VBS call is released properly.

Remarks:

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IOT4_eMLPP14 MS in PtP call, pre-emption on A IF by higher prio VGCS call (REC)

Test Purpose:

Verify preemption of an A-Interface SCCP connection with a PTP call due to activation

of a REC group call channel.

Pre-requisites:
- 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

Test Procedure and Test Verification:

ACTION	RESULT
1) MS-A calls (p4 – PTP) MS-D	1) 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	2) 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	3) REC call is released correctly.

Remarks:

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IOT4_eMLPP15 MS in VBS call as originator, pre-emption on Air IF by higher prio VGCS call (REC)

Test Purpose:

Verify preemption on the Air-Interface of MS in VBS call as originator due to a

VGCS (REC) call setup.

Pre-requisites:
- 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

Test Procedure and Test Verification:

ACTION	RESULT
1) MS-A establishes a prio 1 VBS call	1) A prio. 1 VBS call (MS-D <-> MS-A) is established. MS-D joins as listener - Verify correct prio. 1 is seen in the NOTIFICATION message from the BSS.
2) MS-B establishes a REC	2) 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	3) REC call is released correctly.

Remarks:

IOT4_eMLPP19 MS in data call, pre-emption on Air IF by higher prio VGCS call (REC)

Test Purpose:

Verify that a PTP- Data Call (Protocol = transparent, Speed = 9600) preempted on Air interface by high Priority VGCS call (REC)

Pre-requisites:
- 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

Test Procedure and Test Verification:

ACTION	RESULT
1) MS-C establishes a p3 - DataCall to MS-D	1) A prio. 3 DataCall (MS-C <-> MS-D) is established - Verify correct prio. 3 in the PAGING message,transparent service and Data Rate 9.6 kbits/s are seen in the Assignment Request Message from the BSS
2) MS-A establishes a REC call	2) The origination of the REC causes Air Interface preemption upon the resources being used by the prio. 3 -DataCall. - Data call is released
3) MS-A closes the REC	3) REC is ends and all resource are free

Remarks:

IOT4_eMLPP20 MS in PtP call, pre-emption on Air IF by higher prio data call (4800 baud, transparent)

Test Purpose:

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

Pre-requisites:
- 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

Test Procedure and Test Verification:

ACTION	RESULT
1) MS A establishes a priority 2 PtP call to MS –B	1) MS B answers the call
2) MS C makes prio 0 data call to MS D	2) 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	3) The call is released properly

Remarks:

7.6 Voice Group Call Service (VGCS)

IOT4_VGCS1 SS originates VGCS Call

Test Purpose:

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

Pre-requisites:

- 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 Providers BSS on 1 BSC
- 1 MSC in NSS Providers NSS

Test Procedure and Test Verification:

ACTION	RESULT
1) MS A originates a VGCS call as a service subscriber	1) - 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	2) - MS B is able to join the VGCS call. - MS B is in listening mode all the time
3) MS A closes the call.	3) The VGCS call is released properly and all resources are deallocated correctly

Remarks:

IOT4_VGCS3 MS Dispatcher originates VGCS call and takes it down with the Kill Sequence

Test Purpose:

Verify that MS dispatcher can originate the VGCS call and end the call by pressing the kill Sequence.

Pre-requisites:
- 2 GSM-R subscribers (MS A, MS B) with standard options, data fill and routing
- MS-A is a dispatcher 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 on BSS Providers BSS on 1 BSC
- 1 MSC in   NSS Providers NSS

Test Procedure and Test Verification:

ACTION	RESULT
1) MS A originates Voice Group call as a dispatcher by dialing 50 + < GCA > + <GID>	1) - Origination is successful, DCH allocated in cell of originator, GCH allocated in cell of terminator. The DCH of the MS Dispatcher 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 VGCS call
2) MS B joins the VGCS call	2) - MS B is able to join the VGCS call - MS B is in listening mode
3) MS B takes the Uplink	3) MS B has two-way voice path
4) MS A closes the call by entereing the killing sequence.	4) The VGCS call is released properly and all resources are deallocated correctly

Remarks:

IOT4_VGCS4 SS originates VGCS call, leaves, rejoins and ends it.

