SubMenu

S10.5 ED SYSTEM TEST CASES

NOKIA

SubMenu

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SubMenu

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Contents

1. BSC BASICS

1.1 STS0500B0008 BCF software package handling

1. Test purpose
To verify the correct creation of BCF software package

2. Required test environment

- Before the BCF software package can be created and attached to the BCF, the BCF object must be created.

3. Test execution

1. If BCF software package does not exist on the BSCs disk it must be loaded there first.
2. Look the first empty BCF software package subdirectory from the BSCs disk (e.g. command IWX). If download has never been done the first empty subdirectory is /BCF_PACK/PACK_0.
3. Copy BCF software package files to the empty package subdirectory from the floppy disk.
   ZIWY:S... (Identify source.)
   ZIWY:D... (Identify destination.)
   ZIBC (Copy files.)

4. After the BCF software package files are copied to the package subdirectory. The BCF software package must be created. The BCF software package creation operation checks' files and adds package id into the BSCs management file. Create the BCF software package: Command: EWC
5. Then BCF software package is ready to be attached to the BCF. Attachment is made new (NW) status. Command: EWA
   The attachment of the SW-package initiates the software downloading to BTS site in case the background downloading function is supported by the BCF. The package can not be activated by EWV command until the background downloading is completed and the package is transferred to the non-volatile memory of a BCF.
6. The last software package initialization operation is the BCF activation. The command changes the default software package of the BCF. Normally the package activation command causes BCF restart with the new package but in this case the BCF is not restarted because the administrative state of the BCF is LOCKED.
   The package activation command is rejected by the system in case the software background downloading procedure is still going on. In that case the new package is not changed as a default package and the activation command must be given again later. Command: EWV

4. Expected results

1. Creations are successful

1.2 STS0500B0011 Checking base station circuit

1. Test purpose

To verify, how the creation of radio channels are successful

2. Required test environment

- Before you can check base station circuit, BTS and BCF objects must be created

3. Test execution

    1. Check the PCM circuits and time slots of the base stations concerning the radio channels with command ERO. (e.g.ZERO:BTS=base_station_number;)
    2. Take a test call and check the PCM circuits during call.

4. Expected results

    1. Operational state WO-IDLE of TCHF indicates that the radio channel is in normal functional state and ready to be allocated for a call. Operational state WO-FR, -HR or -DR of TCHF indicates that the radio channel is carrying a call at the moment.

1.3 STS0500B0006 Checking of internal circuit groups

1. Test purpose

To verify that circuit groups are created

2. Required test environment

- MML terminal

3. Test execution

    1. Check the internal circuit groups: command: RCI
    2. Check all the necessary circuit groups.

4. Expected results

    1. Circuit groups are created

1.4 STS0500B0007 Creating of BSC's radio network configuration

VERSION: 1.0.0
DESCRIPTION:

1. Test purpose

To verify the correct creation of BSC's radio network configuration

2. Required test environment

- Before you start the test, OMU- and TRX -signaling link must be created.

3. Test execution

   1. Create a Base Control Function (BCF) object of the BTS site:
      Command : EFC
   2. Create a Base Transceiver Station (BTS) object:
      Command : EQC
   3. Create a Transceiver (TRX) object and logical radio channel configuration:
      Command : ERC
   4. Define power control parameters of the BTS:
      Command : EUC
   5. Define handover parameters of the BTS:
      Command : EHC
   6. Define adjacent cell parameters for the BTS:
      Command : EAC

4. Expected results

   1. Creations are successful

1.5 STS0500B0005 Creation of A-bis-interface signaling links

1. Test purpose

To verify that creation of signaling links are successful

2. Required test environment

- MML terminal
-

3. Test execution

    1. Connect ET for A-bis-interface (WUC).
    2. Change the states of the ETs to SE -> TE and run diagnostics (USC, UDU). Change the states to WO.
    3. Create D-channels for OMU and TRX signaling using bit rate 16 and 64 kbit/s (DSE).
    4. Change working state of the created D-channels (DTC).

4. Expected results

    1. Creations are successful

1.6 STS0500B0004 Creation of A-interface

1. Test purpose

To verify that A-if creation is successful

2. Required test environment

- MML terminal
- BSC must be created from MSC site.

3. Test execution

1. Connect ET for A-interface (WUC). Change the states to SE -> TE and run diagnostics (USC, UDU). Change the state to WO.
2. Create signaling links (NCC)
3. Define the own signaling point code (NRP)
4. Create signaling sets (NSC)
5. Create signaling route sets (NRC)
6. Allow activation of signaling links and route sets (NLA, NVA)
7. Change states on the signaling links and route sets to AV-EX (NLC, NVC)
8. Enable SCCP user part message handling (NPC)
9. Create SCCP services for own signaling point and for destination point (NFD)
10. Set SCCP broadcast status (OBM, OBC)
11. Change states of the SCCP services (NGC, NHC)
12. Connect TCSM for A-interface: e.g. ZWGC:32,1:POOL=1:BCSU,0:; e.g. ZWGC:32,1:TYPE=NS;

    Or Connect TCSM2 for A-interface:
    e.g. ZWUC:TCSM,32:TRCO,0:;
    e.g. ZWGC:32,1:POOL=1:BCSU,0:;
    Change the state of the unit to SE -> TE -> WO (USC).

12. Create A-interface speech circuits group (RCC) and add circuits (RCA).
13. Change the state of speech circuits WO-EX (CEC)
14. Change the state of speech circuits from MSC site to WO-EX (CEC).

4. Expected results

A-if creation and all the state changes were successful

1.7 STS0500B0002 Creation of configuration

1. Test purpose

To verify that creation of hardware configuration is successful

2. Required test environment

- MML terminal

3. Test execution

   1. Create hardware configuration for CLSs, CLABs, MCMUs, GSWs, OMU, WDUs, FDU, BCSUs, DAT, BCSUs, ETs. Create rack. (rack = WTJ, cartridge = WTC, unit = WTU, plug-in unit = WTP).
   2. Connect functional units CLS, AS7_U, AFS_T and AC25_S (WUC).
   3. Check configuration (WTI).

4. Expected results

   Creation of hardware configuration was successful

1.8 STS0500B0014 Creation of NMS / 2000 connection

1. Test purpose
To verify that creation of the NMS/2000 Local Area Network (LAN) connection is successful

2. Required test environment
   - Before you create the NMS/2000 LAN connection, A-interface must be created

3. Test execution
   1. Check that c-number is correct
      ZQNI;
   2. Create NMS LAN connection
      ZQEC:CLNS_LAN:ES:OMU:9:000000037801:3:39246F00000116000000010010:
      ZQEG:CLNS_LAN:UNL
      ZQLL::ES:OMU:0::
      ZQLG:::UNL:
      ZQET:CLNS_LAN:
      ZQBH:AFI=39,IDI=246,DFI=00,ORG=000116,RES=00000001,AREA=0010,:
      ZQBN::L:4:NSEL=00 QBC:LOCAL:L:
      ZQBT:LOCAL:1:
      ZQBN::R:5:END=192168197029,NSEL=00
      ZQBN::R:5:END=192168197027,NSEL=00 QBC:REMNMS:R:
      ZQBT:REMNMS:2,:
      ZQBT:REMNMS:3,25
      ZQBI
      ZQBG:1&&4,UNL
      ZQDL:BSC037801F:::UNL:OMU:VFS:LOCAL:1133030210:1133030210:1133:
      ZQDL:BSC037801VT:::UNL:OMU:VTP:LOCAL:2233030220:2233030220:2233:
      ZQDL:BSC037801A:::UNL:OMU:CMI,21F,0:LOCAL:3333030230:3333030230:3333:
      ZQDL:BSC037801EHA:::UNL:OMU:CMI,2B1,0:LOCAL:3333030231:3333030231:3333:
      ZQDG:BSC037801A,LOC
      ZQDA:BSC037801A:MOS=Y,FLT=Y,MR=Y,ES=N,CG=Y,:VER_1_AND_2
      ZQDG:BSC037801A,UNL
      ZQDR:OMC000000FP:::UNL:VFS:REMNMS:1133010210:1133010210:1133:
      ZQDR:OMC000000BP:::UNL:CMI:REMNMS:3333010131:3333010131:3333:
      ZQDR:OMC000000D1:::UNL:CMI:REMNMS:3333010130:3333010130:3333:
      ZQDR:OMC000000SW:::UNL:VFS:REMNMS:1133010110:1133010110:1133:
      ZIID::EVBFIL
      ZIAA:SYSOP:ALL=250:VTIME=FOREVER
      ZIAH:SYSOP1:SYSOP
      ZIOA:SYSOP1:APPL=CM-X
      ZIOM:SYSOP1:APPL=PM-X
      ZIOM:SYSOP1:APPL=FM-X
      ZQET:CLNS_LAN:

4. Expected results

   Creation was successful

1.9 STS0000B0001 Creation of the new BSC software package

1. Test purpose

Activate new software package and perform verification for it

2. Required test environment

- Service terminal
- MML terminal

3. Test execution

    1. Restart the OMU in the minidebugger mode
    2. Set the real-time clock (ZST)
    3. Initialize disks W0 and W1 (ZMI or ZMID)
    4. Create the necessary directories on disk W0 (ZMCD).
    5. Copy software package from the DAT to disk W0 (ZMM)
    6. Copy the file SOMAFIGX.IMG to the SCMANA directory (ZMM)
    7. Copy the software package from disk W0 to disk W1 (ZMMD)
    8. After copying restart the OMU (command ZAUL or reset button)
    9. Start MML session. Set the clock (MML command DCS).
    10. Perform a verification for the SW package (MML command WQB). Check if any faults have been detected.

4. Expected results

    1. No faults should be found in SW package verification.

1.10 STS0703B0007 Default BTS SW package per BTS generation

1. Test purpose

Ensure that initial BTS software package can be set

2. Required test environment

- BTS OMU links and TRX links are created

3. Test execution

1. Create BTS SW package (ZEWC).
2. Set (and check) initial software package (ZEWS, ZEWL) per BTS generation (B, D, C, I, P and F type).
3. Create BCF (ZEFC), BTS (ZEQC) and TRXs (ZERC) and define power control (ZEUC) and handover parameters (ZEHC).
4. Check that BTS SW package is attached and activated (ZEWO).
5. Change the states of TRX, BTS and BCF to working and take test calls.
6. Test with all BCF types.
7. Remove (and check) the initial software package without giving the parameter (ZEWS, ZEWL).
8. Create a new BCF (ZEFC), BTS (ZEQC) and TRXs (ZERC) and define power control (ZEUC) and handover parameters (ZEHC) and attach and activate SW package (ZEWA, ZEWV).
9. Change the states of TRX, BTS and BCF to working and take test calls.

4. Expected results

BTS SW package is attached and activated automatically after BCF creation.
Calls are successful.

1.11 STS0500B0013 Deletion of the A-bis-interface

1. Test purpose

To verify that deletion of Abis-interface is successful

2. Required test environment

- MML terminal

3. Test execution

    1. Change the states of TRX, BTS and BCF to lock state (ERS, EQS, EFS)
    2. Delete the TRX (ERD)
    3. Delete the BTS (EQD)
    4. Delete the BCF (EFD)
    5. Delete the BCF software package (EWD)
    6. Deny activation of the D-channels (DTC)
    7. Delete BTS D-channels (DSD)
    8. Change the state of the ET to SE-NH (USC)
    9. Disconnect ET (WUD).

4. Expected results

    Deletions were successful

1.12 STS0500B0012 Deletion of the A-interface

1. Test purpose

To verify that deletion of the A-interface is successful

2. Required test environment

- MML terminal

3. Test execution

1. Change the state of speech circuits to NU-US (CEC).
2. Delete A-interface speech circuits and routes (RCD, RRD).
3. Change the states of SCCP services (NGC, NHC).
4. Set SCCP broadcast status (OBM, OBC).
5. Delete SCCP services for own signaling point and for destination point. (NFR, NPD, NFT).
6. Change states of the signaling links and route sets to UA-INU (NLC, NVC).
7. Deny activation of signaling links and route sets (NLD, NVD).
8. Delete signaling link from link set (NSR).
9. Delete signaling route sets (NRD).
10. Delete signaling sets (NSD).
11. Delete own signaling point (NRP).
12. Delete signaling link (NCD).

13a. Change the state on the ET to SE-NH (USC).

13b. This step is made with TCSM2 only. Change the state of TCSM to SE-NH (USC). Disconnect TRCO and all ETs of TCSM (WUD and WGD).

14. Change the state of ET to SE-NH (USC).
15. Disconnect the ET (WUD).

4. Expected results

Deletions are successful

1.13 STS0500B0010 State management of the BSC's logical radio network

1. Test purpose

To check how the TRX, BTS and BCF state changes can be done

2. Required test environment

- Before you changes state of TRX, BTS and BCF, A-bis interface must be created

3. Test execution

1. Change the administrative states of each new TRX to UNLOCKED:
   Command: ERS
   The administrative state of TRX(s) is updated to UNLOCKED in BSC's database. The operative state of TRX(s) and TSL(s) remain BLOCKED-USER (BL-USR) because BCF and BTS controlling the TRX(s) are in administrative state LOCKED.
   When changing object administrative state a notice is printed in order to inform of the state change. This notice should also exist in BTS alarm history.
2. Change the administrative state of the BTS(s) to UNLOCKED:
   Command: EQS
   The administrative state of BTS(s) is updated to UNLOCKED in BSC's database. The operative state of BTS(s), TRX(s) and TSL(s) remains BLOCKED-USER (BL-USR) because the BCF controlling the BTS(s) is in administrative state LOCKED.
   When changing object administrative state a notice is printed in order to inform of the state change. This notice should also exist in BTS alarm history.
3. Change the administrative state of the BCF to UNLOCKED:
   Command: EFS
   The BCF UNLOCK operation causes the BCF site reset. A default software package of the BCF and BSC radio network configuration data stored in BSC is transferred to BTS site. The software package of the BCF is not transferred to BTS site in case the BCF software package has been transferred successfully to non-volatile memory of the BCF in connection with package attachment (EWA).
   When changing object administrative state a notice is printed in order to inform of the state change. This notice should also exists in BTS alarm history. The BCF reset status can be monitored by using following commands:
   Commands: EEI, ERO
   The operative state value BLOCKED-RESET (BL-RST) of BCF, BTS(s), TRX(s) and TSL(s) indicates the BTS site reset is going on at the moment. After successful BTS site reset procedure, the BCF, BTS(s), TRX(s) and TSL(s) operational states receive values WORKING which indicates that those radio resources are initialized and available for call control purposes

4. Expected results

1. States changes succeed

1.14 STS0000B0003 State changes and diagnostics

1. Test purpose

To verify that state changes are successful

2. Required test environment

- MML terminal
- BSC equipped with CP6MX in MCMU, PCU and AS7-X in BCSU.

3. Test execution

1. Print the working states of the units on the printer with command: USI:::,LPT0; Execute next four steps for all the units (except ETs) on the list, one unit at the time.
2. Change the state of the unit to TE (USC)
3. Change the state of the unit to SE (USC)
4. Change the state of the unit to TE (USC) and run the diagnostics for each unit (UDU).
5. Change the state of each unit to SP/WO, BCSUs to state SE-NH (USC).
6. Change the state of both the MB's one at the time from SP to TE -> SE -> TE and run diagnostics (UDU). Change the state from TE to SP -> WO.
7. Check that the alarms are updated correctly also in NMS / 2000.

4. Expected results

All the state changes were successful.
Diagnostics of all units were OK.

2. FAULTS

2.1 STS0001B0015 Fault in AS7 of OMU

1. Test purpose

   The purpose of this test is to verify the correct working of BSC in case of the AS7 of OMU fails.

2. Required test environment
   - OMU in WO-EX.
   - OMU in TE-EX.

3. Test execution
   1. Make a test call. Check that OMU is in WO-EX. Remove LAPD controlling AS7 from the rack. Place AS7 back again after the unit has been noticed faulty by the system and returned to SE-OU state. Make a new test call.
   2. Change the state of OMU to TE-EX. Remove AS7 from the rack. Place the AS7 back again.

4. Expected results
   1. The first call is on all the time. OMU is restarted to the same state as it was before the removal.
   2. Nothing happens.

2.2 STS0001B0003 Fault in AS7 of BCSU

1. Test purpose

   The purpose of this test is to verify the correct working of BSC in case of the AS7 of BCSU fails.

2. Required test environment
   - BCSU in WO-EX. BCSU has both Abis-link and A-link in control.
   - BCSU in SP-EX.
   - BCSU in TE-EX.

3. Test execution
   1. Make a test call. Choose the BCSU which controls the call. Remove one of the AS7s from the rack. Place the AS7 back again after the unit has been noticed faulty by the system and returned to SE-OU state. Make a new test call.
   2. Choose one of BCSUs in SP-EX. Repeat the test as in 1.
   3. Change the state of one BCSU to TE-EX. Remove one of the AS7s from the rack. Place the AS7 back again.

4. Expected results
   1. The first call is released. Switchover is generated. The new call is successful.
   2. BCSU is restarted to the same state as it was be-fore the removal. In BSC3i the unit have to be restarted.
      The first call is on all the time.
   3. Nothing happens.

2.3 STS0001B0002 Fault in MBIF of BCSU

1. Test purpose

   The purpose of this test is to verify the correct working of BSC in case of the MBIF of BCSU fails.

2. Required test environment
   - BCSU in WO-EX state. BCSU has both Abis-link and A-link in control.
   - BCSU in SP-EX state.
   - BCSU in TE-EX state.

3. Test execution
   1. Make a test call. Choose the BCSU which controls the call. Remove the active MBIF from the rack. Place MBIF back again. Make a new test call.
   2. Choose on of BCSUs in SP-EX. Repeat the test as in 1.
   3. Change the state of one BCSU to TE-EX. Repeat the test as in 1.

4. Expected results
   1. Switchover between MBs is generated. The first call is on all the time. The BCSU is working all the time.
   2. Switchover between MBs is generated. The first call is on all the time. The BCSU is in spare state all the time.
   3. Nothing happens.

2.4 STS0900O0001 Fault in SERO-T of OMU

1. Test purpose

The purpose of this test is to verify the correct working of BSC in case of the SERO-T of OMU fails.

2. Required test environment
    - Static control wrist strap

3. Test execution
    1. Make a test call. Check that OMU is in WO-EX (ZUSI) remove SERO-T from the rack. (Use Static control wrist strap !)
    2. Check from NMS that this BSC MML and alarms are still available
    3. Place SERO-T back again
    4. Reset the OMU

4. Expected results
    1. The first call is on all the time
    2. BSC local MML and printer connections are missing
    3. MML and printer connections works via NMS

2.5 STS0001B0026 Fault in SW64B of GSWB

1. Test purpose

The purpose of this test is to verify the correct working of BSC in case of the SW64B of GSWB fails.

2. Required test environment
   - MCMU in WO-EX.
   - MCMU in SP-EX.
   - MCMU in TE-EX.

3. Test execution
   1. Make a test call. Choose the MCMU in WO-EX. Remove SW64B from the rack. Place SW64B back again after unit has been noticed faulty by the system and returned to SE-OU state.
   2. Choose the MCMU in SP-EX. Repeat the test as in 1.
   3. Change the state of spare MCMU to TE-EX. Remove SW64B from the rack. Place the SW64B back again.

4. Expected results
   1. The Switchover is generated. The call is successful. MCMU is restarted to SP-EX state.
   2. MCMU is restarted to the same state as it was before the removal. The first call is on all the time.
   3. Nothing happens.

2.6 STS0001B0007 Fault in SWCOP-S of MCMU

1. Test purpose

   The purpose of this test is to verify the correct working of BSC in case of the SWCOP-S of MCMU fails.

2. Required test environment
   - MCMU in WO-EX.
   - MCMU in SP-EX.
   - MCMU in TE-EX.

3. Test execution
   1. Make a test call. Choose the MCMU in WO-EX. Remove cable from SWCOP-S. Place cable to SWCOP-S back again after the unit has been noticed faulty by system and returned to SE-OU state.
   2. Choose the MCMU in SP-EX. Repeat the test as in 1.
   3. Change the state of spare MCMU to TE-EX. Remove cable from SWCOP-S. Insert cable to SWCOP-S back again.

4. Expected results
   1. Switchover is generated. The call is on all the time.
   2. MCMU is restarted to the same state as it was before the removal. The call is on all the time.
   3. Nothing happens.

2.7 STS0001B0018 Fault in WDU

1. Test purpose

The purpose of this test is to verify the correct working of BSC in case of the WDU fails.

2. Required test environment
   - OMU in WO-EX. WDU-0 as WDU-S (ZIWQ). Both WDUs in WO-BU (ZISC).
   - OMU in WO-EX. WDU-1 as WDU-S (ZIWQ). Both WDUs in WO-BU (ZISC).
   - Both WDUs in WO-BU. WDU-0 = WDU-S
   - Both WDUs in WO-BU. WDU-1 = WDU-S
   - Both WDUs in WO-BU.

3. Test execution
   1. Make a test call. Cut power off from WDU-0. Cut power on again after the WDU has been noticed faulty by the system and returned to TE-ID state. Change state of WDU-0 from TE-ID to WO-ID (ZISC) and then to WO-BU. Then restart OMU.
   2. Make a test call. Cut power off from WDU-1. Cut power on again after the WDU has been noticed faulty by the system and returned to TE-ID state. Change state of WDU-1 from TE-ID to WO-ID (ZISC) and then to WO-BU. Then restart OMU.
   3. Change the WDU-B to WO-ID, TE-ID (ZISC). Give disk related MML commands (ex. commands ZAHP and so on).
   4. Change the WDU-B to WO-ID, TE-ID (ZISC). Give disk related MML commands (ex. commands ZAHP and so on).
   5. Take the connector in the back panel of SCSIF or SERO-T plug-in unit which goes to the WDU-B. This is not applicable in case of BSC3i. Give disk related commands (e.g. commands ZAHP and so on).

4. Expected results
   1. Switchover is generated. The call is on all the time. After OMU restart the alarms 2692 and 2870 (or 2861 in case of BSC3i) are cancelled by the system.
   2. Switchover is generated. The call is on all the time. After OMU restart the alarms 2692 and 2870 (or 2861 in case of BSC3i) are cancelled by the system.
   3. MML commands can be still executed on WDU-B (ex. command ZAHP and so on).
   4. MML commands can be still executed on WDU-B (ex. command ZAHP and so on).
   5. WDU-B state to TE-ID. MML commands can be still executed on WDU-B (ex. command ZAHP and so on).

2.8 STS0001B0016 Fault in HWAT of OMU

1. Test purpose

   The purpose of this test is to verify the correct working of BSC in case of the HWAT of OMU fails.

2. Required test environment
   - OMU in WO-EX.
   - OMU in TE-EX.

3. Test execution
   1. Make a test call. Check that OMU is in WO-EX. Remove HWAT from the rack.
   2. Change the state of OMU to TE-EX. Remove HWAT from the rack. Place the HWAT back again.

4. Expected results
   1. The first call is on all the time. Alarm 2760 “HWAT failure” is printed, but OMU stays in WO-EX to enable OMC connections all the time. The alarm is cancelled after HWAT is replaced and OMU restarted by MML.
   2. Nothing happens.

2.9 STS0501B0014 Fault in SCSIF of OMU

1. Test purpose

   The purpose of this test is to verify the correct working of BSC in case of the SCSIF of OMU fails.

2. Required test environment
   - BSC and BTS

3. Test execution
   1. make a test call. Check that OMU is in WO-EX (ZUSI) remove SCSIF from the rack.
   2. check from NMS that this BSC MML and alarms are still available
   3. place SCSIF back again
   4. reset the OMU

4. Expected results
   1. The first call is on all the time
   2. BSC local MML and printer connections are missing
   3. MML and printer connections works via NMS

2.10 STS0001B0025 Fault in AC25-S of OMU

1. Test purpose

   The purpose of this test is to verify the correct working of BSC in case of the AC25-S of OMU fails.

2. Required test environment
   - OMU in WO-EX.
   - OMU in TE-EX.
   - There is an analog O&M connection to OMC created in BSC

3. Test execution
   1. Make a test call. Check that OMU is in WO-EX (ZUSI). Remove AC25-S from the rack. Place AC25-S back again after the link has been noticed faulty by the system. Make a new test call.

   2. Change the state of OMU to TE-EX (ZUSC). Remove AC25-S from the rack. Place the AC25-S back again.

4. Expected results
   1. The first call is on all the time.
   2. Nothing happens.
   3. O&M connection recovers correctly.

2.11 STS0001B0020 Hardware error in CLAB

1. Test purpose

The purpose of this test is to verify the correct working of BSC in case of CLAB fails.

2. Required test environment
   - CLAB in WO-EX.
   - CLAB in SP-EX.
   - CLAB in TE-EX.

3. Test execution
   1. Make a test call. Choose the CLAB in WO-EX (ZUSI). Remove CLAB from the rack. Place CLAB back again after unit has been noticed faulty by the system and returned to SE-OU state. Make a new test call.
   2. Choose the CLAB in SP-EX. Repeat the test as in 1.
   3. Change the state of spare CLAB to TE-EX (ZUSC). Remove CLAB from the rack. Place CLAB back again.

4. Expected results
   1. The first call is on all the time. Switchover is generated.
   2. The first call is on all the time. CLAB is restarted to the same state as it was before the removal.
   3. The first call is on all the time. Alarm 2761 is set. Alarm is cancelled after CLAB is installed and restarted to SP-EX.

2.12 STS0001B0019 Hardware error in CLS

1. Test purpose

   The purpose of this test is to verify the correct working of BSC in case of CL1TG fails.

2. Required test environment
   - CLS in WO-EX.
   - CLS in SP-EX.
   - CLS in TE-EX.

3. Test execution
   1. Make a test call. Choose the CLS in WO-EX. Remove power cable from back of CL1TG from the rack. Place power cable back again after unit has been noticed faulty by the system and returned to SE-OU state. Make a new test call.
   2. Choose the CLS in SP-EX. Repeat the test as in 1.
   3. Change the state of spare CLS to TE-EX. Remove CL1TG from the rack. Place the CL1TG back again.

4. Expected results

   1. The first call is on all the time. Switchover is generated.
   2. CLS is restarted to the same state as it was before the removal.
   3. Nothing happens. After placing back the card the unit could become SP-EX.

NOTE

PCM link goes through CLS1 to CLS0, so if CLS1 is SE-OU then the CLS0 can't have link connection

2.13 STS0001B0021 Hardware error in SBUS

1. Test purpose

The purpose of this test is to verify the correct working of BSC in case of SBUS fails.

2. Required test environment
   - SBUS in WO-EX.
   - SBUS in SP-EX.
   - SBUS in TE-EX.

3. Test execution
   1. Make a test call. Choose the SBUS in WO-EX (ZUSI). Remove SBUS cable from HWAT. Place SBUS cable back again after unit has been noticed faulty by the system and returned to TE-EX(info BYSY) state. Make a new test call.
   2. Choose the SBUS in SP-EX. Repeat the test as in 1.
   3. Change the state of spare SBUS to TE-EX (ZUSC). Remove SBUS cable from HWAT. Place SBUS cable back again.

4. Expected results
   1. The first call is on all the time. Switchover is generated.
   2. The first call is on all the time. SBUS is restarted to the same state as it was before the cable removal.
   3. Nothing happens.

2.14 STS0001B0024 Power breakdown of the whole system

1. Test purpose

The purpose of this test is to verify the correct working of BSC in case of power breakdown of the whole system.

2. Required test environment
- Check that the system is in the normal state with command USI;.

3. Test execution
1. Make a call.
2. Disconnect the power from the system.
3. Connect the power to the system. Check by using service terminal that the system is started and begins loading the software from the local disks. Check that software is loaded correctly to every unit also.
4. Output the states of all the units.
5. Make a new call.

4. Expected results

1. The first call is cut. All the units are restarted to the same state as they were before the power breakdown. The new call successful after the system has restarted.

3. SWITCHOVERS

3.1 STS0002B0009 BCSU controlled switchover in case of only A- or ABIS ET configured.

1. Test purpose
   The purpose of this test is to verify the correct working of BSC in case of BCSU controlled switchover when A- and Abis interfaces are configured own BCSUs.

2. Required test environment
   - Abis interface is created for BCSU 1
   - A-interface is created for BCSU 2
   - one BCSUs is spare unit.

3. Test execution
   1. make a call
   2. make Abis BCSU switchover (ZUSC)
   3. make A-if BCSU switchover
   4. make the new call.

4. Expected results
   1. After switchover former spare BCSU is in working state and call is going on.
   2. A-if BCSU switchover drop down A-if links and call is also cut off.
   3. the new call is possible after A-if links recovery

NOTE: Consecutive switchovers shall be tested also, test execution is as above.

3.2 STS0002B0005 BCSU switchover during a BTS downloading

1. Test purpose

   The purpose of this test is to verify the correct working of BSC in case of controlled switchover of BCSU during a BTS downloading.

2. Required test environment
   - One of the BCSUs is working and the other is a spare.

3. Test execution
   1. Make as many calls as possible (at least one MS-MS and one MS-PSTN). Download BTS software (e.g. ZEWV). Make BCSU switchover by MML during BTS software downloading (ZUSC).
   2. Make new calls.

4. Expected results
   1. Former spare BCSU is now in working state. Calls have been released.
   2. New calls can be made after BTS software downloading is completed.

3.3 STS0002B0004 BCSU switchover during a TRX reconfiguration

1. Test purpose

The purpose of this test is to verify the correct working of BSC in case of controlled switchover of BCSU during a TRX reconfiguration

2. Required test environment
    - One of the BCSUs is working and the other is a spare.

3. Test execution
    1. Make BCSU switchover by MML (ZUSC).
       Reconfigure one of working TRX (ZERM)
    2. Establish calls.

4. Expected results
    1. Former spare BCSU is now in working state. TRX reconfiguration is successful.
    2. Calls can be made after TRX reconfiguration.

3.4 STS0002B0003 BCSU switchover during call and handovers

1. Test purpose

The purpose of this test is to verify the correct working of BSC in case of controlled switchover of BCSU during active call and handovers.

2. Required test environment
   - One of the BCSUs is working and the other is a spare.
   - At least two BTS's under one BSC.
   - BTSs are neighbor cells.

3. Test execution
   1. Make as many calls as possible (at least one MS-MS and one MS-PSTN) and set the parameters so that handovers are done. Make BCSU switchover by MML (ZUSC).
   2. Release the calls and make new calls.

4. Expected results
   1. Former spare BCSU is now in working state. A part of handovers are made to another cell and a part of them still remain in the source cell. Calls are still on.
   2. Calls are released properly and new calls can be made.

   NOTE: Consecutive switchovers shall be tested also. Test execution is as above but calls are not released between the switchovers.

3.5 STS0002B0001 Controlled switchover of MCMU

1. Test purpose

To verify the correct working of BSC in case of controlled switchover of MCMU.

2. Required test environment

- MCMU-0 in WO-EX, MCMU-1 in SP-EX.

3. Test execution
    1. Make as many calls as possible (at least one MS-MS and one MS-PSTN). Make the switchover from MCMU-0 to MCMU-1, by command ZUSC:MCMU,0:SP; After switchover release the calls and make new calls
    2. Make as many calls as possible (at least one MS-MS and one MS-PSTN). Make the switchover from MCMU-1 to MCMU-0, by command ZUSC:MCMU,1:SP; After switchover release the calls and make new calls

4. Expected results

1-2. After the switchover calls can be released and made again.
No hanging resources. The notices of switchovers should be printed.
NOTE: Consecutive switchovers shall be tested also. Test execution is as above but calls are not released between switchovers.

4. RESTARTS

4.1 STS0003B0006 Controlled restart of BCSU

1. Test purpose

   The purpose of this test is to verify the correct working of BSC in case of controlled restart of BCSU.

2. Required test environment
   - BCSU in WO-EX.
   - BCSU in SP-EX.
   - BCSU in TE-EX.

3. Test execution
   1. Make a test call. Choose the BCSU which controls the call. Restart the BCSU by MML-command ZUSU:BCSU,0;
      Make a new test call.
   2. Choose one of BCSUs in SP-EX. Repeat the test as in 1.
   3. Change the state of one BCSU to TE-EX. Repeat the test as in 1.

4. Expected results
   1. The first call is released. The BCSU is restarted to the same state as it was before the restart. The new call is successful.
   2. - 3. The first call is on all the time. The BCSU is restarted to the same state as it was before the restart.

4.2 STS0003B0007 Controlled restart of BSC

1. Test purpose

   The purpose of this test is to verify the correct working of BSC in case of controlled restart of BSC.

2. Required test environment
   - Check that the system is in the normal state with command USI;.

3. Test execution
   1. Restart the whole system by MML-command
      ZUSS:SYM:C=DSK;
   2. Check by using service terminal that the system is started and begins loading the software from the local disks. Check that software is loaded correctly to every unit.
   3. Output the states of all the units (ZUSI)

4. Expected results
   1. All the units are restarted to the same state as they were before the restart.
   2. Calls can be made after system restart.
   3. Calls can be made also after system restart and individual unit restart (BCSU,MCMU).

   NOTE: After system reset must be tested that kind of cases where BCSU, MCMU and OMU will be reset separately again.

4.3 STS0003B0004 Controlled restart of OMU

1. Test purpose

   The purpose of this test is to verify the correct working of BSC in case of controlled restart of OMU.

2. Required test environment
   - OMU in WO-EX.
   - OMU in TE-EX.

3. Test execution
   1. Make a test call. Check that OMU is in WO-EX.
      Restart OMU by MML-command ZUSU:OMU;
   2. Change the state of OMU to TE-EX. Repeat the test as in 1.

4. Expected results
   1. - 2. The call is on all the time. OMU is restarted to the same state as it was before the restart.

4.4 STS0003B0005 Controlled restart of MCMU

1. Test purpose

   The purpose of this test is to verify the correct working of BSC in case of controlled restart of MCMU.

2. Required test environment
   - MCMU in WO-EX.
   - MCMU in SP-EX.
   - MCMU in TE-EX.

3. Test execution
   1. Make a test call. Choose the MCMU in WO-EX.
      Restart the MCMU by MML-command ZUSU:MCMU,0;
      Make a new test call.
   2. Choose the MCMU in SP-EX. Repeat the test as in 1.
   3. Change the state of MCMU to TE-EX. Repeat the test as in 1.

4. Expected results
   1. The first call is released. System restart is generated. The new call is successful.
   2. - 3. The first call is on all the time. The MCMU is restarted to the same state as it was before the restart.

4.5 STS0003B0003 Spontaneous restart of BCSU

1. Test purpose

   The purpose of this test is to verify the correct working of BSC in case of spontaneous restart of BCSU.

2. Required test environment
   - BCSU in WO-EX.
   - BCSU in SP-EX.
   - BCSU in TE-EX.

3. Test execution

   1a. Make a test call. Choose the BCSU which controls the call (ZEEI). Restart the unit by pushing the reset button of CPU board. Make a new test call.
   1b. The same case as 1a, but two consecutive pushes.
   2. Choose one of BCSUs in SP-EX. Repeat the test as in 1a.
   3. Change the state of one BCSU to TE-EX (ZUSC). Repeat the test as in 1a.

4. Expected results
   1a. The first call is released. The BCSU is restarted to the same state as it was before the restart.
   1b. The first call is released. Switchover is generated. The new call is successful.
   2. - 3. The first call is on all the time. The BCSU is restarted to the same state as it was before the restart.

4.6 STS0003B0002 Spontaneous restart of MCMU

1. Test purpose

   The purpose of this test is to verify the correct working of BSC in case of spontaneous restart of MCMU.

2. Required test environment
   - MCMU in WO-EX.
   - MCMU in SP-EX.
   - MCMU in TE-EX.

3. Test execution
   1. Make a test call. Choose the MCMU in WO-EX.
      Restart MCMU by pushing the reset button of CPU board.
      Make a new test call.
   2. Choose the MCMU in SP-EX. Repeat the test as in 1.
   3. Change the state of MCMU to TE-EX (ZUSC). Repeat the test as in 1.

4. Expected results
   1. The first call is on all the time. Switchover is generated.
   2. - 3. The first call is on all the time. The MCMU is restarted to the same state as it was before the restart.

4.7 STS0003B0001 Spontaneous restart of OMU

1. Test purpose

   The purpose of this test is to verify the correct working of BSC in case of spontaneous restart of OMU .

2. Required test environment
   - OMU in WO-EX.
   - OMU in TE-EX.

3. Test execution

   1a. Make a test call. Check that OMU is in WO-EX. Restart OMU by pushing the reset button of CPU board.
   1b. The same case as 1a, but two consecutive pushes.
   2. Change the state of OMU to TE-EX. Repeat the test as in 1a.

4. Expected results

   1a. The call is on all the time. OMU is restarted to the same state as it was before the restart.
   1b. The call is on all the time. Alarm 2693 is set. OMU has info FLTY. Alarm is cancelled and info cleared when OMU is changed to TE-EX and back to WO-EX manually.
   2. The call is on all the time. OMU is restarted to the same state as it was before the restart.

5. LINK FAILURES

5.1 STS0005B0006 Abis-if link failure, short disturbance

1. Test purpose

   To verify the correct working of BSC in case of Abis-if link failure

2. Required test environment
   - A-layer signaling network is active. Commands: RCI, NFJ.
   - BTSs and TRXs to be needed are operational state working. Commands: EEI, ERO.

3. Test execution
   1. Take a test call, leave the call hanging on.
   2. Disconnect 2M PCM cable from ET where BTSs and TRXs are configured. Place 2M PCM back immediately (less than 1 second disturbance).

4. Expected results

   1. Call stays in conversation mode. Abis LAPD signaling links are working all the time. Radio network is working all the time.

   Note: This test case is not relevant in ANSI environment.

5.2 STS0005B0009 Smuxed Ater-if link failure, disturbance causes MTP pause and reset procedure to A-if

1. Test purpose

To verify the correct working of BSC in case of Ater-if link failure

2. Required test environment
   - A-layer ET is configured and working.
   - Signaling link is working.

3. Test execution
   1. Take a test call, leave the call hanging on.
   2. Disconnect 2M PCM cable from ET where A-layer link is active. Place 2M PCM back after FAULT RATE MONITORING alarm prints out.

4. Expected results
   1. Call is cleared (no hanging recourses). Mobile access class is updated on Abis after MTP pause. The reset procedure is executed on A-layer after MTP is resumed and SCCP subsystem is available.

5.3 STS0005B0011 Smuxed Ater-if link failure, short disturbance

1. Test purpose

To verify the correct working of BSC in case of Ater-if link failure

2. Required test environment
   - Two A-layer ETs configured and working.
   - One signaling link configured and working on both ETs.

3. Test execution
   1. Take a test call, leave the call hanging on.
   2. Disconnect 2M PCM cable from ET where A-layer circuits are reserved. Place 2M PCM back immediately (less than 1 second disturbance).

4. Expected results
   1. Call stays in conversation state. Both signaling links are working.

5.4 STS0005B0008 Synchronization input failure

1. Test purpose
   To check that synchronization input changes when fault detected

2. Required test environment
   - All the three synchronization inputs are connected.
   - Hierarchic synchronization.
   - Both of the timers are set to reasonable value. Command : DRI;

3. Test execution
   1. Remove cable from the back side of ET cartridge where the second highest synchronization input in priority is connected. Wait the value of synchronization signal malfunction tolerance time at least.
   2. Remove cable from the back side of ET cartridge where the highest synchronization input in priority is connected. Wait the value of synchronization signal malfunction tolerance time at least.
   3. Remove cable from the back side of ET cartridge where the lowest one synchronization input in priority is connected. Wait the value of synchronization signal malfunction tolerance time at least.
   4. Install cable to the back side of ET cartridge where the lowest one synchronization input in priority is connected. Wait the value of repaired synchronization input observation time at least.
   5. Install cable to the back side of ET cartridge where the second highest synchronization input in priority is connected. Wait the value of repaired synchronization input observation time at least.
   6. Install cable to the back side of ET cartridge where the highest synchronization input in priority is connected. Wait the value of repaired synchronization input observation time at least.

4. Expected results
   1. Alarm from CLS; “Failure in synchronization signal”. In MMI, command DRI: Synchronization input FAULTY.
   2. Alarm from CLS; “Failure in synchronization signal”. In MMI, command DRI: Synchronization input FAULTY. The system takes the lowest synchronization input in priority to use.
   3. Alarm from CLS; “Failure in synchronization signal”. In MMI, command DRI: Synchronization input FAULTY. The synchronization input mode is changed to plesiochronious.
   4. Alarms caused in test 1 are cancelled. In MMI, command DRI: Synchronization input CONNECTED. The synchronization input mode is changed to hierarchic.
   5. Alarms caused in test 2 are cancelled. In MMI, command DRI: Synchronization input CONNECTED. The system takes the highest synchronization input in priority to use.
   6. Alarms caused in test 3 are cancelled. In MMI, command DRI: Synchronization input CONNECTED.

5.5 STS0005B0007 Abis-if link failure, long disturbance

1. Test purpose

   To verify the correct working of BSC in case of Abis-if link failure

2. Required test environment
   - A-layer signaling network is active. Commands : RCI, NFJ
   - BTSs and TRXs to be needed are operational state working. Commands : EEI, ERO

3. Test execution
   1. Take a test call, leave the call hanging on.
   2. Disconnect 2M PCM cable from ET where BTSs and TRXs are configured. Place 2M PCM back after FAULT RATE MONITORING alarm prints out.

4. Expected results
   1. Call is cleared. Radio network is cut off. TRXs are restarted after the PCM is replaced and FRM is cancelled. The new call is successful.
   2. When call is cleared must be checked also that MSC clears resources.

5.6 STS0500B0018 PCM line fault

1. Test purpose

To verify that TRXs configured on the PCM are blocked out of use and corresponding alarms are printed out.

2. Required test environment
   - Check the status of the signaling network with BSC MML.(ZNEL)
   - Check current alarms in system.(ZAHO)
   - Check that the TRX(s) and the BTS(s) to be tested are in operational state WORKING.(ZEEI)

3. Test execution
   1. Disconnect the PCM-cable in which the TRX(s) of the BTS(s), to be tested, are configured.
   2. Connect the PCM-cable.
   3. Check any new alarms in the system
   4. Check that the alarms are updated correctly also in NMS/2000.

4. Expected results
   1. Operative states of TRX(s) and TSLs configured on the PCM are set BLOCKED - RSL FAULT (BL-RSL). Operative states of BCF and BTS remains 'WORKING'.
   2. Alarm 7767 is set if all TRXs of the BTS are configured on the same PCM.
   3. When the PCM is connected, the TRXs are updated to operational state WORKING and the alarm 7767 is canceled.

5.7 STS0005B0010 Smuxed Ater-if link failure, long disturbance

1. Test purpose

To verify the correct working of BSC in case of Ater-if link failure

2. Required test environment
   - Two A -layer ETs configured and working.
   - One signaling link configured and working on both ETs.

3. Test execution
   1. Take a test call, leave the call hanging on.
   2. Disconnect 2M PCM cable from ET where A-layer circuits are reserved.

   Place 2M PCM back after FAULT RATE MONITORING alarm prints out.
4. Expected results
   1. Call is cleared because of CONN FAIL on Abis-layer with cause value REMOTE TRANSCODER FAILURE.
      Block message from A-layer after disconnecting 2M PCM and unblock message after FRM alarm is cancelled. Both signaling links are working.
   2. When call is cleared must be checked also that MSC clears resources.

6. SYSTEM MAINTENANCE

6.1 STS0611B0002 Alarm when N+1 (spare) unit is taken to use

1. Test purpose

   To verify that system outputs the alarm when spare unit is taken to use

2. Required test environment
   - BSC is working and there is no critical alarms on.
   - One BCSU in SE-NH and the others in WO-EX state.

3. Test execution
   1. Connect one available ET with MML command to SE-NH BCSU
      ZWUC:ET,<nbr>:ET2E,0:IF=A:BCSU,1;
   2. Change the state of the ET and BCSU to WO-EX (ZUSC)

4. Expected results
   1. When confirmation is asked “THERE EXIST NO SPARE CONTROL UNIT AFTER EXECUTION OF THIS COMMAND” is displayed
   2. The state of ET unit changes to WO-EX without problems
   3. The state of BCSU unit changes to WO-EX without problems

6.2 STS0723B0003 Signaling point code modification

1. Test purpose

To verify working of the new modification command

2. Required test environment

- 2 MSC (1 & 2) where this BSC is created with similar (unlocked) data

3. Test execution
    1. Make a call via MSC 1
    2. Lock SCCP parts by command: ZNGC, ZNLC,ZNLD,ZNVC and ZNVD
    3. Change the A-interface PCM of BSC from MSC 1 to MSC 2
    4. Modify signaling point code by command:
       ZNRX:NA0,<MSC_1_spc>:NA0,<MSC_2_spc>:<MSC_2_sp_name>;
    5. Unlock SCCP parts by command: ZNVA, ZNVC, ZNLA, ZNLC and ZNGC
    6. Make a call via MSC 2
    7. Check that the new signaling point code number and name are changed:
       ZNSI,ZNET,ZNHI,ZOBL
    8. Check alarms.

4. Expected results
    1. Call is successful
    5. All unlockings goes well
    6. First call attempt may fail, second call works
    7. The new SPC number and name are updated correctly.
       Note: ZRCI list has old SCP name.
    8. Alarms are canceled after modification

7. SW HANDLING

7.1 STS0904B0004 FULL-fallback and activation of FB-package with NMS

1. Test purpose

FULL-fallback and activation of FB-package with NMS/2000

2. Required test environment
   - BU-package is active
   - FB-package already exist
   - There is no unfinished SW or DB operations
   - NMS/2000

3. Test execution
   1. Start a measurement which updates while taken a MS to MS call
      ZTPM, ZTPS
   2. Make MS to MS call
   3. Take a MML connection to BSC with NMS and do fallback with NMS
      ZWKS:MODE=FULL,NAME=<FB_name>,DIRE=<FB_DIRE>;
   4. Check states of databases as file updating during copying
      ZDBS:<database>,0; DUD;
   5. Check how the copying progress
      ZWKI;
   6. Check the safe copy log with different parameters
      ZWKP:FULL:TOTAL/PHASES/FILE/EMODE:LATEST;
   7. Compare BU- and FB-packages
      ZWQM:STAT=BU:STAT=FB;
   8. Check logs and alarms
   9. Check package history
      ZWQH;
   10. Check states of databases and file updating system
       ZDBS:<database>,0;
       ZDUD;
   11. Check the contents of SCMANA directory and SOMAFI-files in FB-package
   12. Check that ASWDIR-directory is copied to FB-package
   13. Take the FB-package in use
       ZWSD:STAT=FB;
   14. Rollback statuses
       ZWSR;
   15. Check logs and alarms
   16. Check states of databases and file updating system
   17. Check that database and file updating to disk works
   18. Stop measurements
       ZTPE
   19. Check measurements

4. Expected results
   1. FULL-fallback success (BU=FB)
   2. Databases have a state “BACKUP ON” during copying
   3. All phases are found from backup log

4. SCMANA-directory of FB-package includes two SOMAFIGX. In SOMAFIGX.IMG the FB-package is the active package, and information of FB-package is right. The SOMAFIGX.ORG is similar than the SOMAFIGX in original SCMANA.
5. Fallback is found from package history too
6. There is no extra logs or alarms
7. State of databases is normal after copying
8. A notice is printed out about every 10th minutes
9. FB-package works without problems
10. Measurements updates correctly

7.2 STS0904B0005 DATA-fallback with NMS

1. Test purpose

To check correct work of DATA-fallback with NMS

2. Required test environment
   - FB package
   - NMS

3. Test execution
   1. Start a measurement which updates while taken a MS to MS call ZTPM ZTPS
   2. Take a MML connection to BSC with NMS and do DATA-fallback with NMS ZWKS:MODE=DATA;
   3. Check states of databases as file updating during copying ZDBS:<database>,0; DUD;
   4. Check how the copying progress ZWKI;
   5. Check the safe copy log with different parameters ZWKP:FULL:TOTAL/PHASES/FILE/EMODE:LATEST;
   6. Check logs and alarms
   7. Check package history ZWQH;
   8. Check states of databases and file updating system ZDBS:<database>,0; DUD;
   9. Check the contents of SCMANA directory and SOMAFI-files in FB-package
   10. Check that ASWDIR-directory is copied to FB-package
   11. Take the FB-package in use ZWSD:STAT=FB;
   12. Rollback statuses ZWSR;
   13. Check logs and alarms
   14. Check states of databases and file updating system
   15. Check that database and file updating to disk works
   16. Stop measurements ZTPE
   17. Check measurements

4. Expected results
   1. DATA-fallback success (BU=FB)
   2. Databases have a state “BACKUP ON” during copying
   3. All phases are found from backup log
   4. SCMANA-directory of FB-package includes two SOMAFIGX. In SOMAFIGX.IMG the FB-package is the active package, and information of FB-package is right. the SOMAFIGX.ORG is similar than the SOMAFIGX in original SCMANA.
   5. Fallback is found from package history too
   6. There is no extra logs or alarms
   7. State of databases is normal after copying
   8. A notice is printed out about every 10th minutes
   9. FB-package works without problems
   10. Measurements updates correctly

7.3 STS0703B0013 ARCHIVE-fallback after installation of CDs and activation of FB-package

1. Test purpose

Successful ARCHIVE-fallback after installation of CDs

2. Required test environment
   - BU-package is active
   - FB-package exist
   - Some CDs are available on floppy disks
   - There is no unfinished SW- or DB-management operations

3. Test execution
   1. Copy a CDs to CDTEMP-directory
   2. Install the CDs
      (ZWNA:NAME=<old_BU_package>:1.2...;)
   3. Create a new package
      (ZWQC:NAME=<new_BU_package>,DIRE=<BU_dire>:CW=NEW;)
   4. Switch the new package active
      (ZWSS:NAME=<new_BU_package>;)
   5. Take the new package in use. Restart/update the PAID.
      1. OMU
      2. MCMUs
      3. BCSUs
   6. Delete the old package
      (ZWQD:NAME=<old_BU_package>:MAFILE;
   7. Take an ARCHIVE-backup
   8. Check how the copying progress
      (ZWKI;)
   9. Check that new files your have installed are copied to FB-package during backup
   10. Check backup log
       (ZWKP:ARCHIVE:TOTAL/PHASES/FILE/EMODE/::;)
   11. Check package history
       (ZWQH;)
   12. Check logs and alarms
   13. Check states of databases
       (DBS:<database>,0;)
   14. Compare BU- and FB-packages
       (ZWQM:STAT=FB:STAT=BU;)
   15. Check that PAID and CDID is same in FB and BU package (ZWQO:CR;)
   16. Check that all CDs are copied to FB-package
   17. Check that ASWDIR is copied to FB-package too
   18. Check that FB-package includes two SOMAFI: SOMAFI.ORG is similar than the SOMAFI in SCMANA In SOMAFI.IMG the FB-package is the active package, and information of FB-package is right.

19. Change the running package
20. Check logs and alarms
21. Check states of databases
22. Check that updatings of files and database to disks work
23. Rollback statuses (ZWSR;)

4. Expected results
    1. ARCHIVE-fallback success
    2. All changed files are copied
    3. Phases and files are found from backup-log
    4. Backup copying founds from package history
    5. There is no extra logs or alarms
    6. Databases are in normal state after copying
    7. PAID and CDID is same in FB and BU package
    8. FB-package works without problems

7.4 STS0703B0016 Automatic return to old package, installation from NMS, OMU reset loop

1. Test purpose

Automatic return success if OMU goes to reset loop

2. Required test environment
   - BU-package is active and units are working.
   - different kind of CDs are available on FEs disk
   - there is only one package in BU-package directory
   - safe copy of BU-package exist.
   - MML-session from NMS is working

3. Test execution
   1. take a DATA-safe copy of BU-package (ZWKS:MODE=DATA;)
   2. compare BU- and FB-packages (ZWQM:NAME=<BU-package>:NAME=<FB_package>;)
   3. delete old files from CDTEMP directory
   4. copy CDs to CDTEMP directory of BU-package in same order you are going to install them
   5. check that all modules are copied
   6. install CDs (ZWNA:NAME=<BU_package>:1&2...;)
   7. check the information of CDs. (ZWNI and ZWNH)
   8. check from directories that modules are copied and new MAFILE is created
   9. create new SW-package to same directory with different name and status UT

      (ZWQC:NAME=<new_BU__package>,DIRE=<BU_dire>,PAID=,:

      CW=NEW;)
   10. check that information of ZWQO:CR- and ZWQO:EX-commands are right
   11. switch the new package active (ZWSS:NAME=<new_BU_package>;)
   12. check that copied modules and new MAFILE are default versions.
   13. try to update PAID (ZWNJ:UPDATE:NAME=<new_BU_package>;)
   14. allow the automatic return to old package. (ZWSA:TOFB:BOTH)
   15. check that alarm “AUTOMATIC RETURN ON RESTART FAILURE IN FORCE (*) BU->FB 003” and notice “AUTOMATIC RETURN AFTER TIME PERIOD ALLOWED BU->FB 600d” are set
   16. give a controlled reset to the OMU. (ZUSU:OMU,C=DSK)
   17. give two more reset to OMU (reset button)
   18. take a new session from NMS to BSC when OMU is working again
   19. check that default package is changed from BU to FB and alarm UNCONTROLLED CHANGE OF DEFAULT PACKAGE (***) BU->FB” is set
   20. check that system works correctly (ZWQO:CR; ZWQO; USI:COMP:BOTH;)
   21. deny the automatic return to old package. (ZWSB;)
   22. rollback FB->BU->NW. (ZWSR)
   23. delete NW-package and UT-package from same directory.
   24. take a FULL-safe copy of package (ZWKS:MODE=FULL:NAME=FALLBACK:DIRE=FALLBACK;)
   25. check the package history. (ZWQH;)

26. check PAID. (ZWNJ:CHECK:NAME=<BU_name>;)
    NO SUCH FILE error appears
27. check CD information of BU- and FB-package (WNI:NAME=<package_name>; ZWNH:NAME=<package_name>;)
28. check logs.

4. Expected results
    1. default package is changed during third restart
    2. system works correctly
    3. package history information is up-to-date
    4. at the end, system is ready for new installation

7.5 STS0703B0010 CDs are copied to CDTEMP in wrong order

1. Test purpose

Installation of CDs will be interrupt if same load module is in several CD and CDs are copied to CDTEMP in wrong order

2. Required test environment
- Some new CDs are available on floppy disks.
- Same load module is in several CD
- There is only one package in directory

3. Test execution
    1. Copy the CDs to CDTEMP directory from floppy disk. Do the copying in wrong order so, that the default version of load module (same in some CDs) is not the latest one.
    2. Check that all modules are copied.
    3. Install CDs, now right order. (ZWNA:NAME=<BU_name>1&2...;)
    4. Check the information of CDs. (ZWNI and ZWNH)
    5. Delete files from CDTEMP and copy CDs now in right order
    6. Install CDs again
    7. Check the information of CDs. (ZWNI and ZWNH)
    8. Check logs

4. Expected results
    1. CD installation is interrupted.
    2. User is informed with error message
    3. No files are copied
    4. Second installation success.

7.6 STS0703B0009 Multiple change deliveries removing

1. Test purpose

   Successful removing of installed CDs even new load modules are already in use
2. Required test environment
   - BU-package is active
   - Some new CDs are available on floppy disks
   - There is some CDs installed and introduced in BU-package

3. Test execution
   1. Delete old files from CDTEMP
   2. Copy CDs to CDTEMP directory of BU-package in same order you are going to install them
   3. Install CDs (ZWNA:NAME=<old_BU_package>:....;)
   4. Create a new package (ZWQC:NAME=<new_BU_package>,DIRE=<BU_dire>:CW=NEW;)
   5. Check the package history (ZWNH:NAME=<new_BU_package>:STATE=CREATED;)
   6. Switch the new package active. (ZWSS:NAME=<new_BU_package>;
   7. Check that new load modules are default versions
   8. Check the history information (STATE=ACTIVE)
   9. Check which units needs to be restart (ZWNJ:CHECK:NAME=<new_BU_package>;)
   10. Restart/update the PAID in right order
       1. OMU
       2. MCMUs
       3. BCSUs
   11. Check that new load modules are running (ZWQV)
   12. Check that PAID is updated and system works correctly (ZWQO:RUN, ZUSI, ZAHO, logs)
   13. SWITCH the old package active (ZWSS:NAME=<old_BU_package>;)
   14. Check that history information is updated (ZWNH:NAME=<old_BU_package>:STATE=CREATED;)
   15. Check which units needs to be restart to get the old load modules in use (ZWNJ:CHECK:NAME=<old_BU_package>;)
   16. Restart/update the PAID in right order
       1. OMU
       2. MCMUs
       3. BCSUs
   17. Check that PAID is updated and old load modules are back in use
   18. Delete the new package with file deletion (ZWQD:NAME=<new_BU_package>:MAFILE;)

19. Check the history information
    (ZWNH:NAME=<old_BU_package>:STATE=REMOWED;)
20. Check that *.cfl files are removed from ASWDIR
21. Check log writings, alarms and unit states

4. Expected results
    1. Removing success
    2. There is no extra log writings or alarms

7.7 STS0703B0008 Successful multiple change deliveries installation

1. Test purpose

Successful installation and introduction of multiple Change Deliveries

2. Required test environment
   - BU-package is the default and running package
   - There is no nondefault version of MAFILE
   - FB-package exist
   - Some Change Deliveries are available on floppy disks

3. Test execution
   1. Take a DATA-fallback of BU-package
      (ZWKS:MODE=DATA;)
   2. Copy CDs to CDTEMP-directory of BU-package in same order you are going to install them.
   3. Install CDs
      (WNA:NAME=<BU_name>...;)
   4. Check that all load modules are copied to right directories and new MAFILE is created.
   5. Check the CD information and CD history information(STATE=PASSIVE)
      (ZWNI:NAME=<BU_package>:CDID=<cdid>;

      ZWNH:NAME=<BU-name>;)
   6. Create a new package to same directory with BU-package.
      (ZWQC:NAME=<new_package>,DIRE=<BU_dire>:CW=NEW;)
   7. Check the package information and CD history (STATE=CREATED)
      (ZWQO; ZWNH:NAME=<BU_name>;)
   8. Switch the new package to be the active one
      (ZWSS:NAME=<new_package>;)
   9. Check the CD history information (STATE=ACTIVE)
   10. Check that all new load modules and MAFILE are default versions in directories.
   11. Try to update the PAID.
       (ZWNJ:UPDATE:NAME=<new_package>;)
   12. Check the units that needs to restart to get the CD in use.
       (ZWNJ:CHECK:NAME=<new_package>;)
   13. Restart/update the PAID with command in right order:
       1. OMU
       2. MCMUs (if units need to be restart, restart the SP-unit first, do switchover and restart the other (SP) unit)
       3. BCSUs (if units need to be restart, restart the SP-unit first, do switchover to rest of the units)
   14. Check that PAID is updated to all units
       (ZWQO:RUN; ZWNJ:CHECK:NAME=<new_package>;)
   15. Check that installed load modules are active in units.
       (ZWQV: ;)

16. Check that system works correctly (units, alarms, logs)
17. Delete the old package and old load modules from directory
    (ZWQD:NAME=<old_package>:MAFILE;)
18. Take an ARCHIVE-fallback
    (ZWKS:MODE=ARCHIVE;)
19. Check that new load modules are copied to FB-package and the PAID of FB-package is updated.
20. Check the CD history information of FB-package

4. Expected results
    1. Installation of all CDs success
    2. Latest CDID is found from package information of the new package and the repair id is increased
    3. When trying to update the PAID first time with command, the PAID will be updated in order OMU, MCMUs and BCSUs until the first unit that needs to be restart is found.
    4. PAID is updated to all units according installed CDs
    5. History information is up-to-date in every phase
    6. System works correctly

7.8 STS0703B0011 Unsuccessful installation to FB- or UT-package

1. Test purpose

It is not allowed to install CDs to any other packages than BU or NW

2. Required test environment
   - FB- and UT-packages exist
   - There is no other packages in same directory
   - Some CDs are available on floppy disks

3. Test execution
   1. Create CDTEMP-directory to FB-package directory
   2. Copy some CDs to CDTEMP
   3. Try to install CDs to FB-package (ZWNA:NAME=<FB_package>;)
   4. Do same test with UT-package
   5. Check logs

4. Expected results
   1. Both installations are rejected
   2. User is informed with error message

7.9 STS0703B0014 Unsuccessful updating of database to disk during fallback copying

1. Test purpose

   Database updatings to disks are prevented during fallback copying

2. Required test environment
   - BU-package exist
   - FB-package is not the default package
   - There is no MA-list 1

3. Test execution
   1. Start FULL-fallback
      (ZWKS:MODE=FULL,DIRE=<FB_dire>,NAME=<FB_name>;)
   2. Create MA-list
      (ZEBE:1,900;)
   3. Check that MA-list is not found from disks (ZMX:W0-LFILES/BSD012MX.IMG)
   4. Wait until the fallback is complete
   5. Check the backup log.
      (ZWKP:FULL...;)
   6. Check states of databases
      (ZDBS:<database>,0;)
   7. Check that MA-list is found from disks
   8. Delete the MA-list
      (ZEBR:1;)

4. Expected results
   1. The information of the new MA-list is not updated to disks before the fallback is complete

8. Q3

8.1 STS0527B0001 Abis Signaling Link Upload

1. Test purpose
   Purpose of this test is to ensure that LAPD link uploaded correctly between BSC and NMS / 2000
2. Required test environment

   - Before you start this case, you have to check that NMS / 2000 include at least T8 software
3. Test execution
   1. Start Uploading Managed Objects application from the NMS / 2000.
      Open Network Configuration Management from utils menu
      Choose Uploading Managed Objects

   2. In the browser window, select one BSC double click this object
      List of children appears

   3. Select one LAPD from list and start the uploading
      Select Upload menu
      Select Start
      Starting the Uploading Process window appears

   4. Start uploading.
      It should work properly - check in view/status of UMD
      Check that there are no differences between NW and DB.

   5. Create one LAPD link in the OMC database.
      Select BSC and select RNW management.

      Use LAPD link manager application to create link.
   6. Set the parameters of one LAPD link object in the BSC to the minimum values.
      Use TSL values. The values must be between 1...30.
   7. Start the uploading.
   8. After uploading user gets the information about
      Upload status and update status.

      Upload should be DIFFERENT
      Update should be updated
      Check in view details
      Recheck using a max value.
   9. Do the same as in steps 4 - 8 but maximum values
      Use TSL values. The values must be between 0...30.

4. Expected results

   The selected object is uploaded from the BSC.

   Upload results reported by the application.

8.2 STS0710B0001 Management of Trunk reservation threshold tables from NMS/2000

1. Test purpose

Management of Trunk reservation threshold tables from NMS/2000

2. Required test environment

- NMS/2000 with software at least T11.
- Trunk reservation feature and parameter must be on
  ZWOC:10,8,FF;
  ZEQT:BTS=<bts_id>:TR=Y;

3. Test execution
   1. Create trunk reservation table from NMS/2000.
   2. Modify trunk reservation table from NMS/2000.
   3. Interrogate the trunk reservation table.
   4. Delete the trunk reservation table.
   5. Create and delete trunk reservation tables with BSC's MML (ZETC, ZETD).
   6. Check that all changes are made to BSC and NMS/2000.

4. Expected results

   It is possible to create, modify and delete trunk reservation table from NMS/2000. The changes made with BSC's MML are updated to NMS/2000.

8.3 STS0513B0003 Separate Q3 updating from local printout

1. Test purpose

To verify that BTS alarms are updated to the NMS/2000 despite of state of a local printer.

2. Required test environment
   - Working BSC and BTS with NMS/2000-connection
   - BSC alarm printer

3. Test execution
   1. Restart the BCF by command
   ZEFR:<bcf_id>;
   2. Check that the NMS/2000 has BCF initialization alarm 7701
   3. Check that after restart alarm is cancelled

4. Expected results
   1. Alarm updates correctly to NMS/2000.

8.4 STS0710B0002 BSS configuration retrieval to NMS/2000

1. Test purpose

To verify the working of the configuration retrieval of the transmission network elements

2. Required test environment

- Transmission network element (DN2, DMR, TE, TC, SM, BSTE and TCSM2) has to be created before you can upload the information.
- NMS/2000 software T11

3. Test execution
    1. From NMS/2000, Upload the information of the transmission network elements (DN2, DMR, TE, TC, SM, BSTE and TCSM2).

4. Expected results

Upload is successful.

Uploaded information includes the network element type.

8.5 STS0812B0001 Controlled online interface between BSC an NMS/2000

1. Test purpose

   To check that BSC sends only that kind of information to NMS/2000 that the current NMS-release understands

2. Required test environment
   1. Software levels of other network element: NMS/2000 T10

3. Test execution
   1. Check that there isn't S8 mode in use in BSC
      ZDFD:OMU:088E0000,0;
      You can change it by command
      ZDFS:OMU:088E0000,0,11,B;
      answer Y, then give value 36 or 37 (36=S6 mode and 37=S7 mode)
      answer Y
   2. Make a call
   3. Start BSS Radio Resource Online Display from NMS/2000 (NMS/2000: PERFORMANCE MNGT / BSS RADIO RESOURCE ONLINE DISPLAY)

4. Expected results
   1. NMS/2000 shows BSS radio resources correctly
   2. If there is S8 mode in BSC NMS doesn't show anything (T10 SW)

8.6 STS0704O0002 Management Support for Radio Network parameters through Q3

1. Test purpose

Check that Radio Network parameters managements can be done through Q3

2. Required test environment

- Version of NMS/200 release has to be T11 or later.
- Feature RNOS_USAGE_P is activated (ZWOI, ZWOA 10-27)

3. Test execution
    1. Output Base Station Controller parameters (ZEEO:SUP:; ZEEO:MIS:;).
    2. Modify Base Station Controller parameters (ZEEN:...; ZEEQ:...;) and check from NMS/2000 (Radio Network Mgmt --> RNW Parameters) that parameters are also updated there.
    3. Change parameters back to original settings from NMS/2000 site and check them from BSC (ZEEO).
    4. a) Start RXLEVEL and TIMING_ADV measurements from BSC e.g.
       ZTPM:MEASUR,TMING_ADV:MON,9-00-9-15,15:
       TA1=1,TA2=2,TA9=60;
       ZTPM:MEASUR,RXLEVEL:MON,9-00-9-15,15:RX1=1,RX2=2,RX5=60;
       ZTPS:MEASUR,TIMING_ADV:1998-4-27,1998-4-27:;
       ZTPS:MEASUR,RXLEVEL:1998-4-27,1998-4-27:;
       Wait until measurements are enabled and check it with command
       ZTPI:MEASUR::;
       Make a normal call with MS and close call. Check counters updating from the NMS/2000.
       (NMS/2000: UTILS / PERFORMANCE MNGT / DB CONTENTS)
       b) Start same measurements from NMS/2000 and repeat test case
       (NMS/2000: UTILS / PERFORMANCE MNGT / ADMINISTRATION)

4. Expected results

   Base Station Controller parameters changes can be done and these are updated to BSC and NMS/2000.

8.7 STS0812B0002 Start event to NMS/2000, when measurement is started using MML.

1. Test purpose

To check that NMS gets a message when a measurement is started using MML-commands

2. Required test environment
   - Software levels of other network element: NMS/2000 T11

3. Test execution
   1. Modify measurement parameters
      ZTPM:MEASUR,LOAD:ALL,0-0-24-0,15;
   2. Start processor load measurement with command:
      ZTPS:MEASUR,LOAD;
      Message number 1991 from OMU can be checked (ZOQE)
   3. Check the measurement state
      ZTPI:MEASUR,LOAD:;
   4. After a while stop the measurement with command:
      ZTPE:MEASUR,LOAD;
   5. Check that the start event information is sent to NMS (NMS/2000: UTILS / PERFORMANCE MNGT / ADMINISTRATION)

4. Expected results
   1. NMS gets same information than in stop-event

8.8 STS0800B0001 AC25 OSI link failure

1. Test purpose

To verify the correct working of BSC and NMS/2000 in the case of AC25 OSI link failure.

2. Required test environment

- Working BSC and NMS/2000 (AC25 connection)

3. Test execution
    1. Disconnect AC25 cable from the PIU
    2. Create some alarms in BSC
    3. Connect cable to the PIU
    4. Check alarms from NMS/2000

4. Expected results

    Alarms which are created in BSC are uploaded to NMS/2000.

9. TRANSMISSION EQUIPMENT AND SUPERVISION

9.1 STS0723B0002 Call release after loss of TRAU frame synchronization

1. Test purpose

To verify working of transcoder failures parameter

2. Required test environment

- working RNW
- interface signaling analyzer

3. Test execution
    1. modify the number of ignored transcoder failures parameter: ZEEQ:ITCF=3; (default=0)
    2. leave one WO-EX speech circuit to MSC, other are blocked.
    3. take a call mobile to PSTN and monitoring signaling from Abis-if
    4. make trough connection to this speech circuit in TCSM2E (ZWGA)
    5. call is dropped after short delay and alarm 2992 “bts and tc unsynchronization clear calls on A interface”
    6. count “a connection failure” messages with cause “remote transcoder failure” from Abis-if
    7. remove speech circuit trough connection (ZWGR)
    8. modify parameter value back to the default value (ZEEQ)
    9. take a call, verify the quality, release the call

4. Expected results
    1. parameter modification goes well
    2. call is cut after 4 failure messages
    3. alarms are set and canceled right moment from printer and NMS/2000.

9.2 STS0405B0001 Several number of failed calls - alarm.

1. Test purpose

To test that BTS-TC connection establishment works correctly.

2. Required test environment

- Block all but one A-interface circuits.

3. Test execution
    1. Change value of parameter “alarm limit for successive remote tc failures” by MML command ZEGP:10...
    2. Connect timeslot through in Transcoder.
    3. Establish normal call (e.g. MOC). BSC will then release resources connected to this call.
    4. Check that alarm 2992 BTS AND TC UNSYNCHRONIZATION CLEAR CALLS is printed. Repeat this so many times that you have set parameters value. The response on any interface shall be recorded.
    5. Check clear codes from MSC

4. Expected results
    1. An alarm is written to local printer and NMS is informed.
    2. Clear code B16 exist in MSC (TUT:CLR).

9.3 STS0003O0003 Fault management/TRCU, SM2M, DN2, TRU, BIE and SSS fault display

1. Test purpose

To verify that remote MML connection to transmission equipment and service terminal command Fault display works properly.

2. Required test environment

- Q1 service channel is created and TRCU, SM2M, DN2, TRU, BIE and SSS added to the channels

3. Test execution
   1. Start a remote transmission equipment handling session with MML command QUS. The index of the transmission equipment are given as parameters. MML starts to emulate the local service terminal functions. MML returns back to the top service menu with command TOP<cr>, one menu upward with command UP<cr> and back to the MML prompt with command EXIT<cr>. Possible service menu operations are presented in Operating Handbook.
   2. Give command 1, fault display.

4. Expected results

   Service terminal command can be given and fault status is displayed.

9.4 STS0500B0024 Supervision of transmission equipments

1. Test purpose

   To verify the correct working of the supervision of the transmission equipment.

2. Required test environment

   Note: If reversed hunting is used, PCM CIRCUIT(S) are blocked in BSC side (not in MSC).

   - See the function modes and equipments of the service channel to be supervised (ZYEI).
   - Check that the circuit group number 142 by the name Q1 exists, and all circuits used as service channels belong to the group. (ZRCI)
   - Check the settings of the devices (e.g. TRCU, SM2M, DN2 and SSS) (ZQWI).

3. Test execution
   1. Restart the OMU of the BSC.
   2. Check that the supervision start-up succeeds (by command ZQWI;).
      Check writings in the log and possible alarms.
   3. Cause a channel fault to the transcoder unit, remove one TR15 plug-in unit.
   4. Cancel previous channel fault to the transcoder unit.(ZACC,ZACA)

4. Expected results

   1. Alarm 2952 TRANSCODER PLUG-IN UNIT FAILURE is active and PCM CIRCUIT(S) created to this transcoder go to the state of BL-SY.
   2. Alarm 2952 will be cancelled and PCM CIRCUIT(S) will go to the state of WO-EX.

10. TCSM2

10.1 STS0516B0008 Alarm caused TCSM2 diagnostic

1. Test purpose

Check that diagnostic programs of TCSM2 will start after caused alarm

2. Required test environment

- Modify supporting rule command

  ZARM:C:2952,TCSM:2598:::64:N:;

  ZARM:D:2952,TCSM:2598:::64:N:;

3. Test execution

   1. Remove one TR12/TR16 plug-in unit from TCSM2.
   2. After TCSM2 is changed to the state separate (SE-OU) push TR12/TR16 plug-in unit back.
   3. Change TCSM2 state to WO (ZUSC).
   4. Make prerequisite changes back as they were before test case!

4. Expected results

   1. 2952 alarm appears and TCSM2 diagnostic will start.
   2. After diagnostic, a diagnostic report will be printed to the alarm printer and the unit is changed to SE-OU state (faulty).
   3. TCSM2 unit can be changed to the state of WO-EX.

10.2 STS0400B0004 Controlled restart of TCSM2 by MML command

1. Test purpose
TCSM2 restart

2. Required test environment
   - Working TCSM2. Check the state with MML command ZUSI
   - One A-if link created to BSC (ZNEL)

3. Test execution
   1. Make a call
   2. Restart TCSM2 by MML command ZUSU
   3. Check alarms from BSC
   4. Make new calls after the TCSM is working
   5. Check alarms from NMS

4. Expected results
   1. TCSM recovers correctly
   2. Alarms are set and cancelled correctly in BSC and NMS
   3. Calls succeed and speech quality is good

10.3 STS0400B0002 Fault in synchronization

1. Test purpose

Selection of next input in priority when used input fails, incoming PCM-signal missing

2. Required test environment

- TCSM2, 2 PCMs connected to MSC
- VDU connected to TRCO D-connector

3. Test execution
    1. Check the used clock input from local user interface (ZLS)
    2. Remove the incoming PCM-line associated with the used clock input.
    3. Check BSC alarm printer.
    4. Check the used clock input from local user interface

4. Expected results
    1. Alarms printed OK.
    2. Next priority clock input taken into use.

10.4 STS0500B0021 Hardware configuration for TCSM2

1. Test purpose

Hardware configuration management is needed for the TCSM when the TCSM is taken into use as a functional unit in the BSC system maintenance

2. Required test environment

3. Test execution
   1. Create first rack for TCSM
      ZWTJ:TC2E,2A:PSFP=2,PSA=2;
   2. Create cartridge for TC1C
      ZWTC:TC1C,2A88-01:AL=1A120-37-2,P1=2A88-32:;
   3. Create unit for the TCSM
      ZWTU:TCSM,32:2A88-01:;
   4. Create TRCO plug-in-unit
      ZWTP:TCSM,32:TRCO,0,0::GENERAL,4,32,TSL,1:;
   5. Create other cartridges and PIU's
      ZWTC:ET1C,2A120-01::;
      ZWTP:TCSM,32:TR16,0,1:;
      ZWTP:TCSM,32:TR16,1,2:;
      ZWTP:TCSM,32:ET2E,0,0::
   6. Connect TCSM2 for A-interface:
      ZWUC:TCSM,32:TRCO,0:;

      ZWGC:32,1:POOL=5:BCSU,0:;
   7. Change the state of the unit to SE -> TE -> WO (USC)

4. Expected results
   1. Text COMMAND EXECUTED is displayed
   2. Equipment database is updated ZWTI:...

10.5 STS0516B0007 PCM failure during TCSM2 diagnostic

1. Test purpose

Checking the function, when there is a PCM failure during TCSM2 diagnostic from BSC.

2. Required test environment

- TCSM2 in TE-EX (ZUSC)

3. Test execution
    1. Active total diagnosis of the TCSM2 from BSC-site by command ZUDU.
    2. When total diagnosis is executing, remove a PCM-cable from BSC-site and connect it back after alarm.

4. Expected results
    1. Diagnostic program of TCSM2 can be executed.
    2. After diagnostic, a diagnostic report will be printed to the alarm printer if PCM-cable is connected back during diagnostic and the unit stays in the state of test (nothing found).

10.6 STS0516B0002 Power break during TCSM2 software download from BSC

1. Test purpose

Check that software download works after power break failure

2. Required test environment

- Cause damage to TCSM2 software (TRCO, TR or ET program checksum) by PC using some kind of program which can edit HEX-code or load old version of SW.

3. Test execution
   1. Load damaged/old TCSM2 program first in normal way using local VDU. (LAPD-link can't be working)
   2. Change state of the TCSM2 to WO-EX. Start TCSM2 software download from BSC-site by command ZUSU.
   3. Switch power off and on in TCSM2 unit during download.
   4. After download take a test call.

4. Expected results
   1. Load OK, software download from BSC start after system notice that there is TCSM2 old software/checksum error.
   2. TCSM2 restart after power break and download start again.
   3. TRCO,TR or ET program loaded from BSC.
   4. New software loaded on FLASH.
   5. The call is successful.

10.7 STS0400B0006 Spontaneous TRCO restart

1. Test purpose

TCSM2 recovery

2. Required test environment
   - Working TCSM2. Check the state with MML command ZUSI
   - One A-if link created to BSC (ZNEL)

3. Test execution
   1. Set up a call.
   2. Remove TRCO plug-in-unit.
   3. Check alarms from BSC.
   4. Place the TRCO PIU back.
   5. Make new calls after the TCSM is working
   6. Check alarms from NMS

4. Expected results
   1. TCSM recovers correctly
   2. Alarms are set and cancelled correctly in BSC and NMS
   3. Calls succeed and speech quality is good

10.8 STS0400B0007 TCSM2 fault handling, ET failure

1. Test purpose

   A fault in ET plug-in unit of TCSM2 shall be found and all channels served by the faulty ET shall be blocked

2. Required test environment

   - TCSM is in WO-EX state

3. Test execution

   1. Cause a fault to at least two different ET plug-in units in the MSC interface of the TCSM2. If fault is caused ET plug-in unit where is connected two PCMs, diagnostic is started by system and all speech circuits are changed to the state BL-SY

4. Expected results
   1. The fault is found by the TCSM2 internal supervision, alarm 0x2202 ET FAILURE is set and sent to the BSC. BSC alarm system forwards the alarm to the Transcoder channel fault handler (TFHPRB). TFHPRB finds out the corresponding SMUX_PCM in the BSC and blocks all the channels. In BSC the state of the faulty channels changes to BL-SY and in MSC the state of the channels changes to BA-SY.
   2. After the ET fault is repaired, the alarm is cancelled and TFH deblocks the channels.

10.9 STS0717B0002 TCSM2 service terminal enhancement

1. Test purpose

Check that call type is shown in TSL usage output

2. Required test environment

- Network is capable to make FR, HR, DR, EFR and data calls

3. Test execution
    1. Make a terminal connection to TCSM2
       ZDDT:TCSM,<index>;
    2. Make a call
    3. Output PCM-TSL status info,
       ZRM:<TC-PCM_number>

       where TC-PCM_number is the speech circuit that handles current call
    4. Loop stages 3 and 4 by making different types of calls (FR, HR, DR, EFR, data).

4. Expected results

    Call type is printed to the screen correctly

10.10 STS0717B0003 Through connection handling

1. Test purpose

Check that through connections are correctly connected

2. Required test environment

- TCSM2 in WO-EX state
- Free timeslots in A interface PCM

3. Test execution
    1. Set number of through connected channels
       ZWGS:32:3:;
    2. Add through connected channels
       ZWGA:32-31:1-31:;
       ZWGA:32-30:1-30:;
    3. Output current configuration
       ZWGO:32;
       ZWGF:32;
    4. Remove the BSC - TCSM PCM cable
    5. Make a local terminal connection to TRCO
    6. Check LAPD channel state
       ZCS, should be NO CONNECTION
    7. Set through connection
       ZGH:29,1,29
    8. You can verify changes by command
       ZRC:1:1
    9. Connect the PCM cable back
    10. Check the new configuration from BSC
        ZWGF:32;
        It should be similar to the earlier settings. In other words through connections are restored as they are in the BSC (master).
    11. Remove all connections
        ZWGR:32-31

4. Expected results

    Through connection changes are updated from BSC to TCSM

10.11 STS0903B0001 Tandem Free Operation

1. Test purpose

In S9 Tandem Free Operation (TFO) is always in use if call is a MS to MS call, transcoder is TFO capable and the same codec is on both sides. Also usage of TFO shall be enabled. Purpose of this test is to check that this feature works correctly.

2. Required test environment

- TFO capable TCSM2 with FR or EFR codec
- 2 MSs
- 1 PSTN phone
- PRFILE parameter TFO_USAGE (class 2) must be set on in software packaging.

3. Test execution

1. Configurate A-interface so that only either FR or EFR codec is in use.
   Enable TFO usage in TCSM2 with command
   ZRN:<pcm>:<codec>=ON
   Start to transcoder monitoring with command
   ZRM:<pcm>
2. Make a MS to MS call
3. Check that encoding/decoding is not in use.
4. Make a MS to PSTN call
5. Check that encoding/decoding is in use.

4. Expected results

1. TFO is in use
2. TFO is not in use

10.12 STS0718O0001 AEC support for EFR and HR codecs

1. Test purpose

Compare call quality with and without AEC

2. Required test environment
   - BSC with EFR feature on (ZWOI,10,33;)
   - HR and EFR pools are created (EFR only in ANSI)

3. Test execution
   1. Have a terminal connection to the TCSM2
      ZDDT:TCSM,32:;
      and check that AEC for HR and EFR are not active

      ZRC:<TCSM-PCM_index>:10
   2. Make a HR call with an echoing mobile phone and listen the mobile originated acoustic echo from a normal phone.
   3. Perform an EFR call with an echoing mobile phone
   4. Have a terminal connection to the TCSM2
   5. Activate acoustic echo cancellation for EFR and HR
      ZRU:ALL:HR=ON
      ZRU:ALL:EFR=ON
   6. Check the current configuration
      ZRC:<TCSM-PCM_index>:10
   7. Make EFR and HR calls again. You should hear that the acoustic echo is removed.

4. Expected results

   When AEC is set on, speech quality is improved (no acoustic echo).

10.13 STS0622B0002 Diagnostics for TCSM2 ETs

1. Test purpose

Verify that diagnostics for ETs can be done

2. Required test environment

- TCSM2 in TE-EX (ZUSC)

3. Test execution
   1. Start remote session to transcoder:
      DDT:TCSM,32;
   2. Make diagnostics for ETs:
      ZCE:x
         x = 0..3 / ALL
   3. You can display diagnostic results by command
      ZCO
   4. Remove one ET and run diagnostics again
   5. Diagnostic reports an ET failure by command ZCO

4. Expected results
   1. Diagnostics for ETs can be executed.
   2. Report should give a notice about ET failure.

10.14 STS0516B0005 Fault in TR16/TR12

1. Test purpose

Checking the function, in case of the TR16/TR12 of TCSM2 fails

2. Required test environment

- TCSM2 in TE-EX.
- Check the settings of the TCSM2 with remote MML ZDDT. Check that the TCSM2 hardware configuration match to the hardware in the racks. Use service terminal command ZGT.

3. Test execution

    1. Remove one TR16/TR12 plug-in unit and active total diagnosis of the unit TCSM2 from BSC by command ZUDU.
    2. After diagnostic change TCSM2 state to WO-EX (ZUSC)
    3. Cause a channel fault to the transcoder unit by pulling out TR16/TR12 plug-in-unit.
    4. Cancel previous channel fault to the transcoder unit and start plug-in-unit TR16/TR12 again. (ZUP:TR,0)

4. Expected results

    1. Diagnostic programs of TCSM2 can be executed.
    2. After diagnostic, a diagnostic report will be printed to the alarm printer and unit is found faulty (code 3838) and TCSM2 goes to SE-OU state.
    3. Alarm 2952 TRANSCODER PLUG-IN UNIT FAILURE is active and PCM CIRCUIT(S) created to this transcoder go to the state of BL-SY.
    4. Alarm 2952 will be cancelled and PCM CIRCUIT(s) will go to the state of WO-EX

10.15 STS0516B0003 PCM failure during TCSM2 software download from BSC

1. Test purpose

   Check that software download works after PCM failure

2. Required test environment

   - Cause damage to TCSM2 software (TRCO, TR or ET program checksum) by PC using some kind of program which can edit HEX-code or load old version of SW.

3. Test execution
   1. Load damaged/old TCSM2 program first in normal way using local VDU. (LAPD-link can't be working)
   2. Change state of the TCSM2 to WO-EX. Start TCSM2 software download from BSC-site by command ZUSU.
   3. Remove PCM-cable in BSC-site and connect it back after alarm (during download).
   4. After download take a test call.

4. Expected results
   1. Load OK, software download from BSC start after system notice that there is TCSM2 software error.
   2. TCSM2 restart after failure and download start again.
   3. TRCO,TR or ET program loaded from BSC.
   4. New software loaded on FLASH.
   5. The call is successful.

10.16 STS0516B0006 Power break during TCSM2 diagnostic

1. Test purpose

   Checking the function, when there is a power break during TCSM2 diagnostic from BSC

2. Required test environment

   - TCSM2 in TE-EX (ZUSC)

3. Test execution
   1. Active total diagnosis of the TCSM2 unit from BSC-site by command ZUDU.
   2. When total diagnosis is executing, switch TCSM2 unit power off and on.

4. Expected results
   1. Diagnostic program of TCSM2 can be executed.
   2. After power break diagnostic will start again.
   3. After diagnostic, a diagnostic report will be printed to the alarm printer and the unit stay in the state of test.

10.17 STS0516B0010 Sending wired alarms from TC2E rack to BSC

1. Test purpose

   Check that wired alarms from TC2E rack can be send to the BSC

2. Required test environment

   - TCSM2 is in WO state

3. Test execution
   1. Give command ZAW:ON from TCSM2 (Wired alarms are sent to BSC).
   2. Turn power off from other TCSM2 unit.
   3. Turn TCSM2 power on.

4. Expected results
   1. Wired alarms (2960) can be seen from TCSM2 and BSC.
   2. Alarms are cancelled from TCSM2 and BSC.

10.18 STS0400B0003 TCSM2 cold restart to WO state

1. Test purpose
TCSM2 recovery after power off-on

2. Required test environment

- TCSM2, VDU connected to TRCO D-connector

3. Test execution
    1. Turn power on to TC1C cartridge.
    2. Check Pectus startup messages.
    3. Check diagnostic's startup messages.
    4. Check TCSM2 state.
    5. Check speech connections by calling through all channels.

4. Expected results
    1. Pectus start-up-messages OK.
    2. Diagnostics messages OK.
    3. Calls succeed and the speech quality is good.

10.19 STS0717B0004 TCSM2 ET downtime statistics

1. Test purpose

Verify that measurement handling for TCSM ETs works correctly

2. Required test environment

- NMS T11

3. Test execution
    1. Modify measurement parameters
       ZTPM:TRANSM,ET_TCSM:ALL,0-0-24-0,60:;
    2. Start measurement by command:
       ZTPS:TRANSM,ET_TCSM:,:;
    3. Interrogate measurement parameters
       ZTPI:TRANSM,ET_TCSM:;
    4. Remove a PCM cable from TCSM ET and put it back.
    5. Remove ET card from TCSM and wait a while, then put it back.
    6. Measurement can be stopped with following command
       ZTPE:TRANSM,ET_TCSM::;
    7. Counters can be read from NMS or by using FOX extension
       ZLE:1,FOX_BXSX

4. Expected results
    1. Measurement can be modified, started, interrogated and stopped from BSC
    2. Counters are updated to NMS.

10.20 STS0400B0008 TCSM2 remote MMI, co-operation with a remote user in NMS / 2000 site

1. Test purpose

To verify that an another remote MMI user can't interrupt the remote MMI session

2. Required test environment

- TCSM2 is created and O&M D-channel link is in WO-EX state (ZDTF)

3. Test execution
    1. Start a remote session from OMC site with MML command ZDDT
    2. Execute some command RC:1:1 (display channel configuration)
    3. Try to start an another remote session to the same TCSM2 from BSC MML

4. Expected results
    1. TCSM2 commands can be remotely done
    2. The TCSM2 answer on remote MMI start command by the NO FREE REMOTE MMI CONNECTION status.

10.21 STS0500B0023 TCSM2 state changes

1. Test purpose

To check that TCSM2 state changes can be done

2. Required test environment

- TCSM2 is created and O&M link is in WO-EX state (ZDTF:TCSM,32:OMU;)

3. Test execution

Use command USC to change states of TCSM2.

Possible functional states of the TCSM are WO-EX, WO-RE, BL-EX, BL-ID, TE-EX, SE-OU and SE-NH. The state of the TCSM can only be changed by the user with a Working State and Restart Handling MML command (no automatic recovery).

When the user changes the state of the TCSM to BL-EX, all the traffic channels implemented by the TCSM are blocked. The on-going calls are not released, but new calls can not be established. After five minutes the recovery changes the TCSM to state BL-ID.

When the user changes the state of the TCSM to TEst, all the traffic channels implemented by the TCSM are blocked. If the state change is made ForCeD the on-going calls are released.

When the user changes the state of the TCSM to SEparate, the TCSM O&M link is taken out of use.

In trunk interface, TCSM transcoder plug-in unit and TCSM channel fault conditions, the system takes the connection out of use until the error has been corrected.

Calls to faulty connections are diversed to alternative TSLs.

4. Expected results

TCSM2 state changes can be done as told above

Note: Calls are dropped just if the state change is made ForCeD.

10.22 STS0810O0001 TCSM2/ Routine tests of A-if circuits

1. Test purpose

   To check that BSC performs the test to TCSM2 channel in WO-EX state and idle without disturbing the busy channels
2. Required test environment

   - Working BCF exists

3. Test execution
   1. Check the circuit group number
      ZRCI:SEA=3:CGR=<cgr_nr>:PRINT=5;
   2. Modify routine test parameters
      e.g. ZWGT:PARAM:CGR=<CGR_number>,THRESHOLD=30,TEST=ON:;
   3. Take a call
   4. Clear routine test data
      ZWGT:DATA:CGR=<CGR_number>;
   5. Check circuits state
      ZRCI:SEA=3:CGR=<cgr_nr>:PRINT=5;
   6. Check the routine test data
      ZWGI:DATA:CGR=<CGR_number>;
   7. Close a call.

4. Expected results
   1. Circuits are first blocked and then in WO-EX state.
   2. Routine test data is OK.
   3. The call doesn't drop.

10.23 STS1014B0001 Improved transcoder PCM type modification

1. Test purpose

To check that user can modify TC-PCMs without deleting and recreating them with automatic circuit transfer.

2. Required test environment

- TCSM exists and state of the unit is either SE-NH or WO-EX.
- A-interface is created. e.g. FR transcoder PCM type is created, what will be changed to DR, EFR&DR and FR&D144.

3. Test execution

1. Execute next 8 steps (2-9) for all three cases:
   FR->DR, FR->EFR&DR, FR->FR&D144
2. Block speech circuits of the TC-PCM:
   ZCEC:ETPCM=<ETPCM>,CRCT=<CIRCUITS>:BL (or BA);

3: Modify the TC-PCM type (note that the target circuit group has to exist):
   ZWGM:<ETPCM>,<TCPCM>:POOL=<DEST_POOL>:
   NCGR=<DEST_GROUP>;

4. Because the TC-PCM type in the TCSM2 is changed and the TCSM unit is in WO-EX state, the TCSM unit must be restarted. The TCKONF-MML notifies about this during ZWGM-command:
   ZUSU:TCSM,<INDEX>;
5. Unblock speech circuit of the TC_PCM:
   ZCEC:ETPCM=<ETPCM>,CRCT=<CIRCUITS>:WO;
6. Display transcoder PCM types
   ZDDT:TCSM,<INDEX>;
   ZRD;
7. Make necessary changes also to MSC.
   e.g. pool creation...
8. Take test calls using changed PCMs.
9. Check from TCSM which TCH is used.
   ZDDT:TCSM,<INDEX>;
   ZRC:<TCPCM>:5;

4. Expected results

1.TCSM2 PCM type modification can be done.
2. Calls succeeds and speech quality is good.

10.24 STS1014B0002 Improved transcoder PCM type modification, disabled cases

1. Test purpose

To check that user can't modify TC-PCMs between types that use different amount of bits in Ater interface.

2. Required test environment

- TCSM exists and state of the unit is either SE-NH or WO-EX.
- A-interface is created. FR transcoder PCM type is created, what will be changed to HR and HS2. HR transcoder PCM type is created, what will be changed to DR.

3. Test execution

1. Execute next 3 steps (2,3 & 4) for all three cases:
   FR->HR, HR->DR, FR->HS2
2. Block speech circuits of the TC-PCM:
   ZCEC:ETPCM=<ETPCM>,CRCT=<CIRCUITS>:BL;
3: Modify the TC-PCM type (note that the target circuit group has to exist):
   ZWGM:<ETPCM>,<TCPCM>:POOL=<DEST_POOL>:
   NCGR=<DEST_GROUP>;
4. Unblock speech circuits of the TC-PCM:
   ZCEC:ETPCM=<ETPCM>,CRCT=<CIRCUITS>:WO;

4. Expected results

1.TCSM2 PCM type modification can't be done.

11. HW DATABASE

11.1 STS0012B0001 BCF HW database management

1. Test purpose

   After successful creation and activation the database is updated into files and to disks and flash memory in BCF.