Test Purpose:

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

Pre-requisites:
- 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 Providers BSS on 1 BSC
- 1 MSC in   NSS Providers NSS

Test Procedure and Test Verification:

ACTION	RESULT
1) MS A originates VGCS call as a service subscriber	1) • 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	2) MS B is able to join and is in listening mode all the time.
3) MS A leaves the group call	3) The VGCS call stays up.
4) MS A rejoins the group call	4) MS A is in listening mode in the VGCS call
5) MS A takes the Uplink	5) MS A has two way voice path after obtaining the GCH UL
6) MS A closes the group call	6) The VGCS call is released properly and all resources are deallocated correctly

Remarks:

IOT4_VGCS5 SS enters into VGCS broadcast area with ongoing VGCS call and is notified of it.

Test Purpose:

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

Pre-requisites:
- 2 GSM-R subscribers (MS A, MS B) with standard options, data fill and routing
- MS-A is a dispatcher 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 Providers BSS on 2 BSCs
- 1 MSC in   NSS Providers NSS

Test Procedure and Test Verification:

ACTION	RESULT
1) Establish voice group call from MS A as Dispatcher by dialing 5+0+<SA>+<GID>	1) - Origination is successful, DCH allocated in cell of originator, GCH allocated in cell of terminator. The DCH of the MS Dispatcher stays allocated for the duration of the call - MS B is notified of the VGCS call - MS A 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	2) MS B is notified of the ongoing VGCS call
3) MS B joins the VGCS call	3) - MS B is able to join the VGCS call. - MS B is in listening mode
4) MS B takes the Uplink	4) MS B has two-way voice path
5) MS A closes the VGCS call by dialing the killing sequence	5) The VGCS call is released properly and all resources are deallocated correctly

Remarks:

IOT4_VGCS6 MS Dispatcher joins ongoing VGCS call

Test Purpose:

Verify MS dispatcher is able to join ongoing VGCS (only) when he is entitled to.

Pre-requisites:
- 1 MS dispatcher MS A that is entitled to originate and to kill the VGCS call, located outside the GCA
- 1 MS dispatcher MS B that is not entitled to originate the VGCS call, located outside the GCA
- 1service subscribers: MS C, located in the GCA
- 2 cells on BSS Providers BSS on 1 BSC
- 1 MSC in   NSS Providers NSS

Test Procedure and Test Verification:

ACTION	RESULT
1) Establish voice group call from MS C as SS	1) 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>	2) 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>	3) VGCS origination/joining of MS B is rejected by the NSS
4) MS A closes the call by dialing the killing sequence.	4) VGCS calls get released properly. All resources are free

Remarks:

IOT4_VGCS13 Mute sequence for originating MS Dispatcher

Test Purpose:

Verify that mute sequence works correctly for originating MS Dispatcher and appropriate SET PARAMETER message is sent to a VGCS talker in case originating dispatcher sends MUTE sequence.

Pre-requisites:
- GSM-R mobiles MS A, MS B, MS DISP C
- 1 BSS Providers cell
- 1BSC
- 1 MSC

Test Procedure and Test Verification:

ACTION	RESULT
1) MS DISP C dials 5+0+<GCAREA>+<GID> to originate VGCS call MS A and MS B take call.	1) VGCS call is established between MS A, MS B and DISP C. DISP C has speech path to MS A and MS B
2) MS A requests the GCH UL	2) MS A has speech path to MS B and DISP C Setparameter message instructs talker to unmute his downlink
3) DISP C presses MUTE sequence	3) Setparameter message is sent to talker to mute his downlink. MS A has speech path to MS B and dispatcher C
4) DISP C presses MUTE sequence again	4) No setparameter message is sent. MS A has speech path to MS B and DISP C (robustness)
5) DISP C presses KILL sequence	5) All parties are released from the call. All network resources for call are released

Remarks:

IOT4_VGCS14 Unmute sequence for originating MS Dispatcher

Test Purpose:

Verify that unmute sequence works correctly for originating MS Dispatcher and appropriate SET PARAMETER message is sent to a VGCS talker in case originating dispatcher sends UNMUTE sequence.