2. Required test environment
   - The BSC is in a normal working state
   - There is no HW database in BCF flash memory

3. Test execution
   1. Copy a HW database from floppy into a subdirectory of the disks (/BCF_PACK/HWDATA)
      ZMM:F0-/BTS44OM.TMP,DW0-/BCF_PACK/HWDATA/
   2. Create a HW database command (EVC)
      ZEVC:DATABASE53:NAME=BTS44OM,EXT=TMP;
   3. List existing HW databases (EVL-command)
   4. Attach a HW database to the BCF with EVA command
   5. List HW database configuration of the BCF (EVO-command)
   6. Activate the BCF HW database to a passive state with EVV command.

4. Expected results
   1. The creation command is completed successfully
   2. The HW database can be found among existing databases
   3. The attachment command is completed successfully
   4. The activation command is completed successfully.
   5. The database is moved to the flash according to the BSC's request.
   6. BCF is O&M reset and the database is loaded to the BCF.
   7. The new HW database is the active database.
   8. BTS is working correctly after HW database activation and alarms are going to NMS

11.2 STS0605O0001 BTS HW Database Modification on BSC

1. Test purpose

Successful uploading of database from BSC’s disk to MMI-PC and downloading of database from MMI-PC to BSC’s disk.

2. Required test environment

- MMI-PC is connected to BSC’s service terminal port.
- Created databases are available on BSC’s disk.
- Version of BCF-MMI program have to be B11.0/DF3.0 or newer.

3. Test execution

1. Choose a database ID not attached to upload from BSC’s disk.
   (ZEVL; CONN=0)
2. Upload the database from BSC’s disk to MMI-PC.
4. Choose an attached database ID to upload.
   (ZEVL; CONN<>0)
5. Upload the database from BSC’s disk to MMI-PC.
6. Check that files exist on MMI-PC.
7. Check that database ID you are going to use is not used in BSC.
   (ZEVL)
8. Download the database from MMI-PC to BSC’s disk.
9. Check from BSC’s disk that file is downloaded and new database is created.
   (ZEVL)

4. Expected results

All databases are uploaded and downloaded successfully. After downloading new database is created.

12. HARDWARE TESTS AND RECOVERY

12.1 STS0603B0001 BCCH TRX faulty, when using Abis timeslot allocation

1. Test purpose

Check that it is possible make BCCH reconfiguration, though Abis allocation isn't equal between TRXs

2. Required test environment
   - BCF and BTS are created
   - 16 kbps signaling links for TRXs are created
   - If this feature is used in DE21/DF12 BTS then best result is achieved with SMBS-27 card, but SMBS 23/24/25/26 are also possible.

3. Test execution
   1. Create TRXs using abis allocation
      Create a TRX to use timeslots n and n+1, and set the parameter Subslots_For_Signalling to 2 -> execution print-out corresponds to the command. Configure BCCH to this TRX.
   2. Create another TRX to use timeslots n+2 and n+3, and set the parameter Subslots_For_Signalling to 1 -> execution print-out corresponds to the command.
   3. Unlock the BTS and the TRXs -> the TRXs is WOrking.
   4. Make a call through the TRXs -> success.
   5. Do BCCH TRX faulty -> BCCH is swapped to the another TRX
   6. Make a call through the TRX -> success.

4. Expected results
   1. Creation succeeds
   2. State changes succeeds
   3. Call is successful

12.2 STS0604B0002 BSC MMI for scheduled TRX test

1. Test purpose
   To verify that scheduled TRX tests are possible execute

2. Required test environment

- Version of NMS/2000 release have to be at least T10.
- Here is a table which shows what kind of TRX test can be done on which BTS and test equipments.

Test type	BTS type	Test equipment
TRX test by cable	$2^{nd}/3^{rd}$ gen. BTS	RFTE/STMA or newer
TRX test by air	$2^{nd}/3^{rd}$ gen. BTS	STMA or newer
TRX antenna test	$2^{nd}/3^{rd}$ gen. BTS	RFTE/STMB or newer
TRX loop test	$3^{rd}/4^{th}$ gen. BTS	NONE
antenna loop test	4^{th} gen. BTS	NONE

1 to 15 independent scheduled TRX test can be created in BSC at same time (id's 1 to 15).

3. Test execution
   1. Create a few scheduled TRX tests from NMS/2000. Test times must be given so that tests starts nearly immediately, all the tests at same time and tests are executed only one time.
   2. Interrogate scheduled TRX tests by MMI of BSC using short and long report. (ZUCI)
   3. Stop some scheduled TRX test by MMI of BSC. (ZUCS)
      Test which is stopped with MML-command can't be started again.
   4. After scheduled TRX test is stopped (administrative state is locked), delete it using MMI of BSC. (ZUCD)
   5. Create scheduled TRX test from NMS/2000 using incorrect configuration/parameters.

4. Expected results
   1. Concerned BTS's TRXs will be tested and reported to the NMS/2000.
   2. Short and full report interrogation from MMI of BSC is successfully executed and all information is correct in print-outs.
   3. Scheduled TRX test can be stopped from BSC.
   4. Scheduled TRX test can be deleted from BSC.
   5. When using incorrect configuration/parameter NMS/2000 receives error report from BSC (No Test Equipment Defined For BCF In Question, Invalid Test Equipment Defined For Test In Question, Requested Test Is Not Supported By The Defined Site Type, Invalid Test Parameters, Circuit Not Free)

12.3 STS0501B0022 BTS site reset

1. Test purpose

To check that BTS SW and DB download from BSC works correctly after erasing DB and SW from BTS Flash.

2. Required test environment

- DE34
- BCF software package is created and attached to the BCF.
- BCF HW database is created and attached to the BCF.
- BTS is in the state of WO.

3. Test execution
   1. Erase BTS DB and SW from Flash by OMU-MMI.
   2. Start BTS DB and SW download from BSC by site-reset command ZEFR.
   3. After download activate BTS DB by command ZEVV.
   4. Check by OMU-MMI that BTS SW and DB can be found from Flash.

4. Expected results
   1. BTS DB and SW download to flash from BSC success.
   2. BTS is restarted to same state as it was before site-reset.

12.4 STS0702O0005 Mains power down, BCCH TRX left working

1. Test purpose
Calls are successfully transferred to neighboring cells when handover to BCCH TRX is not possible. All other TRXs but BCCH TRX are powered off due to mains power alarm

2. Required test environment

- Feature BTS_SITE_BATBU_PROC must be activated (ZWOI; ZWOC:9,37,FF;)
- The BTS site has to be equipped with a battery backup unit.
  (BTS alarm inputs can be used to simulate BBU)
- Feature is not available to the Prime Site (DE45/DF45)
- UNLOCKED BCF 1, BTS 1 and 2 TRXs exists.
- UNLOCKED BCF 2, BTS 2 and TRX exist.
- BTSs are defined to be neighboring cells each other.
- BTS site battery backup forced handover timer is set to ten seconds.
  (ZEEM:TIM=10;)

3. Test execution
   1. Lock TCH channels of BCCH TRX 1
      Define shutdown procedure to BCCH TRX left working with A (NTIM) and B (BTIM) timers.
      (ZEFM:<bcf_id>:BBU=BCCH,NTIM=1,BTIM=3;)
      Establish calls on TRX 2
      Cut the mains power supply to the BTS.
   2. No neighbor cells. Lock TCH channels of BCCH TRX 1 Define shutdown procedure to BCCH TRX left working with A and B timers. (ZEFM)
      Use different timer values
      Establish calls on TRX 2
      Cut the mains power supply to the BTS.
      Unlock TCH channels of BCCH TRX 1 before A timer is exceeded.
   3. Define shutdown procedure to ALL left working. (ZEFM:<bcf_id>:BBU=ALL;)
      Establish call on BTS 1
      Cut the mains power supply to the BTS.
      Check current alarms and operative state of TRXs during tests (ZAHO; ZEEI:<bcf_id>;)

4. Expected results

Alarm 7313 Battery Backup Unit mains failure (2nd gen. BTS) or 7995 Mains breakdown with Battery Backup (3rd gen BTS) appears.

1. TRX 2 is set BL-SHD and --> BL-PWR in database and calls are transferred to BTS 2.
2. TRX 2 is set BL-SHD and --> BL-PWR in database and calls are transferred to BCCH TRX.
3. Calls stay on BTS 1.

12.5 STS0703B0005 MOC test call using different threshold values

1. Test purpose
To verify that MOC / Terminating test call is correctly executed when different threshold values are used in test.

2. Required test environment
   - DE21 with STM or DE34 with STM.

3. Test execution
   1. MOC test call will be started by the MML command ZUBG.
      Execute MOC test call with default parameters.
      (Default parameters can be checked by the MML command ZUCV)
      Check that test is passed (ZUBP)
   2. Modify threshold values (ZUCV) of parameters in MOC call:
      Enable cause 34 parameter (no circuit/channel available).
      Lock all TCH channels and execute MOC test call again.
      Check the test report (ZUBP).

4. Expected results
   1. Test is passed.
   2. Test result is failed. Alarm 7739 will be set to failed TRX.

12.6 STS0603O0003 Regular BCCH TRX fault, reuse TRX is available

1. Test purpose
To check that TRX is blocked/deblocked

2. Required test environment

- IUO parameter (UNDERLAY_OVERLAY_US_P) from PRFILE has set on (Parameter 10-23)
- BTS with: 1 Regular BCCH TRX
  1 super-reuse TCH TRX
  1 normal TCH TRX
  Super-reuse TRX can be modified by command: e.g.
  ZERM:BTS=1:TRX=1:FRT=1;

3. Test execution
   1. Generate regular BCCH TRX fault
   2. Take a test call
   3. Cancel BCCH TRX fault

4. Expected results
   1.1. The TRX is set Blocked in database
   1.2. NMS/2000 is updated
   1.3. Swap is done (regular to reuse). BCCH TRX is blocked and super-reuse TCH TRX is configured act as a regular BCCH TRX and the faulty TRX is configured to act as super-reuse.
   1.4. Alarms are correctly in current alarms and in alarm history
   1.5. Call is successful
   2.1. The TRX is set WORKING in database
   2.2. New swap is not done
   2.3. Alarms are correctly in current alarms and in alarm history

12.7 STS0603O0005 Reuse TCH TRX fault

1. Test purpose
TRX fault is generated for TRX having only TCHs

2. Required test environment

- IUO parameter (UNDERLAY_OVERLAY_US_P) from PRFILE has set on (Parameter 10-23)
- BTS with : 1 Regular BCCH TRX
  1 Regular TCH TRX
  1 super-reuse TCH TRX

  Super-reuse TRX can be modified by command:

  e.g. ZERM:BTS=1:TRX=1:FRT=1;

3. Test execution
   1. Generate super-reuse TCH TRX fault.
   2. Take a test call.
   3. Test also situation when there is call on the super-reuse-TRX, when generating fault.

4. Expected results

   1.1. The TRX is set Blocked in database
   1.2. NMS/2000 is updated
   1.3. No swapping is done
   1.4. Call is successful. If there is call on the reuse-TRX when it is selected by recovery the call is lost.
   1.5. Alarms are correctly in current alarms and in alarm history

12.8 STS0702O0003 Save calls by forced handover prior to cell recovery

1. Test purpose

Ensure that calls are saved during cell recovery

2. Required test environment

- Feature Intelligent Underlay-Overlay must be activate. (ZWOC:10,23,FF;)
- 2 Working BTS as adjacent cells.
- BTS 1 with 3 TRXs and BTS 2 with at least 1 TRX.

3. Test execution

1. Working BCCH-TRX, 2 Working TCH TRX. Call established on TCH-TRX, generate fault to BCCH TRX. Set faulty TRX as PREF marked and cancel fault.
2. a) Working BCCH-TRX, 1 Working TCH TRX and working adjacent cell. Call established on TCH-TRX. Generate fault to BCCH-TRX.
b) BCF, BTS, BCCH-TRX is UNLOCKED, TCH-TRX (PREF marked) is LOCKED. Working adjacent cell. Call established on BCCH-TRX. Modify the TCH-TRX administrative sate to UNLOCKED.
3. Working BCCH-TRX, 2 Working TCH TRX and BB hopping is on. Working adjacent cell. Call established on BTS 1.
a) Generate fault to BCCH TRX (call is not on this TRX).
b) Generate fault to TCH TRX (call is not on this TRX).
4. Working BCCH-TRX, 2 Working TCH-TRX and working adjacent cell.
a) Call established on BTS1. Block BTS-1 TRX (which has call on) by local MMI. Test same case again, but lock first other TCH-TRX.
b) Call established on BTS1. Block BTS-1 by local MMI.
5. Working BCCH-TRX, 2 Working TCH-TRX (1 TCH-TRX is super-reuse) and working adjacent cell. Make a new call, HO to super-reuse TCH-TRX. Generate fault to BCCH-TRX. When fault corrected HO is NOT possible back to IUO TRX (make a new call). Same test, but generate fault to normal TCH-TRX (new call).

4. Expected results

1. The TCH TRX calls are handed over to other TCH TRX before the reconfiguration is done.
2. The BCCH reconfiguration is done and calls are handed to adjacent cell.
3. a) If the BTS is baseband hopping all the working TRXs has to blocked, because the hopping parameters are changed. New TRX for BCCH is searched. When TRX for BCCH is found the forced handover procedure is called to handover all the calls from non-faulty TRXs. After handovers, the reconfiguration of the BCCH TRX is done and hopping parameters is updated and all expect the faulty TRX is raised to WO.
b) When BB hopping on TRX gets faulty, all TRXs from that cell has to be blocked. Before that forced handover is executed to those TRXs which are still in state WO. Handover is made to adjacent cell and after that non faulty TRXs are raised WO.

4.a) Local block is done to TRX, that TRXs calls are forced handed over to same cells TRX if there are WO TRXs otherwise to adjacent cell. After that TRX is set to blocked state.

b)Local block is done to BTS. All TRXs are emptied by forced handover to adjacent cell. After that the BTS is set blocked state.

5. When SDDCH or TCH TRX gets faulty and they are regular TRXs then new TRX is searched among super-reuse TRXs. When new TRX is found forced handover is done to same cell TRX if any WO available. Then swap is done and normal recovery will continue.

12.9 STS0603B0002 TRX-link control in PCM fault

1. Test purpose

Check that TRX-link control works properly.

2. Required test environment

- Working network is needed.

3. Test execution
    1. Make Abis PCM fault
    2. Repair the Abis PCM fault
    3. Take a call when mobiles get in service.

4. Expected results
    1. PCM fault alarm comes and mobiles lost service in 12-22 seconds.
    2. TRX links are kept down until PCM fault is disappeared and BSC is ready to make calls.
    3. There is a little delay (1 min) before PCM fault is cancelled and then mobiles get in service. After that calls should be succeeded within a few seconds.

12.10 STS0101B0005 BCCH TRX power breakdown

1. Test purpose

To verify that reconfiguration is successful.

2. Required test environment

- There is hopping BTS.
  ZEQE:BTS=<>:HOP=BB;

3. Test execution

    1. Make a call.
    2. Switch BCCH TRX power off.
    3. Make a call after reconfiguration.
    4. Switch power on.
    5. Make a call after reconfiguration.

4. Expected results

    1. Call is successful.
    2. Reconfiguration is successful, and BCCH moves to the another TRX.
    3. Call is successful.
    4. The faulty TRX may stay CU-fault state after switching power on.
    5. Call is successful.

12.11 STS0101B0003 BTS power breakdown

1. Test purpose
Recovery after BTS power break

2. Required test environment
   - There is at least one real BTS.
   - Some BTSs may have BTS SW in the flash and some may not.

3. Test execution
   1. Make calls.
   2. Switch power off and on in real BTS(s).
   3. When site is up make some calls.
   4. Switch power off and on in real BTS(s).
   5. Give reset to the all BTSs in the generator.
   6. Make calls.

   NOTE! If there is not possible to use traffic generator test calls are run with real mobile phones (as many as possible).

4. Expected results
   1. Calls release, when reset start.
   2. Sites rise up normally.
   3. If BTS loads SW package from the BSC, the SW package is saved to the flash.

12.12 STS0702O0004 Mains power down, BIE/TRU left working

1. Test purpose

Calls are successfully transferred to neighboring cells and all TRXs are powered off due to mains power alarm

2. Required test environment

- Feature BTS_SITE_BATBU_PROC must be activated (ZWOI and ZWOC:9,37,FF;)
- The BTS site has to be equipped with a battery backup unit.
- Feature is not available to the Prime Site (DE45/DF45)
- 2 BCFs
- BTSs are defined to be neighboring cells each other.
- BTS site battery backup forced handover timer is set to ten seconds. (ZEEM:TIM=10;)
- BB-hopping is on

3. Test execution

1. Define shutdown procedure to BIE/TRU left working with A (NTIM) and B (BTIM) timers.
   (ZEFM:<bcf_id>:BBU=NONE,NTIM=1,BTIM=3)
   Establish calls on TRX 2 (non BCCH TRX).
   Cut the mains power supply to the BTS.
   Check current alarms and operative state of TRXs during tests (ZAHO; ZEEI:<bcf_id>;)
2. Test same case also without BB-hopping with different timer values.

4. Expected results

Alarm 7313 Battery Backup Unit mains failure (2nd gen. BTS) or 7995 Mains breakdown with Battery Backup (3rd gen BTS) appears.

After NTIM (1 minute) from mains failure the following happens:

1. The operative state of non-BCCH TRXs which have no calls is changed to BL-PWR.
2. Forced handover for non-BCCH TRXs having ongoing calls starts, and the TRXs operative state is changed to BL-SHD. After the handover the TRXs operative state is BL-PWR.
3. If the cell is baseband hopping also BCCH TRX is blocked (BL-SYS) with forced handover and reconfigured.
4. Finally all non-BCCH TRXs operative state is BL-PWR.

After NTIM + BTIM (4 minutes) from mains failure the following happens:

1. The operative state of BCCH TRXs which have no calls operative state is changed to BL-PWR.
2. Forced handover for BCCH TRXs having ongoing calls starts and their operative state is changed to BL-SHD. After the handover BCCH TRXs operative state is BL-PWR.
3. In the end the operative state of all TRXs is BL-PWR.

Calls are transferred to BTS 2 and not released.

12.13 STS0702B0001 Preferred BCCH TRX

1. Test purpose
Ensure that BCCH TRX is swapped to the pB-marked TRX

2. Required test environment

- Feature can be taken use for example by creating TRX or by modifying TRX with MML command ERC or ERM and setting the preferred BCCH TRX parameter ON. e.g. ZERM:BTS=1:TRX=1:PREF=P:;
- BTS with 3 working TRX

3. Test execution

Take test calls during tests.
1. At 3 TRXs site where is two pB-marked TRXs (1 BCCH TRX and 1 normal TCH TRX).
   Generate BCCH TRX fault (which is pB-marked).
2. Only one pB-marked TRX (BCCH) in BTS. Generate BCCH TRX fault. Cancel BCCH TRX fault.
3. Only one pB-marked TRX (BCCH) in BTS . Generate BCCH TRX fault and lock BCF after reconfiguration. Cancel BCCH TRX fault and unlock BCF .
4. BTS hasn't any pB-marked TRXs. Lock BTS and set pB-mark to some TCH TRX and unlock BTS.
5. BTS hasn't any pB-marked TRXs. Lock and set pB-mark to some TCH TRX and unlock pB-marked TRX.
6. BTS hasn't any pB-marked TRXs. Set some pB-mark to some TCH TRX. Restart BCF or BTS (ZEFR / ZEQS)

4. Expected results
1. BCCH is reconfigured to other working pB-marked TRX.
2 and 3. BCCH is reconfigured to some other working TRX, when the pB-marked TRX is made working again the BCCH is reconfigured back to pB-marked TRX.
4 and 5. The BCCH reconfiguration should appear to pB-marked TRX.
6. BCCH reconfiguration is done only after BCF or BTS restart.
   Calls are successful after recovery.

12.14 STS0603O0004 Regular TCH TRX fault, reuse TRX is available

1. Test purpose
TRX fault is generated for TRX having only TCHs

2. Required test environment

- IUO parameter (UNDERLAY_OVERLAY_US_P) from PRFILE has set on (Parameter 10-23)
- BTS with: 1Regular BCCH TRX
  1 Regular TCH TRX
  1 super-reuse TCH TRX

  Super-reuse TRX can be modified by command:

  e.g. ZERM:BTS=1:TRX=1:FRT=1;

3. Test execution
   1. Generate regular TCH TRX fault.
   2. Take a test call
   3. Cancel TCH TRX fault

4. Expected results
   1.1. The TRX is set Blocked in database
   1.2. NMS/2000 is updated
   1.3. Swap is done (regular to reuse). Regular TCH TRX is blocked and super-reuse TCH TRX is configured act as a regular TCH TRX and the faulty TRX is configured to act as super-reuse.
   1.4. Alarms are correctly in current alarms and in alarm history
   1.5. Call is successful
   2.1. The TRX is set WORKING in database
   2.2. New swap is not done
   2.3. Alarms are correctly in current alarms and in alarm history

12.15 STS0101B0004 SU power breakdown

1. Test purpose
BTS recovery after power break

2. Required test environment
    - There is a big network with at least one real BTS.

3. Test execution
    1. Make lot of calls with generator through the test.
    2. Make calls with real mobiles.
    3. Switch SU-unit(s) power off and on.
    4. Make calls.
    NOTE! If there is not possible to use traffic generator test calls are run wit real mobile phones (as many as possible).

4. Expected results
    1. Calls are released, when power is switched off.
    2. BTS is restarted.
    3. After reset calls are succeeded

13. ADMINISTRATOR FUNCTIONS

13.1 STS0502B0010 Forced handover of internal- and external BTS

1. Test purpose

To verify the correct working of BSC in case of internal- and external cell handover

2. Required test environment

- There are two internal BTSs and one external BTS, which have correct neighbor definitions to each others.

3. Test execution

1. Block external BTS (ZEQS)
2. Make a call and do not release it during test.
3. Lock that internal BTS, which has a call, with FHO parameter.
4. After handover, unlock internal BTS.
5. When both internal BTSs are working state, make a another call and lock another internal BTS.
6. Unlock internal BTS.
7. Make a call through both BTSs.
8. Unblock external BTS and block another internal BTS
9. Repeat test with external BTS

4. Expected results

1. Handovers occurs and calls do not release.
2. Lock/Unlock succeeds.

13.2 STS0102B0002 Spontaneous restart of FU

1. Test purpose

The purpose of this test is to verify the correct working of BSC in case of spontaneous restart of FU .

2. Required test environment

- Working BCF exists.

3. Test execution

    1. Press reset button from the FU board.

4. Expected results

    1. After FU is restarted again, TRX is working.
    2. Telecom LAPD cuts off.
    3. Calls are cut off by BSC.
    4. The capacity of BTS decreases because of unavailable frequency.
    5. If this FU has BCCH, BCCH is reconfigured to another FU by BSC.

13.3 STS0003O0004 SW background downloading during session

1. Test purpose

The BCF remote MMI session succeeds although background downloading of the SW package is done during it.

2. Required test environment

- BCF is created.
- A PC with OMU MMI is connected to the BSC OMU via RS232 cable.

3. Test execution

   1. Create BCF remote MMI session from OMU MMI or from test-PC.
   2. Attach the SW package to a BCF.
   3. Wait until SW package downloading is finished.
   4. Send data message from PC.
   5. Check the messages are received (with GPA).

4. Expected results

   1. The BCF remote session is created successfully.
   2. The SW package downloading is completed successfully.
   3. The messages are transferred correctly after SW package downloading.
   4. The BCF remote session is closed successfully.

13.4 STS0702B0002 TRX locking with forced handover

1. Test purpose
Ensure TRX locking with forced handover

2. Required test environment

- 2 working BTS.

3. Test execution
    1. 1 BTS with 2 working TRXs.
       Take test calls and lock TRX which has calls on with forced HO. e.g. ZERS:BTS=x,TRX=y,:L:FHO,:; (default time limit 10 seconds)
    2. 2 working BTS. First BTS has free traffic channels only in one TRX.
       Take test calls on first BTS and lock TRX which has calls on with forced HO. Use different FHO time as default.
    3. 1 BTS with 1 working TRX.
       Take test calls and lock TRX which has calls on with forced HO.
    4. BTS is unlocked and site is Baseband Hopping.
       Take test calls and lock TRX which has calls on with forced HO.
    5. a)BTS's operational state is WO and O&M link is out of order.
       b)TRX's administrative state is locked or operational state is not WO.
       Lock TRX with forced HO.
    6. Test TRX locking with forced HO also from NMS site.
       (T11 software for NMS/2000 is needed.)

4. Expected results

Locking the BCCH TRX with forced handover option is possible. The BCCH transmission is interrupted, which prevents from establishing new calls but ongoing calls through the other TRXs of the cell are not disturbed.

1. Calls will handed over to other TRX of the cell.
2. No free traffic channels on the same cell, calls will be handed over to other cell.
3. No free traffic channels available, calls are lost and channels are blocked after time limit expires
4. Locking fails. Locking of a TRX in a baseband hopping cell requires locking of the whole cell first.
5. Locking fails.
6. TRX locking with forced HO success also from NMS/2000.

13.5 STS0102B0006 BTS forced handover

1. Test purpose

Calls are not released during BTS locking

2. Required test environment

- There is two BTSs, which have correct neighbor definitions to each others

3. Test execution

1. Make a call and do not release it during test.
2. Lock that BTS, which has a call, with FHO parameter (ZEQS:BTS=<bts-id>:L:FHO;)
3. After handover, unlock BTS (ZEQS:BTS=<bts-id>:U;)
4. When both BTSs are working state, make a another call and lock another BTS.
5. Unlock BTS.
6. Make a call through both BTSs.

4. Expected results

1. Handovers occurs and calls do not release.
2. Lock/Unlock succeeds.

13.6 STS0102O0002 Remote BIE handling

1. Test purpose

To verify that a remote service terminal session to a BIE can be opened and the service terminal commands work properly

2. Required test environment

- Transm_eq_mml_enable parameter value is true in PRFILE.
- BCF is created and O&M D-channel link between BSC and the BCF is WO-EX.
- BIE is created to the BTS HW data and local cable between BTS OMU and BIE maintenance interface is connected.

3. Test execution

1. Start a remote transmission equipment handling session with MML command QUS. The numbers of the BCF and BIE are given as parameters. MML starts to emulate the local BIE service terminal functions. MML returns back to the top service menu with command TOP<cr>, one menu upward with command UP<cr> and back to the MML prompt with command EXIT<cr>. Possible service menu operations are presented in BIE Operating Handbook.
2. Give command 1, fault display.
3. Go to sub-menu 4, identifications. Read HW and SW identifications of all installed BIE plug-in units.
4. Go to sub-menu 8, statistics. Read statistics concerning 2M interfaces of BIE.

4. Expected results

1. BIE service terminal command can be given and results are as presented in the BIE operating handbook.

13.7 STS0102B0001 Spontaneous restart of OMU in BTS

1. Test purpose

The purpose of this test is to verify the correct working of BSC in case of spontaneous restart of OMU .

2. Required test environment

- Working BCF

3. Test execution

   1. Press reset button from the OMU board.

4. Expected results

   1. O&M LAPD cuts off. Calls are on.
   2. When LAPD is available again, OMU sends LAPD alarm to Abis and BSC loads software to OMU via LAPD.
   3. If clock signal cuts off, q1 channel is initialized again.
   4. Alarms during OMU code load can be saved.
   5. The unchangeable alarms of FUC, happened before the removal, are disappeared.

13.8 STS0301B0002 SW background loading

1. Test purpose

BTS software handling

2. Required test environment

- There is at least one real BTS.
- Some BTSs may have new BTS SW in the flash and some may not.

3. Test execution

1. Make calls all the time.
2. Attach BTS SW package to the all BTSs (ZEWA)
3. Detach BTS SW package during downloading (ZEWE)
4. Attach new SW package to the all BTSs during downloading.
5. Remove RXUA- card TCH-TRX.

4. Expected results

1. Calls do not release, when downloading starts.
2. New calls can establish.
3. SW downloading succeed and package is transferred to the flash.
4. Detach and new attach succeed only those BTSs, which have completed previous package handling operation, rest of BTSs give alarm “unfinished package handling operation exist”.
5. CU-fault message is send from the BTS to the BSC after SW downloading.

13.9 STS1011B001 TSC different from BCC

1. Purpose

Purpose of this test case is to verify that TSC can be different than BTS's BCC.

2. Required test environment

- BSC (S10)
- BTS with 3 TRXs

3. Test execution

Before you can modify TSC,FRT,HOP AND UHOP -parameters BTS and TRX have to be locked:

ZERS:BTS=1,TRX=2:L;
ZEQS:BTS=1:L;

1. Change the TSC of the non-BCCH TRX to different than BTS's BCC (Non hopping or RF-hopping BTS).

   ZERM:BTS=1,TRX=2:TSC=2;

   Unlock the TRX

   ZERS:BTS=1,TRX=2:U;

   Unlock the BTS

   ZEQS:BTS=1:U;

2. Also test that if the BCCH TRX's TSC is different than BTS's BCC, (Non hopping or RF-hopping BTS)

   ZERM:BTS=1,TRX=1:TSC=2;

3. Also test that if the TCH TRX's TSC is different than BTS's BCC, (BB-hopping BTS)

   ZERM:BTS=1,TRX=2:TSC=2;
   ZEQE:BTS=1:HOP=BB;

4. Also test that if the IUO is used and layer (underlay FRT=1-16) is BB-hopping and same layer TRXs have different TSC values.

   ZWOC:10,23,FF;
   ZERM:BTS=1,TRX=2:TSC=2,FRT=1
   ZERM:BTS=1,TRX=3:TSC=1,FRT=1
   ZEQE:BTS=1:UHOP=BB;

4. Expected results

1. TRX and BTS unlock succeeds.

2. TRX unlock does not succeed.

14. ALARM HANDLING

14.1 STS0500B0015 BTS alarm handling

1. Test purpose

To verify that the alarms received from BTS are stored to current alarms and alarm history in BSC. Modification of BCF maintenance mode parameter works correctly

2. Required test environment

- Working BTS (DE21/DF12) exists
- There are alarms in current alarm history
- All alarms are in NMS/2000 as well

3. Test execution

1. List current BTS alarms, e.g. EOL:1;
2. Cancel an alarm (ZEOR)
3. List alarm history, e.g. EOH::BCF=1;
4. Prevent the alarm printing concerning this BCF. The command is: EMM:1:MOD=PRT:ACT=OFF;
5. Generate FU-fault to BTS with MMI: Dev. ctrl./Local block/FU
6. List alarm history with different parameters:
   e.g. ZEOH::BCF=1:OBJ=FU;
   e.g. ZEOH::STA=0;
   e.g. ZEOH::NR=7210,BCF=1;
   e.g. ZEOH::CLS=AL3;
7. Check that the alarms are updated correctly also in NMS/2000.
8. Check any new alarms in the system.

4. Expected results

1. The cancelled alarm is not in current alarms
2. The alarm exist in alarm history
3. The alarm is not printed to printer when printing is prevented
4. All alarms for object are output
5. The NMS/2000 alarm history is updated correctly

14.2 STS0908B0002 Filtering for BTS alarms

1. Test purpose

To test that filtering for BTS alarms work correctly.

2. Required test environment

- Working BTS exists

3. Test execution

   1. Set the BSC parameter BTS_ALARM_FILTERING_USE ON
      ZWOC:16,7,1;
   2. Modify informing and canceling delays e.g.
      ZEOM:7870:MOD=IDL,TIME=60;
      ZEOM:7870:MOD=CDL,TIME=60;
      You can check informing and canceling delays with command ZEOO.
   3. Generate BTS fault. e.g. Open the cabinet door-> alarm 7870 is generated
   4. Check that the alarm is not seen before delay time is expired.
      (ZEOL,ZEOH)
   5. Check that the alarms are updated correctly also in NMS/2000

4. Expected results

   1. Alarms are correctly updated in the alarm history.
   2. The NMS/2000 alarm history is updated correctly.

14.3 STS0013B0001 BCF maintenance mode

1. Test purpose
   Modification of BCF maintenance mode parameter works correctly

2. Required test environment

   - Working BCF

3. Test execution
   1. Set mode on to printer
      EMM:1:MOD=PRT,ACT=ON;
   2. Generate fault on BCF
   3. Set mode off to printer (and reset BCF)
      EMM:1:MOD=PRT,ACT=OFF;
   4. Generate fault on BCF
   5. Set recovery mode on
      EMM:1:MOD=REC,ACT=ON;
   6. Generate fatal fault on BCF
   7. Set mode off to recovery (and reset BCF)
      EMM:1:MOD=REC,ACT=OFF;
   8. Generate fatal fault on BCF
   9. Set mode on to NMS
      EMM:1:MOD=OMC,ACT=ON;
   10. Generate fatal fault on BCF
   11. Set mode off to recovery (and reset BCF)
       EMM:1:MOD=OMC,ACT=OFF;
   12. Generate fatal fault on BCF

4. Expected results
   1. Alarm is printed
   2. Alarm is not printed
   3. Alarms are sent to recovery system
   4. Alarms are not sent to recovery system
   5. Alarms are sent to NMS
   6. Alarms are not sent to NMS

15. RADIO NETWORK MANAGEMENT

15.1 STS0500B0017 BCCH-TRX reconfiguration

1. Test purpose

To verify the reconfiguration of BCCH functionality in case of local (OMU MMI) blocking of TRX carrying BCCH timeslot.

2. Required test environment

- Check the status of the signaling network with BSC MML.
- Check current alarms in system.
- There has to be at least two TRXs in operational state WORKING on the BTS to be tested.

3. Test execution

   1. Block the BCCH-TRX locally from the BTS OMU MMI.
      (Open window from MMI: OBJECT/TRX: BLOCK/DEBLOCK)
   2. Check TRX state with BSC MML (ZEEI,ZERO)
   3. Deblock the TRX locally from the BTS OMU MMI.
   4. Check any new alarms in the system.
   5. Check that the alarms are updated correctly also in NMS/2000.

4. Expected results

   1. Locally blocked TRX is blocked out of use in BSC. The operational state of the TRX and TSLs is updated to BLOCKED-FU FAULT (BL-FU), BLOCKED-CU FAULT (BL-CU) or BLOCKED-TRX FAULT (BL-TRX) depending on the blocked unit of the BTS.
   2. BCCH timeslot is reconfigured on the another TRX of the BTS and the new BCCH-TRX is initialized by restarting it.
   3. After successful new BCCH-TRX restart the CCH-TRX is updated to operational state WORKING.
   4. When the local blocked TRX is locally deblocked, the TRX and TSLs are updated to operational state WORKING.

15.2 STS0103B0002 Generating the alarm 'Excessive TCH interference' for a several TSL.

1. Test purpose

To verify that Radio Network Supervision works as determined when supervising the high TCH interference of a TSL.

2. Required test environment

- Make the necessary Radio Network Supervision parameter definitions (ZEEN):
  THR FOR HIGH TCH INTERFERENCE LEVEL (HIFLVL) = 2
  THR FOR DISTRIBUTION OF TCH INTERFERENCE ON HIGH INTERFERENCE LEVELS (HIFSHR) = 1%
  TCH MHT SUPERV MEAS PERIOD (PRDMHT) = 0 MIN
  SCH MHT SUPERV MP (PRDMHS) = 0 MIN
  CH FAIL RATE SUPERV MP (PRDCFR) = 0 MIN
  BTS CH CONGESTION SUPERV MP (PRDCNG) = 0 MIN
  HIGH TCH INTERFERENCE SUPERVISION MEAS PERIOD (PRDHIF) = 5 MIN

3. Test execution

Send a message from MCMU to set the interference of the TCHs to certain level. Wait for end of measurement period.
ZOS:*,act-MCMU,1B4,,,,,9413,,,BTS-id,TRX-id,FF,FF,FF,04,FF,FF,04,
FF,FF,04,FF,FF,04,FF,FF,04,FF,FF,04,FF,FF,04,FF,FF

4. Expected results

Alarm 'EXCESSIVE TCH INTERFERENCE' should be generated from several TSL's, with additional info:
bts id (hex)
trx id (hex)
high if shares (hex)
high if level threshold (hex)
if alarm percentage (hex)

15.3 STS0606B0003 Modify and output LAC-CI parameters in adjacent cell

1. Test purpose

The LAC-CI parameters in adjacent cell are modified and output.

2. Required test environment

- Version of NMS/2000 release have to be at least T10
- 2 BTS are created and working as adjacent cells.

3. Test execution
    1. Make a call so that it will start making handovers.
    2. Lock another BTS and change it under other BSC.
    3. Modify Changed BTS's LAC-CI parameter according another BSC. (ZEAM) Use necessary parameters—NEWLAC, NEWCI, NEWABTS or NEWNAME
    4. Delete changed BTS from original BSC and create it under new BSC so that these BTS' are as adjacent cells.
    5. Make a call so that it will start making handovers.

4. Expected results

The LAC-CI parameters in adjacent cell are modified and test call(s) are successful.

15.4 STS0601B0001 RNW background parameter handling

1. Test purpose

To verify RNW background parameters loading

2. Required test environment

- Working BTS (a) with adjacent cell (b)

3. Test execution

Note: Check data of the background database after every phase by: ZEQO, ZERO and ZEEG:CHK;

1. check background database: ZEEG:CHK
2. create background parameters of BTS and TRX:
   ZEQE:BTS=<a>:BHOP=BB;
   ZERM:BTS=<a>,TRX=<trx_nr>:BFREQ=<y>;
3. create background parameters of adjacent cell:
   ZEAM:BTS=<b>:ABTS=<a>:BFREQ=<y>;
4. activate the background database:
   ZEEG:ACT;
   Try to edit background parameters during the activation. Note, the huge radio network is needed that activation will take more than 1 second
5. activate the back-up parameter database
   ZEEG:ACT;
6. activate again the background parameter database
   ZEEG:ACT;
   and interrupt the activation by a command
   ZEEG:INT;
7. continue the activation of the background parameter database
   ZEEG:ACT;
   interrupt the downloading by the command
   ZEEG:INT;
   and cancel the interrupted activation (do this quickly after interrupt)
   ZEEG:CNL;
8. prepare background database
   ZEER;

4. Expected results
   1. the background database will have a clear-status.
   2. the status of the background database is New after creation and the background database is checked and error about adjacent cell is occurred
   3. the status of the background database is “New” after creation
   4. the background database is activated and the status will be “Activating” during activation. No parameters are modified during the activation. After activation status of the database is “Back-up” after activation
   5. the back-up database is activated and the status will be Back up after activation of the back-up database
   6. the activation is interrupted and the status will be Activating-interrupted
   7. the activation is cancelled after the interruption
   8. the background database will have a clear-status.

15.5 STS0500B0016 BCCH-TRX local block

1. Test purpose

   To verify the correct working of the BSC in case of local (OMU MMI) blocking of TRX carrying BCCH timeslot.

2. Required test environment
   - Check the status of the signaling network with BSC MML.
   - Check current alarms in system.
   - There is only one TRX in operational state WORKING on the BTS to be tested. If needed, set other TRX(s) of the BTS to administrative state LOCKED with BSC's MMI.

3. Test execution
   1. Block the BCCH-TRX locally from the BTS OMU MMI.
      (Open window from MMI: OBJECT/TRX: BLOCK/DEBLOCK)
   2. Check TRX state with BSC MML (ZEEI,ZERO)
   3. Deblock the TRX locally from the BTS OMU MMI.
   4. Check any new alarms in the system.
   5. Check that the alarms are updated correctly also in NMS/2000.

4. Expected results

   1.Locally blocked TRX is blocked out of use in BSC. The operational states of the TRX and TSLs are updated to BLOCKED-FU FAULT (BL-FU), BLOCKED-CU FAULT (BL-CU) or BLOCKED-TRX FAULT (BL-TRX) depending on the blocked unit of the TRX.
   2.Alarm 7208 LOCAL BLOCK is set.
   3.When the local blocked TRX is locally deblocked, the TRX and TSLs is updated to operational state WORKING and the alarm 7767 is canceled.

15.6 STS0606B0002 Modify and output BCF site type

1. Test purpose

Check that BCF site type can be modified and output.

2. Required test environment

- Version of NMS/2000 release have to be at least T10
- DE45/DF45 BCF site type can't be modified.
- DE21/DF21 does not support Floating TRX and RF hopping.
- DE34/DF34 does not support RFTE as test equipment.
  In these cases system rejects illegal configurations as site is modified.

3. Test execution
   1. First old BTS must be normally working . Make a test call.
   2. Stop BTS testing activities for the BCF, e.g. scheduled tests. (ZUCS)
   3. Lock the BCF. (ZEFS)
   4. Modify BCF site type. (ZEFM)
   5. Disconnect Abis for the old BCF and connect Abis for the new BCF.
   6. Attach and activate proper software and HW database for the BCF. (ZEWA, ZEWV, ZEVA, ZEVV)
   7. Unlock BCF (ZEFS)
   8. Make test call(s).
   9. Make modification from DE21/DF21 to DE34/DF34 and vice versa.

4. Expected results

The BCF site type is modified and test call(s) are successful.

15.7 STS0500B0029 TRX channel type modification

1. Test purpose

To verify that TRX channel type modification is successful

2. Required test environment
   - Before you start the test, links, BCF, BTS and TRX must be created.

3. Test execution
   1. Modify TRX channel types using full , half and dual rate channels
      Command : ERM e.g.
      ERM:BTS=1,TRX=1:CH1=TCHF,CH2=TCHH:CH3=TCHD;
   2. Check that modifications were successful.
      Command : ERO
   3. Take a test call using modified channels.

4. Expected results
   Modifications are successful

16. STM

16.1 STS0515B0013 STMD originating test call

1. Test purpose

To verify that test call termination works correctly

2. Required test environment
   - DE34/DF34-BTS with BTS SW DF2.0 release and STMD
   - Concerned BCF's test equipment must be defined as STMD in the BSC's database (ZEFO)
   - MS

3. Test execution
   1. execute the test call (ZUBG) to MS
   2. check speech quality which is looped back to MS by STMD

4. Expected results
   1. call from STMD is succeed and speech quality is good
   2. The printer shows also this occurrence.

17. STATISTICS

17.1 STS0808B0007 Radio network supervision improvement

1. Test purpose

To check that alarms are now TRX-specific instead of TCH

2. Required test environment

3. Test execution
   1. Modify supervision parameters
      ZEEN:SCHFR=1,PRDMHT=5,PRDCFR=5,CS=1,TCHFR=100;
   2. Make a call attempt (alert -> disconnect) seizure should be under 10 seconds
   3. Make another call and lock the occupied channel and unlock it (ZERS)

      Alarms 7743 MEAN HOLDING TIME BELOW DEFINED TRESHOLD and 7745 CHANNEL FAILURE RATE BELOW DEFINED TRESHOLD should arise

4. Expected results

   There are only one alarm per TRX which includes information of failed TCHs

17.2 STS0709B0005 CCCH improvements

1. Test purpose

To verify that the measurements report includes new counters.

2. Required test environment

- NMS/2000 software T11.
- BTS softwares B11 and DF4.
- Before modifying measurements you have to stop it if it is on.

3. Test execution
   1. Start the resource access measurement (ZTPS).
   2. Interrogate the measurement (ZTPI).
   3. In order to have information in measurement report you have to for example make calls. If you want to get exact values, you have to have needed features activated and make certain kind of traffic.
   4. Check that the measurement report includes new counters. (MAX PAGING BUFFER CAPA, AVE PAGING BUFFER CAP, DELETE PAGING COMMAND)
   5. Stop the measurement (ZTPE).

4. Expected results

Measurement report includes new counters.

17.3 STS0709B0001 Different measurement intervals during one day

1. Test purpose

To verify that different measurement intervals can be set for one day.

2. Required test environment

- This feature will be supported in NMS/2000 software T11.
- Before modifying measurements you have to stop it if it is on.

3. Test execution
   1. Modify measurement to have two different measurement intervals for one day. For example: ZTPM:MEASUR,AVAIL:MON,0-00-06-00&06-00-20-00&20-00-24-00,2&60&2;
   2. Modify a different measurement to have three different measurement intervals for one day (ZTPM).
   3. Start the measurements (ZTPS).
   4. Check the status of the measurements and that the intervals are correct (ZTPI).
   5. In order to have information in measurement report you have to for example make calls. If you want to get exact values, you have to have needed features activated and make certain kind of traffic.
   6. Check that the measurements are coming at correct intervals at correct times. Without NMS/2000 software T10 you can use BSC's service terminal extension FOX_BXSX to interrogate the measurement file.
   7. Stop measurements (ZTPE).

4. Expected results

Different measurement intervals can be set for one day.
Measurements come at correct intervals at correct times.

17.4 STS0709B0002 ET downtime statistics

1. Test purpose

To verify working of measurements ET_BSC and ET_TCSM

2. Required test environment

- TCSM2
- This feature will be supported in NMS/2000 software T11.
- Before modifying measurements you have to stop it if it is on.

3. Test execution
    1. Modify transmission measurements ET_BSC intervals.
       (values 15 and 30 minutes are not possible)

       For example: ZTPM:TRANSM,ET_BSC:ALL,00-00-24-00,2;
    2. Start measurements ET_BSC (ZTPS).
    3. Interrogate the measurements (ZTPI).
    4. Check from NMS/2000 that the measurements come at right times.
       With NMS/2000 software T10 you can use BSC's service terminal extension FOX_BXSX to interrogate the measurement file.
    5. Check that the measurement report includes only WO-EX ET's and all of them.
    6. Stop measurements (ZTPE).

4. Expected results

    1. It is possible to modify, start and stop ET_BSC and ET_TCSM2 measurements.
    2. The measurements are collected at correct times.
    3. The measurement report includes only WO-EX ET's and all of them.

17.5 STS0619O0005 Handover adjacent cell measurement improvements

1. Test purpose

The purpose of the test is to ensure that Handover adjacent cell measurements are saved and sent correctly between BSC and NMS/2000.

2. Required test environment

- Before you start this case, you have to check that NMS/2000 include at least T11 software.
- The adjacent cell list includes only one cell (BTS2), which belongs to the same BSC as the source cell.
- Check the status of the optional feature. Command is ZWOI;
- Feature RXQ_HAC_USAGE should be active in PRFILE.

3. Test execution

1. Active feature RXQ_HAC_USAGE. Command is ZWOC:10,28,FF;
2. Handover parameters are set into database so that inter cell handover will be result of algorithm. (dl qual < 0.2 % , BTSs are defined as adjacent cells to each others: ho_margin = -24dB). Commands are:
   e.g.
   ZEHQ:BTS=1,...QDR=0,QDP=1,QDN=1,QUR=1,QUP=1,QUN=1
   ZEAM:BTS=1,... ho_margin_qual = -24dB
   ZEAM:BTS=1,... enable_ho_margin_lev_qual=Y
3. Modify the GSM measurement characteristics. Command is:
   e.g. TPM:MEASUR,HOADJ: “measurement day”, “ measurement intervals “,“ output interval “;
4. Start HOADJ-measurement. Command is:
   e.g. TPS:MEASUR,HOADJ:YY-MM-DD,YY-MM-DD:;
5. Take test calls from cell A to cell B and make a handover to cell A.
6. When the measurement period is terminate, verify that measurement reports are sent to NMS / 2000. Open window from NMS/2000: UTILS / PERFORMANCE MNGT / DB CONTENTS.
7. Start HOADJ-measurement from NMS/2000 and repeat test case. Open window from NMS/2000: UTILS / PERFORMANCE MNGT / ADMINISTRATION / ACTION. (If you make the measurement at first time, before you start the measurement you have to create it.)

4. Expected results

1. Call succeeds and speech quality is good
2. Measurement reports sent to NMS/2000 directly.
3. The performance of HOADJ-measurement is successful from NMS/2000

17.6 STS0619O0002 Hot Spot Location measurements

1. Test purpose

To verify that the Hot Spot Location measurements are saved and sent correctly between BSC and NMS / 2000

2. Required test environment
   - Before you start this case, you have to check that NMS / 2000 include at least T11 software.
   - Check the status of the optional feature. Command is e.g. ZWOI
   - Features HOT_SPOT_USAGE_P should be active in PRFILE

3. Test execution
   1. Define serving cell to have three neighbor cells.
   2. Set the handover parameters so that no handovers will be made. Command is e.g. EHG:...
   3. Set neighbor cells PMRG and QMRG parameters to maximum values e.g. ZEAM:BTS=<bts_id>:ABTS=<abts_id>...
   4. Active feature HOT_SPOT_USAGE_P. Command is e.g. ZWOC:10,35,FF;
   5. Modify the GSM measurement characteristics. Command is: e.g. TPM:MEASUR,HOTSPOT:"measurement day", " measurement intervals ", " output interval ":LC=**;
      Set the Hot Spot Location measurement to be on for 2 hours.
         method =1
         LAC + CI of test cell (serving cell)
      Set the counter collection period to be 15 minutes.

   6. Start HOTSPOT measurement. Command is:
      e.g. TPS:MEASUR,HOTSPOT:YY-MM-DD,YY-MM-DD:;
   7. Set up a call in serving cell
   8. Make sure no handovers will be made
   9. Let the call be on about two hours

   Note: Hot Spot measurement has own counter collection to the data area of PUMPRB. This collection happens after the measurement period has finished.

   10. When the measurement period is terminate, verify that measurement reports are sent to NMS / 2000. Open window from NMS / 2000: UTILS / PERFORMANCE MNGT / DB CONTENTS.
   11. Start HOTSPOT measurement from NMS / 2000 and repeat test case. Open window from NMS / 2000: UTILS / PERFORMANCE MNGT / ADMINISTRATION / ACTION. (If you make the measurement at first time, before you start the measurement you have to create it.)

4. Expected results
   1. HOTSPOT feature activate is successful.
   2. Call succeeds and speech quality is good
   3. Measurement reports sent to NMS / 2000 directly.
   4. The performance of HOTSPOT measurement is successful from NMS / 2000

17.7 STS0610B0005 Measurement intervals and interruption

1. Test purpose

To verify that no data is lost when measurement is interrupted

2. Required test environment
   - BSC

3. Test execution
   1. Modify measurement parameters to be as following:
      ZTPM:MEASUR,LOAD:ALL,0-0-24-0,15;
   2. Start processor load measurement with command:
      ZTPS:MEASUR,LOAD;
   3. After a while stop the measurement with command:
      ZTPE:MEASUR,LOAD;
   4. Wait couple of minutes and check the measurement file is updated:
      ZIFO:OMU:MEASUR:1&&300;

4. Expected results
   1. Results will be found in measurement file

17.8 STS0619O0004 MS Speed Detection; HO to micro cell

1. Test purpose

   To verify that slow moving MS is directed to the micro cell.

2. Required test environment
   - Before you start this case, you have to check that BTS include at least B 10.0 or DF 3.0 software.
   - Feature FMMS_USAGE_P should be active in PRFILE.
   - Macro and micro cell thresholds are suitable for testing (ZEEM)

3. Test execution
   1. Active feature FMMS_USAGE_P. Command is ZWOC:10,25,FF;
   2. Define BTS2 to be a adjacent cell to BTS1. Command is e.g. ZEAC:BTS=**:ABTS=**:;
   3. Modify adjacent cell Handover parameters
      LowerSpeedLimit (LSL) 2
      UpperSpeedLimit (USL) 2
      MSSpeedThreshold_nx (STN) 1
      MSSpeedThreshold_px (STP) 1
      Command is e.g. ZEHP:BTS=**:LSL=2,USL=2,STN=1,STP=1,:;
   4. Modify Averaging parameters
      MSSpeedAveragin (MSA)....................................1
      Command is e.g. EHA:BTS=**:MSA=1,:;
   5. Modify Adjacent cell parameters (BTS2 = micro cell)
      Adjacent Cell Layer (ACL) ....lower
      Command is e.g. EAM:BTS=**:ABTS=**:ACL=LOWER,AUCL=-100;
   6. Reset BSC measurement counters. Command is e.g. ZTVR:2:0;
   7. Take test call
   8. Make sure that the MS's speed is to be less than 4 km/h
   9. Make sure that the MS makes a handover to BTS2 which is determinated to be a micro cell.
   10. Check out the following statistical counters. BSC_HANDOVER_MEAS_C 120 INTER_DET_SLOW_MOW_MS

       Command is: e.g. ZTVI:48;

4. Expected results
   1. The slow moving MS makes a handover to the micro cell.
   2. Speech quality is good all the time

17.9 STS0610B0001 PCM downtime statistics for TRU/BIE

1. Test purpose

To check that content of measurement file corresponds with the monitored ones

2. Required test environment
- BSC+BTS with TRU equipment (BIE is not supported)
- NMS/2000 SW T10
- Transmission equipments are updated to BSC (ZQWL / timer for collection ZWOI:9; parameter 55)

3. Test execution
   1. Set measurement time to 15 min (ZTPM) and start TRU/BIE measurement with command
      ZTPS:TRANSM,TRU/BIE;
   2. Remove used PCM cable for couple of seconds.
   3. Check error codes from TRU/BIE equipment:
      ZQUS:BCF=<used_bcf>,TRU=1; (Remote session)
   4. Write down error counters: 8,1,X,2   where X is used direction
   5. Wait until measurements are written to the measurement file (11 min after period)
   6. Check that measurement report includes information about TRU\BIE equipment.
   You can use NMS/2000 or BSCs service terminal extension FOX to interrogate the measurement file.
   8. Compare the number of error counters in the report to the number of error messages from TRU/BIE equipment.

4. Expected results
   1. Measurements are started after command in phase 1.
   2. The error counters are the same in file and in message from TRU/BIE equipment

17.10 STS0619B0006 TRX level performance statistics

1. Test purpose

The purpose of the test is to ensure that Power measurements are saved and sent correctly between BSC and NMS / 2000

2. Required test environment

- Before you start this case, you have to check that NMS / 2000 include at least T10 software.

3. Test execution
    1. Modify the GSM measurement characteristics. Command is: e.g. TPM:MEASUR,POWER: “measurement day”, “ measurement intervals “, “ output interval “;
    2. Start POWER-measurement. Command is: e.g. TPS:MEASUR,POWER:YY-MM-DD,YY-MM-DD:;
    3. Take test calls from cell A to cell B and make a handover to cell A.
    4. When the measurement period is terminate ,verify that measurement reports are sent to NMS / 2000. Open window from NMS / 2000: UTILS / PERFORMANCE MNGT / DB CONTENTS.
    5. Start POWER-measurement from NMS / 2000 and repeat test case. Open window from NMS / 2000: UTILS / PERFORMANCE MNGT / ADMINISTRATION / ACTION. (If you make the measurement at first time, before you start the measurement you have to create it.)

4. Expected results
    1. Call succeeds and speech quality is good
    2. Measurement reports sent to NMS / 2000 directly.
    3. The performance of POWER-measurement is successful from NMS / 2000

17.11 STS0909O0001 Channel Finder Measurement

1. Test purpose

To verify the working of the Channel Finder measurements

2. Required test environment
   - Two BTS with same BCCH, but different BCC or NCC or different BCC and NCC
   - Several other non-adjacent cells
   - NMS/2000 with software T11,5 (can be tested also without NMS)
   - Double BA list feature should be installed

3. Test execution
   1. Activate channel finder feature with command
      ZWOC:10,65,FF;
   2. Create BCCH frequency list. The list should be created so that used frequencies are on it.
      ZEBC:<bcch_frequency_list_nbr>,900:<bts1_frequency>&

      <bts2_frequency>&...;
   3. Define which BCCH-list serving BTS/BTS'es are used
      ZEQB:BTS:<bts-id>:IDLE=<bcch_frequency_list_nbr>,ACT=IDLE;
   4. Modify channel finder measurement with command:
      ZTPM:MEASUR,CHAN_FIN:ALL,0-0-24-0,60:DB1=2,DB2=5;
   5. Start the channel finder measurement
      ZTPS:MEASUR,CHAN_FIN;
   6. Check that channel finder measurement is enabled
      ZTPI:MEASUR,CHAN_FIN;
   7. Make a MS to MS call
   8. Stop the channel finder measurement
      ZTPE:MEASUR,CHAN_FIN;
   9. At the end of measurement period, check measurement file e.g. with PCBSC_S9 -tool

4. Expected results
   1. Measurement file contains data and it is reasonable

17.12 STS0909O0002 Channel Finder Measurement, error situation

1. Test purpose

To verify the correct working of the Channel Finder measurements

2. Required test environment

3. Test execution
   1. Try activate the measurement with unspecified dBm value. Value can be in range from 63 to 63 dB. These shouldn't be possible e.g.
      ZTPM:MEASUR,CHAN_FIN:ALL,0-0-24-0,60:DB1=0,DB2=64; e.g.
      ZTPM:MEASUR,CHAN_FIN:ALL,0-0-24-0,60:DB1=-64,DB2=0; e.g.
      ZTPM:MEASUR,CHAN_FIN:ALL,0-0-24-0,60:DB1=0,DB2; eg.
      ZTPM:MEASUR,CHAN_FIN:ALL,0-0-24-0,60:DB1,DB2=0;
   2. Try also situation where DB1=DB2 and DB1>DB2. These shouldn't be possible e.g.
      ZTPM:MEASUR,CHAN_FIN:ALL,0-0-24-0,60:DB1=0,DB2=0; e.g.
      ZTPM:MEASUR,CHAN_FIN:ALL,0-0-24-0,60:DB1=0,DB2=-63;

4. Expected results

   The error ***SEMANTIC ERROR***
   INVALID PARAMETER VALUE should appear

17.13 STS0910B0001 MS Capability Indication (ST)

1. Test purpose

   To verify that MS capability indication feature works and counters are updated.
2. Required test environment
   - Several Mobile Stations:
     - Revision level ph1 and ph2
     - Single band MS (GSM900 & GSM1800)
     - Extended GSM900 band supporting MS
     - Dual band MS
     - Tri band MS
     - Multislot incapable MS
     - Multislot capable MS
     - E-OTD capable MS (LCS)
   - NMS/2000 at least SW level T12

   - PRFILE parameter MS_CAP_IND_USAGE (class 2) must be set on in software packaging.
3. Test execution
   1. Modify Early sending Indication (ESI) parameter
      ZEQM:BTS=<bts_id>:ESI=Y;
   2. Activate Mobile Station Capability Measurement.
      e.g. ZTPM:MEASUR,MS_CAP:ALL,00-00-24-00,30::;
   3. Start Mobile Station Capability Measurement
      e.g. ZTPS:MEASUR,MS_CAP;
   4. Make location updates or calls by using following mobiles:
      Revision levels phase1 and phase2
      Single band MS GSM900
      Extended GSM900 band supporting MS
      Dual band MS
      Tri band MS
      Multislot incapable MS
      Multislot capable MS (at least two different multislot classes)
      E-OTD capable MS (LCS)
   5. Check results from NMS2000 or by using service terminal extension
      FOXMEA or PCBSC_S9 -tool

4. Expected results
   1. Following counters are updated:

      Revision level counters
      0 REP_TIME_BY_PH_1_MS

      1 REP_TIME_BY_PH_2_MS
      2 TCH_RES_BY_PHASE_1_MS
      3 TCH_RES_BY_PHASE_2_MS

      Frequency band
      4 REP_TIME_BY_GSM_900_MS
      5 REP_TIME_BY_EGSM_900_MS

6 REP_TIME_BY_GSM_1800_MS
7 REP_TIME_BY_DUAL_BAND_MS
8 REP_TIME_BY_TRI_BAND_MS
9 TCH_RES_BY_GSM_900_MS
10 TCH_RES_BY_EGSM_900_MS
11 TCH_RES_BY_GSM_1800_MS
12 TCH_RES_BY_DUALBAND_MS
13 TCH_RES_BY_TRIBAND_MS

Multislot counters
14 TCH_RES_BY_MSLOT_INCAP_MS
15 TCH_RES_BY_MSLOT_CL_MS_1
16 TCH_RES_BY_MSLOT_CL_MS_2
17 TCH_RES_BY_MSLOT_CL_MS_3
18 TCH_RES_BY_MSLOT_CL_MS_4
19 TCH_RES_BY_MSLOT_CL_MS_5
20 TCH_RES_BY_MSLOT_CL_MS_6
21 TCH_RES_BY_MSLOT_CL_MS_7
22 TCH_RES_BY_MSLOT_CL_MS_8
23 TCH_RES_BY_MSLOT_CL_MS_9
24 TCH_RES_BY_MSLOT_CL_MS_10
25 TCH_RES_BY_MSLOT_CL_MS_11
26 TCH_RES_BY_MSLOT_CL_MS_12
27 TCH_RES_BY_MSLOT_CL_MS_13
28 TCH_RES_BY_MSLOT_CL_MS_14
29 TCH_RES_BY_MSLOT_CL_MS_15
30 TCH_RES_BY_MSLOT_CL_MS_16
31 TCH_RES_BY_MSLOT_CL_MS_17
32 TCH_RES_BY_MSLOT_CL_MS_18

All the counters shall be checked!!!

17.14 STS0610B0006 Additional traffic counters

1. Test purpose

   To verify that new measurements works correctly and new counters are added to traffic measurement report

2. Required test environment
   - BSC and BTS
   - NMS/2000 SW T10

3. Test execution
   1. activate MS speed detection from prfile: ZWOC:10,25,FF;
   2. activate Hotspot from prfile: ZWOC:10,35,FF;
   3. activate C/I Ratio from prfile: ZWOC:10,36,FF;
   4. check that activated functions and Dual Band -feature have status ON with command ZWOI:
   5. modify useful measuring period to these measurements (ZTPM)
   6. start traffic, msspeed, dual, C/I_ratio and hotspot measurements
   7. make calls when measurements are active
   8. Check from NMS/2000 that the measurement file includes right counters.

4. Expected results
   1. measurement reports are printed with usable counter values
   2. HOTSPOT counters are added to the traffic measurement report. numbers of counters are: 1135 to 1147.

17.15 STS0709B0006 Call success factors

1. Test purpose

   To verify that the measurement report includes new counters

2. Required test environment

   - This feature will be supported in NMS/2000 software T11.
   - Before modifying measurements you have to stop it if it is on.

3. Test execution
   1. Modify BSC level clear codes measurement CC_SERLEV (ZTPM)
   2. Start the BSC level clear codes (serlev) measurement (ZTPS).
   3. Interrogate the measurement (ZTPI).
   4. In order to have information in measurement report you have to for example make calls. If you want to get exact values, you have to have needed features activated and make certain kind of traffic.
   5. Check that the measurement report includes new counters.
      With NMS/2000 software T10 you can use BSC's service terminal extension FOX_BXSX to interrogate the measurement file.
   6. Stop the measurement (ZTPE).

4. Expected results

   Measurement report includes new counters.

17.16 STS0619O0001 C/I Ratio Statistic

1. Test purpose

To verify that the C/I Ratio Statistics Measurements are saved and sent correctly between BSC and NMS / 2000

2. Required test environment

- Before you start this case, you have to check that NMS/2000 include at least
- T10 software.
- Check the status of the optional feature. Command is e.g. ZWOI
- Feature CI_ STATISTICS_USAGE_P should be active in PRFILE.
- Make sure that BTS1 and BTS2 are under different BCSUs.

3. Test execution

1. Define BTS 2 to be adjacent cells to BTS1.
2. Active feature CI_STATISTICS_USAGE_P. Command is: e.g.
   ZWOC:10,36,FF;
3. Modify the GSM measurement characteristics. Choose two different measurement periods. Command is: e.g.
   TPM:MEASUR,C/I_RATIO:"measurement day", " measurement intervals ", " output interval ":LC=**,LOW=**,HI=**,AMO=**,LC1=**,SLA=**;
   Where

Test cell	LC	= BTS2 (LAC + CI)
C/I band	LOW	= 0
BSIC decode time	BSIC	= current vale (default)
Number of interfering cells	AMO	= 2
Interfering cell	LC1	= BTS3
Signal level adjustment	SLA1	= current value

4. Start C/I Ratio Statistics measurement. Command is: e.g.
   ZTPS:MEASUR,C/I_RATIO:YY-MM-DD,YY-MM-DD:;
5. Take some test calls from subscriber A to subscriber B and subscriber A' to subscriber B'. Call test calls from different cells during both measurement periods.
6. When the measurement period is terminate, verify that measurement reports are sent to NMS / 2000. Open window from NMS / 2000: UTILS / PERFORMANCE MNGT / DB CONTENTS.
7. Start C/I Ratio Statistics measurement from NMS / 2000 and repeat test case. Open window from NMS / 2000: UTILS / PERFORMANCE MNGT / ADMINISTRATION / ACTION.

(If you make the measurement at first time, before you start the measurement you have to create it.)

4. Expected results

1. C/I Ratio Statistics feature activate is successful.
2. Call succeeds and speech quality is good
3. Measurement reports sent to NMS / 2000 directly.
4. The performance of C/I Ratio Statistics measurement is successful from NMS / 2000

17.17 STS0610B0002 Enhanced call trace report

1. Test purpose

To verify that call trace report includes route trace data

2. Required test environment
   - MSC + BSC + BTS +2 MS
   - and Abis-interfaces are created and there is TRX available in BTS

3. Test execution
   1. Define a TCH observation if there is no one defined. Parameters are not important. For example:
      ZTPM:OBSERV,TCH_OBS:ALL,00-00-24-00,15:BTS=1,TRX=1,TSL=ALL;
      (Checking with ZTPI)
   2. Activate the trace from MSC with commands:
      ZMWC:IMSI="phone IMSI code": REF="same reference value with NMS/2000";
   3. Select priority output from BSC. The first byte of the BMPARA00 file from LFILES directory have to be modified.
      Choices are the followings:
      0 = reports are saved only to BSC disk.
      1 = reports are saved to BSC disk and sent to online display of the NMS/2000 at the same time
      2 = reports are saved only to NMS/2000
      (If priority output is not selected, reports are saved to BSC disk and then sent to NMS/2000, value FF).
      In this case reports are saved only to BSC disk.
      Command for modify: ZDFS:OMU:6C7,0,0; (6C7 = BMPARA00.IMG)
      Command for check: ZDFD:OMU:6C7,0;
   4. Make MS-MS call using a traced MS.
   5. During a call check the PCM and time slots where call is on.
      A-int. : ZCEL:CGR=1,FORM=EXT,CONN=BU;
      Abis : ZERO:BTS=<bts_number>;
   6. Cut the call
   7. You can use NMS/2000 or BSCs service terminal extension FOXMEA to interrogate the observation file.
   8. Compare A- and Abis PCMs and time slots to these which were checked in phase 5 of this case.

4. Expected results
   1. Trace type and system id are included in the report.
   2. Route trace data about actual hardware route of a call is included in the report

17.18 STS0812O0001 HO reason to HOADJ measurement

1. Test purpose

To check that given reason starts measurement

2. Required test environment
   - BTS1/TRX1 and BTS2/TRX1
   - BTSs are adjacencies to each other
   - Features DR_USAGE and RXQ_HAC_USAGE_P are active (ZWOI).
   - Software levels of other network element: NMS/2000 T11.

3. Test execution
   1. Activate features:
      ZWOC:10,5,FF; and ZWOC:10,28,FF;
   2. Prohibit queuing and block all TCHs of BTS1 (ZEQH & ZERS)
   3. BTS2 is barred (ZEQF)
   4. Allow the DR handover in BSC and BTSs by MML:
      ZEQF:BTS=<x>:DR=Y;
   5. Set parameter of BTS1 DR method to “threshold evaluation method” (ZEQF)
   6. Set adjacent parameter “DR threshold” (DRT) of BTS2 in BTS1 to -80dBm (ZEAM), check that “RX level min cell” (SL) is much under “DRT” value
   7. Adjust BTS2 power over -80dBm (MS display) (ZEUG)
   8. Start handover adjacent cell measurement and give HO measurement reason e.g. ZTPM:MEASUR,HOADJ:ALL,0-0-24-0,60:NORMAL=65:; and ZTPS
   9. Establish a call in BTS1
   10. Stop measurement (ZTPE), check measurement file

4. Expected results
   1. Handover adjacent cell measurement is updated, verify counters.
   2. Check from measurement file header HO reason.

17.19 STS0709B0004 Measurement improvements

1. Test purpose

   To verify working of counters for IMSI detach and successful total calls.

2. Required test environment

   - IMSI attach/detach has to be on (ZEQO, ZEQJ <ATT>).
   - This feature will be supported in NMS/2000 software T11.
   - Before modifying measurements you have to stop it if it is on.

3. Test execution
   1. Modify Traffic, Resource access and Handover measurements (ZTPM).
   2. Start measurements (ZTPS).
   3. Interrogate measurements (ZTPI).
   4. Reset the PM counters (ZTVR).
   4. Make some calls and close the phones (power OFF).
   5. Check that the measurement reports include IMSI detach and successful total calls information. With NMS/2000 software T10 you can use BSC's service terminal extension FOX_BXSX to interrogate the measurement file.
   6. Check the IMSI detach counter from BSC PM measurements (ZTVI:48;).
   7. Stop measurements (ZTPE).

4. Expected results

   Measurement reports include IMSI detach and successful total calls information. IMSI detach counters have been incremented.

17.20 STS0619O0003 MS Speed Detection; HO to macro cell

1. Test purpose

   To verify that fast moving MS is directed to the macro cell.

2. Required test environment
   - Before you start this case, you have to check that BTS include at least B 10.0 or DF 3.0 software.
   - Feature FMMS_USAGE_P should be active in PRFILE.
   - Macro and micro cell thresholds are suitable for testing (ZEEM)

3. Test execution
   1. Active feature FMMS_USAGE_P.command is e.g. ZWOC:10,25,FF;
   2. Define BTS2 to be a adjacent cell to BTS1. Command is e.g.
      ZEAC:BTS=**:ABTS=**:;
   3. Modify adjacent cell Handover parameters
      LowerSpeedLimit (LSL) 2
      UpperSpeedLimit (USL) 2
      MSSpeedThreshold_nx (STN) 1
      MSSpeedThreshold_px (STP) 1
      Command is e.g. ZEHP:BTS=**:LSL=2,USL=2,STN=1,STP=1,:;
   4. Modify Averaging parameters
      MSSpeedAveragin (MSA)...................................1
      Command is e.g. EHA:BTS=**:MSA=1,:;
   5. Modify Adjacent cell parameters (BTS2 = macro cell)
      Adjacent Cell Layer (ACL) ....UPPER
      Command is e.g. EAM:BTS=**:ABTS=**:ACL=UPPER,AUCL=-100;
   6. Reset BSC measurement counters. Command is:
      e.g. ZTVR:2:0;
   7. Take test call
   8. Make sure that the MS's speed is to be more than 4 km/h
   9. Make sure that the MS makes a handover to BTS2 which is determinated to be a macro cell.
   10. Check out the following statistical counters.
       BSC_HANDOVER_MEAS_C
       137 INTER_DET_FAST_MOW_MS
       Command is e.g. ZTVI:48;

4. Expected results
   1. The fast moving MS makes a handover to the macro cell.
   2. Speech quality is good all the time

17.21 STS0709B0003 Observation improvements

1. Test purpose

To verify that new parameter can be used and that the observation report includes new fields

2. Required test environment

- This feature will be supported in NMS/2000 software T11.
- Before modifying observations you have to stop it if it is on.

3. Test execution
   1. Modify observations and use parameter ALL with tsl for example:
      ZTPM:OBSERV,SDCCH_OBS:ALL,00-00-24-00,2:BTS=13,TRX=1,TSL=ALL;
   2. Start the observations (ZTPS).
   3. Interrogate the observations (ZTPI).
   4. In order to have information in observation report you have to for example make calls. If you want to get exact values, you have to have needed features activated and make certain kind of traffic.
   5. Check from NMS/2000 that the observation report includes source BSIC (NCC+BCC) and BCCH in SDCCH_OBS, TCH_OBS, INT_HO_OBS, and OUT_HO_OBS and target BSIC (NCC+BCC) and BCCH in INT_HO_OBS, INC_HO_OBS and OUT_HO_OBS.
      Without NMS/2000 software T10 you can use BSC's service terminal extension FOX_BXSX to interrogate the measurement file.
   6. Stop the observations (ZTPE).

4. Expected results
   Parameter ALL tsl's can be used with observations.
   Observation report includes BSIC and BCCH in observations listed above.

17.22 STS0812O0002 Trace window for dropped calls

1. Test purpose

   To check that information on dropped calls will be written to the disk file before failure

2. Required test environment

   - Software levels of other network element: NMS/2000 T12

3. Test execution
   1. Set feature DC_OBSERVATION_USAGE on
      ZWOC:10,51,FF;
   2. Modify Dropped Call Observation.
      e.g. ZTPM:OBSERV,DC_OBS:ALL,0-0-24-0,15:BTS=19;
   3. Start observation
      ZTPS:OBSERV,DC_OBS;
   4. Check the observation state
      ZTPI:OBSERV,DC_OBS:;

   Administrative state is UNLOCKED and operational state is ENABLED.

   5. Take a call
   6. Cause a call drop e.g. by removing battery of the MS.
   7. Check from NMS/2000 the observation file.

4. Expected results

   The information on dropped calls are written to the disk file during last 16 seconds before failure.

17.23 STS1015B0001 IMSI tracing at SGSN

1. Test purpose

Check the tracing method, verify the recorded data at the NMS/2000 site.

2. Required test environment
- NMS: T12
- SGSN, SG2 with GPRS trace
- BSC, S10 with System Level Trace
- at least 2 BTS
- MS
- All the required network elements are supposed to be GPRS compatible

3. Test execution
    1. activate IMSI tracing of the test MS in SGSN:
        ZT4A:IMSI=<imsi>:REF=<ref>;
    2. establish some GPRS calls and transfer data UL and DL
    3. check at the NMS/2000 the BSC has produced trace reports

4. Expected results
    Counters are updated, results sent to NMS/2000 site.

17.24 STS1015B0002 IMEI tracing at SGSN, pending table restoration if PCU reset occurs

1. Test purpose

Check the tracing method, verify the recorded data at the NMS/2000 site.

2. Required test environment
- NMS: T12
- SGSN, SG2 with GPRS trace
- BSC, S10 with System Level Trace
- at least 2 BTS
- MS
- All the required network elements are supposed to be GPRS compatible

3. Test execution
1. activate IMEI tracing of the test MS in SGSN:
   ZT4A:IMEI=<imei>:REF=<ref>;
2. establish GPRS calls and transfer data UL and DL
3. restart the BCSU:
   ZUSU:BCSU,<bcsu_id>;
4. PCU reset occurs, pending table is restoring from back-up disk
5. establish GPRS calls and transfer data UL and DL
6. check at the NMS/2000 the BSC has produced trace reports

4. Expected results

Pending table is restored in case of PCU reset, counters are updated, results sent to NMS/2000 site.

17.25 STS1015O0003 FER measurement for FH, activating the measurement

1. Test purpose
Check new measurement type FER, verify activation, set up a correlation table, check counters.

2. Required test environment
- NMS: NetAct OSS3.1
- BSC: S10
- BTS with FH
- RX quality feature must be activated. Use command ZWOI to check, and ZWOC to activate.

3. Execution
   1. activation of FER usage:
      ZWOA:2,628,A;
      verify activation:
      ZWOS:2;
      00628 FER_USAGE ACTIVATED
   2. modify averaging window parameters, define classes:
      ZTPM:MEASUR,FER:ALL,0-0-24-0,15:CL1=2,CL2=4,
      CL3=7,CL4=10;CL5=15,CL6=20,CL7=30,WIN=4;
   3. start FER measurement:
      ZTPS:MEASUR,FER;
   4. interrogate measurement:
      ZTPI:MEASUR,FER;
   5. establish several calls, and clear them after a while
   6. stop measurement:
      ZTPE:MEASUR,FER;
   7. check counters at BSC (in the measurement file or FOXMEA service terminal extension, measurement type 77=BSC_FER_MEAS_C) and NMS

4. Expected results
   Counters are reasonable, FEP calculated after correlation table fixing, results sent to NMS site.
   NOTE: counters related to downlink FER are not updated until the correlation table is not built

17.26 STS1015O0004 Changing FH parameters check correlation table update (BB hopping used)

1. Test purpose

With the new FER measurement activated, change the FH scheme. Verify the correlation table update, check counters.

2. Required test environment
- NMS: OSS3.1
- BSC: S10
- BTS: Nokia TalkFamily DF6.0 cell with no hopping
- 2 MS
- RX quality option must be activated. Use command ZWOS to check, and ZWOA to activate.
- FER usage activated, check with: ZWOS:2;

  00628 FER_USAGE ACTIVATED if not, activate: ZWOA:2,628,A;

3. Test execution
   1. modify averaging window parameters, define classes:
      ZTPM:MEASUR,FER:ALL,0-0-24-0,15:CL1=2,CL2=4,CL3=7,
      CL4=10,CL5=15,CL6=20,CL7=30,WIN=5;
   2. start FER measurement:
      ZTPS:MEASUR,FER;
   3. interrogate FER measurement:
      ZTPI:MEASUR,FER;
   4. lock BTS:
      ZEQS:BTS=<bts>:L;
   5. change frequency hopping scheme to BB hopping:
      ZEQE:BTS=<bts>:HOP=BB;
   6. unlock BTS:
      ZEQS:BTS=<bts>:U;
   7. correlation table is updating. This updating procedure has long duration caused by number of necessary collected samples.
   8. establish some calls
   9. stop FER measurement:
      ZTPE:MEASUR,FER;
   10. check counters at BSC and NMS/2000

4. Expected results
   Counters are updated, results sent to NMS/2000 site.

17.27 STS1015O0005 FER measurement during BCSU switchover (BB hopping used)

1. Test purpose

With the new measurement type FER activated, do a BCSU switchover, verify the correlation table update, check counters.

2. Required test environment

- NMS: OSS3.1
- BSC: S10
- BTS: Talk Family DF6.0 cell with BB hopping
- 2 MS
- RX quality option must be activated. Use command ZWOS to check, and ZWOA to activate.
- FER usage activated, check with:ZWOS:2;

  00628 FER_USAGE ACTIVATED if not, activate: ZWOA:2,628,A;

3. Test execution

   1. modify averaging window parameters, define classes:
      ZTPM:MEASUR,FER:ALL,0-0-24-0,15:CL1=2,CL2=4,
      CL3=7,CL4=10,CL5=15,CL6=20,CL7=30,WIN=4;
   2. start FER measurement:
      ZTPS:MEASUR,FER;
   3. interrogate FER measurement:
      ZTPI:MEASUR,FER;
   4. display FEP with FOX tool (in the related BCSU), initially all FEP values are 0
   5. establish some calls, until the FEP is upgraded (non-0 values)
   6. do a BCSU switchover:
      ZUSC:BCSU,<bcsu>:SP;
   7. check FEP again in old (now spare) BCSU, FEP values were deleted
   8. check FEP in the new BCSU (initially 0s)
   9. establish some calls, correlation table is updating. This updating procedure has long duration caused by number of necessary collected samples.
   10. the FEP values should be upgraded after a while
   11. stop FER measurement:
       ZTPE:MEASUR,FER;
   12. check counters at BSC and NMS/2000

4. Expected results

   Counters are updated, results sent to NMS/2000 site.

17.28 STS1015O0006 FER based handover (RF hopping used)

1. Test purpose

Verify FER based handover, check counters.

2. Required test environment
- NMS: OSS3.1
- BSC: S10
- BTS: two adjacent cells with RF hopping
- RX quality option must be activated. Use command ZWOI to check, and ZWOC to activate.
- FER usage activated, check with: ZWOS:2;

  00628 FER_USAGE ACTIVATED if not, activate: ZWOA:2,628,A;

3. Test execution
   1. modify the measurements:
      ZTPM:MEASUR,FER:ALL,0-0-24-0,15:CL1=1,CL2=5,
      CL3=15,CL4=35,CL5=70,CL6=120,CL7=240,WIN=1;
   2. parameters should be setup to ban all the handover types (RX quality modified so RXqual HO can't occur)
   3. start FER measurement in both BSCs:
      ZTPS:MEASUR,FER;
   4. interrogate FER measurement:
      ZTPI:MEASUR,FER;
   5. establish calls until correlation table is built (check FEP table from FOX) after table is built, no handover occurs
   6. modify FER based handover parameter value:
      ZEEQ:FPHO=Y;
   7. FER handover is made, check counters (appears like RX quality handover)
   8. stop measurement:
      ZTPE:MEASUR,FER;
   9. check the counters from BSC and NMS/2000

4. Expected results
   Counters are updated, results sent to NMS/2000 site.

17.29 STS1015O0007 DAC measurement

1. Test purpose
   Verify the new measurement type - DAC measurement -, check counters at NMS/2000 site.

2. Required test environment NMS: OSS3.1 BSC: S10
   - 2 BTSs adjacent cells

3. Test execution
   1. activate DAC measurement:
      ZWOA:2,626,A;
   2. check the feature is activated:
      ZWOS;
      00626 DAC_USAGE ACTIVATED
   3. create BCCH list, and attach it to the BTSs:
      ZEBC and ZEQB commands
   4. modify DAC measurement (define two dB values) and undefined adjacent cell measurement:
      ZTPM:MEASUR,DAC:ALL,0-0-24-0,15:DB1=0,DB2=10;
      ZTPM:MEASUR,UNDEF_ADJ:ALL,0-0-24-0,15;
   5. start DAC and UNDEF_ADJ measurement:
      ZTPS:MEASUR,DAC:;
      ZTPS:MEASUR,UNDEF_ADJ:;
   6. interrogate measurement:
      ZTPI:MEASUR,DAC,;
      ZTPI:MEASUR,UNDEF_ADJ:;
   7. establish some calls
      in the 2nd measurement period establish some calls, and then do a BCSU switchover:
      ZUSC:BCSU,<bcsu>:SP;
   8. stop measurement:
      ZTPE:MEASUR,DAC;
      check counters at BSC and NMS

4. Expected results
   1. DBm values are listed in the measurement file the defined adjacent cell and undefined adjacent cell measurement can be active in the same time.
   2. standard deviation counter value must be updated (it is calculated by the NMS)
   3. in the 2nd measurement period is not generated measurement file

17.30 STS1015B0008 S10.5 failure counters

1. Test purpose

   To verify that new measurements work correctly and new counters are added to traffic and CC SERLEV measurement report

2. Required test environment
   - BSC and BTS
   - OSS

3. Test execution

   1. Create Traffic and CC SERLEV measurements (ZTPM).
   2. Start Traffic and CC SERLEV measurements (ZTPS).
   3. Make calls and generate connection failures immediately after call initialization (for counters A, B, C) or after HO initialization. The measurements should be active in this time.
   4. Check if the measurements include the right counters. The cause and phase of release can be checked from internal messages.

4. Expected results
   1. One of the related counters is updated: 57043, 00192,00193 or 00194

Note: This can be tricky to get it to work in real network

18. EXTENDED CELL

18.1 STS0616B0001 Improved solution for extended cell

1. Test purpose

To ensure that MS to MS call and HO succeed between extended area E-TRX and normal TRX.

2. Required test environment

- BTS is D-type, second TRX is extended TRX (E-TRX) and TRX HW version is at least TRXA13
- Intra cell HO is allowed (ZEHG:BTS=<bts_id>:EIC=Y;).

3. Test execution

    1. If second TRX isn't E-TRX, you can modify it.
       Change state of TRX.
       ZERS:BTS=<bts_id>,TRX=<trx_id>,:L;
       Modify normal TRX.
       ZERM:BTS=<bts_id>,TRX=<trx_id>:ETRX=E,CH0=ERACH,
       CH1=SDCCH;
    2. Set the HO thresholds for uplink quality as follows:
       HO THRESHOLDS QUAL UL RX QUAL ... < 0.2% PX .. 01 NX .. 01
       ZEHQ:BTS=<bts_id>:QUR=1,QUP=1,QUN=1;
    3. Make a call.

4. Expected results

    1. The HO succeeds and speech quality is good all the time.
    2. The TCH of TRX is released.

19. PERFORMANCE MANAGEMENT

19.1 STS0700B0001 GSM Phase 2 Trace

1. Test purpose

   Ensure that the Trace report includes Trace Type and Operation System id (NMS / 2000 id).

2. Required test environment

   - Use Phase 2 MS's

3. Test execution
   1. Activate Phase 2 Trace from HLR.
      ZMTT:IMSI=<SIM cards IMSI number>:REF=<same in MSC and NMS / 2000>;
   2. Verify that the report is printed correctly from MSC printer.
      ZIID::GSMME1PR,:;
   3. In order to see that trace reports are sent to NMS / 2000, you must open BSS RADIO MEASUREMENT ONLINE DISPLAY window to terminal of NMS / 2000.

      Reference value must be same when in MSC.

   4. Take test call and verify that Trace type and Operation System id are included into the report.

4. Expected results

   The Trace report includes Trace type and Operation System id.

19.2 STS0505B0007 Results file identifier verification

1. Test purpose

   To check TRX frequency in measurement object.

2. Required test environment

   - Working BSS and NMS/2000

3. Test execution

   1. Activate features: 10,28 RX_HAC_USAGE_P
10,23 UNDERLAY_OVERLAY_P
10,27 RNOS_USAGE_P
ZWOC
   2. Activate RXQUAL, UNDERL and RXLEVEL -measurements
ZTPM, ZTPS
   3. Make few test calls.
   4. Check results from NSM/2000.

4. Expected results
   1. TRX_FREQUENCY counter has value.
   2. Object includes frequency (object=bts+trx+frequency).

20. ISDN ABIS

20.1 STS0612O0001 ISDN Abis

1. Test purpose

   To verify creation and working of the Abis-interface via ISDN-connection.

2. Required test environment
   - 30B+D-connection to BSC and 2B+D-connection to BTS
   - BTS with GTRU/ISDN-module (2B+D).

3. Test execution
   1. Connect ET to DSS1 interface:
      ZWUC:ET,68:ET1E,0:IF=DSS1:BCSU,0:;
   2. Create D channel:
      ZDSC:ISDN1:BCSU,0:68-16:U;
   3. Create circuit group and add circuits:
      ZRCC:NCGR=ISDNABIS,TYPE=DCS,CGR=100:LSI=DSS01;
      ZRCA:NCGR=ISDNABIS:CRCT=46-1&&-15&-17&&-31,DCS=ISDN1;
   4. Create route:
      ZRRC:EXT:ROU=1,OUTR=DSS01,STP=1,NCGR=ISDNABIS;
   5. Change state of D channel:
      ZDTC:ISDN1:WO;
   6. Change state of circuits:
      ZCEC:CRCT=68-1&&-15&-17&&-31:BA;
      ZCEC:CRCT=68-1&&-15&-17&&-31:WO;
   7. Change state of circuit group:
      ZCRM:CGR=100:WO;
   8. Change state of external route:
      ZCRC:ROU=1:WO;
   9. Create special circuit group for timeslot 0-1 and add circuits if needed.
      ZRCC:NCGR=TONES,CGR=99,TYPE=SPE:FORMAT=0,HUNTED=Y
      ZRCA:CGR=99,CRCT=0-1;
   10. Create BCF D channel:
       ZDSE:BCF07:BCSU,0:62,1:16,0-0,0;
   11. Create TRX D channel:
       ZDSE:T0701:BCSU,0:0,1:16,0-0,0;
   12. Create BCF:
       ZEFC:7,D:DNAME=BCF07:TEST=NOT:BBU=NONE:;
   13. Create BTS:
       ZEQC:BCF=7,BTS=7,NAME=ISDN7,:CI=507,BAND=900:NCC=0,BCC=0:M
       CC=520,MNC=18,LAC=5:HOP=N,UHOP=N:;
   14. Create ISDN Abis TRX:
       ZERC:BTS=7,TRX=1:TRA=ISDN,:53,0:DNAME=T0701:SIGN=2,
       TLOC=0,OLOC=2,TEL=123456789,CH0=MBCCHC,
       CH1=NOTUSED:;
       where TEL=123456789 is a ISDN telephone number of TRX
   15. Make sure that branching table of BTS is usable

16. Set BSC call number:
    ZEEM:BCN=987654321:;
    BTS uses this number to check that message sender has permission
17. Create other parameters as for normal BTS (ZEUC, ZEHC)
18. Create, attach and activate the BTS SW (ZEWC, ZEWA, ZEWV)
19. Unlock TRX, BTS and BCF (ZERS, ZEQS, ZEFS)
20. Take a call.

4. Expected results
    1. Creation of connection is possible without problems.
    2. Calls can be made.

21. CB

21.1 STS0401B0001 CB during active BCSU switchover

1. Test purpose
To ensure that CB will continue after BCSU switchover.

2. Required test environment
    - SMS_CB_DRX_USD_IN_BSC is active in PRFILE (ZWOC:10,34,FF;).
    - BTS has CB=Y and channel for CBs (ZEQM, ZERM).

3. Test execution
    1. Create SMS CB message:
       ZECA:0:0:1:1,ENG,3;
    2. Activate the message by command ZECS
    3. Make a such fault to active BCSU that switchover will occur.
    4. Check from trace that CB is going on.

4. Expected results
    CB msg broadcasting is switched over to the new active BCSU.

21.2 STS0719B0001 Creation and activation of CB messages

1. Test purpose
To verify working of CBs.

2. Required test environment
   - BTS has to have a cell broadcast channel.
   - Parameter SMS_CBC_USD_IN_BSC is off (ZWOC:10,44,00;)
   - The feature SMS_CB_DRX_USD_IN_BSC is on (ZWOC:10,34,FF;).

3. Test execution
   1. Activate the CB usage in BTS (EQM)
   2. Create CB messages using coding groups 0000 and 0001 (UCS2) with same MSG ID (ECA).
   3. Set the number of broadcast messages topic in the MS to be the same as the MSG ID in CB messages.
   4. Activate those messages with the same MSG ID (ECS).
   5. After receiving messages deactivate them (ECC or ECE).
   6. Modify message which uses group 0000 so that the MSG ID and coding group changes to 0001 and character set remains the same (7bit). (ECR)
      With coding group 0001: e.g.

         hi=Hindi
         eu=Basque
         sw=Swahili

      Coding Group is recommended when you want to define the language of the message, but the language is not among the 13 languages in the coding group 0000. In this coding group the two-letter language identifiers are defined in the ISO 639 standard and the language identifier is written by the user at the beginning of the message (first two letters followed by <CR> = 0D H). You must also choose the alphabet used in the message. The choices are 7-bit default alphabet and UCS2 characters.
   7. Display the new message (ECP)
   8. Change MS message topic to correspond modified message identity.
   9. Activate message (ECS).
   10. After receiving message deactivate it (ECC or ECE).
   11. Delete all messages (ECD).

4. Expected results

   MS receives all messages.

21.3 STS0401B0003 CB during active TRX switchover inside BCSU

1. Test purpose
To ensure that CB will continue after TRX switchover.

2. Required test environment
   - The switched over BCCH-TRX shall have active cell broadcasting going on.
   - There shall be a spare TRX, where the switch over is performed to.

3. Test execution
   1. Make such a fault to active TRX that switchover is necessary:
      ZDTC:<trx_link>:P,BL;
   2. Check from trace that CB is going on.

4. Expected results

   CB msg broadcasting is switched over to the new active TRX.

22. RADIO CHANNEL ALLOCATION

22.1 STS0302B0003 Alarm if nbr of usable a-if circuits below limit

1. Test purpose

To verify that the A-if availability alarm procedure works.

2. Required test environment
   - Working BSS
   - All A-interface circuits are in the WO-state

3. Test execution
   1. Use MML command to change parameters alarm limit and delay for unavailable A-if circuits. Default value for delay is 60s and for limit 100%.
      ZEGP:8:0;
      ZEGP:9:5;
   2. Block A-interface circuits over alarm limit (ZCEC).
   3. Wait alarm delay.

4. Expected results

   Alarm 2087 “LOW TRAFFIC CAPACITY ON CIRCUIT GROUP” will set on.

22.2 STS0618B0001 BCCH TRX channel allocation

1. Test purpose

To verify that TCH is allocated from correct TRX when BTS parameters require that.

2. Required test environment
- Before you start this case, you must create at least two TRX to BTS.
- All TCHs are idle on both TRXs.

3. Test execution
    1. Change BTS parameter, TRX Priority In TCH Allocation to 0,1 and 2.
       EQM:BTS=<bts_id>:TRP=<0-2>:;
       Where TRP values are:
       0 = No priorities
       1 = TCH allocation from BCCH
       2 = TCH allocation from another than BCCH
    1. Take some test calls MS to MS invariably when you changed TRP values.
    2. Verify that from all combinations and during all test calls, TCH channel allocated correctly.

4. Expected results

   TCH channels are allocated correctly.

22.3 STS0618B0002 Active channel interference estimation

1. Test purpose

   To verify that BSC received correct if-level information from both idle and active channels.

2. Required test environment
   - Before you start this case, you have to check that NMS/2000 include at least T10 and BTS B10.0 or DF3.0 software.
   - Prohibit handovers:
     EHG:BTS=<bts_id>:...
   - Load Radio Resource monitoring extension (RRM) from disk:
     00-MAN>ZLE:1,E00_BXSX
   - Implement extension 1:
     00-MAN> 1
   - Start TRX STATE OUTPUT monitoring:
     00-RRM>TC:BTS-ID,TRX-ID

3. Test execution
   1. Take MS to MS test call and verify if-level value from service terminal
   2. Change if-level values from both idle and active channels.

      Send RF RECOURCE INDICATION message to A-bis interface that in all channels there are starting interference level.