Pre-requisites:
- GSM-R mobiles MS A, MS B, MS DISP C
- 1 BSS Providers cell
- 1BSC
- 1 MSC

Test Procedure and Test Verification:

ACTION	RESULT
1) MS DISP C dials 5+0+<GCAREA>+<GID> to originate VGCS call MS A and MS B take call.	1) VGCS call is established between MS A, MS B and MS DISP C. MS DISP C has speech path to MS A and MS B
2) MS A request the GCH UL	2) MS A has speech path to MS B and MS DISP C Setparameter message instructs talker to umute his downlink
3) MS DISP C presses UNMUTE SEQUENCE	3) No setparameter message is sent. MS A has speech path to MS B and MS DISP C
4) MS DISP C presses MUTE and then UNMUTE SEQUENCE	4) MS DISP C has speech path to MS A and MS B Two setparameter messages are sent, the first o mute the downlink and the second to unmute the downlink
5) MS DISP C presses KILL sequence	5) All parties are released from the call All network resources for call are released

Remarks:

IOT4_VGCS17 Parallel group calls are possible to the same cell

Test Purpose:

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

Pre-requisites:
- 2 service subscribers with GID A: MS A, MS B
- 2 service subscribers with GID B: MS D, MS E
- 1 BSS Providers cell
- 1 BSC
- 1 MSC

Test Procedure and Test Verification:

ACTION	RESULT
1) MS A originates VGCS call to GID A. MS B takes call.	1) VGCS call is established between MS A and MS B.VGCS call up,
2) MS A request the DCH UL	2) 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	3) VGCS call is established between MS D and MS E.VGCS call up
4) MS E request the GCH UL	4) 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	5) MS B have speechpath to MS A
6) MS A and MS D close the VGCS calls	6) Both VGCS calls get released properly. All resources are idle

Remarks:

IOT4_VGCS44 GID delivered correctly to terminating SS in SS originated VGCS call

Test Purpose:

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

Pre-requisites:
- 2 service subscribers: MS A, MS B activated for GID<xxx> with standard options, datafill and routing
- 1 cell
- 1 BSC
- 1 MSC

Test Procedure and Test Verification:

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

Remarks:

IOT4_VGCS 51 VGCS talker leaves GCA

Test Purpose:

Verify that the GCH uplink is released properly when the VGCS talker leaves the GCA.

Pre-requisites:

- 2 GSM-R mobiles (MS A, MS B) with standard datafill and routing
- 1 BSS Providers cell.

Test Procedure and Test Verification:

ACTION	RESULT
1) MS A and originates a VGCS call	1) VGCS call establishes correctly
2) MS B joins the call	2) MS B is notified of the call
3) MS B takes the GCH UL	3) The GCH UL is released when the talker leaves the GCA
4) MS B leaves the GCA while having the GCH UL	4) VGCS stays up, after MS B left the GCA UL is released properly.
5) MS A closes the call	5) VGCS call is taken down, all resources are released

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IOT4_VGCS 52 VGCS originator leaves GCA

Test Purpose:

Verify that the VGCS call stays up when the VGCS originator SS leaves the GCA

Pre-requisites:

- 2 GSM-R mobiles (MS A, MS B) with standard datafill and routing
- 1 BSS Providers cell.

Test Procedure and Test Verification:

ACTION	RESULT
1) MS A and originates a VGCS call	1) MS B is notified of the call VGCS call establishes correctly
2) MS B joins the call and takes the UL	2) UL is granted to MS B
3) MS A leaves the GCA	3) VGCS stays up, after MS originator left the GCA

Remarks:

ADD_SRS_1 Service Subscriber originates Voice Group (VGCS) Call, Joining Dispatcher, Mute and Un-Mute

Test Purpose:

Verify Mandatory Requirement SRS 3.8.4 and 3.8.2

-VGCS call origination

- VGCS Uplink

- VGCS Group ID

- Dispatcher can speak any time during the call

- Multiple Driver communication using VGCS group call

Pre-requisites:
- 4 GSM-R mobiles (MS-A, MS B, MS C, MS D, MS E) with standard options, datafill and routing
- MS C, MS D, MS-E are configured as dispatcher, MS D only originating Dispatcher
- 1 BTS
- 1 BSC
- 1 MSC