      ZOS:*,4,1B4,,,,,9413,,,7,1,FF,FF,FF,3,FF,FF,3,FF,FF,3,FF,FF,3,FF,FF,3,FF,FF,3,FF,FF,3,FF,FF

      Where 4 = active MCMU
      7 = BTS id (HEX)
      1 = TRX id
      FF,FF,FF = value for SDCCH TSL
      3,FF,FF = interference value for TCH TSL (0...4)

      Interference values returned back to allowed values of network by AVERAGING PERIOD time
      You can check AVERAGING PERIOD, AP time with command :
      ZEQO:BTS=<bts_id>:INT:;
   3. Verify that if-level information is updated correctly from both idle and active channels

4. Expected results

   When RF RECOURCE INDICATION message is sent, information is updated also to occupied channels.

22.4 STS0302B0002 Alarm if usable TCH number below limit

1. Test purpose

   To check that alarm is raised when operational states of the channels falls below the defined limit.

2. Required test environment

   - Working BSS

3. Test execution
   1. Define alarm limit for full rate TCH availability with MML-command
      ZEEQ:ALFRT=100;
   2. Generate fatal fault to (non BCCH) TCH TRX. Link should be blocked to generate alarm and wait for a while.
      ZDTC:<d-link>:BL;
   3. Check BTS alarms (ZEOL)
   4. Correct fatal fault
   5. Check BTS alarms

4. Expected results

   WORKING FULL RATE TCH RATIO BELOW TRESHOLD 7711 alarm is printed.

23. MS POWER HANDLING

23.1 STS0526B0002 New MS pwr levels, ph2 MS transm. pwr decr. max -> min

1. Test purpose
To verify that it is possible to decrease phase 2 MS (GSM, DCS or GSM1900) transmitting power to minimum level.

2. Required test environment

- Ph2 MS (GSM, DCS or GSM1900)

3. Test execution
   1. Allow power control and change interval to 1
      ZEUG:BTS=<bts_id>:PENA=Y,INT=1;
   2. Set power control parameters: PcUpperThresholdsLevUL = -100 dBm, PcLowerThresholdsLevUL = -110 dBm and for all thresholds Px=3 and Nx=4
      ZEUS:BTS=<bts_id>:UUR=-100,LUR=-110,UUP=3,UUN=4,
      LUP=3,LUN=4;
   3. Set quality thresholds as follows: upper qual < 0.2 %, lower qual > 12.8 %
      ZEUQ:BTS=<bts_id>:UUR=0,LUR=7;
   4. Set BTS parameters: ms_txpwr_min = 5 dBm for GSM, 0 for GSM1900 (power level 19 for GSM, 15 for GSM1900)
      ZEQM:BTS=<bts_id>:PMIN=5;
   5. Test will be executed according to following sequence:

      Set up one call
      BSC receives a measurement result from BTS

```
          MS            BTS              BSC
            meas report      meas result
          -------------->   --------------->
               ...              ...
            meas report      meas result
          -------------->   --------------->
```

      MS transmitting power will be decreased into minimum power level with one power command.

```
              L1 header       ms power ctrl
          <--------------   <---------------
            meas report      meas result
          -------------->   --------------->
```

4. Expected results
   1. MS transmitting power has been decreased more than one step to minimum:
      19 (5 dBm) with ph2 GSM MS (MS Power Class 4)
      15 (0 dBm) with ph2 GSM1900 MS (MS Power Class 1)
   2. Results can be verified in MEAS.RES. / L1 info messages from tracer.

23.2 STS0003O0002 Enable optimization of MS txpwr after handover

1. Test purpose

   To verify that MS transmitting power won't be at maximum value after inter cell handover.

2. Required test environment
- Configuration is BSC with two BTSs and one MS.
- BTSs are defined as adjacents to each others.

3. Test execution
   1. Activate MS_PWR_OPT_LN_HO_P -feature
      ZWOC:10,21,FF;
   2. Set the C/N threshold for the Target Cell to 10 dB
      ZEQK:BTS:<target>,CNT=10;
   3. Parameters are set into database so that inter cell handover will occur. (quality or power budget)
      ZEHQ:BTS=<source>:QDR=0,QDP=32,QDN=32;
      ZEAM:BTS=<source>,ABTS=<target>:PMRG=-24,MRGS=Y;
      ZEQM:BTS=<target>,PMAX=31;
      31 responds value 6 in HO_command (GSM)!
   4. Change C/N threshold for target BTS to allow optimization
      ZEQK:BTS=<target>:CNT=5
   5. Set up one call.
   6. Enable MS txpwr optimization. Set the parameter MsPwrOptLevel value to be 10dB < signal_level for adjacent cell in measurement_result -message.
      If signal_level=35 => signal_level=-65dBm(-110+35) => MsPwrOptLevel=-85dBm(-75-10)

      63 < -47 dBm
      41 >= -69 dBm
      35 >= -75 dBm
      30 >= -80 dBm
      0 >= -110 dBm

      ZEAM:BTS=<source>:ABTS=<target>:POPT=<level>;
   7. BSC will start inter cell handover sequence after few power_control message (decrease MS tx power).
   8. Disconnect the call
   9. Take the second call and handover

4. Expected results
   1. MS has been handed over to adjacent cell.
   2. Power level for first call should be 6 in handover_command -message and 6 in measurement_result -message.
   3. Power level for second call should be more than 6 in handover_command message and more than 6 in measurement_result -message (successful optimization of MS transmitting power).

23.3 STS0526B0001 New MS pwr levels, ph2 MS transm. pwr incr. min -> max

1. Test purpose

   To verify that it is possible to increase phase 2 MS (GSM, DCS or GSM1900) transmitting power to maximum level.

2. Required test environment

   - Ph2 MS (GSM, DCS or GSM1900)

3. Test execution
   1. Allow power control and change interval to 1
      ZEUG:BTS=<bts_id>:PENA=Y,INT=1;
   2. Set power control parameters: PcUpperThresholdsLevUL = -70 dBm, PcLowerThresholdsLevUL = -80 dBm and for all thresholds Px=3 and Nx=4
      ZEUS:BTS=<bts_id>:UUR=-70,LUR=-80,UUP=3,UUN=4,
      LUP=3,LUN=4;
   3. Set quality threshold as follow: upper qual < 0.2 %, lower qual 0.2 to 0.4%
      ZEUQ:BTS=<bts_id>:UUR=0,LUR=1;
   4. Set BTS parameters: ms_txpwr_max = 43 dBm for GSM, 33 for GSM1900 (power level 0 for GSM1900, 5 for GSM)
      ZEQM:BTS=<bts_id>:PMAX1=43;
   5. Test will be executed according to following sequence:

      Set up one call
      MS power will be decreased due to power control
      BSC receives a measurement result from BTS

```
MS            BTS              BSC
  meas report      meas result
  -------------->  --------------->
       ...            ...
  meas report      meas result
  -------------->  --------------->
```

      Increase the attenuation so that MS transmitting power will be increased into MAXIMUM ALLOWED power level with one power command.

```
  L1 header        ms power ctrl
  <--------------  <---------------
  meas report      meas result
  -------------->  --------------->
```

4. Expected results
   1. MS transmitting power has been increased more than one step to maximum allowed level.
   2. Results can be verified in MEAS.RES. / L1 info messages from tracer.

24. BTS POWER HANDLING

24.1 STS0910B0002 Variable Downlink step size

1. Test purpose

To test BTS power decrease by using variable downlink step size.

2. Required test environment
   - MS
   - BTS with 2 TRX

3. Test execution
   1. Enable VariableDLStepUse with command
      ZEEQ:VDLS=Y;
   2. Set TRX specific parameter Optimum RxLevDL to -90dBm (both TRX's).
      ZERM:BTS=<bts_id>,TRX=<trx_id>:LEVD=-90;
   3. Set power control parameters:
      ZEUG:BTS=<bts_id>:PENA=Y,PMAX=0,PMIN=30,INC=4,RED=4,INT=1;
      ZEUA:BTS=<bts_id>:LDS=1,LDW=1,LUS=1,LUW=1,QDS=1,QDW=1,
      QUS=1,QUW=1;
      ZEUQ:BTS:<bts_id>:UDR=2,UDP=1,UDN=1,UUR=1,UUP=32,UUN=32,
      LDR=7,LDP=32,LDN=32,LUR=3,LUP=32,LUN=32,LQR=3,LQP=32,
      LQN=32;
      ZEUS:BTS:<bts_id>:UDR=-47,UDP=1,UDN=1,UUR=-47,UUP=1,
      UUN=1,LDR=-110,LDP=32,LDN=32,LUR=-110,LUP=32,LUN=32;
   4. Establish a call so that the call is handed in the non BCCH-TRX. DL power control should be performed. Check from the tracer that BS power control appears. Check BS power control level from measurement result.

4. Expected results
   BTS power is decreased more than 4 dB in one go

5. Unexpected results
   BTS power is not decreased more than 4 dB in one go

25. FACCH CALL

25.1 STS0504B0003 FACCH call setup due to SDCCH congestion

1. Test purpose

To test procedures which concern the facch call setup for ordinary and emergency call.

2. Required test environment
   - PSTN phone which has defined receives emergency call.
     - o (Check routing zones from MSC (ZRUI), add zone for BTS (ZEPR))
   - B9.0/DF2.0 or newer BTS software must be available.
   - FACCH call set up in PRFILE is active (ZWOC:10,15,FF;).

3. Test execution
   1. Modify following parameters:
      a) ordinary call on FACCH
         ZEEM:EOF=Y;
      b) emergency call on FACCH
         ZEEM:EEF=Y;
      c) ordinary call on FACCH
         ZEEM:EOF=N;

      Change also emergency call restricted parameter
         ZEQF:BTS=<bts_id>:EC=N;
   2. Modify BTS channel configuration as follow:
         ZERM:BTS=<bts_id>,TRX=<trx_id>:CH0=MBCCH,CH1=SDCCH;
   3. Block the SDCCH by OMU service terminal command:
      ZOS:*,<WO-EX_MCMU>,1B4,,,,,5996,,,<BTS_hex>,<TRX_hex>,<CH_hex>,7

      Unblock:

      ZOS:*,<WO-EX_MCMU>,1B4,,,,,9500,,,<BTS_hex>,<TRX_hex>,<CH_hex>
   4. Start TRX monitoring by OMU service terminal commands:
         ZLE:N,E00_BXSX
         ZNTC:<BTS_hex>,<TRX_hex>

   5. Make calls
      a) from MS to PSTN, call succeeds
      b) emergency call from MS, call succeeds
      c) from MS to PSTN, call is rejected

   6. Verify the speech quality
   7. Check counters
         ZTVI:48;

4. Expected results
   1. Speech quality is good.
   2. Following counters are updated
         28 FACCH EMERGENCY CALL
         31 FACCH MO SPEECH CALL

26. HO DEVELOPMENT

26.1 STS0004O0002 Chained cells in rapid field drop, rxlevel_min reqs. not met

1. Test purpose
To verify that no handover made when rxlevel_min requirements are not met.

2. Required test environment

- 3 BTSs

3. Test execution
    1. Configure BTSs as follows: BTS1 = serving cell, BTS2&3 = chained adjacent cell to BTS1
       ZEAM:BTS=<1>:ABTS=<2&3>:CHAIN=Y;
    2. Set BTS output power for BTS1 = 24 dB, BTS2 = 12 dB & BTS3 = 24 dB
       ZEUG:BTS=<1>:PMAX=24;
    3. Set parameter 10,24 on (ZWOC:10,24,FF;)
    4. Set the parameter rxLevMinCell of the chained adjacent cells to (SL) 47 dBm (ZEAM:)
    5. Set the parameter threshold level uplink for rapid field drop (RPD) -47dBm (ZEHS:)
    6. Set the parameter count of successive rapid field drop thresholds (CNT) 1 (ZEHS:)
    7. Set minimum interval between HOs (MIH) to 1s (ZEHG)
    8. Set up a call on BTS1
    9. Check counters (ZTVI:48;)

4. Expected results
    1. The call continues on BTS1
       (Rapid field drop functionality can be checked by changing

       SL to -100dBm (ZEAM) -> call is handed over to other BTS)
    2. Counter 115 INTER_RAP_FLD_DROP is updated

26.2 STS0617O0003 Handover Measurement Averaging Method

1. Test purpose

To ensure that Handover measurements are saved and sent correctly between BSC and NMS/2000.

2. Required test environment
    - Before you start this case, you have to check that NMS/2000 include at least T10 software.
    - The adjacent cell list includes only one cell (BTS2), which belongs to the same BSC as the source cell.

3. Test execution
    1. Handover parameters are set into database so that inter cell handover is possible
       ZEAM:BTS=1:ABTS=2:PMRG=-24;
    2. Modify the GSM measurement characteristics. Command is:
       ZTPM:MEASUR,HO:...
    3. Start HO-measurement. Command is:
       ZTPS:MEASUR,HO:;
    4. Take test calls from subscriber A to subscriber B and make a handover to subscriber A.
    5. When the measurement period is terminated (ZTPE), verify that measurement reports are sent to NMS/2000. Open window from NMS/2000: UTILS / PERFORMANCE MNGT / DB CONTENTS.
    6. Start HO-measurement from NMS/2000 and repeat step 4 and 5.
       Open window from NMS / 2000: UTILS / PERFORMANCE MNGT / ADMINISTRATION / ACTION. (If you make the measurement at first time, before you start the measurement you have to create it).

4. Expected results
    1. Handover measurement activation is successful.
    2. Call succeeds and speech quality is good.
    3. Measurement reports are sent to NMS/2000 directly.
    4. The performance of HO-measurement is successful from NMS/2000.

26.3 STS0011B0001 Internal intra-cell handover, MS fails assignment

1. Test purpose

To verify that DX-error causes update correctly in case of the intra cell handover attempt when MS fails in assignment (return onto the old channel).

2. Required test environment

- 2nd generation BTS and MMI for it.
- Clear code measurements started in BSC and MSC.

3. Test execution
    1. Disable BSC from executing External Intra Cell Handover.
       ZEEQ:DINHO=N;
    2. Set ARFCN of the TCH CU in BTS to be different from that in the BSC. Use MMI/DEV ctrl./CU channels for modifying.
    3. Conditions triggering an internal intra cell handover decision shall be established.
       Example: ZEHQ:BTS=<>:QDR=0,QUR=0;
       ZEHI:BTS=<>:IDR=-100,IUR=-100;
       ZEHG:BTS=<>:EIC=Y,EIH=N;
    4. Make a call
    5. Check out the BSC Failure Measurements:
       ZTVI:<47..49>

       47. BSC Clear Code SERLEV Measurement

       :3 INTERNAL_INTRA_HO_TARGET
       :8 TCH_FAILS
       :16 TCH_SEIZURES

       48. BSC Clear Code PM Measurement
       :8 TCH_FAILS
       :18 TCH_SEIZURES

       49. Clear Code Measurement (Phase=0D)
       :323 HO_FAIL

    6. BSSMAP-cause in A-interface
    7. Check out BSC Error Counter Inquiry Command (ZTVO) function with Clear Code Measurement.
    8. Check out corresponding counters from OMC and clear codes from MSC.

4. Expected results
    1. The call is going on the old TCH. The new TCH is released.
    2. The counters have been incremented correctly in BSC, OMC and MSC.

26.4 STS0508B0001 Successful intra cell handover, uplink quality

1. Test purpose

To verify that it is possible to start a successful intra cell handover caused by uplink quality.

2. Required test environment
    - Configuration is one BTS with one TRX and one MS.
    - BTS does not have any adjacent cells.

3. Test execution
    1. Set quality threshold parameters:
        ZEHQ:BTS=<>:QDR=0,QUR=0;
    2. Set interference levels:
        ZEHI:BTS=<>:IDR=-100,IUR=-100;
    3. Enable IntraHoInterUL:
        ZEHG:BTS=<>:EIC=Y,EIH=N;
    4. Make a call.

4. Expected results
    1. The call is handed over to other channel of TRX.
    2. Handover cause is uplink quality in handover_performed-message on A-interface.

26.5 STS0721O0005 Bad quality experience guard time

1. Test purpose

To verify working of bad quality experience guard time in micro cell network.

2. Required test environment
   - Software levels of other network element at least: NMS/2000 T10, BTS B10 & D2.1.
   - BTS1/TRX1 is macro and BTS2/TRX1 is micro cell.
   - FMMS_USAGE_P is on (ZWOF:10,25,FF;)

3. Test execution

   Note: changed parameters are in use after new call
   1. Disable BTS1 power budget, level and quality HOs (ZEHG, ZEHQ).
   2. BTSs are adjacencies to each other, create macro/micro (layer) cell info in adjacent data and umbrella level (ZEAM / ACL = upper/lower, AUCL=-100).
   3. Set MS speed parameters for source (ZEHP / LSL=5, USL=50, STP=1, STN=1 and SDS=0).
   4. Set macro cell threshold to 19 dB and micro cell threshold to 17 dB (ZEEM / GMAC,GMIC).
   5. Set BTS1&2 MS txpwrmax to 21 dBm (ZEQM / PMAX).
   6. Set HO windows size and quality threshold parameters (lower layer) to minimum (ZEHA / QUWS, QDWS and ZEHQ / QUR, QDR, QDP, QDN).
   7. Reset counters (ZTVR:2:0;).
   8. Make call.
   9. Adjust power level so that MS perform HO micro to macro cell because of “bad quality”, after 4 minutes it is possible to make a new HO to micro cell. This 4 min. is the “bad quality experience guard time” (ZEUG).
   10. Enable power budget HO for upper layer BTS
   11. Make call. Now it is possible to make HO back to the micro cell without guard time.
   12. Check counters (ZTVI:48;). (Number 103 INTER_DL_RXQUAL)

4. Expected results
   1. Call and HOs are successful.
   2. HOs are possible between macro and micro cells.
   3. Guard time set limit to HO if reason is “bad quality”.

26.6 STS0510B0001 Combined umbrella & power budget, microcells, ho due to PBGT

1. Test purpose
To verify that a handover from micro cell to micro cell can be performed due to combined umbrella & power budget criterion.

2. Required test environment

- 3 BTSs and one MS

3. Test execution
   1. Modify radio network as follows:
      BTS_source has adjacents: BTS_target_1 and BTS_target_2
         ZEAC:BTS=<source>,ABTS=<target_1&2>;
         ZEAM:BTS=<source>,ABTS=<target_1&2>:ACL=LOWER,AUCL=-100;
      BTS_target_1 has adjacent BTS_target_2:
         ZEAC:BTS=<target_1>,ABTS=<target_2>;
      Enable umbrella and power budget HO
         ZEHG:BTS=<source>:EPB=Y,HPP=3,EUM=Y,HPU=3;
      Set the power budget handover margin and disable MS txpwr optimization
         ZEAM:BTS=<source>,ABTS=<target_1&2>:PMRG=-24,POPT=N;
      Set micro cell and macro cell thresholds for GSM
         ZEEM:GMAC=43,GMIC=33;
      and/or for DCS
         ZEEM:DMAC=32,DMIC=32
      Adjust output power
         ZEUG:BTS=<source>:PMAX=16;
         ZEUG:BTS=<target_1>:PMAX=16;
         ZEUG:BTS=<target_2>:PMAX=10;
      Set MS TxPwrMax (PMAX2 for DCS)
         ZEQM:BTS=<source>:PMAX1=25;
         ZEQM:BTS=<target_1>:PMAX1=29;
         ZEQM:BTS=<target_2>:PMAX1=37;
      Reset counters
         ZTVR:2:2;
   2. Set up a call
   3. BSC will start inter cell handover to BTS_target_1
   4. Change MS TxPwrMax between BTS_target_1 and BTS_target_2
   5. BSC will start inter cell handover to BTS_target_2

4. Expected results
   1. Call is handed over and HO_PERFORMED-message includes the cause “better cell”
   2. Check counters (ZTVI:48;)
         109=INTER_UMBRELLA_HO
         108=INTER_PBGT-HO

26.7 STS0721O0004 ICE handover support

1. Test purpose

To verify working of intelligent coverage enhancements

2. Required test environment
   - Software levels of other network elements: NMS2000 T10, BTS D2.1
   - The intelligent coverage enhancements (ICE_USAGE_P) feature is active (ZWOC:10,45,FF;)
   - IUO feature is active (ZWOC:10,23,FF;)
   - D-BTS1/TRX1 is regular cell (high power) and BTS1/TRX3 is super reuse cell (low power) (ZERM / FRT)

3. Test execution
   1. Configure BTS so that TRX1 antenna line doesn't go through combiner1. Connect antenna cable from TRX to upper connector “TX” in AFUA unit, TRX2 is not in use, now TRX1 has 3dBm higher power than TRX3
   2. Adjust BTS1 power to -75dBm (MS display) (ZEUG)
   3. Set HO parameter of BTS1 “super reuse bad RX level threshold” to 80dBm, “super reuse good RX level threshold” to -70dBm, “PX” and “NX” to 1 and method to “ICE”
      ZEHY:BTS=<nbr>:METH=ICE,CGR=-70,CBR=-80,CGP=1,
      CGN=1,CBP=1,CBN=1;
   4. Reset counters (ZTVR:2:0;)
   5. Take a call in BTS1. It stays in TRX1
   6. Increase power level of BTS1 so that TRX1 level goes over -70dBm
   7. HO is performed to low power TRX3
   8. Decrease power level of BTS1 so that TRX3 level goes under -80dBm
   9. HO is performed to high power TRX1
   10. Check counters (ZTVI:48;)

4. Expected results
   1. Call and HOs are successful
   2. Counters confirm type of HOs: 125 “intra_ok_ci_ratio” and 126 “intra_bad_ci_ratio”.

26.8 STS0721O0002 Rapid field drop improvement (ST)

1. Test purpose

To verify working of enhanced rapid field drop (ERFD) HO

2. Required test environment
   - Software levels of other network element: NMS2000 T10, BTS B10 & D2.1
   - Enhanced rapid field drop (EFRD_USAGE_P) feature is active (ZWOI, ZWOC, 10-46)
   - Chained cell usage feature is not active (ZWOI, ZWOC, 10-24) -> prevent old rapid field drop
   - BTS1 and BTS2

3. Test execution
   1. BTSs are chained adjacencies to each other (ZEAC / CHAIN)
   2. Set BTS2 barred (ZEQF)
   3. Adjust BTS1 power to -70 dBm on mobile screen (ZEUG)
   4. Set HO parameter of BTS1: ZEHS / LDR=-47, ERFD=DL, ERT=2,ERN=1,ERP=1,ERMW=1, ERZ=1, ERD=4, ERAW=2; ZEHA/ LDWS=32
   5. Reset counter (ZTVR:2:2;)
   6. Make a call in BTS1
   7. Cause rapid field drop (>10dBm) BTS1 (ZEUG)
   8. Enhanced rapid field drop HO to BTS2 is performed
   9. Check tracer and counter (ZTVI:48;)

4. Expected results
   1. Call and HOs are successful
   2. HO cause on tracer is “better cell”
   3. HO take place one measurement after the ERT threshold has been triggered.
   4. Counter 138 “inter_efrd_ho” confirm type of HOs.

26.9 STS0721O0001 Various window size

1. Test purpose
   To verify effect of MS speed to HO decision.
2. Required test environment
   - Software levels of other network element: NMS2000 T10, BTS B10 & D3.0.
   - Fast moving MS usage (FMMS_USAGE_P) feature is active (ZWOI, ZWOC, 10-25).
   - BTS1/TRX1 is lower and BTS2/TRX1 upper layer.

3. Test execution
   1. BTSs are adjacencies to each other (ZEAC / LMRG=-24, ACL=lower/upper), and:
      ZEAM:BTS=<bts_2>:ABTS=<bts_1>:AUCL=-100;
   2. Set BTS2 cell barred (ZEQF)
   3. Set ZEEM / GMAC=33, GMIC=33
   4. Set speed related parameters of BTS2 :
      ZEHP / LSL= 4, USL =10, STP=1, STN=1, SDS=0
   5. Set HO averaging parameters of BTS1:
      ZEHA / LDWS=20, LUWS=20, QDWS=20, QUWS=20
      and speed related parameters:
      ZEHP / LSL= 1, USL =2, STP=1, STN=1, SDS=10.
   6. Set HO signal strength parameters of BTS1
      ZEHS/ LDR=-110, LDP=1, LDN=1, LUR=-50
   7. Use OMU extension E01_BXSX to monitoring ms speed (R:bts_hex,trx)
   8. Reset counters (ZTVR:2:2;)
   9. Take a call in BTS1
   10. RX level UL is triggered (counter 102) HO to BTS2 after few second
   11. HO to back BTS1 is caused by slow moving MS after few second
   12. Set SDS=50 in HO parameter of BTS1 (ZEHP)
   13. Take a call in BTS1
   14. During call MS is detected fast moving MS in BTS1, after this system set rxlev HO widow sizes to 50%(SDS) from 20. This can be verified from measurement reports on tracer.
   15. Call is HO loop between BTS1&2
   16. Check counter (ZTVI:48;)

4. Expected results
   1. Parameters modification is managed without object locking
   2. Call and HOs are successful
   3. In situation where window size is decreased measurement report number after which the HO is performed, is 10
   4. Counters confirm type of HOs: 119/120 slow & 102 inter_UL_rxlev

27. TRAFFIC REASON HANDOVER

27.1 STS0519B0001 Traffic reason handover

1. Test purpose

To verify that traffic reason handover on every call in the cell can be performed successfully.

2. Required test environment
   - BTS1 has BTS2 created to adjacent in the BSC and MSC
   - Radio resource HOs are denied (ZEHG / EIC, EIH, EPB)
     For example:

HO THRESHOLDS QUAL DL RX QUAL .... > 12 % PX .. 32 NX ..32
HO THRESHOLDS QUAL UL RX QUAL .... > 12 % PX .. 32 NX ..32
HO THRESHOLDS LEV DL RX LEVEL .... - 050 dBm PX .. 32 NX.. 32
HO THRESHOLDS LEV UL RX LEVEL .... - 050 dBm PX .. 32 NX.. 32
HO THRESHOLDS LEV UL FOR RAPID FIELD DROP . - 110 dBm PX .. 00 (DISABLED)
HO THRESHOLDS INTERFERENCE DL RX LEVEL ..-050 dBm PX..32 NX..32
HO THRESHOLDS INTERFERENCE UL RX LEVEL ..-050 dBm PX..32 NX..32

3. Test execution
   1. Modify adjacent cell parameters:
      ZEAM:BTS=<source>:ABTS=<target>:TRHO=-100,SL=-110;
   2. Activate TR and set the Resource_Indication_Method to PERIODIC in MSC
      ZEPI:NO=<source&target>:RI=ON,RIM=PER;
   3. Set TR parameters in MSC for outgoing HOs
      ZEPH:NO=<source>:TRHO=ON,OUTC=98;
   4. Set TR parameters in MSC for incoming HOs
      ZEPH:NO=<target>:TRHI=ON;
   5. Reset BSC counters
      ZTVR:2:2;
   6. Make a call
   7. See BSC measurement counters
      ZTVI:48;
   8. Make a call

4. Expected results
   1. Call is handed to target cell
   2. Counter EXT_OUT_TR_HO value has increased
   3. Cause in the HANDOVER REQUIRED msg is “Response to MSC invocation”.

28. HO TYPE RESELECTION

28.1 STS0520B0001 Handover type reselection: Inter BSC HO after unsuccessful Intra BSC HO

1. Test purpose

To verify that if intra BSC handover fails due to congestion, inter BSC handover is started immediately.

2. Required test environment

- BSC1 with BTS1 (=source cell) and BTS2 (=the first target cell).
- BSC2 with BTS3 (=the second target cell).

3. Test execution

1. Set the BTS1 and BTS2 to have only one free TCH
   ZERS:BTS=<>,TRX=<>,CH=<>:L;
2. Set the parameter MSC CONTROLLED HO to NO in the BSC1
   ZEEQ:DINHO=N;
3. Set the parameter MIN INTERVAL BETWEEN UNSUCC HO ATTEMPT to be 5s in BSC ZEHG:BTS=<BTS2>:MIU=5;
4. Set the parameter NUMBER OF PREF CELLS to 2.
   ZEEM:NPC=2;
5. Enable queuing in BTS2 and BTS3
   ZEQH:BTS=<>:MQL=50,QPU=N
6. Set BTS power levels so that BTS2 is better than BTS3
   ZEUG:BTS=<>:PMAX=<>;
7. Set up a call to the BTS2 from the MS to fixed network.
   (BTS2 must have REAL congestion)
8. Set on the HAS log writings. It can be set on/off by command:
   ZOS:*,*,1C0,,,,,6034,,,1/0 (BCSU controlling BTS2)
9. Make another call
   - Inter BSC handover attempt is started.
   - Because BTS2 has no free resources, external handover is started to BTS3

4. Expected results

1. Check that in the HANDOVER REQUIRED message the cell identifier list includes only the BTS3.
2. Clear command message includes the cause “handover successful”.
3. The TCH of BTS1 is released.
4. The call is going on a TCH of BTS3 belonging to BSC2.

28.2 STS0520B0003 Handover type reselection: Inter BSC DR after unsuccessful Intra BSC DR

1. Test purpose
   To verify that if intra BSC directed retry handover fails due to congestion, external handover attempt is started.

2. Required test environment
   - BSC1 with BTS1 (=source cell) and BTS2 (=the first target cell).
   - BSC2 with BTS3 (=the second target cell).
   - Check that DEXDR=N (ZEEO:MIS;) (Disable external DR)

3. Test execution
   1. Activate DR feature
      ZWOC:10,5,FF;
   2. Allow DR for BTS1 and BTS2
      ZEQF:BTS=<BTS1&2>:DR=Y;
   3. Block all TCH:s at the BTS1 and BTS2.
      ZERS:BTS=<BTS1&2>,TRX=<>,CH=<>:L;
   4. Set all the channels available at the BTS3.
   5. Allow queuing in BTS1, and set the queuing time to be shorter than the dr_cell_list_creation_time.
      ZEQH:BTS=<BTS1>:QPU=Y,TLH=0;
   6. The first cell in the cell list belongs to BSC1.
   7. Set up a call to the BTS1.
   8. Check the counters: ZTVI:48;

4. Expected results
   1. Successful external handover (starts as soon as DR_Cell_List is created).
   2. Clear Command includes the cause ‘Handover successful’
   3. Counter 11 is updated (external_ho_source_succ).

28.3 STS0520B0002 Handover type reselection: Intra BSC HO after unsuccessful Inter BSC HO

1. Test purpose

To verify that if external handover fails due to congestion, internal handover attempt is started immediately.

2. Required test environment
   - BSC1 with BTS1 (=source cell) and BTS2 (=the first target cell).
   - BSC2 with BTS3 (=the second target cell).

3. Test execution
   1. Set the following parameters in BSC:
      HO_Load_Factor and Priority_level for BTS2 and BTS3 to 0
      ZEAM:BTS=<BTS1>:ABTS=<BTS2&3>:OF=0,PRI=0;
   2. Disable queuing in BTS3.
      ZEQH:BTS=<BTS3>:QPU=N;
   3. Block TCHs 3...7 in BTS3 and use 2 MS to block the rest 2.
      ZERS:BTS=<BTS3>,TRX=<>,CH=<>:L;
   4. Set parameter ‘MinIntervalBetweenUnsuccHoAttempt’ to 5s
      ZEHG:BTS=<BTS3>:MIU=5;
   5. Modify Number_Of_Pref_Cells to be 1.
      ZEEM:NPC=1;
   6. First cell in the cell list belongs to BSC2.

   7a. Set up a call to the BTS1 (from the MS to fixed network).
   8a. External handover attempt is started.
   9a. Because BTS3 has no free resources, intra handover is started ‘immediately’ to BTS2
   10b. Set the parameter ‘DisableInternalHo’ to yes:
      ZEEQ:DINHO=N;
   11b. Set up a call

4. Expected results

   1a. HANDOVER_REQUIRED_REJECT message includes the cause ‘No radio resource available’
   2a. Successful internal handover to BTS2.
   3b. No intra BSC handover attempt after unsuccessful inter BSC ho attempt
   A new inter BSC handover attempt can be started after the timer ‘Min_Interval_Between_Unsucc_HO_Attempt’ has expired.

29. RADIO RESOURCE MANAGEMENT DEVELOPMENT

29.1 STS0722O0001 Dynamic SDCCH allocation

1. Test purpose

   To verify working of dynamic SDCCH allocation.

2. Required test environment
   - Software levels of BTSs at least B11 & D4.0
   - Dynamic SDCCH allocation (DYNAMIC SDCCH) feature is active (ZWOC:10,42,FF;)

3. Test execution
   1. Configure channels of TRX: CCCH, SDCCH and 6 TCHF (ZERM)
   2. To ensure that “FACCH call setup” is not in use (ZWOC:10,15,00;)
   3. Block static SDCCH resources from “radio resource management program block” of working MCMU by command:
      ZOS:*,<04/05>,1B4,,,,,5996,,,<bts_id>,<trx_id>,<tsl_id>,7
   4. Check that SDCCH RTSL are blocked using E00_BXSX extension in OMU service terminal (ZLE, Z<x>T)
   5. Start traffic measurement (ZTPM,ZTPS)
   6. Take a call
   7. Clear the call
   8. Check counters
   9. Deactivate the feature (ZWOC:10,42,FF;)
   10. Take new call
   11. Unblock SDCCH channels:
       ZOS:*,<04/05>,1B4,,,,,9500,,,<bts_id>,<trx_id>,<tsl_id>

4. Expected results
   1. Call setup is successful when feature is active
   2. Counters confirm SDCCH reconfiguration:
      “154 DYNAMIC_SDCCH_RECONFIG_ATT”
   3. Call setup is not successful when feature is deactivated

29.2 STS0722O0002 Dynamic hotspot

1. Test purpose

   To verify working of dynamic hotspot (former soft capacity)

2. Required test environment
   - Software levels of BTSs at least B10 & D2.1
   - Prfile where is possible to activate the dynamic hotspot (DYN_HOTSPOT_USAGE)
   - BTS1&2 with 2 TRXs, BTSs are adjacencies

3. Test execution
   1. Activate the dynamic hotspot (DYN_HOTSPOT_USAGE) feature (ZWOC:10,43,FF;)
   2. Modify and start the traffic measurement (ZTPM & ZTPS)
   3. Lock BTSs and BCFs (ZEQS & ZEFS)
   4. Set BTS2 to barred (ZEQF)
   5. Set the BB-hopping in use in BTS1 and BTS2 (ZEQE)
   6. Set adjacent parameters
      ZEAM:BTS=1:ABTS=2:IC=1;
   7. Set BTS1 value of the parameter SOFTBLOCKING THRESHOLD (STR) to 0 (ZEQM)
   8. Create the following dynamic hotspot threshold table (one/BSC):
      ZEEU:GQL=10,BQL=90,SQL1=30,SQL2=20,TCP1=20,TCP2=40,TCP3=60;
   9. Unlock BTSs and BCFs (ZEQS & ZEFS)
   10. Check that traffic measurement is started and take a call in BTS 1 (ZTPI)
   11. Call establishment continues normally and the call succeeds
   12. The traffic meas. report include event in counter
       1150 TCH_SEIZ_GOOD_QUAL_IN_ADJ_C.
       Counters 1151, 1152 and 1153 are also dyn. hotspot counters.

       Report can be checked using NMS/2000 or OMU service terminal extension FOX_BXSX.

4. Expected results
   1. Call setup is successful when feature is active
   2. Counters confirm working of dyn. hotspot.

30. SDCCH HANDOVER

30.1 STS0002O0002 Internal inter-cell SDCCH handover

1. Test purpose

   To verify that the inter-cell handover can be executed correctly on a SDCCH and the call attempt continues on the new channel in BTS2.

2. Required test environment
   - 2 BTSs
   - SDCCH feature is active in PRFILE (ZWOC:10,22,FF;)
   - Disable fast averaging call set up (ZWOC:10,15,00;)

3. Test execution
   1. Disable BSC from executing External handover
      ZEEQ:DINHO=N;
   2. Enable SDCCH and intra handovers
      ZEHG:BTS=<BTS1>:ESD=Y,EIC=Y;
   3. Set HO quality threshold
      ZEHQ:BTS=<BTS1>:QDR=0,QDP=1,QDN=1;
   4. Set signal interference threshold level
      ZEHI:BTS=<BTS1>:IDR=-110;
   5. Set adjacent cell information
      ZEAM:BTS=<BTS1>:ABTS=<BTS2>:QMRG=-24,MRGS=Y;
   6. Modify parameters related to adjacent cell
      ZEHN:BTS=<BTS1>:AWS=1,NOZ=0;
   7. Conditions triggering an internal intercell handover from SDCCH to SDCCH decision shall be established (in real environment delay may be needed). The cell list includes only BTS2.
   8. Make a call
   9. FOX extension can be used to check counters (handover): counter numbers 54, 58, 61, 66 and 69 verifies correct working.
      Target BTS counters: 58 and 61
      Source BTS counters: 66 and 69
   10. Also MSC controlled SDCCH HO is possible (ZEEQ:DINHO=Y;).

4. Expected results
   1. The signaling continues on SDCCH of the BTS2.
   2. The call will be established on the BTS2.

31. TRUNK RESERVATION

31.1 STS0524B0001 Priority call set-up, trivial decision table (ST)

1. Test purpose

   To verify that priority call set-up is successful when priority call traffic type is connected to trivial decision table.

2. Required test environment

   - 2 MSs

3. Test execution
   1. Use PIE to subscriber conversion MML to define suitable PIE value for priority type subscriber
      ZEET:PR=3,ST=2:;
   2. Set BSC parameter TR_USAGE on
      ZWOC:10,8,FF;
   3. Set BSC parameter CM_BASED_SUBS_TYPE to 1Fh
      ZWOC:10,11,1F;
   4. Set BSC parameter PRIOR_BASED_SERV_SEP to TRUE
      ZWOC:10,12,FF;
   5. Set cell parameter TR_USED to YES
      ZEQT:<bts_id>:TR=Y;
   6. Check that BTS has only one TCH idle (ZERO:...).
   7. Define the number of traffic channels reserved in the BTS for priority subscribers only
      ZEQT:<bts_id>:TCRP=1,LIMIT=1,REM=STAT;
   8. Define random value upper limit
      ZETC:TBL=1,:100;
   9. Attach traffic types to TR decision tables in BTS
      ZEQT:<bts_id>::TT=5,TBL=1;

      TT1 -> TBL0
      TT2 -> TBL0
      TT3 -> TBL0
      TT4 -> TBL0
      TT5 -> TBL1
      TT6 -> TBL0
   10. Check priority from MSC & HLR or tracer:
      HLR:

      ZMIO:IMSI=<imsi_no>; ----> category=<cat> <>OR

      (set with MIM)

      MSC:
      'Priority assignment function' have to be turned ON (check with ZEDO, set with ZEDI)

      Sub analysis: ZRQI:MOC:NAME=<name>; -----> if ACAT=<cat>

then result=<res> (handle with RQC, RQM)

Sub analysis can be edited just on test side/state. Change state with RQN.

A-if result: ZRQQ:AIF:NAME=<res>; ---> priority=3,

(pre-emption capability indicator) PCI=N

11. Make MO call set-up with priority and ordinary subscribers to this BTS.
12. Modify subscriber:
    ZEET:PR=3,ST=0:;
13. Make MO call set-up with priority and ordinary subscribers to this BTS.

4. Expected results
   1. Priority value received in ASSIGNMENT REQUEST corresponds to value set to priority subscribers.
   2. In the first case, call set-up with priority subscriber is successful
      > ASSIGNMENT COMPLETE is sent to MSC, and ordinary subscriber fails.
   3. In the second case both call setups fails.

32. DUAL BAND

32.1 STS1002O5001 Inter-cell handover between different bands

1. Test purpose
To verify the correct working of BSC in case of inter-cell HO between two different bands (eg. GSM and GSM1800).

2. Required test environment
- Dual band feature activated in PRFILE (ZWOO; modifying not possible!)
- Dual band MS
- BTS1 is on band1, BTS2 is on band2
- BTSs are adjacents

3. Test execution
   1. Modify adjacent cell information
      ZEAM:BTS=<BTS1>:ABTS=<BTS2>:PMRG=-24;
   2. Allow adjacency on other band
      ZEQF:BTS=<BTS1>:DBC=Y;
   3. Make a call

4. Expected results
   1. Handover succeeds and speech quality is good all the time.
   2. TCH of BTS1 is released.

32.2 STS1002O5002 External cell handover between different bands

1. Test purpose
To verify the correct working of BSC in case of external cell handover between different bands (eg. GSM and GSM1800).

2. Required test environment
- Dual band feature activated in PRFILE (ZWOO; modifying not possible!)
- Dual band MS
- BTS1 (on BSC1) is on band1 and BTS2 (on BSC2) is on band2
- BTSs are adjacents

3. Test execution
1. Disable internal handovers
   ZEEQ:DINHO=Y;
1. Modify cell quality thresholds
   ZEHQ:BTS=<BTS1>:QDR=0,QDP=1,QDN=1,QUR=1,QUP=1,QUN=1;
2. Allow quality HOs between cells
   ZEAM:BTS=<BTS1>:LAC=<BTS2>,CI=<BTS2>:MRGS=Y,QMRG=-24;
3. Allow adjacency on other band
   ZEQF:BTS=<BTS1>:DBC=Y;
4. Make a call

4. Expected results
1. The handover succeeds and speech quality is good all the time.
2. The TCH of BTS1 is released.

33. DOUBLE BA

33.1 STS0027O0002 Measurements of undefined neighbors

1. Test purpose
   To verify that BSC works as determined when measuring undefined neighbors.

2. Required test environment
   - 2 BTSs

3. Test execution
   1. Disable BSC from executing External Inter Cell Handover
      ZEEQ:DINHO=N;
   2. First define two real BTSs as adjacent cells to each other (ZEAC, ZEAM).
   3. Define an idle BA list (nbr 1) which the BTSs will use. The idle BA list should include several frequencies, including the BCCH frequencies of the real BTSs.
      ZEBC:1,900:33&45&59&60&85&93;
   4. Define parameters so that HOs will be performed back and forth from BTS to BTS.
      ZEAM:BTS=<BTS1>:ABTS=<BTS2>:PMRG=-24;

      ZEAM:BTS=<BTS2>:ABTS=<BTS1>:PMRG=-24;
   5. Idle BA list is in use, BTS parameter UsageForActiveMS = Y.
      ZEQB:BTS=<BTS1>:IDLE=1,ACT=IDLE;
   6. Set the UNDEFINED ADJACENT CELL MEASUREMENT active in BTS1 (ZTPM, ZTPS).
   7. Set up a call (BTS1). At the moment there are no undefined adjacent cells and thus there should not be any statistical events about undefined adjacent cells.
   8. After the first measurement period, delete the adjacent cell (BTS2) descriptions of the BTS1 (ZEAD). The execution of handovers is interrupted. Now there should be observations about undefined adjacent cells.

4. Expected results

   There are measurement results from undefined neighbor cell in measurement report.

33.2 STS0027O0001 Inter-cell handover, idle BA list is used as a neighbor cell list

1. Test purpose
   To verify that the inter cell handover can be executed correctly when using idle BA list.

2. Required test environment
   - 2 BTSs

3. Test execution
   1. Disable BSC from executing External Inter Cell Handover
      ZEEQ:DINHO=N;
   2. First define some ‘dummy’ adjacent cells which use same BCCH-frequencies as the real BTSs (BTS2). Then BTS1 and ‘dummy’ are defined as adjacent cells to each other (ZEAC, ZEAM).
   3. Define parameters so that HOs will be performed back and forth from BTS to BTS.
      ZEAM:BTS=<BTS1>:ABTS=<BTS2>:PMRG=-24;

      ZEAM:BTS=<BTS2>:ABTS=<BTS1>:PMRG=-24;
   4. Define an idle BA list (nro 1) which the BTSs will use. The idle BA list should include several frequencies, including the BCCH frequencies of the real BTSs.
      ZEBC:1,900:33&45&59&60&85&93;
   5. At first idle BA list is used only on BCCH, BTS parameter
      UsageForActiveMS = N.
      ZEQB:BTS=<BTS1>:IDLE=1;
   6. Set up a call (BTS1).
   7. After a few handovers, change the value of the parameter UsageForActiveMS from No to Yes. Now the idle BA list is used as neighbor cell list and measurement results are handled according to that list.
      ZEQB:BTS=<BTS1>:ACT=IDLE;
   8. Modify the idle BA list by adding a BCCH frequency (20) that is lower than any other frequency in the list.
      ZEBM:1,A:20;
   9. Change the value of the parameter UsageForActiveMS back to No.
      ZEQB:BTS=<BTS1>:ACT=ADJ;

4. Expected results
   1. The call is going on and it is handed over from BTS to BTS back and forth without any interruption although the adj.cell list is changed into idle BA list and vice versa.
   2. The BA-USED indication bit is in the measurement results.

34. DIRECTED RETRY AND INTELLIGENT DR

34.1 STS0617O0002 DR and Queuing priority

1. Test purpose
   To verify the target cell evaluation is successful, a target cell is found and the BSC starts the DR handover when the values of parameter MinTimeLimitDR and MaxTimeLimitDR are changed, and Queuing is prohibit.

2. Required test environment
   - 2 BTSs

3. Test execution
   1. Activate DR feature
      ZWOC:10,5,FF;
   2. Disable external HOs
      ZEEQ:DINHO=N;
   3. Allow DR for BTS1
      ZEQF:BTS=<BTS1>:DR=Y;
   4. Block all TCH:s at the BTS1
      ZERS:BTS=<BTS1>,TRX=<>,CH=<>:L;
   5. Prohibit queuing at the BTS1
      ZEQH:BTS=<BTS1>:MQL=0;
   6. Change MinTimeLimitDR and MaxTimeLimitDR values
      ZEQF:BTS=<BTS1>:MIDR=0,MADR=15;
   7. The cell list includes only one cell (BTS2)
   8. Make a test call and verify time of HO in tracer
   9. Change MinTimeLimitDR and MaxTimeLimitDR values
      ZEQF:BTS=<BTS1>:MIDR=7,MADR=15;
   10. Take a new test call and verify time of HO in tracer
   11. Check counter 79 ‘CAUSE_DIRECTED_RETRY’ from FOX (RCGSTA/HANDOVER)

4. Expected results
   1. The test target cell evaluation for the directed retry is successful, a target cell is found in specified process of time and the BSC starts the DR handover. The call is going on at the BTS2.
   2. The SDCCH of BTS1 is released.