Test Procedure and Test Verification:

ACTION	RESULT
1) MS A originates Voice Group call as a service subscriber via the MMI. MS a takes uplink by pressing PTT.	1) MS B is notified for the VGCS call. Dispatcher MS C and MS E getting paged. The Group ID is visible on the display.
2) MS B answers the call	2) MS A has uplink voice path while MS B is in listening mode
3) MS A releases the PTT button.	3) MS A is in listening mode.
4) MS B presses the Push-To-Talk (PTT) button. (until Step 12)	4) MS B has two way voice path while MS A is in listening mode
5) Dispatcher MS C sends the unmute sequence ("###").	5) Set Parameter message send. Dispatcher MS C and MS-E can speak, MS B has two way voice path while MS A is in listening mode
6) Dispatcher MS E as well sends the unmute sequence ("###").	6) No new Set Parameter message send. Dispatcher MS-C and MS E can still speak, MS B has two way voice path while MS A is in listening mode

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7) Dispatcher MS C sends the mute sequence ("#**").	7) MS A is in Listening, MS B has uplink voice path
8) Dispatcher MS D starts (joins) call to ongoing Group call	8) Dispatcher MS D can speak, MS B has uplink voice path
9) Dispatcher MS D leaves Group Call	9) MS A is in Listening, MS B has uplink voice path
10) Dispatcher MS C sends the unmute sequence ("###").	10) Dispatcher can speak, MS B has two way voice path while MS A is in listening mode
11) Dispatcher MS D starts (joins) call to ongoing Group call	11) MS B has two way voice path while MS A is in listening mode
12) MS B release the uplink.	12) MS B could successful release uplink
13) MS A request/release the uplink and closes the call by pressing the red button and chooses close on MMI.	13) The Voice group call is released.

Remarks:

7.7   Voice Broadcast Service (VBS)

Note: Unless otherwise stated, the VBS calls are originated with priority 4.

IOT4_VBS1 Service Subscriber originates Voice Broadcast (VBS) Call

Test Purpose:

Verify SS can originates Voice Broadcast (VBS) Call

Pre-requisites:
* 2 GSM-R mobiles with standard options, datafill and routing , (MS-A present in BSS Providers BSS and MS B present in   NSS Providers BSS)
* 2 cell (Cell-A present in BSS Providers BSS and Cell-B present in   NSS Providers BSS)
* 2 BSC (BSC-A present in BSS Providers BSS and BSC- B present in   NSS Providers BSS)
* 1 MSC in   NSS Providers NSS

Test Procedure and Test Verification:

ACTION	RESULT
1) MS A originates Prio 1 Voice broadcast call as a service subscriber	1) - 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	2) MS A has two way voice path while MS B is in listening mode
3) MS A closes the call	3) VBS calls is released and all resources are deallocated

Remarks:

IOT4_VBS2 SS originates prio0 VBS call

Test Purpose:

Verify SS can originates prio0 Voice Broadcast (VBS) Call

Pre-requisites:
- 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 Providers BSS)
- 1 BSC (BSS Providers BSC)
- 1 MSC in   NSS Providers NSS

Test Procedure and Test Verification:

ACTION	RESULT
1) MS A originates Prio 0 Voice broadcast call as a service subscriber	1) - 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	2) MS A has two way voice path while MS B is in listening mode
3) MS A closes the call	3) VBS calls is released and all resources are deallocated

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IOT4_VBS8 MS Dispatcher originates VBS call and takes down the call by disconnecting

Test Purpose:

Mobile Subscriber as dispatcher can Originates VBS call and takes down call by

pressing the red button on MMI.