34.2 STS0720O0003 Direct access to super-reuse TRX in IUO

1. Test purpose

To verify working of direct access to super-reuse from regular TRX

2. Required test environment
   - Software levels of other network element: NMS2000 T10, BTS B10 & D2.1
   - IUO feature is active (ZWOI, ZWOC:10,23,FF;)
   - BTS with 2 TRX, regular and super-reuse.
   - MSC controlled HOs must be disabled (ZEEQ:DINHO=N;)

3. Test execution
   1. Modify non_BCCH TRX frequency types to 1 which means super-reuse TRX (ZERS, ZERM, FRT)
   2. Adjust BTSs power level to ~70 dBm on mobile screen (ZEUG)
   3. Allow IUO in BTS
      ZEHY:BTS=<bts_id>:METH=MAX;
   4. Create “dummy” adjacent cell for BTS:
      ZEAC:BTS=<bts_id>:LAC=888,CI=888:NCC=6,BCC=6,FREQ=66;
   5. Identify the interfering cell for the super-reuse TRX:
      ZERY:BTS=<bts_id>,TRX=<trx_id>:LAC1=888,CI1=888;
   6. Adjust HO parameters. Ex:
      ZEHG:BTS=<bts_id>:EIC=N,EIH=N;

      ZEHA:BTS=<bts_id>:LDWS=10,LUWS=10,QDWS=10,QUWS=10;...
   7. Enable “direct access” in the super-reuse TRX: (ZERM, DAL= -100)
   8. Reset counters: ZTVR:2:2;
   9. Make a call
   10. Check the HO to the super reuse TRX and terminate the call
   11. Verify that counter no: 131 “intra_direct_access” is updated: ZTVI:48;
   12. Disable “direct access” in the super-reuse TRX (ZERM, DAL=N)
   13. Reset counters: ZTVR:2:2;
   14. Make a call
   15. Wait HO and terminate the call
   16. Verify that counter no: 131 “intra_direct_access” is not updated (HO type was normal IUO HO and counter 125 “intra_ok_ci_ratio” has incremented)

4. Expected results
   1. DAL parameter modification is managed without TRX locking
   2. Call and direct access to super-reuse are successful, because DAL parameter is fulfilled
   3. Counters confirm type of HOs.

34.3 STS0721O0003 DR improvements

1. Test purpose
   To verify working of directed retry improvements

2. Required test environment
   - Software levels of other network element: NMS2000 T10, BTS B10 & D2.1
   - DR and/or IDR_USAGE feature is active (ZWOI, ZWOC, 10-5&10-6)
   - BTS1/TRX1 and BTS2/TRX1

3. Test execution
   1. BTSs are adjacent to each other (ZEAC)
   2. Prohibit queuing and block all TCHs of BTS1 (ZEQH & ZERS)
   3. BTS2 is barred (ZEQF)
   4. Set parameter of BTS1 DR method to "threshold evaluation method" (ZEQF)
   5. Set adjacent parameter "DR threshold" (DRT) of BTS2 in BTS1 to -80dBm (ZEAM), check that "RX level min cell" (SL) is much under "DRT" value
   6. Adjust BTS2 power under -80dBm (MS display) (ZEUG)
   7. Reset counter (ZTVR:2:0;)
   8. Take a call in BTS1
   9. Call is unsuccessful, because BTS2 level is under "DRT"
   10. Increase BTS2 power to over -80 dBm
   11. Take a call in BTS1
   12. Call is successful, DR is performed to BTS2
   13. Check counter (ZTVI:48;)

4. Expected results
   1. Calls and DR are performed as description
   2. Counter 111 INTER_DR_HO confirm DR

34.4 STS0502O0005 Intelligent directed retry

1. Test purpose
   To verify decision algorithm, if DR or IDR is started, works as determined.

2. Required test environment
   - 3 BTSs, BTS2&3 are adjacents to BTS1
   - 2 MSs with different class marks -> one is defined as MCN

3. Test execution
   1. Activate DR and IDR feature
      ZWOC:10,5,FF;

      ZWOC:10,6,FF;
   2. Allow IDR for BTS1
      ZEQF:BTS=<BTS1>:IDR=Y,DR=Y;
   3. Block all TCH:s at the BTS1
      ZERS:BTS=<BTS1>,TRX=<>,CH=<>:L;
   4. Set all the channels available at the BTS2&3
   5. BTS2 is defined as MCN cell
      ZEQF:BTS=<BTS2>:CTY=MCN;
   6. Check the class number of MS from tracer and set it to MCN
      use by BSC parameter: ZWOC:10,11,<x>;
      Where <x> is RF power capability number after transformation.
      (RF power capability=4 ---> 0000 1000 ---> 8H ---> ZWOC:10,11,8;)
   7. Disable external HOs
      ZEEQ:DINHO=N;
   8. Deny queuing in BTS1
      ZEQH:BTS=<BTS1>:MQL=0;
   9. Mobile A is MCN and mobile B is GSM mobile
   10. Call from subscriber A to B. Both mobiles are located on the BTS1

4. Expected results
   1. The call succeeds and IDR procedure is started; the first and only cell in the candidate cell list is MCN cell. (MCN MS in BTS2, GSM MS in BTS3)
   2. Assignment complete message includes Cell Identification (LAC+CI).

35. HALF RATE

35.1 STS0504O0008 External FR to FR HO, no proper channels available

1. Test purpose

   To verify the external handover attempt in the case no required type of radio resources available

2. Required test environment

   - BSC1 with BTS1 (BTS1 has FR channels)
   - BSC2 with BTS2 (BTS2 has HR channels)

3. Test execution

   1. Define BTS1 and BTS2 as adjacent cells to each other (ZEAC)
   2. Enable BSC executing External Handovers
      ZEEQ:DINHO=Y;
   3. Channel rate changes are allowed
      ZEEM:HRI=1;
   4. Set parameters so that external handover is possible
      ZEAM:BTS=<BTS1>:LAC=<BTS2>,CI=<BTS2>:PMRG=-24;
   5. Set up a call to the BTS 1 using FR MS

4. Expected results

   1. HANDOVER FAILURE message includes the cause ‘no radio resource available’, and following IEs: Circuit Pool (includes information of the pool which the circuit belongs to) Circuit Pool List (includes ‘half rate pool’)
   2. Call continues on the original channel

35.2 STS0504O0006 External FR to HR handover

1. Test purpose

To verify that the external handover can be executed correctly on a traffic channel, and that channel rate can be switched from FR to HR

2. Required test environment

- BSC1 with BTS1 (BTS1 has FR channels)
- BSC2 with BTS2 (BTS2 has HR channels)

3. Test execution

1. Define BTS 1 and BTS 2 as adjacent cells to each other (ZEAM)
2. Enable BSC executing External Handovers
   ZEEQ:DINHO=Y;
3. Channel rate changes are allowed (BSC2)
   ZEEM:HRI=4;
4. Set parameters so that external handover is possible
   ZEAM:BTS=<BTS1>:LAC=<BTS2>,CI=<BTS2>:PMRG=-24;
5. Set up a call to the BTS 1 using HR MS.
6. Check the used channel rate and speech coder
7. Check the presence of the “circuit pool” in the HANDOVER REQUEST ACKNOELEDGE

4. Expected results

1. The call is handed over on the TCH of the target-cell.
2. The original TCH is released.
3. HANDOVER REQUEST ACKNOWLEDGE message includes IE’s Circuit pool and Chosen channel.

35.3 STS0504O0009 Handover failure, A-if doesn’t have proper pool available

1. Test purpose
   To verify the unsuccessful external handover attempt in the case where target BSC hasn’t proper pool in the A-if

2. Required test environment

   - BSC1 with BTS1 (BTS1 has HR channels), A-if HR
   - BSC2 with BTS2 (BTS2 has HR channels), A_if FR

3. Test execution
   1. Define BTS1 and BTS2 as adjacent cells to each other (ZEAM)
   2. Enable BSC executing External Handovers
      ZEEQ:DINHO=Y;
   3. Channel rate changes are allowed
      ZEEM:HRI=1;
   4. Set parameters so that external handover is possible
      ZEAM:BTS=<BTS1>:LAC=<BTS2>,CI=<BTS2>:PMRG=-24;
   5. Set up a call to the BTS1 using HR MS

4. Expected results
   1. Cause in the HANDOVER FAILURE is “no radio resource available”
   2. Source BSC1 has HO required reject message with cause “no radio resource available”
   3. Call continues on the original channel.

35.4 STS0500B0027 Creation of the half rate A-interface

1. Test purpose

To verify that A-interface creation is successful

2. Required test environment

- MML terminal
- BSC must be created from MSC site.

3. Test execution

1. Connect ET for A-interface (WUC). Change the states to SE -> TE and run diagnostics (USC, UDU). Change the state to WO.
2. Create signaling links (NCC)
3. Define the own signaling point code (NRP)
4. Create signaling sets (NSC)
5. Create signaling route sets (NRC)
6. Allow activation of signaling links and route sets (NLA, NVA)
7. Change states on the signaling links and route sets to AV-EX (NLC, NVC)
8. Enable SCCP user part message handling (NPC)
9. Create SCCP services for own signaling point and for destination point (NFD)
10. Set SCCP broadcast status (OBM, OBC)
11. Change states of the SCCP services (NGC, NHC)
12. Hardware configuration for TCSM2
    a. Create first rack for TCSM2
        e.g. WTJ:TC2E,2A:PSFP=2,PSA=2;
    b. Create cartridge for TC1C
        e.g. WTC:TC1C,2A88-01:AL=1A120-37-2,P1=2A88-32:;
    c. Create unit for the TCSM2
        e.g.WTU:TCSM,32:2A88-01:;
    d. Create plug-in-unit for Transcoder controller TRCO
        e.g. WTP:TCSM,32:TRCO,0,0::GENERAL,4,32,TSL,1:;
    e. Create other cartridges and PIU's
        e.g. (WTC:ET1TC,2A120-01::;
        WTP:TCSM,32:TR16,0,1:;
        WTP:TCSM,32:TR16,1,2:;
        WTP:TCSM,32:ET2E,0,0::)
    f. Connect TCSM2 for A-interface:
        e.g. ZWUC:TCSM,32:TRCO,0:;
        e.g. ZWGC:32,1:POOL=1:BCSU,0:;
        e.g. ZWGC:32,2:POOL=2:BCSU,0:;
        Change the state of the unit to SE -> TE -> WO (USC).}

13. Create A-interface speech circuits (RCC) and add circuits (RCA).
14. Change the state of speech circuits WO-EX (CEC)
15. Change the state of speech circuits from MSC site to WO-EX (CEC).

4. Expected results

   Creations are successful

35.5 STS0500B0028 Creation of the half rate BSC radio network configuration

1. Test purpose
   To verify the correct creation of the half rate BSC radio network configuration

2. Required test environment
   - Before you start the test, OMU- and TRX -signaling link are created.

3. Test execution
   1. Create a Base Control Function (BCF) object of the BTS site:
      Command : EFC
   2. Create a Base Transceiver Station (BTS) object:
      Command : EQC
   3. Create a Transceiver (TRX) object and logical radio channel configuration using half rate / dual rate channels
      Command : ERC e.g. ERC:BTS=1,TRX=1:55,0,40-1,N:DNAME=0101:
      CH0:MBCCHC,CH1=TCHH,CH2=TCHD;
   4. Define power control parameters of the BTS:
      Command : EUC
   5. Define handover parameters of the BTS:
      Command : EHC
   6. Define adjacent cell parameters for the BTS:
      Command : EAC
   7. Check that TRX half rate support parameter is used.
      Command : ERO

4. Expected results
   1. Creations are successful

36. SATELLITE ABIS

36.1 STS0505O0002 MS call via satellite Abis

1. Test purpose

   To verify that feature is activated and it works correctly

2. Required test environment
   - Real satellite connection or satellite simulator in A-bis
   - BTS (B type) has to have EPROM version OMUB D150 and OMUB D160
   - PC with MMI
   - In TRX1 two timeslots are defined for a signaling: a combined BCCH and SDCCH/8 (six others defined as TCH's), in other TRX's one timeslot is defined for signaling (SDCCH/8 and seven others defined as TCH's).

3. Test execution
   1. Set bit error rate (BER) to 10E-6 over BTS-BSC path (simulator)
   2. Activate the satellite A-bis feature
      ZWOC:10,31,FF;
   3. Check next parameter values:
      Number of Slots Spread Transmission (SLO) = 50
      Max. Number of Retransmission (RET) = 4
      Max. Number of Repetition (NY1) = 5
      Modify if necessary by command ZEQM
   4. Set the delay of satellite simulator to 280ms
   5. Modify Frame Unit Control Timer (FUC) T200 timer from default 240ms to 1000ms by MMI (this LapD-timer is in OMU HW-DB of BTS)
   6. If TCSM2 is used set time alignment OFF and delay to 520ms
      ZRS:ALL:OFF
      ZRU:ALL:DELAY=520
   7. Create and activate satellite SW for BTS (ZEWC, ZEWA, ZEWV)
   8. Take a MS to MS call

4. Expected results
   1. Call control works correctly
   2. Speech quality is clear
   3. Speech delay is over 500 ms

37. ENHANCED COVERAGE BY FREQUENCY HOPPING

37.1 STS0808O0006 Enhanced coverage by RF hopping

1. Test purpose
   Perform enhanced coverage by using RF hopping

2. Required test environment
   - The Intelligent Underlay Overlay (10,23) and Handover Support for Coverage
   - Enhancements (10,45) features must be activated (ZWOI, ZWOC)
   - Frequency hopping for intelligent underlay overlay must be activated in PRFILE
   - At least DF3 software is needed (RF hopping is not supported by DE21/DF21 base stations)

3. Test execution

   BTS, with 2 TRX

   BTS=1 HOP N
   TRX1 FREQ=1 CH0=MBCCHC FRT=1..16 (underlay)
   TRX2 FREQ=10 FRT=0 (overlay)

   Modify (ZERM / FRT)

   1. Lock BCF and BTS (ZEFS, ZEQS). Create MA list for overlay layer.
      ZEBE:1,900:10&12&14&20:;
   2. Attach MA list for layer and set overlay RF hopping on.
      ZEQA:BTS=1:MAL=1

      ZEQE:BTS=1:HOP=RF,HSN1=1:;
   3. Unlock site (ZEQS, ZEFS).
   4. Establish a call.
   5. Check from tracer (Assignment Command) that hopping is on and MAIO and HSN values are correct.

4. Expected results
   1. RF-hopping can be set on
   2. Calls can be established successfully and is handed over to hopping TRX

38. HSCSD AND 14.4KBIT/S DATAT SERVICES

38.1 STS0715B0001 14.4kbit/s data call - internal HO

1. Test purpose
   To check that 14.4kbit/s data rate can be achieved after HO.

2. Required test environment
   - MSC M8, BTS B11 or D4
   - Check that D144 speech circuit is created. (ZWGO, ZRCI)
   - DATA_144_USAGE (10,48) is on and HSCSD_USAGE (10,47) is off (ZWOC)
   - 2 BTS are adjacent to each other

3. Test execution
   1. Parameters are set into database so that inter cell handover will be result of algorithm. (dl_qual < 0.2 % , BTSs are defined as adjacent cells to each others: ho_margin = -24dB)
      Commands are:

      ZEHQ:BTS=1:... QDR=0, QDP=1, QDN=1, QUR=1, QUP=1, QUN=1
      ZEAM:BTS=1:... QMRG=-24, MRGS=Y
      ZEQX:BTS=2:... HDT=1, HME=1

   2. Make a transparent data call (2 PC with data cards)
   3. After HO check current data rate from tracer

4. Expected results

   Data call is successful and data rate is same before and after HO

38.2 STS0715B0002 14.5kbit/s data call - external HO

1. Test purpose
   To check that 14.5kbit/s data rate can be achieved after HO

2. Required test environment
   - MSC M8, BTS B11 or D4
   - Check that D144 speech circuit is created (ZWGO, ZRCI)
   - DATA_144_USAGE (10,48) is on and HSCSD_USAGE (10,47) is off (ZWOC)
   - 2 BTS adjacent to each other

3. Test execution
   1. Enable external handovers
      ZEEQ:DINHO=Y;
   2. Parameters are set into database so that inter cell handover will be result of algorithm. (dl_qual < 0.2 % , BTSs are defined as adjacent cells to each others: ho_margin = -24dB)
      Commands are:

      ZEHQ:BTS=1:... QDR=0, QDP=1, QDN=1, QUR=1, QUP=1, QUN=1
      ZEAM:BTS=1:... QMRG=-24, MRGS=Y
      ZEQX:BTS=2:... HDT=1, HME=1

   3. Make a non-transparent data call (2 PC with data cards)
   4. After HO check current data rate from tracer

4. Expected results

   Data call is successful and data rate is same before and after HO

38.3 STS0715O0004 Automatic link adaptation for multislot data call

1. Test purpose
   To check that ALA is performed

2. Required test environment
   - MSC M8, BTS B11 or D4, at least.
   - Check that D144 speech circuit is created (ZWGO, ZRCI)
   - DATA_144_USAGE (10,48) is on and HSCSD_USAGE (10,47) is on (ZWOC)

3. Test execution
   1. Set parameters for ALA

      ZEUG:BTS=1:... AENA=Y, ALIM=20, PMAX=20, PMIN=30
      ZEUQ:BTS=1:... LQR=1, LGN=1, LQP=1

   2. Make a non-transparent, multislot data call
   3. By increasing power, ALA can happen

      ZEUG:BTS=1:... ALIM=4, PMAX=0

   4. Trace the channel coding changes from BTS.
      It should increase from 12 kb/s to 14.5 kb/s

4. Expected results

   Channel coding changes according to set parameters

38.4 STS0715O0003 Automatic link adaptation for single slot data call

1. Test purpose

   To check that ALA is performed correctly in accordance with the Configuration Change Command/Mode Modify procedure.

2. Required test environment
   - MSC M8, BTS B11 or D4, at least.
   - Check that D144 speech circuit is created (ZWGO, ZRCI)
   - DATA_144_USAGE (10,48) is on and HSCSD_USAGE (10,47) is off (ZWOC)
   - BTS with 2 TRX (BCCH + TCH) (lock all TCH in BCCH TRX).

3. Test execution
   1. Set parameters for ALA in BTS 1

      EUG: AENA=Y, ALIM=2, PMAX=0, PMIN=30
      EQM: MS_TX_PWR_MAX = 33
      EQM MS_TX_PWR_MIN = 00
      EUQ: LQR=1, LGN=1, LQP=1

   Set Parameters for Power Control.

PC Upper Threshold QUAL DL RX QUAL	0.4% - 0.8% Px=32 Nx=32
PC Upper Threshold QUAL UL RX QUAL	0.4% - 0.8% Px=32 Nx=32
PC Lower Threshold QUAL DL RX QUAL	> 12% Px=32 Nx=32
PC Lower Threshold QUAL UL RX QUAL	> 12% Px=32 Nx=32
PC Lower Threshold QUAL144 RX QUAL	>0.8% - 1.6% Px=1 Nx=1

   Enable BS Power control.

   ALA Power Limits for MS and BS.
   For the MS, the power limit for ALA is defined as
      MS_ALA_PWR_LIMIT = MsTxPwrMax - ALIM
   For the BS, the power limit for ALA is defined as
      BTS_ALA_PWR_LIMIT = BsTxPwrMax - ALIM

   2. Make a non-transparent 14.4Kbit single slot UDI data call. Check form the Channel Activation message that the call has been set up with 14.5Kb channel coding.

   3. Generate bad QUAL worse than the value set for (PC Lower Threshold QUAL144 RX QUAL >0.8% - 1.6%). After the first measurement where this criteria is met the ALA procedure should take place, this can be confirmed by checking that the mode Modify message contains the channel coding change for 12Kbit/s.

   4.Remove the source generating bad QUAL, after 32 SACCH periods where the QUAL has exceeded either the PC Upper Threshold QUAL DL RX QUAL or PC Upper Threshold QUAL UL RX QUAL and also where the BTS and MS power values are both below their ALA power limits, channel coding is changed from 12 kbits/s to 14.5 kbit/s. This can be confirmed by checking that the mode Modify message contains the channel coding change for 14Kbit/s.

4. Expected results

Channel coding changes take place from 14.5kbits/s --> 12kbits/s for ALA due to QUAL144 being triggered.

Channel coding changes take place from 12kbits/s --> 14.5kbits/s for ALA due to PC Upper threshold being triggered.

38.5 STS0717B0001 Creating and deleting D144 circuit pool

1. Test purpose
   To create and delete D144 circuit pool

2. Required test environment
   - DATA_144_USAGE (10,48) is on (ZWOC)
   - A interface ET is in WO-EX state
   - Number of through connected channels are set (ZWGS)

3. Test execution
   1. Create a D144 circuit pool
      ZWGC:32,1:POOL=20:BCSU,1:;
   2. Output current configuration
      ZWGO:32;
   3. Create speech circuit group and add circuits.
      ZRCC:NCGR=D144,TYPE=CCS,:DIR=IN,NET=NA0,LSI=AINA0,SP=201ZRCA:
      NCGR=D144:ETPCM=32,CRCT=1-1&&-15:CCSPCM=0;
   4. Delete speech circuit
      ZRCD:NCGR=D144;
   5. Delete circuit pool
      ZWGD:32,1;

4. Expected results
   1. D144 pool type can be created and deleted
   2. Also configuration of pool type is echoed to the screen correctly

   Note: To set receiving MS to use 14,4 by command: at+cbst=75,0,1

38.6 STS0717B0005 Creating and deleting HSCSD circuit pools

1. Test purpose
   To create and delete HS2 and HS4 circuit pools

2. Required test environment
   - HSCSD_USAGE and DATA_144_USAGE are on (ZWOC)
   - Number of through connected channels are set (ZWGS)

3. Test execution
   1. Create HS2 circuit pools
      ZWGC:32,1:POOL=10:BCSU,1:;

      ZWGC:32,2:POOL=21:BCSU,1:;
   2. Output current configuration
      ZWGO:32;
   3. Create speech circuit group (ZRCC) and add circuits (ZRCA).
      ZRCC:NCGR=HS2+D144...

      ZRCA:...
   4. Delete speech circuits
      ZRCD:NCGR=HS2+D144;
   5. Delete circuit pool
      ZWGD:32,2;
   6. Create new circuit pool
      ZWGC:32,1:POOL=13:BCSU,1:;
   7. Go through steps 2-4. In step 4 change the pool to 22
   8. Delete both TCSM PCMs
      ZWGD:32,2;

      ZWGD:32,1;

4. Expected results
   1. All four different pool types can be created and deleted.
   2. Also configuration of these types is echoed to the screen correctly.

38.7 STS0715O0007 HSCSD external HO with upgrade procedure

1. Test purpose

   To check that data rate changes after handover

2. Required test environment
   - MSC M8, BTS B11 or D4
   - Check that HS4&D144 speech circuit is created (ZWGO, ZRCI)
   - DATA_144_USAGE (10,48) is on and HSCSD_USAGE (10,47) is on (ZWOC)
   - 2 BTS are adjacents to each other (BSC1 has BTS1, BSC2 BTS2)

3. Test execution
   1. Enable external handovers
      ZEEQ:DINHO=Y;
   2. Make a handover to subscriber A. Parameters are set into database so that external handover will be result of algorithm. (dl_qual < 0.2 %, BTSs are defined as adjacent cells to each others: ho_margin = -24dB)
      Commands are:

      ZEHQ:BTS=1:... QDR=0, QDP=1, QDN=1, QUR=1, QUP=1, QUN=1
      ZEAM:BTS=1:... QMRG=-24, MRGS=Y
      ZEQX:BTS=2:... HUT=1, HUG=1

   3. Check that original cell has one free TCH
   4. Target cell should have two or more free TCHs
   5. Make a nontransparent data call
   6. Trace reserved traffic channels before and after HO

4. Expected results
   1. Handover succeeds
   2. Data rate increases after HO

38.8 STS0715O0006 HSCSD inter-cell HO with downgrade procedure

1. Test purpose

   Check that data rate changes after handover

2. Required test environment
   - MSC M8, BTS B11 or D4
   - Check that HS4&D144 speech circuit is created (ZWGO, ZRCI)
   - DATA_144_USAGE (10,48) is on and HSCSD_USAGE (10,47) is on (ZWOC)
   - 2 BTS are adjacents to each other

3. Test execution
   1. Make a handover to subscriber A. Parameters are set into database so that inter cell handover will be result of algorithm. (dl_qual < 0.2 %,BTSs are defined as adjacent cells to each others: ho_margin = -24dB)
      Commands are:

      ZEHQ:BTS=1:... QDR=0, QDP=1, QDN=1, QUR=1, QUP=1, QUN=1
      ZEAM:BTS=1:... QMRG=-24, MRGS=Y
      ZEQX:BTS=2:... HDT=1, HME=1, HTM=50

   2. Check that original cell has at least three free TCHs
   3. Block from target cell TCHs so that there are same amount of free TCHs as source cell
   4. Make a nontransparent data call that uses all free timeslots from source cell.

TSLs	9.6kbit/s	14.4kbit/s
1	9.6	14.4
2	19.2	28.8
3	28.8	43.2
4	38.4	57.6

   5. Make a normal call to the target cell
   6. Trace reserved traffic channels before and after normal call

4. Expected results
   1. Handover succeeds.
   2. Data rate decreases after normal call is established.

38.9 STS0715O0005 Measurements for HSCSD

1. Test purpose
   Modify, start, interrogate and stop HSCSD measurement

2. Required test environment
   - MSC M8, BTS B11 or D4
   - Check that D144 speech circuit is created (ZWGO, ZRCI)
   - DATA_144_USAGE (10,48) is on and HSCSD_USAGE (10,47) is off (ZWOC)

3. Test execution
   1. Modify measurement parameters

      ZTPM:MEASUR,HIGH_SPEED:ALL,0-0-24-0,15:;
   2. Start measurement

      ZTPS:MEASUR,HIGH_SPEED:,:;
   3. Interrogate given parameters

      ZTPI:MEASUR,HIGH_SPEED:;
   4. Make several data calls (transparent, non-transparent)
   5. Stop measurement

      ZTPE:MEASUR,HIGH_SPEED::;
   6. Check measurement’s counter values from NMS or with FOX

4. Expected results

   Measurement handling works correctly and counters are updated to NMS

39. IUO

39.1 STS0705O0004 BB hopping with IUO

1. Test purpose

   Check BB hopping with underlay overlay

2. Required test environment
   - The Intelligent Underlay Overlay (10,23) feature must be activated (ZWOI, ZWOC)
   - Frequency hopping for intelligent underlay overlay must be activated in PRFILE to get usage of IUO hopping related commands (ZEQE / UHOP , ZEQO / HOP and ZEFO/ HOP)
   - DF3 or B11 BTS software is needed and 2nd generation requires prom upgrade for the Frequency Hopping unit
   - 2 BTSs, one with 4 TRXs

   Note! InSite BTS cannot hop Frequency Hopping or Base Band hopping is not supported with combination of PrimeSite with BTS SW DF6

3. Test execution
   1. Set underlay TRXs as follows
      BTS with 4 TRX
      TRX1 FREQ=<> CH0=MBCCHC FRT=0 (overlay)
      TRX2 FREQ=<> FRT=0 (overlay)
      TRX3 FREQ=<> FRT=1 (underlay)
      TRX4 FREQ=<> FRT=1 (underlay)
      Command are ZERS, ZERM
   2. Create BTS2 as adjacent cell for BTS1 (ZEAC)
   3. Lock BCF and BTSs (ZEFS, ZEQS)
   4. Set BB hopping for overlay and underlay
      ZEQE:BTS=1:HOP=BB,HSN1=1,HSN2=2,UHOP=BB,UHSN=3:;
   5. Define BTS2 as interference cell for BTS1 (ZERY)
   6. Unlock site (ZEQS, ZEFS)
   7. Establish call through all TRXs by changing intelligent underlay-overlay parameters (ZEHY)
   8. Check hopping related parameters:
      ZEQO:BTS=<bts_id>:HOP; or ZEFO:<bcf_id>:HOP;
   9. Check from tracer (Assignment Command) that hopping is on and MAIO and HSN values are correct.
   10. Test also cases when BB hopping is on only in overlay or underlay TRXs

4. Expected results
   1. BB hopping can be set on
   2. Calls can be established successfully

39.2 STS0720O0004 Handover cause priorisation in IUO

1. Test purpose

   To verify that PBGT HO has higher priority than bad C/I ratio in IUO

2. Required test environment
   - IUO feature is active (ZWOI, ZWOC:10,23,FF)
   - BTS1 has regular and super reuse TRX and BTS2 has 2 TRX (ZERM / FRT)
   - BTSs are neighbor to each other and BTS2 is interference cell to TRX2 of BTS1 (ZEAC, ZERY)
   - NMS/2000 has T10 software

3. Test execution
   1. Enable power budget ho of BTS1 (ZEHG)
   2. Adjust BTSs power level so, that BTS1 is ~10 dBm better than BTS2 power levels are show on mobiles screen
   3. Change BTS1 parameter so that HO BTS1 regular to super reuse TRX will perform (ZEHY/ GCI=-30, BCI=10, METH=MAX)
   4. Check that regular-super-regular HO works
   5. Set power budget HO threshold (ZEAM) to same level with bad C/I ratio (BCI)
   6. Reset counters ZTVR:2:2;
   7. Take a call on BTS1 and HO to super-reuse TRX2
   8. Increase BTS2 power so that PBGT and C/I thresholds are fulfilled
   9. MS make HO to BTS2 by reason “better cell” (= PBGT HO)
   10. Check counters ZTVI:48;

4. Expected results
   1. HO follow the new priorisation, PBGT before C/I HO
   2. Counter 108 confirm power budget and 125, 126 IUO HOs

39.3 STS0705O0005 RF hopping with IUO

1. Test purpose

   Check RF hopping with underlay overlay

2. Required test environment
   - The Intelligent Underlay Overlay (10,23) feature must be activated (ZWOI, ZWOC)
   - Frequency hopping for intelligent underlay overlay must be activated in PRFILE to get usage of IUO hopping related commands (ZEQA / UMAL, ZEQE / UHOP, ZEQO / HOP and ZEFO / HOP).
   - DF3 software is needed
   - RF hopping is not supported by DE21/DF21 base stations.
   - RF hopping can not be used on the BCCH transceiver.

3. Test execution
   1. Set underlay TRXs as follows
      BTS with 4 TRX

TRX1 FREQ=1	CH0=MBCCHC	FRT=0 (overlay)
TRX2 FREQ=10		FRT=0 (overlay)
TRX3 FREQ=12		FRT=1 (underlay)
TRX4 FREQ=14		FRT=1 (underlay)

      Command are ZERS, ZERM
   2. Create BTS2 as adjacent cell for BTS1 (ZEAC)
   3. Lock BCF and BTSs (ZEFS, ZEQS)
   4. Create own MA list for overlay and for underlay
      ZEBE:1,900:10&20&22&24
      ZEBE:2,900:12&14&16&18
   5. Attach MA lists for layers and set RF hopping on for both layers
      ZEQA:BTS=1:MAL=1,UMAL=2:;
      ZEQE:BTS=1:HOP=RF,HSN1=1,UHOP=RF,UHSN=2:;
   6. Unlock site (ZEQS, ZEFS)
   7. Establish call through all TRXs by changing intelligent underlay-overlay parameters (ZEHY)
   8. Check hopping related parameters:
      ZEQO:BTS=<bts_id>:HOP; or ZEFO:<bcf_id>:HOP;
   9. Check from tracer (Assignment Command) that hopping is on and MAIO and HSN values are correct.
   10. Test also cases when RF hopping is on only in overlay or underlay In these cases change FRT parameters so that you have two hopping TRXs (ZEQM)

4. Expected results
   1. RF hopping can be set on
   2. Calls can be established successfully

39.4 STS0617O0001 TCH assignment to Super-Reuse TRX in IUO

1. Test purpose

   To verify that the target cell evaluation is successful, a target cell is found and the BSC starts the handover to Super-Reuse TRX

2. Required test environment

   - 2 BTSs

3. Test execution
   1. Activate features UNDERLAY_OVERLAY_US_P and DR_USAGE (ZWOC)
   2. Check that parameters are as follows:

      BTS parameters of BTS1
      INTELLIGENT DR.................N
      DIRECTED RETRY USED............Y
      MinTimeLimitDR.................8
      MaxTimeLimitDR.................10
      Modify commands are: EQO / EQF

      TRX 1 parameters of BTS1
      TrxFrequencyType...............0 regular TRX
      TRX 1 parameters of BTS2 (BTS2 must be barred)
      TrxFrequencyType...............1 super-reuse TRX1 If BCCH TRX is reuse all TRXs must be also reuse!
      Verify / Modify commands are: ERO / ERM

      Handover parameters (BTS1&2)
      ENABLE INTRA HO INTERF UL..........N
      ENABLE INTRA HO INTERF DL..........N
      ENABLE SDCCH HANDOVER..............N
      MIN INT BETWEEN HO REQ.............5s
      MIN INT BETWEEN UNSUCC HO ATTEMPT..05s
      Verify / Modify commands are: EHO / EHG

      AVERAGING WINDOW SIZE ADJ CELL.....01
      Verify / Modify commands are: EHO / EHN

      SUPER REUSE ESTIMATION METHOD..   ....MAX
      INTERFERING CELL AVERAGING WINDOW SIZE.....10
      INTERFERING CELL NUMBER OF ZERO RESULTS....2
      ALL INTERFERING CELLS AVERAGED.............Y
      SUPER REUSE GOOD C/I THRESHOLD...........-20 dB PX..1 NX..1
      SUPER REUSE BAD C/I THRESHOLD..............10 dB PX..1 NX..1
      ENA TCH ASS SUPER IUO......................1
      (C/I values are: (SUPER REUSE TRX level)-(Interference Cell TRX level))
      Verify / Modify commands are: e.g. EHO / EHY

3. Define interference cell for TRX 2 of BTS1 (ZERY)
4. Block all TCHs of BTS1
   ZERS:BTS=1,TRX=1,CH=1&&7,:L;
   ZERS:BTS=1,TRX=2,CH=0&&7,:L;
5. Make sure that all TCH channels of BTS1 are blocked
   ZERO:BTS=1,;
6. Take a test call to BTS1 and verify that HO to Super-Reuse TRX succeed

4. Expected results
   1. Features activate are successful.
   2. Target cell is found and the BSC starts handover to Super-Reuse TRX.
   3. The call is going on the BTS2 and the SDCCH of BTS1 is released.
   4. Counter 111 INTER_DR_HO should be increased

39.5 STS0004O0003 Underlay-Overlay: inter-cell HO, from parent cell to child

1. Test purpose

   To verify the Intelligent Underlay-Overlay internal inter-cell handover from the parent cell to the child cell.

2. Required test environment
   - IUO feature is active (ZWOI; and ZWOC:10,23,FF;)
   - 2 BTSs

3. Test execution
   1. Define BTS1 to have regular TRX, which is parent cell, and BTS2 to have only super-reuse TRX, which is child cell (ZERM / FRT).
   2. Set BTS2 (child cell) to be barred
      ZEQF:BTS=<BTS2>:BAR=Y;
   3. Change BTS1&2 IUO parameters as follows
      ZEHY:BTS=<BTS1>:METH=MAX;

      ZEHY:BTS=<BTS2>:METH=MAX,EFHO=SUP;
   4. Create ‘dummy’ adjacent cell for BTS1 (ZEAC)
   5. Identify interfering cell for all super-reuse TRXs
      ZERY:BTS=<BTS2>,TRX=<>:LAC1=<>,CI1=<>;
   6. Reset counters
      ZTVR:2:2
   7. Make a call

4. Expected results
   1. Counter 117 INTER_OK_C/I_RATIO confirm IUO HOs (ZTVI:48;)

39.6 STS0705O0007 Flexible MAIO management for sectorized site with IUO

1. Test purpose

   Check flexible MAIO management with IUO

2. Required test environment
   - The Intelligent Underlay Overlay (10,23) feature must be activated (ZWOC)
   - RF hopping is not supported by DE21/DF21 base stations
   - RF hopping can not be used on the BCCH transceiver

3. Test execution

   BCF, 2 sectors with 6 TRX in each
   BTS=1 HOP N
   TRX1 FREQ=1 CH0=MBCCHC FRT=0 (overlay)
   TRX2 FREQ=2 FRT=0 (overlay)
   TRX3 FREQ=3 FRT=0 (overlay)
   TRX4 FREQ=10 FRT=1 (underlay)
   TRX5 FREQ=11 FRT=1 (underlay)
   TRX6 FREQ=12 FRT=1 (underlay)

   BTS=2 HOP N
   TRX7 FREQ=4 CH0=MBCCHC FRT=0 (overlay)
   TRX8 FREQ=5 FRT=0 (overlay)
   TRX9 FREQ=6 FRT=0 (overlay)
   TRX10 FREQ=13 FRT=1 (underlay)
   TRX11 FREQ=14 FRT=1 (underlay)
   TRX12 FREQ=15 FRT=1 (underlay)
   Modify ZERM / FRT

   1. Lock BCF and BTSs (ZEFS, ZEQS)
   2. Create MA lists
      ZEBE:1,900:2&3&5&6&10&11&12&13&14&15&16;
   3. Attach MA lists to BTSs and define MAIO offsets. Set hopping mode to RF and define HSN1.
      ZEQA:BTS=1:MAL=1,MO=0,MS=1,UMAL=1,UMO=4,UMS=1;
      ZEQE:BTS=1:HOP=RF,HSN1=1,UHOP=RF,UHSN=1;
      ZEQA:BTS=2:MAL=1,MO=2,MS=1,UMAL=1,UMO=7,UMS=1;
      ZEQE:BTS=2:HOP=RF,HSN1=1,UHOP=RF,UHSN=1;
   4. Unlock site (ZEQS, ZEFS)
   5. Give commands:
      ZEQM:BTS=1,TRP=2;
      ZEQM:BTS=2,TRP=2;
   5. Establish call through all TRXs
   6. Check hopping related parameters:
      ZEQO:BTS=<bts_id>:HOP; or ZEFO:<bcf_id>:HOP;

4. Expected results
   1. RF hopping can be set on
   2. Calls can be established successfully

40. ENHANCED FULL RATE CODEC

40.1 STS0613O0006 Deletion of the EFR A-interface and deactivation of the EFR feature

1. Test purpose
   Delete and deactivate EFR

2. Required test environment

   - STS0613O0001

3. Test execution
   1. Change the state of speech circuits to NU-US (ZCEC).
   2. Delete A-interface speech circuits (ZRCD).
   3. Disconnect the ET from TCSM2 (ZWGD).
   4. Switch off EFR_SUPPORT_IN_BSC parameter by the following command.
      ZWOC:10,33,0;

4. Expected results
   1. Speech circuits can be deleted
   2. Disconnection of TCSM_ET is successful
   3. Feature can be disabled

40.2 STS0613O0001 EFR feature activation and A-if creation

1. Test purpose
   To create EFR circuit pool

2. Required test environment

- TCSM2 is WO-EX

3. Test execution
   1. Switch on EFR_SUPPORT_IN_BSC parameter
      ZWOC:10,33,FF;
   2. Create PIUs for TCSM2 if needed
      ZWTP:TCSM,32:TR16,0,1:;
      ZWTP:TCSM,32:TR16,1,2:;
      ZWTP:TCSM,32:ET2E,0,0:;
   3. Connect EFR PCM to TCSM2
      ZWGC:32,1:POOL=5:BCSU,0:;
   4. Create A-interface speech circuit group (RCC) and add circuits (RCA):
      ZRCC:NCGR=EFR...

      ZRCA:...
   5. Change the state of speech circuits to WO-EX (CEC)

4. Expected results
   Activation and creation can be done

40.3 STS0613O0004 External FR to EFR handover

1. Test purpose
   To verify that the external handover can be executed correctly on a traffic channel, and that the channel rate can be switched from FR to EFR

2. Required test environment
   - BSC1 with BTS1, FR speech circuits
   - BSC2 with BTS2, EFR speech circuits

3. Test execution
   1. Define BTS 1 and BTS 2 as adjacent cells to each other (ZEAC)
   2. Enable BSC executing External Handovers
      ZEEQ:DINHO=Y;
   3. Channel rate changes are allowed in both BSC
      ZEEM:HRI=4;
   4. Set parameters so that external handover is possible
      ZEAM:BTS=<BTS1>:LAC=<BTS2>,CI=<BTS2>:PMRG=-24;
   5. Make a call with phase 2 MS
   6. Check that handover between BTS1 and BTS2 is successful and verify signaling with the tracer from source and target cell

4. Expected results
   1. Call is handed over on the TCH of the target cell.
   2. Original TCH is released.
   3. HANDOVER REQUEST ACKNOWLEDGE message includes IE's Circuit pool and Chosen channel

40.4 STS0613O0005 Inter cell HO between HR and EFR

1. Test purpose
   To verify the correct working of BSC in case of inter cell handover between HR and EFR

2. Required test environment
   - Before you can make handover between HR and FR BTS, check that the BTSs are created as adjacent cells
   - The adjacent cell list includes only one cell (BTS2), which belongs to the same BSC as the source cell.
   - Check that HR and EFR&FR speech circuits are created.
   - Check that BTS 1 has HR channels and BTS 2 has FR channels
   - Verify that you have Ph 2 HR MS

3. Test execution
   1. Parameters are set into database so that inter cell handover will be result of algorithm. (dl qual < 0.2 %, BTSs are defined as adjacent cells to each others and ho_margin = -24dB) Commands are:
      ZEHQ:BTS=<BTS1>:QDR=0,QDP=1,QDN=1,QUR=1,QUP=1,QUN=1
      ZEAM:BTS=<BTS1>:ABTS=<BTS2>:PMRG=-24,MRGS=Y;
   2. Call from subscriber A to B.

4. Expected results
   1. Handover succeeds and speech quality is good all the time.
   2. TCH of BTS1 is released.

41. ADVANCED MULTILAYER HANDLING

41.1 STS0808O0002 AMH handover with IUO

1. Test purpose

   To verify HO between super-reused TRXs by using AMH

2. Required test environment

   - IUO and AMH_USAGE feature is active (ZWOC:10,23,FF; ZWOC:10,53,FF;)
   - BTS has regular and super reuse TRXs (ZERM / FRT)

3. Test execution

   1. Change IUO estimation method to MAX:
      ZEHY:BTS=<>:METH=MAX;
   2. Create “dummy” adjacent cell for BTS:
      ZEAC:BTS=<>:LAC=888,CI=888:NCC=6,BCC=6,FREQ=66;
   3. Identify the interfering cell for all super-reuse TRXs:
      ZERY:BTS=<>,TRX=<2&3>:LAC1=888,CI1=888;
   4. Allow AMH with IUO
      ZEHG:BTS=<>:ATCI=Y;
   5. Modify IUO threshold level
      ZEHY:BTS=<>:GCI=-24;
   5. Modify AMH lower load threshold parameter so that HOs are allowed
      ZEEM:ALT=0;
   7. Make a call
      HO is successful
   8. Change AMH lower load threshold parameter so that HOs are denied
      ZEEM:ALT=20;
   9. Make a call
      no HO

4. Expected results

   HO is successful when load is under treshold

41.2 STS0808O0003 AMH in traffic reason HO

1. Test purpose

   To verify that BSC initiated traffic reason handover occurs with AMH feature

2. Required test environment

   - BTS1 and BTS2 are created adjacents to each others(ZEAC)
   - AMH_USAGE in prfile is on (ZWOF:10,53,FF;)
   - Radio resource HOs are denied (ZEHG)
   - MSC controlled TRHO feature should be deactivated
   - MSC: ZEPH / TRHI and TRHO are OFF)
   - Internal HOs are accepted and external DR is disabled
     ZEEQ:DINHO=N,DEXDR=Y;

3. Test execution

   1. Ensure that PBGT is enabled for both BTSs
      ZEHG:BTS=<1&2>:EPB=Y,HPP=6;
   2. Verify normal PBGT HO
   3. Set adjacent cell target level
      ZEAM:BTS=BTS1:ABTS=2:TRHO=-100,PMRG=+63;
   4. Set AMH power budget value so that HO is possible:
      ZEHG:BTS=1:ATPM=-24;
      ZEEM:AUT=0,AML=50;
   5. Make a call
      HO performed
   6. Modify AMH target cell max load:
      ZEEM:AML=0;
   7. Make calls
      first HO is performed second one not possible due to cell load
   8. Adjust adjacency parameters for BTS 2
      ZEAM:BTS=2:ABTS=1:PMRG=-24;
   9. Make a call
      HO is delayed for 30 seconds (target -> source)
   10. Modify guard timer
       ZEEM:TGT=5;
   11. Make a call
       HO will be triggered after 5 seconds

   12. Check counters (ZTVI:48;)

4. Expected results

   1. Call is handed to target cell
   2. After target_cell_max_load modification HOs are prevented
   3. Guard timer prevents HOs back to original cell before expiration
   4. Involved counters 140 INTER_BSC_TRHO and 145 EXT_OUT_BSC_TRHO
      (Counter 145 is updated if DINHO=Y, ZEEO:ALL;)

41.3 STS0808O0001 Dual band HO with AMH

1. Test purpose

   To check AMH workability in dual band configuration with FMMS

2. Required test environment

   - 2 adjacent cells in different bands (band1 & band2) (ZEAC, ZEQF / DBC=Y)
   - AMH_USAGE is on (ZWOI, ZWOC, 10,53)
   - FMMS_USAGE is on (ZWOI, ZWOC, 10,25)
   - Umbrella HOs are denied because FMMS is used (ZEHO, ZEHG)

3. Test execution

   1. Allow AMH with dual band/micro cell:
      ZEHG:BTS=1:ATCM=Y;
   2. Define band2 cell to be micro.
      ZEAM:BTS=1:ABTS=2:ACL=LOWER;
   3. Adjust MS speed thresholds
      ZEAM:BTS=1:ABTS=2:FMT=1,AUCL=-100;
   3. Change AMH threshold: (Every time you change this parameter, wait 20 sec before making a call)
      ZEEM:ALT=0;
   4. Make a call
      HO is successful
   5. Change AMH threshold:
      ZEEM:ALT=60;
   6. Make a call
      HO not performed

4. Expected results

   1. ALT allows or prevents HOs to micro cell
   2. Counter 120 INTER_DET_SLOW_MOW_MS is incremented

41.4 STS0808O0008 AMH with macro/micro HOs in dual band

1. Test purpose

   To check AMH workability in dual band configuration with macro/micro

2. Required test environment

- 2 adjacent cells in different bands (ZEAC, ZEQF / DBC=Y)
- AMH_USAGE is on (ZWOI, ZWOC:10,53,FF;)
- Umbrella HOs are accepted (ZEHO, ZEHG)

3. Test execution

   1. Allow AMH with dual band/micro cell:
      ZEHG:BTS=1:ATCM=Y;
   2. Define macro/micro cell thresholds.
      ZEEM:GMAC=33,GMIC=33,DMAC=34,DMIC=30;
   3. Adjust adjacent parameters
      ZEAM:BTS=1:ABTS=2:AUCL=-100;
   4. Change AMH threshold: (Wait 20 sec after changing this parameter value).
      ZEEM:ALT=0;
   5. Make a call
      HO is successful
   6. Change AMH threshold:
      ZEEM:ALT=60;
   7. Make a call
      HO not performed

4. Expected results

   1. ALT allows or prevents HOs to micro cell

42. DIRECT ACCESS TO DESIRED LAYER/BAND

42.1 STS0808O0004 Direct access to desired layer/band

1. Test purpose
   To verify the correct working of DADL/B in dual band network

2. Required test environment
   - 2 cells on different bands are adjacents (ZEAC)
     (only intra BSC HOs are possible)
   - DADLB_USAGE is active (ZWOI, ZWOC:10,50,FF;)
   - single band phone for source cell and dual band phone
   - Internal HOs enabled and external DR disabled
     ZEEQ:DINHO=N,DEXDR=Y;

3. Test execution
   1. Allow adjacency on other band for both BTSs
      ZEQF:BTS=<both>:DBC=Y
   2. Change BTS parameters so that HO and DADL/B attempt will start immediately
      ZEAM:BTS=<source>:ABTS=<target>:AUCL=-100;
   3. Activate DADL for adjacent cell
      ZEAM:BTS=<source>:ABTS=<target>:DADL=Y;
   4. Put BTSLoadTreshold for source cell to very low
      ZEQM:BTS=<source>:BLT=2
   5. Clear counters
      ZTVR:2:0;
   6. Make calls
      - first call with single band phone (stays in source cell) because real congestion is needed in source
      - dual band will handed over to target cell in SDCCH phase of setup.
   7. Check counters
      ZTVI:48;
   8. Change BLT value to 50 and execute step 6 again
      - both calls remains in source cell

4. Expected results
   1. Handover is successful: source -> target
   2. Counter 141 INTER_DADLB is incremented

43. ENHANCED GSM

43.1 STS0808O0005 EGSM Support

1. Test purpose
   Create TRXs using new frequency band extension

2. Required test environment

- 2 BTSs at least 3'rd generation
- D-links for BTSs exists
- BTS software DF3 (freq=975-1023), DF4 (freq=0,975-1023)
  - frequencies can't be mixed between GSM and EGSM

3. Test execution
   1. Create a BTS and TRXs for it
      ZEFC, ZEQC
      ZERC:BTS...:FREQ=<0,975-1023>
   2. Modify BTS2 TRXs to use EGSM frequency
      ZERM...
   3. Create adjacency between BTSs using LAC and CI format
      ZEAC:...
   4. Make a handover possible between BTSs.
      ZEAM:...:PMRG=-24;
   5. Make a call
      HO is successful

4. Expected results
   TRXs can be created, modified and be adjacent by using EGSM frequencies

44. HIGH CAPACITY BSC

44.1 STS0805O0004 BSC high capacity

1. Test purpose

To check that it is possible to create the maximum number of TRXs to BCSU with the high capacity feature (248 BCF, 248 BTS, 512 TRX)

2. Required test environment

- CP6LX type of CPU and MBIF-UA type of message bus interface in all computer units
- 8 BCSUs in WO-EX and one in SP-EX state. BCSUs are equipped with 3 AS7_Vs
- one AS7_V in the OMU.
- Needed Abis ETs are connected and in WO-EX state.
- Needed LAPD channels are created (ZDSE).