Pre-requisites:
- 2 GSM-R mobiles with standard options, datafill and routing , (MS-A present in BSS Providers BSS and MS B present in   NSS Providers BSS)
- 2 cell (Cell-A present in BSS Providers BSS and Cell-B present in   NSS Providers BSS)
- 2 BSC (BSC-A present in BSS Providers BSS and BSC B present in   NSS Providers BSS)
- 1 MSC in   NSS Providers NSS

Test Procedure and Test Verification:

ACTION	RESULT
1) MS A originates voice broadcast call as a dispatcher	1) • 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	2) MS A has two way voice path while MS B is in listening mode
3) MS A closes the call	3) VBS calls is released and all resources are deallocated

Remarks:

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IOT4_VBS9 MS Dispatcher originates VBS call and takes down call with the kill sequence

Test Purpose:

Mobile Subscriber as dispatcher can Originates VBS call and takes

down call with the kill Sequence

Pre-requisites:
- 2 GSM-R mobiles with standard options, datafill and routing , (MS-A present in BSS Providers BSS and MS B present in   NSS Providers BSS)
- 2 cell (Cell-A present in BSS Providers BSS and Cell-B present in   NSS Providers BSS)
- 2 BSC (BSC-A present in BSS Providers BSS and BSC B present in   NSS Providers BSS)
- 1 MSC in   NSS Providers NSS

Test Procedure and Test Verification:

ACTION	RESULT
1) MS A originates voice broadcast call as a dispatcher	1) • 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	2) MS A has two way voice path while MS B is in listening mode
3) MS A closes the call by sending the kill sequence	3) VBS call is released and all resources are deallocated.

Remarks:

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IOT4_VBS10 MS Dispatcher is able to join ongoing VBS

Test Purpose:

Verify VBS MS Dispatcher can join the ongoing VBS call .

Pre-requisites:
- 2 GSM-R mobiles with standard options, datafill and routing , (MS-A present in BSS Providers BSS and MS B present in   NSS Providers BSS)
- 1 originating dispatchers: DISP C (present in BSS Providers BSS)
- 2 cell (Cell-A present in BSS Providers BSS and Cell-B present in   NSS Providers BSS)
- 2 BSC (BSC-A present in BSS Providers BSS and BSC B present in   NSS Providers BSS)
- 1 MSC in   NSS Providers NSS

Test Procedure and Test Verification:

ACTION	RESULT
1) MS A originates Voice broadcast call as a service subscriber	1) • 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	2) MS A has two way voice path while MS B is in listening mode
3) MS DISP C joins ongoing VBS call by dialing 51+<GCA>+<GID>	3) MS DISP C joins ongoing VBS and is in the listening mode
4) MS A closes the call	4) VBS calls is released and all resources are deallocated

Remarks:

IOT4_VBS11 SS enters into VBS broadcast area with ongoing VBS call and is notified of it, SS joins the VBS call

Test Purpose:

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

Pre-requisites:
- 3 GSM-R mobiles with standard options, datafill and routing , (MS-A and MS-C present in BSS Providers BSS and MS B present in   NSS Providers BSS)
- 2 cell (Cell-A present in BSS Providers BSS and Cell-B present in   NSS Providers BSS)
- 2 BSC (BSC-A present in BSS Providers BSS and BSC B present in   NSS Providers BSS)
- 1 MSC in   NSS Providers NSS

Test Procedure and Test Verification:

ACTION	RESULT
1) MS A originates Voice broadcast call as a service subscriber	1) • 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.	2) 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	3) The call gets released properly. VBS resources are free.

Remarks:

7.8 Railway Emergency Call (REC)

IOT4_REC1 SS originates a REC

Test Purpose:

Verify SS can originate Railway Emergency Call .

Pre-requisites:
- 1 cell (BSS Providers BSS)
- 1 BSC (BSS Providers BSS)
- 1 MSC in   NSS Providers NSS
- 3 GSM-R mobiles (MS-A, MS-B and MS-C) with standard options, datafill and routing

Test Procedure and Test Verification:

ACTION	RESULT
1) MS A originates emergency call as service subscriber and releases the UL on the DCH	1) • 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	2) MS A has speech path, MS B and MS C are in listening mode.
3) MS A release the call	3) The call gets released properly.
4) Check the signaling msg's.	4) Immediate SETUP is used by MS A (configured on the SIM) ISETUP (= Immediate Setup (BCC/GCC) is used by MS A

IOT4_REC3 SS accepts an incoming REC

Test Purpose:

Verify SS can accept an incoming REC

Pre-requisites:
- 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 Providers BSS on 2 BSCs
- Voice Inactivity timer is set long enough in order to execute steps 1-4 before the timer expires.