3. Test execution

1. Create the BCF using the last possible number of site
   ZEFC:248,F:;
2. Create the BTS
   ZEQC:BCF=248,BTS=248:...
3. Create over 32 TRXs to the same BCSU. The last TRX to the BTS number 248.
   ZERC:BTS=248:...
4. Check ZDTI::BCSU;
5. Lock all but the last TRX.
6. Make a test call.

4. Expected results

Creation of the BCF, BTS and TRXs succeeds

44.2 STS0807O0003 Creation of the HW for high capacity BSC (BSC2E/A)

1. Test purpose
   To verify that the creation of the new HW for feature High Capacity BSC is successful.
2. Required test environment

   - BSC's all computer units are equipped with CP6LX's and MBIF-UA's.
   - BCSU's are equipped with three AS7-V or AS7-US plug-in units.
   - The OMU is equipped with SERO-T and AS7-V or AS7-US. DMCT2-S terminator for DMC-bus, SCSI cabling and new cross-connection brick to OMU (PCMCO05, to rearrange PCM's).
   - Connector panel (CBD8 C72502) is needed for additional MML interfaces.
   - GSWB equipped with three SW64B plug-in units and two extra ET cartridges are needed for additional PCM's, however this test can be done without them.

3. Test execution
   1. Create the CLS's and the CLAB's. (commands ZWTC, ZWTU, ZWTP)
   2. Create the basic and extension rack's. (command ZWTJ)
   3. Create the MCMU's with CP6LX and MBIF-UAs. (commands ZWTC, ZWTU, ZWTP)
   4. Create the GWS's. (commands ZWTC, ZWTU, ZWTP)
   5. Change the state of the MCMU's to WO-EX and SP-EX, (command ZUSC)
   6. Create the OMU with CP6LX, MBIF-UAs, SERO-T and AS7-Vs (or AS7-USs with ANSI BSC). (commands ZWTC, ZWTU, ZWTP)
   7. Connect the AS7-Vs (or AS7-USs) of the OMU. (command ZWUC)
   8. Create the Hard disks, floppy disk and DAT. (commands ZWTC, ZWTU, ZWTP)
   9. Change the state of the OMU to WO-EX. (command ZUSC)
   10. Create the BCSU's with CP6LX, MBIF-UAs and three AS7-Vs (or AS7-USs with ANSI BSC). (commands ZWTC, ZWTU, ZWTP)
   11. Connect the AS7-Vs (or AS7-USs) of the BCSU's. (command ZWUC)
   12. Create SBUS's. (command ZWTU)
   13. Create ET's. (commands ZWTC, ZWTU, ZWTP)
   14. Connect ET's. (command ZWUC)
   15. Change the state of the BSCU's to WO-EX and SP-EX. (command ZUSC)
   16. Change the state of the ET's to WO-EX. (command ZUSC)
   17. Connect the CLS's. (command ZWUC)
   18. Change the state of the CLS's, CLAB's and SBUS's to WO-EX and SP-EX. (command ZUSC)

4. Expected results

   Creation of the HW succeeds with the new plug-in units.

45. GPRS & EGPRS

45.1 STS0915O0001 GPRS: BCSU switchover

1. Test purpose
   To verify the correct working of BSC in the case of BCSU controlled switchovers when A-, Abis and Gb interfaces are configured own BCSU.

   Note! This must be verified also with Gb Over IP feature.

2. Required test environment
   - Working GPRS environment

3. Test execution
   1. make a GPRS call
   2. make Abis-if BCSU switchover (ZUSC)
   3. make Gb-if BCSU switchover

4. Expected results
   1. switchover former spare BCSU is now in working state and calls are going on.
   2. BTS is configured correctly
   3. NSVCI state is WO-EX, DLCI operative state is AV-EX

45.2 STS0908O0005 GPRS: Controlled restart of BCSU

1. Test purpose

   The purpose of this test is to verify the correct working of BSC in case of controlled restart of BCSU.

2. Required test environment
   - BCSU in WO-EX.
   - BCSU in SP-EX.
   - BCSU in TE-EX.

3. Test execution
   1. Make GPRS call. Choose the BCSU which controls the call. Restart the BCSU by MML-command ZUSU:BCSU;
      Make a new test call.
   2. Choose one of BCSUs in SP-EX. Repeat the test as in 1.
   3. Change the state of one BCSU to TE-EX. Repeat the test as in 1.

4. Expected results
   1. The first call is released. The BCSU is restarted to the same state as it was before the restart. The new GPRS call is successful.
   2. - 3. The GPRS call is on all the time. The BCSU is restarted to the same state as it was before the restart.

45.3 STS0915O0002 GPRS: Creation of Gb-interface

1. Test purpose
   To verify that creation of GB-if is successful

2. Required test environment
   - MML terminal
   - Required hardware is installed to BSC
   - Working SGSN

3. Test execution
   1. Create a bearer channel to PCU
      ZFUC:<bearer channel id><bearer channel name><access rate>
      <ext.PCM><first ext. TSL><BCSU><index>,<FR_terminal_index>;
   2. Create NSVC to an already created bearer channel
      ZFWC:<NSVCI><name><NSEI><DLCI><CIR><BCI/BCN>
      (NSEI, NSVC, CIR and DLCV must be created to SGSN with same value)
   3. Change the state of created NSVC
      ZFWS:< NSVCI>:U;
   4. Check also that it’s not possible to change the state of the NSVC if the cell is GPRS enabled.

4. Expected results
   Creations are successful and state change is OK.

45.4 STS0915O0003 GPRS: Deletion of Gb-interface

1. Test purpose
   To verify that deletion of GB-if is successful

2. Required test environment
   - MML terminal
   - Required hardware is installed to BSC

3. Test execution
   1. Disable GPRS in BTS
      ZEQV:BTS=1:GENA=N;
   2. Change the state of created NSVC
      ZFWS:<name of NSVC>:L;
   3. Delete NSVC
      ZFWD:<NSVCI>;
   4. Delete a bearer channel to PCU
      ZFUD:<bearer channel id><bearer channel name>;

4. Expected results
   Deletions are successful

45.5 STS0912O0001 GPRS: GPRS call

1. Test purpose
   To verify the correct working of BSC in the case of GPRS call

2. Required test environment
   - MML terminal
   - Required hardware and software are installed to BSC
   - Both type of Gb interface are created (FR and Gb Over IP)

3. Test execution
   1. Modify BTS GPRS parameters e.g.
      ZEQV:BTS=1:GENA=Y,BFG=Y,RAC=1,CDED=50,CDEF=50:TRAT=FR;
      Output: ZEQO:BTS=1;
   2. Create RAC e.g.
      ZEBF:MCC=520,MNC=18,LAC=42,RAC=1;
   3. Modify transceiver parameters e.g.
      ZERM:BTS=1,TRX=1:GTRX=Y;
      Output: ZERO:BTS=1;
   4. Make GPRS call.
   5. Modify BTS GPRS parameters e.g.
      ZEQV:BTS=1:GENA=Y,BFG=Y,RAC=1,CDED=50,CDEF=50:TRAT=IP;
      Output: ZEQO:BTS=1;
   6. Make GPRS call.

4. Expected results

   Modifications are successful and call succeeds. Data is transported with both type of interfaces. (FR & Gb Over IP)

45.6 STS0908O0001 GPRS: BCSU HW configuration management

1. Test purpose

   To verify that BCSU HW is configured correctly

2. Required test environment

- HW configuration for BCSU must not exist

3. Test execution
   1. Create MC1C cartridge for BCSU with command e.g.
      ZWTC:MC1C,1A030-27:P1=1A030-27,AL=1A120-37-4;
   2. Create the BCSU unit with command e.g.
      ZWTU:BCSU,0:1A030-27:MB=30;
   3. Create all plug in units for BCSU with command
      List of plug in units to be created e.g.:
      CP4HX
      ZWTP:BCSU,0:CP4HX,0,1;

      2 x MBIF_T
      ZWTP:BCSU,0:MBIF_T,0,3;
      ZWTP:BCSU,0:MBIF_T,1,4;

      3 x AS7_U
      ZWTP:BCSU,0:AS7_U,0,5::CCS7,4,4,TSL,0&&3;
      ZWTP:BCSU,0:AS7_U,1,6::LAPD,4,5,TSL,0&&31;
      ZWTP:BCSU,0:AS7_U,3,8::LAPD,4,7,TSL,0&&31;

      PSC3
      ZWTP:BCSU,0:PSC3,0,10;

      PCU
      ZWTP:BCSU,0:PCU,4,9::PCUDSP,4,152:TSL,0&&31:
      PCUDSP,4,153:TSL,0&&31:PCUDSP,4,154:TSL,0&&31:
      PCUDSP,4,155:TSL,0&&31:
   4. Connect all AS7_Us and PCUs with command e.g.
      ZWUC:BCSU,0:AS7_U,0;
      ZWUC:BCSU,0:AS7_U,1;
      ZWUC:BCSU,0:AS7_U,3;
      ZWUC:BCSU,0:PCU,0;
   5. Give system restart

4. Expected results
   1. Text COMMAND EXECUTED is displayed for all commands
   2. After system restart the HW configuration should still exists

45.7 STS0908O0003 GPRS: ET HW configuration management

1. Test purpose
   To verify that ET HW is configured correctly

2. Required test environment
   - HW configuration for ET must not exist

3. Test execution
   1. Create ET5C cartridge for ET
      e.g. ZWTC:ET5C,1A030-01:AL=1A120-37-9;
   2. Create the ET unit with command
      e.g. ZWTU:ET,32:1A030-01;
      ZWTU:ET,33:1A030-01;
      ZWTU:ET,40:1A030-01;

   3. Create all plug in units for ET2E
      e.g. ZWTP:ET,32:ET2E,0,0::ETTOO,4,32,TSL,0;
      ZWTP:ET,33:ET2E,0,0::ETTOO,4,33,TSL,0;
      ZWTP:ET,40:ET2E,0,0::ETTOO,4,40,TSL,0;

   4. Connect ET2Es to A-, A-bis and Gb interfaces
      e.g. ZWUC:ET,32:ET2E,0:IF=A:BCSU,0
      ZWUC:ET,33:ET2E,0:IF=GB:BCSU,0
      ZWUC:ET,40:ET2E,0:IF=ABIS:BCSU,0

   5. Give system restart

4. Expected results
   1. Text COMMAND EXECUTED is displayed
   2. Circuit groups are updated
   3. After system restart the HW configuration should still exists

45.8 STS0908O0002 GPRS: State changes and diagnostics

1. Test purpose

   To verify that state changes are successful

2. Required test environment

   - BCSUs are equipped with PCUs.

3. Test execution
   1. Print the working states of the BCSUs with command: USI:;
   2. Change the state of the BCSU to TE (USC)
   3. Change the state of the BCSU to SE (USC)
   4. Change the state of the BCSU to TE (USC) and run the diagnostics for unit (UDU).
   5. Check that the alarms are updated correctly also in NMS / 2000.

4. Expected results
   1. All the state changes were successful.
   2. Diagnostics of all BCSUs were OK.

45.9 STS0909O0003 GPRS: Statistics

1. Test purpose

   To verify working of new measurements

2. Required test environment

   - This feature will be supported in NMS/2000 software T12.
   - Before modifying measurements you have to stop it.

3. Test execution
   1. Modify measurement intervals for one day. For example:
      ZTPM:MEASUR,PCU:ALL,0-0-24-0,15;
      ZTPM:MEASUR,RLC_BLOCKS:ALL,0-0-24-0,15;
      ZTPM:MEASUR,FR:ALL,0-0-24-0,15;
   2. Start the measurements.
      ZTPS:MEASUR,PCU;
      ZTPS:MEASUR,RLC_BLOCKS;
      ZTPS:MEASUR,FR;
   4. Check statuses of the measurements and intervals.
      ZTPI:MEASUR;
   5. If you want to get exact values, you have to have needed features activated and make certain kind of traffic.
   6. Check that the measurements are coming at correct intervals at correct times. With NMS/2000 software T12 you can use BSC's service terminal extension FOX_BXSX to interrogate the measurement file.
   7. Stop measurements (ZTPE).

4. Expected results
   1. Measurements come at correct intervals at correct times.
   2. Correct counters are updated.

45.10 STS0909O0004 GPRS:New counters for old measurements

1. Test purpose

   To verify working of measurements
2. Required test environment

   - This will be supported in NMS/2000 software T12.
   - Before modifying measurements you have to stop it.

3. Test execution
   1. Modify measurement intervals for one day. For example:
      ZTPM:MEASUR,LOAD:ALL,0-0-24-0,15;
      ZTPM:MEASUR,AVAIL:ALL,0-0-24-0,15;
      ZTPM:MEASUR,TRAFFIC:ALL,0-0-24-0,15;
      ZTPM:MEASUR,RES_AVAIL:ALL,0-0-24-0,15;
      ZTPM:MEASUR,CCCH_ACC:ALL,0-0-24-0,15;
   2. Start the measurements.
      ZTPS:MEASUR,LOAD;
      ZTPS:MEASUR,AVAIL;
      ZTPS:MEASUR,TRAFFIC;
      ZTPS:MEASUR,RES_AVAIL;
      ZTPS:MEASUR,CCCH_ACC;
   4. Check the status of the measurements and that the intervals are correct.
      ZTPI:MEASUR;
   5. If you want to get exact values, you have to have needed features activated and make certain kind of traffic.
   6. Check that the measurements are coming at correct intervals. With NMS/2000 software T12 you can use BSC's service terminal extension FOX_BXSX to interrogate the measurement file.
   7. Stop measurements (ZTPE).

4. Expected results
   1. Measurements come at correct intervals at correct times.
   2. Correct counters are updated.

45.11 STS0912O0002 GPRS: Abis-if link failure

1. Test purpose

   To verify the correct working of BSC in case of Abis-if link failure

2. Required test environment

   - Gb-interface is created and GPRS is enabled

3. Test execution
   1. Take a test call, leave the call hanging on.
   2. Disconnect 2M PCM cable from ET where BTSs and TRXs are configured. Place 2M PCM back after FAULT RATE MONITORING alarm prints out.

4. Expected results
   1. First call is released. Radio network is cut off. TRXs are restarted after the PCM is replaced and FRM is cancelled. New call is successful.

45.12 STS0915O0004 GPRS: Bearer channel failure

1. Test purpose

   To verify the correct working of BSC in case of bearer channel failure

2. Required test environment
   - One bearer channel configured.
   - One NSVC configured to bearer channel and it is working.

3. Test execution
   1. Check NSVC state with command ZFWO...
   2. Disconnect 2M PCM cable from ET where bearer channel is created. Place 2M PCM back after FAULT RATE MONITORING alarm prints out.

4. Expected results
   1. NETWORK SERVICE VIRTUAL CONNECTION UNAVAILABLE alarm is triggered.
   2. Alarm is cancelled and NSVC is working

45.13 STS0908O0004 GPRS: Fault in PCU of BCSU

1. Test purpose

   The purpose of this test is to verify the correct working of BSC in case of the PCU of BCSU fails.

2. Required test environment
   - BCSU in WO-EX. BCSU has Abis-link, A-link and NSVC in control.
   - BCSU in SP-EX.
   - BCSU in TE-EX.
   - GPRS capable cell and MSs

3. Test execution
   1. Make a GPRS call. Choose the BCSU which controls the call.
      Remove PCU from the rack. Place the PCU back again after the unit has been noticed faulty by the system and returned to SE-OU state.
   2. Choose one of BCSUs in SP-EX. Repeat the test as in 1.
   3. Change the state of one BCSU to TE-EX. Remove PCU from the rack.
      Place the PCU back again.

4. Expected results
   1. Switchover is generated. After switchover data transfer continues.
   2. BCSU is restarted to the same state as it was before the removal. The first call is on all the time.
   3. Nothing happens.

45.14 STS0908O0006 GPRS: Power breakdown of the whole system

1. Test purpose

   The purpose of this test is to verify the correct working of BSC in case of power breakdown of the whole system.

2. Required test environment
   - Check that the system is in the normal state with command USI;.

3. Test execution
   1. Make a call.
   2. Disconnect the power from the system.
   3. Connect the power to the system. Check by using service terminal that the system is restarted and begins to load the software from the local disks. Check that software is loaded correctly to every unit.
   4. Output the states of all the units.
   5. Make a new call.

4. Expected results
   1. The first call is cut. All the units are restarted to the same state as they were before the power breakdown. The new call successful after the system has restarted.

45.15 STS0914O0001 GPRS:Successful downgrade

1. Test purpose

   To verify that GPRS territory is downgraded successfully.
2. Required test environment

   - TRX 1 (MBCCHC + 5 CSW TSLs + 2 PSW TSLs)
   - Set BTS parameter DedicatedGPRScapacity to 15% (ZEQV:...).
   - Set BTS parameter DefaultGPRScapacity to 30% (ZEQV:...).
   - Set CMAX value so that 2 PSW TSLs are used (ZEQV)
   - Lock TSLs 1..3 in TRX 1 (ZERS:...).
   - Set BTS parameter GPRSenabled on (ZEQV:...).

3. Test execution
   1. Create PSW-traffic so that two TSL is needed and make a call to TRX 1.
   2. Make a new call setup (call 2) to TRX 1.

4. Expected results

   1. Both calls are successful and TSL 6 is downgraded.

45.16 STS0914O0002 GPRS:Successful upgrade

1. Test purpose

   To verify that GPRS territory is upgraded successfully after CSW call release exceeds margin FreeTSLsforCSW_U.

2. Required test environment

   - BTS 1: TRX 1 (MBCCHC + 1 CSW TSLs + 6 PSW TSLs)

3. Test execution
   1. Set BTS parameter DedicatedGPRScapacity to 10% (ZEQV:...).
   2. Set BTS parameter DefaultGPRScapacity to 90% (ZEQV:...).
   3. Set BTS parameter GPRSenabled on (ZEQV:...).
   4. Lock TSLs 1 and 2 in TRX 1 (ZERS:...).
   5. Make two calls to TRX 1.
   6. Make PSW traffic
   7. Unlock TSLs 1 and 2 in TRX 1

4. Expected results
   1. TRX 1
      Calls are allocated to TSLs 3 and 4 and TSLs 2,3,4 and 5 are downgraded.
   2. TRX 1
      After calls are released and channels are unlocked TSLs are upgraded.

45.17 STS0914O0003 GPRS:Successful upgrade, when additional TSL is needed

1. Test purpose

   To verify that GPRS territory is upgraded successfully when additional TSLs are needed.

2. Required test environment

   - BTS 1: TRX 1 (MBCCHC + 6 CSW TSLs + 1 PSW TSLs)

3. Test execution
   1. Set BTS parameter DedicatedGPRScapacity to 10% (ZEQV:...).
   2. Set BTS parameter DefaultGPRScapacity to 10% (ZEQV:...).
   3. Set CMAX so that one additional TSL is reserved (ZEQV)
   4. Set BTS parameter GPRSenabled on (ZEQV:...).
   5. Create GPRS traffic so that amount of traffic exceeds capacity of one TSL.

4. Expected results

   1. TSL 6 is upgraded to additional PSW TSL.

45.18 STS1003B0001 GPRS: Creation of NS-VC (Static and dynamic configuration)

1. Test purpose

   To verify correct working of Gb over IP

2. Required test environment

   - Wirings for PCU Ethernets are done and needed IP network equipments are installed

3. Test execution

   1. Create new PCU without Gb side circuits e.g.
      ZWTP:…
   2. Configure IP addresses of PCUs
      ZQRN:…
   3. Create NSE to new PCU
   4. Create remote IP endpoints with their parameters
      e.g. dynamic configuration:
      ZFWC:NSVCI=1,NAME=NSVC1,NSEI=1:BCSU=0:PCU=4:
      LPNBR=50000:RIP=123.123.123.123:RPNBR=50001:PRE=T;

      e.g. static configuration:
      ZFWC:NSVCI=2,NAME=NSVC2,NSEI=1:BCSU=0:PCU=5:
      LPNBR=50002:RIP=123.123.123.123:RPNBR=50003:PRE=F:
      RDW=1,RSW=1;
   5. Unblock NSVC (only static configuration)
      ZFWS:NSVCI=2:U;
   6. Check configuration e.g.
      ZFWO:NSEI=1;
   7. Make data transfer

4. Expected results

   1. Creations are successful and data transfer is possible.

45.19 STS1003B0002 GPRS: Deletion of NS-VC (dynamic and static configuration)

1. Test purpose

   To verify the deletion of Gb over IP interface

2. Required test environment

   - BSC3i, SG3, one or several NS-VCs
   - Gb Over IP is in use

3. Test execution

   Notice: in static configuration are deleted always one NS-VC at time but in dynamic configuration with one NS-VC deletion request can be deleted one to four NS-VCs

   1. Change the state of NS-VC to be deleted from unlocked to locked. (only in static configuration)
      ZFWS:NSVCI=200:L;
   2. Delete NS-VC
      ZFWD:NSVCI=200;

4. Expected results

   1. Deletion of the NS-VC was successful.

45.20 STS1003B0003 GPRS: Gb line fault

1. Test purpose
   To verify that Gb interface recovers after line fault

2. Required test environment
   - Gb over IP is configured or at least one bearer and one NSVC is configured

3. Test execution

   Gb over IP:
   1. Create two Ethernet interfaces to same PCU
      ZQRN...
   2. Check the state of the interfaces
      ZQRI;
   3. Disconnect WO-LAN cable from working PCU
   4. Check the state of the interfaces
      ZQRI;
   5. Disconnect last LAN cable from the unit
   6. After NS layer failure alarm place cables back and wait for recovery.

   Frame relay:
   1. Check NSVC state with command ZFWO...
   2. Disconnect 2M PCM cable from ET where bearer channel is created. Place 2M PCM back after FAULT RATE MONITORING alarm prints out.

4. Expected results

   Gb over IP:
   1. When first cable is disconnected PCU performs a LAN switchover. After placing the cables back the LAN connection should recover.

   Frame relay:
   1. NETWORK SERVICE VIRTUAL CONNECTION UNAVAILABLE alarm is triggered.

   Both: Alarm is cancelled and NSVC is working.

45.21 STS1003B0004 GPRS: Modification of NS-VC (dynamic and static configuration)

1. Test purpose
   To check that it is possible to modify NSVC

2. Required test environment
   - Gb over IP is configured.

3. Test execution
   1. Change NSVCI state to lock (only static configuration)
      ZFWS
   2. Modify NSVC (only name can be modified in dynamic configuration) e.g.
      ZFWM:NSVCI=1:NEWRDW=5:NEWRSW=2;
   3. Unlock NSVC
   4. Make a call

4. Expected results
   1. NSVC modifying succeeded

45.22 STS1003B0005 GPRS: Gb over IP measurement

1. Test purpose

To verify new measurement type

2. Required test environment

- BSC3i, SG3, MML Terminal

3. Test execution

1. Modify measurement intervals for 15 min measurement interval e.g.
   ZTPM:MEASUR,GBIP:ALL,0-0-24-0,15:;
2. Start the measurement
   ZTPS:MEASUR,GBIP;
3. Check status and intervals of the measurement
   ZTPI:MEASUR,GBIP;
   Administrative state should be UNLOCKED and operational state ENABLED.
4. Make a data call and start a traffic
5. Interrogate disk file information
   ZIFI:OMU:MEASUR:;
   ZIFO:OMU:MEASUR...
6. Stop measurement
   ZTPE:MEASUR,GBIP:;

4. Expected results

1. Measurement files are written to disks and measurement intervals are correct.
2. Following counters are updated
   NBR OF NS_ALIVE MSGS SENT BY PCU
   NBR OF NS_ALIVE_ACK MSGS RCVD FROM SGSN
   NBR OF NS_ALIVE MSGS RCVD FROM SGSN
   NBR OF NS_ALIVE MSGS SENT BY PCU FOR RETRY NBR OF RDF OPERATIONS (Resource Distribution Function)
   NBR OF UDP SIGNALLING FAILURES
   NBR OF PORT CHANGES DUE TO UDP FAILURES
   NBR OF SENT DATA PACKETS
   NBR OF SENT SIGNALLING PACKETS
   NBR OF RCVD DATA PACKETS
   NBR OF RCVD SIGNALLING PACKETS

45.23 STS0914O0004 GPRS: Routing area update of intra BCSU and inter BCSU

1. Test purpose

   Verify the correct working in case of routing area update of intra BCSU and inter BCSU

2. Required test environment
   1. Intra BCSU
      - 2 PCUs/BCSU, NSVC is created for both PCUs with different NSEI
      - 2 BTSs (GPRS capable, adjacencies), GPRS capable MS
      - working SGSN

   2. Inter BCSU
      - 1 NSVC is created for both BCSUs with different NSEI
      - 2 BTSs (GPRS capable, adjacencies), GPRS capable MS
      - working SGSN

3. Test execution
   1. Create different RAC for both NSEIs (e.g.

      ZEBF:MCC=520,MNC=18,LAC=42,RAC=9:NSEI=200;)
   2. Attach BTSs to certain RAC (e.g. ZEQV:BTS=1,GENA=Y,RAC=9;)
   3. Check from SGSN that GPRS cells are in working state (ZEJL)
   4. Make PDP-context and start data transfer
   5. Modify PMAX value of source cell so that MS changes to better cell (destination cell)

4. Expected results
   1. After the changing of routing area data transfer continues
   2. Check from tracer message routing area update complete appears

45.24 STS1009B0005 GPRS: Measurement for QoS

1. Test purpose:
   To verify that the measurement for QoS can be performed correctly
2. Required test environment:
   - BSC: working GPRS environment
3. Test execution:
   1. Modification
      ZTPM:MEASUR,QOS:ALL,0-0-24-0,15;
   2. Start
      ZTPS:MEASUR,QOS:2000-12-24,2000-12-31;
   3. Interrogation
      ZTPI:MEASUR,QOS;
   4. Make GPRS call
   5. Check that measurement is written to the disk
      ZIFO:OMU:MEASUR:1&&300;
   6. Stop
      ZTPE:MEASUR,QOS:2000-12-25;
4. Expected results:
   1. The measurement can be modified, started, interrogated and stopped
   2. Check that measurement is written to the disk and correct counters are updated

45.25 STS1009B0004 GPRS: Priority Based Scheduling in BSC (GPRS QoS Phase 1)

1. Test purpose:
   To verify that QoS functionality works correctly
2. Required test environment:
   - BSC: working GPRS environment
   - MS: 2 GPRS
3. Test execution:
   1. Only one GPRS channel
   2. Change QoS parameters (ZEEV) DHP, DNP, DLP to equal value
   3. Make PDP-context with high and low priority subscribers (HLR)
   4. Start data transfer
   5. Check from tracer that both mobiles gets equal amount of data
   6. Change QoS parameters (ZEEV) DHP=1, DNP=6, DLP=12
   7. Make PDP-context with high and low priority subscribers
   8. Start data transfer
   9. Check from tracer that high priority mobile gets more Air interface time
4. Expected results:
   1. QoS value changes affects to data throughput

45.26 STS1009O0001 GPRS: Creation of PBCCH/PCCCH

1. Purpose:
   To create PBCCH/PCCCH with MML command ZERC:.

2. Requirements:
   - D-channels, BCF and BTS is created with working GPRS/EGPRS environment

3. Execution:
   1. Create TRX where is PBCCH/PCCCH channel e.g.
      ZERC:BTS=1,TRX=1,:.CH0=MBCCHC,CH1=MPBCCH,.
   2. Unlock BCF/BTS/TRX
   3. Output current configuration ZERO:BTS=1;
   4. Enable GPRS (GENA=Y,ZEQV)

4. Results:
   1. PBCCH/PCCCH can be created
   2. Check from PSI1 message that BS_PBCCH_BLKS,BS_PAG_BLKS_RES and BS_PRACH_BLKS are sent with default values
      (3 in MLL = 2 in BSDATA , 4 and 6) (ZEQO:BTS=< >:CCH;)
   3. TRX configuration is echoed to the screen correctly
   4. PBCCH allocation can be checked from SI13 and PSI2 messages.

      NOTE: MPBCCH can be created RTSL's from 1 to 6

45.27 STS1009O0002 GPRS: Modification of PBCCH/PCCCH

1. Purpose:

   To modify PBCCH/PCCCH with MML command ZERM:.

2. Requirements:

   - MPBCCH is used in working GPRS/EGPRS environment

3. Execution:

   1. Disable GPRS (GENA=N, ZEQV)
   2. Lock TRX/BTS (ZERS, ZEQS)
   3. Try to modify PBCCH/PCCCH channel to TSL 7 (ZERM:...)
   4. Try to modify PBCCH/PCCCH channel to NON-BCCH TRX and unlock TRX
   5. Modify PBCCH/PCCCH channel e.g.
      ZERM:BTS=1,TRX=1:CH2=MPBCCH;
   6. Output current configuration ZERO:BTS=1;
   7. Modify following parameters BS_PBCCH_BLKS, BS_PAG_BLKS_RES and BS_PRACH_BLKS for values e.g.
      ZEQJ:BTS=1:PBB=1,PAB=5,PRB=7;
   8. Unlock TRX/BTS (ZERS, ZEQS)
   9. Enable GPRS (GENA=Y, ZEQV)

4. Results:

   1. Modification can not be done because of MML does not allow to configure PBCCH/PCCCH to TSL 7.
   2. Unlock fails because of DX ERROR: Illegal Channel Configuration
   3. PBCCH/PCCCH can be modified
   4. Check from PSI1 that PBB, PAB and PRB values are as defined
   5. TRX configuration is echoed to the screen correctly

   NOTE: MPBCCH can be modified RTSL's from 1 to 6

45.28 STS1009O0004 GPRS: Measurement for PBCCH/PCCCH

1. Purpose:

   To verify that the measurement for PBCCH can be performed correctly

2. Requirements:
   - MPBCCH TRX with working GRPRS/EGPRS environment
   - PBCCH capable MS
   - Gs interface is required for paging (ZEGP:...)

3. Execution:

   1. Modification
      ZTPM:MEASUR,PBCCH:ALL,0-0-24-0,15;
   2. Start
      ZTPS:MEASUR,PBCCH;

   3. Interrogation
      ZTPI:MEASUR,PBCCH;

   4. Activate PDP-context
   5. Wait READY timer expiration (SGSN: ZEJH:..)
   6. Make PS and CS paging for MS (ping from NW and MT call to subscriber)
   7. Check that measurement is written to the disk ZIFO:OMU:MEASUR:1&&300;
   8. Stop
      ZTPE:MEASUR,PBCCH;

4. Expected results:
   1. The measurement can be modified, started, interrogated and stopped
   2. Check that measurement is written to the disk and correct counters are updated

45.29 STS1009O0003 GPRS: Deletion of PBCCH/PCCCH

1. Purpose:

   To delete PBCCH/PCCCH with MML command ZERM:.

2. Requirements:

   - MPBCCH is used in working TRX

3. Execution:

   1. Lock TRX/BTS
   2. Delete PBCCH/PCCCH channel e.g.
      ZERM:BTS=1,TRX=1:CH2=TCHF;
   3. Output current configuration ZERO:BTS=1;
   4. Unlock TRX/BTS
   5. Make PS and CS call

4. Expected results:

   1. PBCCH/PCCCH can be deleted
   2. TRX configuration is echoed to the screen correctly

45.30 STS1009B5001 GPRS: Logical PCU handling

1. Test purpose

   To verify the correct handling of logical PCUs.

2. Required test enviroment

   - BSC3i with PCU cards installed

3. Test execution

   1. Create logical PCUs:
      ZWTP:BCSU,<BCSU_index>:PCU_B,<PIU_index>,<slot>::...
      ZWTP:BCSU,<BCSU_index>:PCU_B,<PIU_index+1>,<slot>::...

   2. Run diagnostics for PCUs

   For the same slot number you have 2 logical PCUs identified by PIU index.

4. Expected results

   1. Creation succeeds

   2. Diagnostics pass for all logical PCUs

45.31 STS1006O0001 EGPRS: Creation of Dynamic Abis Pool (DAP)

1. Test purpose:
   To create Dynamic Abis Pool with MML command ZESE:.

2. Required test environment:
   - BSC: DYN_ABIS_IN_USE and EGPRS_USE is on (ZWOS)
   - BTS: CX3.3

3. Test execution:
   1. Create a DAP
      ZESE:ID=1,CRCT=38-8&&-15,BCSU=0,PCU=0;
      or
      ZESE:ID=1,CRCT=38-8,SIZE=8,BCSU=0,PCU=0;
   2. Attach DAP to the TRX
      ZERC:BTS=20,TXR=1:DAP=1.
   3. Output current configuration
      ZESI:ID=1;
      ZRCI:SEA=3:NCGR=DAP001:PRINT=5;
      ZERO:BTS=20;

4. Expected results:
   1. DAP type can be created
   2. The size of the pool can be defined either by telling the first and last timeslot contained in the pool, or by entering the size directly
   3. Also configuration of pool type is echoed to the screen correctly

NOTE: TRX signaling link, TCH's and DAP must locate on the same ET-PCM, if those aren't DAP can not be created.

45.32 STS1006O0002 EGPRS: Modifying of Dynamic Abis Pool (DAP)

1. Test purpose:
   To modify Dynamic Abis Pool with MML command ZESM:.
2. Required test environment:
   - BSC: DYN_ABIS_IN_USE and EGPRS_USE is on (ZWOS)
   - BTS: CX3.3

3. Test execution:
   1. Modify a DAP
      ZESM:ID=1,NLT=20,BCSU=0,PCU=0;
      or
      ZESM:ID=1,NFT=5,BCSU=0,PCU=0;
   2. Make EGPRS call

4. Expected results:
   1. The size of DAP can be modified by either the new first or last timeslot for the pool, not both
   2. Call succeeds
   3. Also configuration of pool type is echoed to the screen correctly

45.33 STS1006O0003 Deleting of Dynamic Abis Pool (DAP)

1. Test purpose:
   To delete Dynamic Abis Pool with MML command ZESG:.
2. Required test environment:
   - BSC: DYN_ABIS_IN_USE and EGPRS_USE is on (ZWOS)
   - BTS: CX3.3
3. Test execution:
   1. Delete DAP (ZESG)
   2. Lock TRX and delete it (ZERS, ZERD)
   3. Delete DAP (ZESG)
4. Expected results:
   1. Deleting fails because of TRX is attached to DAP
   2. The deletion of TRX is successful
   3. The deletion of DAP is successful

45.34 STS1006O0004 EGPRS: Measurement for Dynamic Abis Pool (DAP)

1. Test purpose:
   To verify that the measurement for DAP can be performed correctly
2. Required test environment:
   - BSC: DYN_ABIS_IN_USE and EGPRS_USE is on (ZWOS)
   - BTS: CX3, I2
3. Test execution:
   1. Modification
      ZTPM:MEASUR,DYNAMIC_ABIS:ALL,0-0-24-0,15;
   2. Start
      ZTPS:MEASUR,DYNAMIC_ABIS:2000-12-24,2000-12-31;
   3. Interrogation
      ZTPI:MEASUR,DYNAMIC_ABIS;
   4. Make EGPRS call
   5. Check that measurement is written to the disk
      ZIFO:OMU:MEASUR:1&&300;
   6. Stop
      ZTPE:MEASUR,DYNAMIC_ABIS:2000-12-25;
4. Expected results:
   1. The measurement can be modified, started, interrogated and stopped
   2. Check that measurement is written to the disk and correct counters are updated

45.35 STS1009O0005 EGPRS: PS and CS paging with BCCH / MPBCCH

1. Purpose:
   This test case tests pagings procedures when both BCCH and MPBCCH are used.

2. Requirements:
   - DYN_ABIS_IN_USE, EGPRS_USAGE and PBCCH_USAGE (ZWOA, ZWOS)
   - Working EGPRS environment with and without MPBCCH
   - PBCCH capable MS
   - Gs interface (between MSC and SGSN) is required for CS paging with PBCCH (ZEGP:..)

3. Execution:
   1. Make activate PDP-context
   2. Wait READY timer expiration (SGSN: ZEJH:..)
   3. Make PS paging for MS (ping from NW)
   4. Make CS paging for MS (data transfer is going on and take MO call to the MS)
   5. Make deactivate DPD-context for both MSs and also detach them.
   6. Repeat steps 1 to 5 when MPBCCH is deleted

4. Result:
   1. PBCCH capable MS uses PBCCH channel for paging
   2. After MPBCCH is deleted paging procedures is done like in S9 implementation to both MSs
   3. MO calls succeeds

   NOTE: MPBCCH can be created RTSL's from 1 to 6

45.36 STS1009O00006 EGPRS: BB hopping with BCCH / MPBCCH

1. Purpose:
   This test case tests BB hopping when BCCH and MPBCCH are used.

2. Requirements:

- Working EGPRS environment with and without MPBCCH
- PBCCH / NON-PBCCH capable MSs
- Following BTS configurations:

BTS 1	TRX 1	CH0=MBCCHC, CH1=MPBCCH
	TRX 2	
	TRX 3	
BTS 2	TRX 1	CH0=MBCCHC

3. Execution:

   1. Lock BTS1 (ZEQS)
   2. Create BTS2 adjacent cell to BTS1 (ZEAC)
   3. Create BTS2 to interfering cell to BTS1 (ZERY)
   4. Attach MA lists for BTS and set BB hopping on
      ZEQA:BTS=1:MAL=1;
      ZEQE:BTS=1:HOP=BB,HSN1=1,HSN2=2,UHOP=BB,UHSN=3:;
   5. Unlock BTS (ZEQS)
   6. Check hopping related parameters:
      ZEQO:BTS=<bts_id>:HOP; or ZEFO:<bcf_id>:HOP;
   7. Activate PDP-context for both MSs
   8. Start data transfer
   9. Deactivate DPD-context for both MSs and also detach them.
   10. Check from tracer (SI 13) that hopping is on and MAIO values are correct
   11. Lock TRX and modify RTSL which's uses MPBCCH to use TCHF. After modification unblock (ZERS / ZEMR / ZERS)
   12. Repeat steps 5 to 9 when MPBCCH is deleted

4. Result:

   1. RF hopping can be set on with and without MPBCCH
   2. Configuration is echoed to the screen correctly
   3. GPRS calls can be established successfully

45.37 STS1009O0007 EGPRS: RF hopping with BCCH / MPBCCH

1. Purpose:

This test case tests RF hopping when BCCH and MPBCCH are used.

2. Requirements:

- Working EGPRS environment with and without MPBCCH
- PBCCH / NON-PBCCH capable MSs
- RF hopping cannot be used on the BCCH transceiver
- Following BTS configuration:

BTS 1	TRX 1	CH0=MBCCHC, CH1=MPBCCH
	TRX 2	
	TRX 3	
	TRX 4	

3. Execution:

1. Lock BTS (ZEQS)
2. Create MA list (ZEBE)
3. Attach MA lists for BTS and set RF hopping on
   ZEQA:BTS=1:MAL=1;
   ZEQE:BTS=1:HOP=RF,HSN1=1,HSN2=2,UHOP=RF,UHSN=3:;
4. Unlock BTS (ZEQS)
5. Check hopping related parameters:
   ZEQO:BTS=<bts_id>:HOP; or ZEFO:<bcf_id>:HOP;
6. Check from tracer (SI 13) that hopping is on and MAIO values are correct.
7. Make activate PDP-context for both MSs
8. Make some data transfer
9. Make deactivate DPD-context for both MSs and also detach them.
10. Lock TRX and modify RTSL which's uses MPBCCH to use TCHF. After modification unblock (ZERS / ZEMR / ZERS)
11. Repeat steps 5 to 7 when MPBCCH is deleted

4. Result:

1. RF hopping can be set on with and without MPBCCH
2. Configuration is echoed to the screen correctly
3. GPRS calls can be established successfully

45.38 STS1009O0008 EGPRS: Direct access to non-BCCH GPRS BTS

1. Purpose:
   This test case tests GPRS and EGPRS calls in same segment, which includes 4 BTSs

2. Requirements:
   - DYN_ABIS_IN_USE, EGPRS_USAGE, PBCCH_USAGE, SEGMENT_USAGE, MULTI_BCF, COMMON_BCCH_GSMx00, COMMON_BCCH_GSM1x00 and GSMx00_1x00_USAGE (ZWOA:2, ZWOS:2). Depend on used frequency bands.
   - Working EGPRS environment
   - Make following SEG configuration

SEG1	
BTS 1(Talk)	TRX 1 CH0=MBCCHC, CH1=MPBCCH
	TRX 2
BTS 2(Talk GSM1x00)	TRX 3
	TRX 4 (GPRS territory)
BTS 3(Ultra)	TRX 5
	TRX 6
BTS 4(Ultra/EGDE GSM1x00)	TRX 7
	TRX 8 (EGPRS territory)

3. Execution:
   1. Lock TRXs 1,2,5,6 and modify parameter GTRX=N (ZERM) and unlock TRXs
   2. Set Non_BCCH_layer_offset (ZEQM:...NBL) parameter to following values:
      BTS1 NBL=0dB
      BTS2 NBL=-3 dB
      BTS3 NBL=+2 dB
      BTS4 NBL=-1 dB

   3. Set GPRS_RXLEV_ACCESS_MIN (ZEQG) parameter to following values:
      BTS1 GRXP=-105 dBm
      BTS2 GRXP=-100 dBm
      BTS3 GRXP=-100 dBm
      BTS4 GRXP=-100 dBm

   4. Set parameter DirectGprsAccess value (DIRE=+5, ZEQG)
   5. Configure GPRS and EGPRS (ZEQV) as follow to BTSs
      ZEQV:BTS=2:CDEF=1,CDED=0,CMAX=35,GENA=Y,EGPRS=N;;

      ZEQV:BTS=4:CDEF=1,CDED=0,CMAX=35,GENA=Y,EGPRS=Y;

   6. Activate PDP-context and transfer data with both MSs

4. Result:
   1. Segment can be created
   2. Data transfer for GPRS MS is going on in TRX4 (GPRS territory) due to NBL value.
   3. Data transfer for EGPRS MS is going on in TXR 8 (EGPRS territory) due to NBL value and DIRE value.

45.39 STS1009O0009 EGPRS: Access to non-BCCH BTS

1. Purpose:
   This test case tests GPRS and EGPRS calls in same segment, which includes 3 BTSs

2. Requirements:
   - Working EGPRS environment without MPBCCH
   - Following BTS configuration

SEG1

BTS 1(Talk/GPRS)	TRX 1	CH0=MBCCHC (GTRX=N)
	TRX 2	
BTS 2(Ultra/GPRS)	TRX 3	(GTRX=N)
	TRX 4	
BTS 3(Ultra/EGPRS)	TRX 5	(GTRX=N)
	TRX 6	

3. Execution:
   1. Lock TRXs 4 and 6 (ZERS)
   2. Make data transfer with EGPRS MS.
   3. Unlock TRX 4
   4. Set
      BTS1 NBL=40dB (ZEQM)
      BTS2 NBL=-40 dB
   5. Unlock TRX 6 (ZERS)
   6. Make another data transfer with EGPRS MS

4.Result:
   1. When NBL values are set to BTS1 and BTS2 call is reallocated to BTS2.
   2. The second call is allocated to BTS3.

45.40 STS1009O0010 EGPRS: CS call with EGPRS territory downgrade and upgrade

1. Purpose
   Normal CS call is possible in EDGE TRX due to this PS call downgrades and upgrades

2. Requirements

   - Working EGPRS environment
   - EDGE TRX (BCCH + MPBCCH+ 1 CSW TSL+5 PSW TSLs

3. Test execution

   1. Set following values:
      ZEQV:BTS=1,CDED=20,CDEF=90,CMAX=100,GENA=Y;
   2. Make EGPRS call and two CS calls
   3. Set parameters CSD=0 and CSU=0 (ZEEM)
   4. Clear CS calls
   5. Set parameters CSD=95 and CSU=4 (ZEEM)
   6. Clear EGPRS call

4. Results

   1. All calls are successful and TSLs 3 and 4 are downgraded.
   2. TSL 4 is upgraded.
   3. TSLs 2 and 3 are upgraded.
   4. TSL 2 is downgraded.