Test Procedure and Test Verification:

ACTION	RESULT
1) MS A originates emergency call as service subscriber	1) • 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	2) MS C is notified of the ongoing REC call
3) MS C joins the REC call	3) • MS C is able to join the VGCS call. • MS C is in listening mode
4) MS C takes the Uplink	4) MS C has two-way voice path
5) MS C releases the uplink	5) Uplink is released
6) MS A closes the REC call	6) The REC call is released properly and all resources are deallocated correctly

Remarks:

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IOT4_REC4 MS Dispatcher originates a REC

Test Purpose:

Verify that MS dispatcher can originate the Railway Emergency Call and end the call by pressing the kill Sequence.

Pre-requisites:
- 2 GSM-R subscribers (MS A, MS B) with standard options, data fill and routing
- MS-A is a dispatcher 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 Providers BSS on 2 BSCs
- 1 MSC in   NSS Providers NSS

Test Procedure and Test Verification:

ACTION	RESULT
1) MS A originates Voice Group call as a dispatcher by dialing 50 + < GCA > + <GID>	1) - Origination is successful, DCH allocated in cell of originator, GCH allocated in cell of terminator. The DCH of the MS Dispatcher 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	2) - MS B is able to join the call - MS B is in listening mode
3) MS B takes the Uplink	3) MS B has two-way voice path
4) MS A closes the call by entering the killing sequence.	4) The REC is released properly and all resources are deallocated correctly

Remarks:

IOT4_REC8 REC in a GCA with a locked cell

Test 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

Pre-requisites:
- 2   NSS Providers 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 Nortel NSS

Test Procedure and Test Verification:

ACTION	RESULT
1) Lock a cell	1) 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 "***"	2) 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.	3) 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.

Remarks:

7.9   Originator to Dispatcher Information

IOT4_OTDI 1 SS originates VGCS call, terminating MS dispatcher receives the OTDI

Test Purpose:

Verify that the terminating dispatcher receives the OTDI from the originating SS

Pre-requisites:

- 1 cell (BSS Providers BSS)
- 1 SS (Registered to a Functional Number)
- 1 MSC in   NSS Providers NSS
- 5 terminating dispatchers of a VGCS call

Test Procedure and Test Verification:

ACTION	RESULT
1) SS originates a Prio 1 VGCS call and sends the OTDI IE	1) VGCS getting established -> dispatcher included in VGCS -> GCC/BCC_SETUP contains OTDI IE
2) Verify that the terminating dispatcher got OTDI from originating SS	2.) Dispatcher receives the uncompressed OTDI in UUS IE of the call setup message
3.) Originator takes the VGCS call down	3.) VGCS call is taken down, all resources are released properly

Remarks:

IOT4_OTDI 5 SS originates VGCS Immediate Setup 2 call, MSC uncompresses the OTDI info and terminating MS dispatcher receives the uncompressed OTDI

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

Pre-requisites:
- 1 cell (BSS Providers BSS)
- 1 SS (Registered to Functional Number)
- 1 MSC in   NSS Providers NSS
- 5 terminating dispatchers of a VGCS call

Test Procedure and Test Verification:

ACTION	RESULT
1) SS originates a Prio 0 VGCS call	1) VGCS getting established -> dispatcher included in GC -> GCC/BCC_IMMEDIATE_SETUP 2 contains compressed OTDI IE
2) Verify that the terminating dispatcher got OTDI from originating SS	2.) Dispatcher receives the uncompressed OTDI in UUS IE of the call setup message
3.) Originator takes the VGCS call down	3.) VGCS call is taken down, all resources are released properly

Remarks:

7.10 Late Entry

IOT4_LE1 SS active in a PTOP call move in a cell with ongoing REC call

Purpose:

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

Initial conditions:

2 cell at least

4 Mobiles

3 SS at least

Emergency Threshold (Signalling Point Object)= Priority 0

Test description:

ACTION	RESULT
1) A Mobile SS which is member of the REC group establishing a PTOP call to an other Mobile/fixed call in a cell A what is not part of the REC group call area.	1) PTOP call getting established -> has voice path
2) In the second cell B a SS establishing a REC.	2.) REC call getting established -> has voice path
3.) Mobile SS which has established PTOP call moves from cell A -> B ->Verify on the Abis Interface that the Mobile SS getting notified with a GCCH Notification Request message	3.) ->Handover successful ->Mobile getting Notification of the ongoing REC ->PTOP (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.	4.) SS get the uplink and has voice path
5.) originating SS takes down the call	5.) The REC call getting properly closed.

IOT4_LE2 Orig. SS active in a VBS call move in a cell with ongoing REC call

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.

Initial conditions:

2 cell at least

4 Mobiles

3 SS at least

Emergency Threshold (Signalling Point Object)= Priority 0

Test description:

ACTION	RESULT
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.	1) VBS (P4) call getting established -> has voice path
2) In the second cell B a SS establishing a REC.	2.) 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	3.) ->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.	4.) SS get the uplink and has voice path
5.) originating SS takes down the call	5.) The REC call getting properly closed.

IOT4_LE3 SS active in a VGCS (GCH) call move in a cell with ongoing REC call

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.

Initial conditions:

2 cell at least

4 Mobiles

3 SS at least

Emergency Threshold (Signalling Point Object)= Priority 0

Test description:

ACTION	RESULT
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	1) VGCS call (P4) getting established -> has voice path
2) In the second cell B a SS establishing a REC.	2.) REC call getting established -> has voice path
3.) Mobile SS with pressed Uplink **(dedicated first talker**) 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	3.) ->Handover successful ->Mobile getting Notification of the ongoing REC ->VGCS (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.	4.) SS get the uplink and has voice path
5.) originating SS takes down the call	5.) The REC call getting properly closed.

A. Appendix

This Annex provides a list of the detailed information to be tracked for Phase 9.2 with the following base configuration:

      KCC NSS

      NSN BSS

1. Details for Section 5.4 of the main document

i. Database Parameters

This section details the appropriate database parameters to be used during this MV-IOT session. It should be noted that it might be necessary to modify certain database parameters from these values in order to perform certain test cases.

Parameter	NSN Value	KCC Value
MCC / MNC / CC / NCD		
Global Title for MSC		
Global Title for VLR		
Global Title for HLR		
MSC point code		
BSC point code		
LACs and CellIDs		
GCAs		
GCRefs		
IMSIs and MSISDNs		

ii. Interconnection Parameters

This section details the agreed parameters to be used for remote interconnection.

Parameter	NSN Value	KCC Value
RAD Box Type		
Number of PWs		
Number of Timeslots		
Jitterbuffer		

SIM	MSISDN on switch	IMSI	Basic Services	Comments

B. Appendix

This Annex provides a list of the detailed information to be tracked for Phase 9.3 with the following base configuration:

> KCC NSS
>
> NSN BSS

1. Details for Section 5.4 of the main document

iii. Database Parameters

This section details the appropriate database parameters to be used during this MV-IOT session. It should be noted that it might be necessary to modify certain database parameters from these values in order to perform certain test cases.

Parameter	NSN Value	KCC Value
MCC / MNC / CC / NCC		
Global Title for MSC		
Global Title for VLR		
Global Title for HLR		
MSC point code		
BSC1 point code		
BSC2 point code		
LACs CellIDs		
GCAs		
GCRefs		
IMSIs and MSISDNs		

iv. Interconnection Parameters

This section details the agreed parameters to be used for remote interconnection.

Parameter	NSN Value	KCC Value
RAD Box Type		
Number of PWs		
Number of Timeslots		

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Jitterbuffer		

SIM	MSISDN on switch	IMSI	Basic Services	Comments

SIM	Supplementary Services			
SIM	Network	Name in Location	GC-Ids data filled	Function	MS-Type

Group	Group Call Area	VGCS GID	VBS GID	VGCS-Priority	VBS-Priority	No Activity Timer (sec)

Content Approval

The contents of this document are approved by:

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