45.41 STS1009O0011 EGPRS: BTS load based allocation

1. Purpose:
   This test case tests BTS load based allocation due to max tbf in UL and DL

2. Requirements:

   - Working EGPRS environment. At MultiBCF configuration EGPRS territory have to be same band as MBCCHC.
   - 2 EGPRS capable MSs
   - SEG, Common (ZWOA, ZWOS)

   Make following SEG configuration

   SEG1

BTS1	TRX 1	CH0=MBCCHC, CH1=MPBCCH
	TRX 2 (GPRS territory)	
BTS2	TRX 3	
	TRX 4 (EGPRS territory)	

3. Execution:
   1. Lock TRXs 1 and 3 and modify parameter GTRX=N (ZERM) and unlock TRXs
   2. Lock RTSLs 0-4 in TRXs 2 and 4 (ZERS)
   3. Configurate GPRS and EGPRS (ZEQV) as follow to BTSs
      ZEQV:BTS=1:CDEF=1,CDED=0,CMAX=35,GENA=Y, EGPRS=N;;
      ZEQV:BTS=2:CDEF=1,CDED=0,CMAX=35,GENA=Y,EGPRS=Y;
   4. Activate PDP-context and transfer data with both MSs
   5. Set parameters MAXIMUN_NUMBER_OF_DL_TBF (MNDL=1) and MAXIMUN_NUMBER_OF_UL_TBF (MNUL=1) (ZEEM)

4. Result:
   1. Segment can be created
   2. After the changing of MNDL and MNUL values the other MS changes to GPRS territory in TRX2

45.42 STS1009O0012 EGPRS: Cell Re-selection criteria C31

1. Purpose:
    This test case tests cell Re-selection when criteria C31 is used. The Signal level threshold criterion parameter C31 for hierarchical cell structures (HCS).

2. Requirements:

- Working EGPRS environment
- MBPCCH capable MS (EGPRS or GPRS)
- Make following BTS configurations:

BTS1 (RAC1)	TRX 1	CH0=MBCCHC, CH1=MPBCCH
E.g. Rx level in MS –58 dBm		
	TRX 2 (EGPRS or GPRS territory)	
BTS2 (RAC2)	TRX 3	CH0=MBCCHC, CH1=MPBCCH
E.g. Rx level in MS –70 dBm		
	TRX 4 (EGPRS or GPRS territory)	

3. Execution:
    1. Lock TRXs 1 and 3 (ZERS). Modify parameter (GTRX=N, ZERM) and unlock TRXs
    2. Set BS TX PWR MAX.PEAK PRW values as followed E.g.: (ZEUG)
        BTS1 PMAX=2
        BTS2 PMAX=10
    3. Set cell reselection criteria C31 parameters: (ZEQG)
        BTS1 CHYS=Y, PRC=7,HCS=-76, RRH=10
        BTS2 CHYS=Y, PRC=7,HCS=-110
    4. Create BTS's adjacencies cells: (ZEAC)
    5. Activate PDP-context and transfer data with both MSs
    6. Set BS TX PWR MAX.PEAK PRW values as followed e.g.: (ZEUG)
        BTS1 PMAX=10

4. Result:
    1. Cell reselection is done when HCS treshold is exceeded.

45.43 STS1009O0013 EGPRS: Cell Re-selection criteria C32

1. Purpose:
   This test case tests cell Re-selection when criteria C32 is used. The cell-ranking criterion Parameter C32 is used to select cells among those with the same priority.

2.Requirements:

- Working EGPRS environment
- MBPCCH capable MS (EGPRS or GPRS)
- Make following BTS configurations:

BTS1 (RAC1)	TRX 1	CH0=MBCCHC, CH1=MPBCCH
E.g. Rx level in MS –58 dBm		
	TRX 2 (EGPRS or GPRS territory)	
BTS2 (RAC2)	TRX 3	CH0=MBCCHC, CH1=MPBCCH
E.g. Rx level in MS –70 dBm		
	TRX 4 (EGPRS or GPRS territory)	
BTS3 (RAC2)	TRX 5	CH0=MBCCHC, CH1=MPBCCH
E.g. Rx level in MS –70 dBm		
	TRX 6 (EGPRS or GPRS territory)	

3. Execution:
   1. Lock TRXs 1, 3 and 5 (ZERS). Modify parameter (GTRX=N, ZERM) and unlock TRXs
   2. Set BS TX PWR MAX.PEAK PRW values as followed e.g. (ZEUG)
      BTS1 PMAX=2
      BTS2 PMAX=10
      BTS3 PMAX=10
   3. Set cell reselection criteria C31 parameters: (ZEQG)
      BTS1 CHYS=Y, HCS=-60, PRC=2
      BTS2 CHYS=Y, HCS=-78, PRC=2
      BTS3 CHYS=Y, HCS=-78, PRC=2
   4. Set cell reselection criteria C32 parameter to BTSs: (QUAL=Y, ZEQG)
   5. Create BTSs adjacencies cells: (ZEAC)
      BTS1 ABTS=2 RAC=1, AGENA=Y, GREO=10, GTEO=10
      BTS1 ABTS=3 RAC=2, AGENA=Y, GREO=-10, GTEO=10
      BTS2 ABTS=1 RAC=1, AGENA=Y
      BTS3 ABTS=1 RAC=1, AGENA=Y
   6. Activate PDP-context and transfer data
   7. Set BS TX PWR MAX.PEAK PRW values as followed e.g. (ZEUG)
      BTS1 PMAX=10
   8. Set BS TX PWR MAX.PEAK PRW values as followed e.g. (ZEUG)
      BTS1 PMAX=2
   9. Deactivate PDP-context
   10. Modify BTS's adjacencies cells parameter GPRS RESELECT OFFSET values vice versa (ZEAM):
       BTS1 ABTS=2 GREO=-10
       BTS1 ABTS=3 GREO=10
   11. Activate PDP-context and transfer data

12. Set BS TX PWR MAX.PEAK PRW values as followed e.g. (ZEUG)
    BTS1 PMAX=10

4. Result:
   1. MS reselect BTS2 according to highest C32 value and data transfer is not interrupted
   2. MS reselect BTS3 according to highest C32 value and data transfer is not interrupted

45.44 STS1009O0014 EGPRS: Link Adaptation in Acknowledged mode with Retransmission

1. Purpose:
   This test case tests Link Adaptation in ACK mode.

2. Requirements:

   - Working EGPRS environment
   - EGPRS capable MS
   - Make following BTS configurations:

BTS1	TRX 1	CH0=MBCCHC, CH1=MPBCCH
	TRX 2 (EGPRS territory)	

3. Execution:
   1. Lock TRX 1 and modify parameter (GTRX=N, ZERM) and unlock TRX
   2. Set BS TX PWR MAX.PEAK PRW values as followed e.g. (PMAX=30, ZEUG)
   3. Set initial MCS for acknowledged mode: (MCA=2, ZEQV)
      Family A
      MCA=3

      Family B
      MCA=2

      Family C
      MCA=1

   4. Configure EGPRS parameters (ZEQV) as follow to BTSs
      ZEQV:BTS=1:CDEF=1,CDED=0,CMAX=35,GENA=Y, EGPRS=Y;
   5. Activate PDP-context and start data transfer
   6. Set maximum BLER in acknowledged mode: (BLA=10, ZEQV)
   7. Set BS TX PWR MAX.PEAK PRW values as followed (PMAX=2, ZEUG)

4. Result:

   1. Retransmission is normally done with IR. LA is a separate algorithm. When MCS within a family is changed due to LA the retransmission is done also with the new MCS. The receiver can use the initial and retransmitted blocks together for demodulation even is they have been sent with different MCS. LA is done between MCSs in the same family always when applicable. When MCS from other family must be selected, retransmission is done with the initial coding. When PCU makes LA to different family, the retransmission must be done with MCS from the original family

   2. Retransmissions can be verified in PCU frames at Abis interface. Messages EGPRS PACKET DOWNLINK ACK / NACK or PACKET UPLINK ACK / NACK.

45.45 STS1009O0015 EGPRS: Link Adaptation in Unacknowledged mode

1. Purpose:
   This test case tests Link Adaptation in UNACK mode.

2. Requirements:
   - Working EGPRS environment
   - EGPRS capable MS
   - Make following BTS configurations:

BTS1	TRX 1	CH0=MBCCHC, CH1=MPBCCH
	TRX 2 (EGPRS territory)	

3. Execution:
   1. Lock TRX 1 and modify parameter (GTRX=N, ZERM) and unlock TRX
   2. Set BS TX PWR MAX.PEAK PRW values as followed (PMAX=30, ZEUG)
   3. Set initial MCS for unacknowledged mode: (MCU=2, ZEQV)
      Family A
      MCU=3

      Family B
      MCU=2

      Family C
      MCU=1

   4. Configure EGPRS (ZEQV) as follow to BTSs
      ZEQV:BTS=1:CDEF=1,CDED=0,CMAX=35,GENA=Y, EGPRS=Y;
   5. Activate PDP-context and start data transfer
   6. Set maximum BLER in unacknowledged mode: (BLU=1, ZEQV)
   7. Set BS TX PWR MAX.PEAK PRW values as followed (PMAX=2, ZEUG)

4. Result:

   1. When unack RLC mode is used then MCS can be changed between different families.

45.46 STS1006O0011 EGPRS: DynAbis usage with two PCMs for one BTS

1. Test purpose:
   To create two Dynamic Abis Pools which using two PCMs.
2. Required test environment:
   - BSC: DYN_ABIS_IN_USE and EGPRS_USE is on (ZWOS)
   - BTS: CX3.3

3. Test execution:
   1. Create a DAP
      ZESE:ID=1,CRCT=38-8&&-15,BCSU=0,PCU=2;
      or
      ZESE:ID=2,CRCT=39-8,SIZE=8,BCSU=0,PCU=2;
   2. Create D-channel for TRXs
      ZDTC:
   3. Attach DAPs to the TRXs
      ZERC:BTS=20,TRX=1:DAP=1.
      ZERC:BTS=20,TRX=2:DAP=2.
   4. Unlock TRX/BTS/BCF
   5. Make EGPRS and GPRS traffic for both DAPs

4. Expected results:
   1. DAP type can be created
   2. The size of the pool can be defined either by telling the first and last timeslot contained in the pool, or by entering the size directly
   3. Data transfer is possible for both TRXs.

NOTE: TRX signaling link, TCH's and DAP must locate on the same ET-PCM, if those aren't DAP cannot be created.

45.47 STS1006O0007 EGPRS: DynAbis mismatch between BTS and BSC

1. Test purpose:
   To create Dynamic Abis Pools when there is mismatch between BTS and BSC configuration.

2. Required test environment:
   - BSC: DYN_ABIS_IN_USE and EGPRS_USE is on (ZWOS)
   - BTS: CX3.3

3. Test execution:
   1. Create a DAP to BSC
      ZESE:ID=1,CRCT=38-1&&-2,BCSU=0,PCU=2;
      or
      ZESE:ID=1,CRCT=38-1,SIZE=2,BCSU=0,PCU=2;
   2. Attach DAP to the TRX
      ZERC:BTS=20,TRX=1:DAP=1.
   3. Create a DAP to BTS
      - Open Nokia BTS Manager
      - Tools
        - o Launch UltraSite BTS Hub Manager

      Click E1/T1 card that is used.
      - Configuration
      - Traffic Manager…
        - o Make EDAP configuration to BTS to be different as in BSC. Save new configuration
      - Exit Hub Manager
      - BTS must be recommissioned
   4. Unlock TRX/BTS/BCF
   5. Modify DAP size for BSC
      ZESM:ID=1,NLT=3,BCSU=0,PCU=2;

4. Expected results:
   1. DAP type can be created
   2. The size of the pool can be defined either by telling the first and last timeslot contained in the pool, or by entering the size directly
   3. DAP can be configured correctly
   4. Unlocking succeed
   5. Modification succeeds at BSC but alarm 7730 Configuration of BCF failed is raised.

NOTE: TRX signaling link, TCH's and DAP must locate on the same ET-PCM, if those aren't DAP cannot be created.

45.48 STS1006O0010 EGPRS: Trying to activate EGPRS to BTS which SW or HW doesn’t support it

1. Test purpose:
   Try to active EGPRS to BTS which SW or HW doesn’t support this feature.

2. Required test environment:
   - BSC: DYN_ABIS_IN_USE and EGPRS_USE is on (ZWOS)
   - BTS: which is not support EGPRS (e.g. UltraSite CX3.0 or 2nd generation BTS) or non-EDGE capable TRX
   - EGPRS must be enabled (EGENA=Y, ZEQV)

3. Test execution:
   1. Create a DAP
      ZESE:ID=1,CRCT=38-1&&-5,BCSU=0,PCU=2;
      or
      ZESE:ID=1,CRCT=38-1,SIZE=5,BCSU=0,PCU=2;
   2. Attach DAP to the TRX
      ZERC:BTS=20,TRX=1:DAP=1.
   3. Unlock TRX/BTS/BCF

4. Expected results:
   1. DAP type can be created
   2. The size of the pool can be defined either by telling the first and last timeslot contained in the pool, or by entering the size directly
   3. Unlocking fails and Alarm 7730 Configuration of BCF failed is raised.

NOTE: TRX signaling link, TCH’s and DAP must locate on the same ET-PCM, if those aren’t DAP cannot be created.

45.49 STS1006O0005 EGPRS: Fault in one PCM when two in use

1. Test purpose:
   To verify functioning of recovery of PCMs when two are in use and the other PCM fails.

2. Required test environment:
   - BSC: DYN_ABIS_IN_USE and EGPRS_USE is on (ZWOS)
   - BTS: CX3.3
   - DAP created

3. Test execution:
   1. Remove Abis (non O&M sig) PCM from ET
   2. Wait until TRX state is BL-RSL
   3. Place PCM back to ET and wait until TRX is back to WO-EX
   4. Make EGPRS and GPRS traffic

4. Expected results:
   1. Alarms of faulty TRX are cancelled
   2. TRX is WO-EX
   3. Data transfer is possible

45.50 STS1006O0008 EGPRS: Modifying dynamic Abis configuration

1. Test purpose
   To modify dynamic Abis pool to different PCU index when bearer is also changed

2. Required test environment

   - DYN_ABIS_IN_USE activated
   - EGPRS_USE activated

3. Test execution
   1. Check DAP index and PCU index that you want to change (ZESI;). Check also controlling BCSU.
   2. Check the current bearer ID of PCU which index you about to change (ZFWO:BCSU=<bcsu_index>;)
   3. Modify PCU index to different bearer (ZESM:ID=<pool_id>,BCSU=<bcsu_index>,PCU=< new_pcu_index>;
   4. Check new PCU index (ZESI;)

4. Expected results
   1. Modifying is possible.

45.51 STS1006O0006 EGPRS: DAP in BSC but not in BTS and vice versa

1. Test purpose
   To verify correct working of BSC when DAP exist in BSC and doesn't exist in BTS and vice versa.

2. Required test environment

   - CX3.3 BTS SW

3. Test execution

   1. Delete TRX (ZERD)
   2. Create DAP with MMI
   3. Create TRX without DAP (ZERC)
   4. Unlock BTS/TRX (ZEQS, ZERS)
   5. Lock BTS/TRX
   6. Delete TRX
   7. Delete DAP with MMI
   8. Create DAP in BSC (ZESE)
   9. Create TRX and take DAP in use (ZERC)
   10. Unlock BTS/TRX (ZEQS, ZERS)

4. Expected results:
   1. DAP can be modified with MMI and MML
   2. After step 10. TRX state is BL-SY and alarm 7730 configuration of BCF failed appears

45.52 STS1006O0009 EGPRS: Dynamic abis loop test

1. Purpose
   Verify that it is possible to test DAP timeslots and sub timeslots of TRX

2. Requirements
   - Working DAP environment

3.Execution
   1. Check DAP configuration (ZESI)
   2. Start loop test e.g.
      ZUBK:TEST:BTS=<id>,TRX=<id>:<RTSL>:SEL=1:ATSL=<abis TSL>;

4. Expected results
   Dynamic Abis loop test can be started and the result of the loop test can be checked from alarm printer.

45.53 STS1009O0020 EGPRS: SMS in EGPRS

1. Test purpose

   Purpose of this test case is to verify SMS functioning in EGPRS

2. Required test environment
   - Fully working EGPRS/GSM environment
   - 2 EGPRS MSs
   - Gs interface in use

3. Test execution
   1. Attach EGPRS mobile to network. Send SMS to attached MS.
   2. Make a CS call from attached EGPRS MS. Send SMS to attached MS. End the call.
   3. Make PDP context and start downloading a file. Send SMS to MS which is downloading the file.

4. Expected results
   1. Mobile originated and mobile terminated SMS succeeded.
   2. Same as 1.

   Note: SMS is delivered over Gb. Download stops while delivering SMS and starts again when delivered.

45.54 STS1009O0017 EGPRS: Measurement for EDGE

1. Test purpose
   To verify that the measurement for EDGE can be performed correctly

2. Required test environment
   - EGPRS capable MS
   - CX3.3 BTS SW
   - working EDGE environment

3. Test execution
   1. Modification
      ZTPM:MEASUR,C_SCHEME:ALL,0-0-24-0,15;
      ZTPM:MEASUR,RLC_BLOCKS:ALL,0-0-24-0,15;
      ZTPM:MEASUR,PCU:ALL,0-0-24-0,15;
      ZTPM:MEASUR,DYNAMIC_ABIS:ALL,0-0-24-0,15;

   2. Start
      ZTPS:MEASUR,C_SCHEME;
      ZTPS:MEASUR,RLC_BLOCKS;
      ZTPS:MEASUR,PCU;
      ZTPS:MEASUR, DYNAMIC_ABIS;

   3. Interrogation
      ZTPI:MEASUR,C_SCHEME;
      ZTPI:MEASUR,RLC_BLOCKS;
      ZTPI:MEASUR,PCU;
      ZTPI:MEASUR,DYNAMIC_ABIS;

   4. Make ack/unack RLC data transfer

   5. Check that measurement is written to the disk ZIFO:OMU:MEASUR:1&&300;

   6. Stop
      ZTPE:MEASUR,C_SCHEME;
      ZTPE:MEASUR,RLC_BLOCKS;
      ZTPE:MEASUR,PCU;
      ZTPE:MEASUR,DYNAMIC_ABIS;

4. Expected results:
   1. The measurement can be modified, started, interrogated and stopped
   2. Check that measurement is written to the disk.
   3. Check that at least following counters are updated with PCBSC.
      C_SCHEME: counter 70000
      RLC_BLOCKS: Old PFH counters 073000, 073001 and 073003
      are incremented by two in the case of MCS-7..9.
      PCU: counters 72088, 72089, 72090, 72091
      DYNAMIC_ABIS: counters 76000, 76001, 76002, 76003

45.55 STS1006O0018 EGPRS: MCMU and BCSU switchovers

1. Test purpose
   To verify correct working of BSC when DAP exist in BSC and switchovers are made.

2. Required test environment

- EGPRS capable MS
- CX3.3 BTS SW
- Working EDGE environment

3. Test execution

   1. Create several DAP same to BCSU and attach them to BTS (ZESE, ZERC)
   2. Make a EGPRS call
   3. Make DAP BCSU switchover (ZUSC)
   4. Release the call and make a new EGPRS call
   5. Make MCMU switchover (ZUSC)
   6. Release the call and make a new EGPRS call

4. Expected results:

   1. Former spare unit is now in working state and calls are going on.
   2. BTS is configured correctly
   3. No abnormal alarms

45.56 STS1006O0019 EGPRS: Unit restarts

1. Test purpose
   To verify correct working of BSC when DAP exist in BSC and restarts are made.

2. Required test environment

   - EGPRS capable MS
   - CX3.3 BTS SW
   - working EDGE environment

3. Test execution

   1. Create several DAP same to BCSU and attach them to BTS (ZESE,ZERC)
   2. Give restart for same BCSU (ZUSU)
   3. Give hot restart for same BCSU (ZUSU)
   4. Give restart for working MCMU (ZUSU)
   5. Give hot restart for working MCMU (ZUSU)
   6. Give restart for BSC (ZUSS)
   7. Disconnect the power from the system.
   8. Connect the power to the system
   9. Make data transfer

   Wait every time until units are working again and check BTS alarms and configuration

4. Expected results:

   1. Units are restarted same state as before
   2. BTS is configured correctly
   3. Data transfer is successful
   4. No abnormal alarms

45.57 STS1009O0022 EGPRS: GPRS and EGPRS TBF multiplexing

1. Purpose
   GPRS and EGPRS TBFs can be multiplexed dynamically on the same timeslot.

2. Requirements
   - Working DAP and EGPRS environment
   - EGPRS/ NON-EGPRS MSs
   - BTS SW at least CX3.3

3. Execution
   1. Lock RTSLs of TRX so that 1 PSW TSL is used.
   2. Set initial MCS unack mode so that 8-PSK is used and enable link adaptation (MCU=6, ELA=2,ZEQV). Set PMAX so that signal strength is enough for 8-PSK (ZEUG).
   3. Make PDP-context for both MSs and start EGPRS data transfer. Check EGPRS data throughput. After that make GPRS data transfer for UL direction and check EGPRS data throughput.
   4. Stop EGPRS and GPRS data transfer and deactivate both PDP-contexts.
   5. Define EGPRS MS so that ack mode is used.
   6. Enable multiple DL EGPRS TBFs by unlocking RTSL e.g. 3 PSW TSLs are used (ZERS)
   7. Set initial MCS ack mode so that 8-PSK is used and change LA (MCA=6, ELA=1, ZEQV) and set PMAX so that signal strength is enough for 8-PSK.
   8. Make PDP-context for both MSs and start EGPRS data transfer. Check EGPRS data throughput. After that make GPRS data transfer for UL direction and check EGPRS data transfer.

4. Expected results
   1. EGPRS data transfer throughput in unack mode is worse when there are multiplexed UL GPRS TBF and DL EGPRS TBF on the same TSL because of MCS is restricted to MCS 1-4. Used MCS for DL EGPRS TBF is MCS-3 (check from tracer).
   2. In EGPRS data transfer throughput in ack mode is worse because of MCS is also restricted to MCS 1-4 on all timeslots if there is e.g. one timeslot is multiplexed with UL GPRS TBF. Used MCS for DL EGPRS TBFs is MCS-3 (check from tracer).

45.58 STS1009O0021 EGPRS: Fault of synchronization in EDGE TRX

1. Purpose
   Verify the correct working in case of fault of synchronization master channel in EDGE TRX and also verify usage of 8-PSK on BCCH TRX TSL 7 if parameter USAGE_8PSK_ON_BCCH value is 1.

2. Requirements
   - Working DAP and EGPRS environment
   - EGPRS MS
   - BTS SW at least CX 3.3

3. Execution
   1. Configure BCCH TRX consists of more than one PSW TSLs (ZEQV)
   2. Make EGPRS call
   3. Lock TSL 7
   4. Unlock TSL 7
   5. Make new EGPRS call and make data transfer.
   6. Lock TSL from PSW territory except TSL 7
   7. Unlock PSW TSL
   8. Stop data transfer and deactivate pdp context.
   9. Set initial MCS unack mode so that 8-PSK is used and enable LA (MCU=7, ELA=2, ZEQV)
   10. Set PMAX value to zero (ZEUG)
   11. Make EGPRS call and start data transfer
   12. Set PMAX value so it differs from zero

4. Expected result
   1. First call was cut off because of psw territory disappeared and the synchronization lost after locking TSL 7. When TSL 7 is unlocked synchronization and psw territory appear. New EGPRS call succeeds.
   2. Territory was downgraded and data transfer continues. After unlocking PSW TSL territory is upgraded and data transfer continues.
   3. MCS-2 is used for EGPRS DL TBF on TSL 7 of BCCH TRX when power level is zero otherwise 8-PSK is allowed.

46. ADAPTIVE MULTIRATE CODEC, AMR

46.1 STS1001O0001 Activating Adaptive Multirate Codec (AMR) Feature

1. Test purpose

   Purpose of this test case is to verify that it is possible to activate AMR and Reversed Hunting feature.

2. Required test environment

   - BSC (S10)
   - AMR capable TCSM2
   - MSC (SW M10), AMR activated.
   - BTS: Nokia Talk-Family DF6, Nokia Prime Site DF6, Nokia Metro Site CX3 and Nokia Ultra Site CX3

3. Test execution

   Circuits must be created as outgoing in the BSS and also routes for every pool must be created towards the MSC and only one route per pool is defined. It is also recommended that the route number should be the same as pool number.

   Activation is made from BSC

   1. Activate AMR and Reversed Hunting features:
      (To output feature status, ZWOS:2;)
      ZWOA:2,619,A;

      ZWOA:2,643,A;

   2. Add AMR channel to transcoder
      ZWGC:32,2:POOL=23:BCSU,1:;

   3. Restart transcoder (ZUSU:TCSM,32;)
   4. Create A-interface speech circuit group and add speech circuits to it:
      ZRCC:TYPE=CCS,NCGR=AMR,CGR=10:DIR=OUT,NET=NA0,SPC=201,LSI=AINA0:;

      ZRCA:NCGR=AMR:ETPCM=32,CRCT=2-1&&-30,:CCSPCM=2:;

   5. Change state of speech circuits to BA and WO:
      ZCEC:ETPCM=32,CRCT=2-1&&-30:BA;

      ZCEC:ETPCM=32,CRCT=2-1&&-30:WO;

   6. Create route:
      ZRRC:EXT:ROU=10,OUTR=AINTF,STP=1,NCGR=AMR;
   7. Change circuit group state to WO:
      ZCRM:NCGR=AMR:WO;
   8. Create special circuit group and add circuits to it:
      ZRCC:TYPE=SPE,NCGR=PCM0,CGR=11:FORMAT=0,HUNTED=N;

      ZRCA:NCGR=PCM0:CRCT=0-0&-1;

   9. Lock BSC in MSC:
      ZEDS:NO=17:L;
   10. In MSC, create speech circuit group and add circuits to it:
       ZRCC:TYPE=CCS,NCGR=BSC17AMR:DIR=IN,NET=NA0,LSI=AIF01,

SPC=132B:INR=IMCG0,TREE=2,NCCP=BSSAP;

ZRCA:NCGR=BSC17AMR:CRCT=191-1&&-30:CCSPCM=2;

11. Set Reversed Circuit Allocation Function Mode ON in MSC:
    ZEDH:NO=17:ON;
10. Unlock BSC in MSC:
    ZEDS:NO=17:U;
11. Change speech circuit state in MSC:
    ZCEC:CRCT=191-1&&-30:BL;

    ZCEC:CRCT=191-1&&-30:WO;

4. Expected results
   1. AMR and Reversed Hunting features are activated successfully.

46.2 STS1001O0002 AMR call, MOC and MTC

1. Test purpose

   Purpose of this test case is to verify that AMR call is successful.

2. Required test environment

   - AMR capable phase 2 MSs
   - AMR feature activated in BSC
   - Only AMR speech circuits is in use
   - BTS is supporting AMR (DF6, CX3)

3. Test execution
   1. Reset counters
      ZTVR:2:0;
   2. Make a call. (MS to FIXED, MS to MS or FIXED to MS)
   3. Use monitoring program in TCSM2 (ZDDT:TCSM,32;) to verify that AMR codec is in use. (ZRM:2)

4. Expected results
   1. Calls are working and AMR codec is used.
   2. Check counters: ZTVI:48;
      1110 Full TCH Seiz Speech Ver 3
      1113 Half TCH Seiz Speech Ver 3

46.3 STS1001O0003 AMR call, Intra cell hand over

1. Test purpose

   Purpose of this test case is to verify that during AMR call intra cell HO is working.
2. Required test environment

   - BTS (Nokia Talk-Family DF6, Nokia Prime Site DF6, Nokia Metro Site CX3, Nokia Ultra Site CX3) with one TRX
   - AMR capable phase 2 MSs

3. Test execution
   1. Modify AMR signal quality threshold parameters.
      ZEHB:BTS=<bts_id>:QDRF=0,QURF=0,IHRF=0;
   2. Check that the BTS1 is hopping (either BB or RF).
      ZEQO:BTS=<bts_id>:HOP;
   3. Make a call.
   4. Use monitoring program in TCSM2 (ZDDT:TCSM,32;) to verify that AMR codec is in use (ZRM:1).
   5. Monitor TRX state and verify that used timeslot is changed. (Also counters 121 and/or 122 should update, ZTVI:48;)

4. Expected results
   1. Call is working and voice quality is good.
   2. Call is handed over to other channel of TRX.
   3. AMR codec is in use before and after the HO.

46.4 STS1001O0004 AMR call, Inter cell hand over

1. Test purpose

   Purpose of this test case is to verify that during AMR call inter cell HO is working.

2. Required test environment

   - 2 BTS (Nokia Talk-Family DF6, Nokia Prime Site DF6, Nokia Metro Site CX3, Nokia Ultra Site CX3)
   - AMR capable phase 2 MSs

3. Test execution
   1. Edit power budget HO parameters so that call is handed over from BTS1 to BTS2 (ping-pong). Edit with commands: ZEHG, ZEHO, ZEAM (PMRG=-24)
   2. Set BTS1 and BTS2 as adjacent cells to each other
   3. Make a call in BTS1
   4. Use monitoring program in TCSM2 (ZDDT:TCSM,32;) to verify that AMR codec is in use on both calls (ZRM:1)

4. Expected results
   1. Calls are working and voice quality is good.
   2. Call is handed over from BTS1 to BTS2.
   3. AMR codec is in use before and after the HO.

46.5 STS1001O0005 AMR call, Inter cell hand over between AMR and normal cell

1. Test purpose

   Purpose of this test case is to verify that inter cell HO from AMR cell to normal cell and back is working.

2. Required test environment

   - 2 BTSs (at least DF6, CX3, DINO2 or IX3)
   - AMR capable phase 2 MS

3. Test execution
   1. Edit power budget HO parameters so, that so called ping- pong HO is generated. Edit with commands: ZEHC, ZEHG, ZEHO.
   2. Set BTS1 and BTS2 as adjacent cells to each other (ZEAC...PMRG=-24;)
   3. Edit BSC parameter HRI to be 4. (ZEEM:HRI=4;)
   4. BTS1 is supporting AMR and BTS2 is normal cell. (ZEQY)
   5. Make a call from BTS1
   6. Use monitoring program in TCSM2 (ZDDT:TCSM,32;) to verify that AMR codec is in use. (ZRM:1)

4. Expected results
   1. Call is working and voice quality is good.
   2. Call is handed over from BTS1 to BTS2.
   3. AMR codec is in use when call is in AMR cell but AMR codec it is not used when call is in normal cell.

46.6 STS1001O0006 AMR related measurements

1. Test purpose

   Purpose of this test case is to verify that AMR and Reversed hunting related measurements are working.

2. Required test environment

   - BSC (S10)
   - AMR capable TCSM2
   - MSC (SW M10)
   - BTS (Nokia Talk-Family DF6, Nokia Prime Site DF6, Nokia Metro Site CX3 and Nokia Ultra Site CX3)
   - AMR capable phase 2 MSs
   - AMR feature activated
   - AMR pool created

3. Test execution
   1. Modify TRAFFIC measurement and REV_HUNT measurement .
      ZTPM:MEASUR,REV_HUNT:ALL,0-0-24-0,15:;

      ZTPM:MEASUR,TRAFFIC:ALL,0-0-24-0,15:;

   3. Start measurement:
      ZTPS:MEASUR,REV_HUNT;

      ZTPS:MEASUR,TRAFFIC;

   4. Check the measurement state:
      ZTPI:MEASUR,REV_HUNT;
      ZTPI:MEASUR,TRAFFIC;
      Administrative state is UNLOCKED and operational state is ENABLED.
   5. Take multiple calls and release them after a while.

4. Expected results
   1. Measurement files are written to disk after measurement period and some of next counters are updated:

      REV_HUNT measurement:

      - (089005) Number of FR1 call attempts
      - (089006) Number of FR2 call attempts
      - (089007) Number of FR3 call attempts (AMR)
      - (089008) Number of HR1 call attempts
      - (089009) Number of HR2 call attempts
      - (089010) Number of FR3 call attempts (AMR)

      TRAFFIC measurement:

      110 FULL_TCH_SEIZ_SPEECH_VER_3
      113 HALF_TCH_SEIZ_SPEECH_VER_3
      184 TCH_CALL_REQ_FOR_AMR

46.7 STS1001O0007 Spontaneous packing and unpacking of AMR calls

1. Test purpose

   Purpose of this test case is to verify that spontaneous packing of FR AMR calls to HR AMR calls and spontaneous unpacking of HR AMR calls to FR AMR calls are working.

2. Required test environment

   - BTS (Nokia Talk-Family DF6, Nokia Prime Site DF6, Nokia Metro Site CX3, Nokia Ultra Site CX3) with one TRX (1 BCCH TSL, 6 FR TSL and 1 HR TSL).
   - AMR capable phase 2 MSs

3. Test execution
   1. Enable parameter ASG=Y with commands ZEEM and ZEEO.
   2. Check that intra-cell HO is enabled (ZEHB:BTS=<bts_id>:IHRF=7,IHRH=0;).
   3. Edit TRX timeslots to support HR & FR (If DR is used, check load parameter values).
      ZERM:BTS=1,TRX=1:CH1=TCHF...CH6=TCHF,CH7=TCHH;
   4. BTS has AMR codec mode sets defined for both AMR FR and AMR HR. Test with different codec settings (ZEQY);
   5. Modify AMR parameters 'Lower limit for FR TCH resources, HRL' (ZEEM, ZEEO) to be 70 % (packing starts when number of free FR resources reduces below this value) and 'Upper limit for FR TCH resources, HRU' to be 80 % (packing stops when number of free FR resources increases above this value). Also BTS level parameters FRL and FRU can be used (command ZEQM).
   6. Reset counters (ZTVR:2:0;)
   7. Make call (call1) and use monitoring program in TCSM2 (ZDDT:TCSM,32;) to verify that AMR FR codec is in use (ZRM:1). Service terminal extension E00_BXSX is also useful.
   8. Keep call1 on and make second call (call2). (Other call should be handed to AMR HR.)
   9. Modify parameter "Intra HO threshold Rx qual for AMR HR" (ZEQM, ZEQO, ZEEM, ZEEO) so that current Rx qual of AMR HR call is below this value.

4. Expected results
   1. After second call other call uses AMR HR codec.
   2. When quality is to bad, AMR HR call is handed to back AMR FR.
   3. Check counters: 'HO ATT FOR AMR TO HR' and 'HO ATT FOR AMR TO FR' in HO measurement.

46.8 STS1001O0008 Deactivating Adaptive Multirate Codec (AMR) Feature

1. Test purpose

   Purpose of this test case is to verify that it is possible to deactivate AMR feature.

2. Required test environment

   - BSC (S10)
   - AMR capable TCSM2
   - MSC (SW M10)
   - BTS (Nokia Talk-Family DF6, Nokia Prime Site DF6, Nokia Metro Site CX3 and Nokia Ultra Site CX3)

3. Test execution

   Deactivation is made from BSC

   1. Delete special circuit group and circuits (ZCEC, ZRCR, ZRCD).
   2. Delete route (ZRRD).
   3. Change state of speech circuits to BA and NU:

      ZCEC:ETPCM=32,CRCT=2-1&&-30:BA;

      ZCEC:ETPCM=32,CRCT=2-1&&-30:NU;
   4. Delete A-interface speech circuit group and speech circuits (Commands ZRCD, ZRCR).
   5. Delete AMR channel from transcoder (ZWGD).
   6. Deactivate AMR and Reversed Hunting features: (To output feature status, ZWOS:2;)

      ZWOA:2,619,D;

      ZWOA:2,643,D;
   7. Remember to delete also speech circuits in MSC and to set Reversed Circuit Allocation Function Mode OFF in MSC.

4. Expected results

   1. AMR feature deactivation is successfully

47. LOCATION SERVICES, LCS

47.1 STS1010O0001 Activating Location Services (LCS) Feature

1. Test purpose

   Purpose of this test case is to verify that it is possible to activate MS Location Services feature.

2. Required test environment

   - BSC (S10)
   - MSC (M10)
   - 6 BTS (Nokia Talk-Family DF6, Nokia Prime Site DF6, Nokia Metro Site CX3, Nokia Ultra Site CX3)
   - LMU installed to BTS

3. Test execution

   Activation is made from BSC
   1. Activate PBS_USAGE feature: ZWOA:2,654,A; to activate and ZWOS:2,654; to check.
   2. Create LCS elements SEG ID, time slot scheme, coordinates, repeater used, front sector direction, front sector width, sector front lobe range, sector back/front lobe ratio, Max. Tx power, environment, LCS neighbors.
      ZEXC:LAC=13,CI=1301:FREQ=620,NCC=0,BCC=0:LAD=65,LAM=…
   3. Create LMU transmission equipment.
      Define Q1 address and BCF_ID of the new LMU equipment
      ZQWA:BCF=<id>:TRE=<id>:131;
      To list Q1 equipments:
      ZQWL;
   4. Create LMU areas
      LMU area id
      LMU report interval
      Reference SEG
      LMU equipment
      LMU coordinates (LMU's antenna coordinates)
      Measured segments
      ZEXA=LMUA=1:LMUU=2:TRE=3,BCF=1,RLCS=13-1301,
      LAD...:MLCS=14-1401;

4. Expected results
   1. LCS feature is activated successfully

47.2 STS1010O0002 Mobile Terminated-Location Request (MT-LR)

1. Test purpose

   Purpose of this test case is to verify correct working of MT-LR

2. Required test environment

   - LCS feature activated in BSC/MSC
   - LCS MS
   - GMLC

3. Test execution
   1. Start PBS measurement (ZTPM, ZTPS).
   2. Make a Location request from GMLC client.
   3. Use Net Hawk analyser to trace right messages on A-if or check if location information is sent to GMLC.

4. Expected results
   1. Location request is sent and proper response (location) received from MS.
   2. Check counters from measurement file.

      NBR OF LOC REQ FROM LCS
      This counter is updated when location calculation requested by LCS client is started. In S10 this is a sum of location requests.

      SUCC LOC CALC BY LCS REQ
      When location calculation requested by LCS client is successful.

      NBR OF E-OTD CALCULATIONS
      Number of the calculations where E-OTD is used

47.3 STS1010O0003 Mobile Originated-Location Request (MO-LR)

1. Test purpose

   Purpose of this test case is to verify correct working of MO-LR

2. Required test environment

   - LCS feature activated in BSC
   - LCS MS

3. Test execution
   1. Modify LCS observation to observe right LCS element
      ZTPM:OMU:PBS_OBS...
   2. Start LCS observation
      ZTPS:OMU:PBS_OBS:;
   3. Make a Location request from MS

4. Expected results
   1. MO-LR request is sent to network and location information is sent to MS. User can see the coordinates.
   2. Observation file is written to disk and counters are updated, at least next counters should be updated:
      E-OTD Assist data ref bcch
      OTD measurement 1 bcch
      OTD measurement 1 OTD
      E-otd used
      GPS used
      Cell ID used
      Method used

47.4 STS1010O0004 Mobile Originated-Location Request (MO-LR) during normal call

1. Test purpose

Purpose of this test case is to verify correct working of MO-LR during normal call.

2. Required test environment

- LCS feature activated in BSC
- LCS MS

3. Test execution
    1. Make a call.
    2. Make a location request from MS

4. Expected results
    1. Call stays on during MO-LR
    2. Request is sent and location information is sent to MS and user can see it.

47.5 STS1010O0006 Mobile Originated-Location Request (MO-LR) while receiving SMS

1. Test purpose
   Purpose of this test case is to verify correct working of MO-LR while receiving SMS.

2. Required test environment

   - LCS feature activated in BSC
   - LCS MS
   - MS (for sending SMS)

3. Test execution
   1. Send SMS and make MO-LR almost at the same time. SMS should be transferred between RRLP message request and RRLP message response to/from MS.

4. Expected results
   1. SMS is transferred correctly and LR is continuing after SMS transfer.
   2. Location request is sent to MS and user can see the coordinates.

47.6 STS1010O0007 Mobile Originated-Location Request (MO-LR) while HO

1. Test purpose

   Purpose of this test case is to verify that LR is not disrupting HO.

2. Required test environment

   - LCS feature activated in BSC
   - LCS MS

3. Test execution
   1. Modify intra cell Power Budged HO parameters so that call is handed between two cells. (So called ping-pong HO.)
      ZEAM:<bts_id>:<abts_id>::PMRG=-24;
   2. Make MO-LR so that RRLP message is sent to MS and before MS replies HO message is appearing.

4. Expected results
   1. HO is performed correctly.
   2. New RRLP message is sent to MS. MS can reply to first RRLP message, but BSC should ignore it.

47.7 STS1010O0008 Emergency call E911

1. Test purpose

   Purpose of this test case is to verify that LCS works with emergency call.

2. Required test environment

   - LCS feature activated in BSC
   - E-OTD supported MS
   - Legacy MS

3. Test execution
   1. Start PBS measurement.
   2. Make an emergency call from MS (E-OTD supported).
   3. Use net-hawk to verify correct messages in A-if.
   4. Make an emergency call from legacy MS.
   5. Use net-hawk to verify correct messages in A-if.
   6. Check counters from measurement

      NBR OF LOC REQ EMERGENCY
      This counter is updated when emergency location calculation is requested.
      This is concurrent with other attempt counters.

      SUCC LOC CALC EMERGENCY
      When emergency location calculation is successful.
      This is concurrent with other successful counters.

      NBR OF E-OTD CALCULATIONS
      Number of the calculations where E-OTD is used

      SUCC LOC CALC CELLID TA
      Successful location calculation using Cell id plus TA method

4. Expected results
   1. Emergency call is successful (E-OTD MS).
   2. Location request is sent to MS and Location response (E-OTD or Cell Id TA) is sent back to MSC.
   3. Emergency call is successful (Legacy MS).
   4. Location request is sent to MS and Location response (Cell Id + TA) is sent back to MSC.
   5. Counters are updated

47.8 STS1010O0009 Transferring RIT transfer table, BCSU and MCMU switchover

1. Test purpose

   Purpose of this test case is to verify correct transferring of RIT transfer table between two SMLCs and to test that transferring works also after MCMU and BCSU switchover.

2. Required test environment

   - 2 BSCs
   - LCS feature activated in BSCs
   - LCS MS

3. Test execution
   1. Create RIT-transfer tables:
      RIT transfer table id
      Target SMLC, TS (Alien BSC)
      SMLC GW. (Own BSC)
      Transfer table. LCS element ids are used in list (Not measured by own BSC LMU).
      ZEXE:RIT=1:RRF=0,RRP=1,TS=11-1172,SGW=18-1872:
      TT=11-1101&11-1151&11-1150:;
   2. Make a location request.
   3. Make MCMU switchover and after spare unit is working make new location request.
   4. Make BCSU switchover and after spare unit is working make new location request.

4. Expected results
   1. RIT data is required from neighbor SMLC and RIT transfer table is received.
   2. Location response with location estimate is sent (A interface).
   3. After MCMU switchover location request and RIT information transferring is working.
   4. After BCSU switchover location request and RIT information transferring is working.

47.9 STS1010O0010 LMU alarm

1. Test purpose

   Purpose of this test case is to verify that LMU alarm is sent properly to BSC.

2. Required test environment

   - LCS feature activated in BSC
   - BTS with LMU connected

3. Test execution
   1. Make a fault to LMU, e.g. disconnect LMU GPS -cable.
   2. Connect cable back to LMU.

4. Expected results
   1. Alarm 8048 “LOSS OF INCOMING SIGNAL” appears in BSC (ZEOL:<bcf_id>;).
   2. Alarm 8048 “LOSS OF INCOMING SIGNAL” is cancelled in BSC. Canceling can take several minutes.

47.10 STS1010O0011 Deactivating MS Location (LCS) Feature

1. Test purpose
   Purpose of this test case is to verify that it is possible to deactivate MS Location feature.

2. Required test environment

   - LCS feature is activated

3. Test execution

   Deactivation is made from BSC

   1. Delete RIT-transfer tables (ZEXF)
      RIT transfer table id
   2. Delete LMU areas (ZEXR)
      LMU area id
   3. Delete LMU transmission equipment
      TRE id, BCF id.
   4. Remove LCS neighbors from LCS elements (ZEXM)
      New neighbors are identified with LCS element ids.
   5. Delete LCS elements (ZEXD)
      SEG ID
   6. Deactivate LCS feature (ZWOA, ZWOS)

4. Expected results
   1. LCS feature is deactivated successfully

47.11 STS1010O0012 S9+ LCS feature

1. Test purpose

   Purpose of this test case is to verify that S9+ LCS feature is working.

2. Required test environment

   - S9+ LCS feature activated in BSC (ZWOA, ZWOS).
   - S10 LCS feature is deactivated in BSC (ZWOA, ZWOS).
   - Legacy and E-OTD MSs
   - Emergency number configured in MSC and BTS/BSC attached to that area.

3. Test execution
   1. Make a emergency call from MS.
   2. Use Net Hawk analyzer to trace perform_lcs_request and perform_lcs_response messages in A interface.

4. Expected results
   1. In call setup phase perform_lcs_request and perform_lcs_response messages are appearing in A- interface and emergency call is working.

47.12 STS1010O0014 Mobile Originated-Location Request (MO-LR) during data call

1. Test purpose
   Purpose of this test case is to verify correct working of MO-LR during data call.
2. Required test environment

   - Data circuits created in BSC
   - LCS feature is activated in BSC
   - E-OTD MS

3. Test execution
   1. Make a data call
   2. Make a location request from MS
   3. Check counters

4. Expected results
   1. Data calls stays on during MO-LR
   2. Location request is sent to MS and user can see it.

48. MULTI BCF CONTROL, COMMON BCCH

48.1 STS1002O0001 SEGMENT and BTS creation, output specific parameters

1. Test purpose
   Verification of BTS and SEGMENT creation commands in the new Common BCCH + Multi BCF environment. Activating the features, and checking them in TalkFamily + UltraSite expanded structure. SEGMENT specific parameter handling.
2. Required test environment
   - BSC: S10
   - BTS: Nokia TalkFamily DF 6.0, Nokia UltraSite CX 3.0, UltraSite objects are not created in the BSC.
   - UltraSite and TalkFamily base stations are synchronized.
   - Abis lines are connected.
   - ETs have been connected to Abis interface and LAPD links created for UltraSite BTS.
   - 2 multiband MS.
   - Starting configuration:

   BCF-1 TalkFamily BTS-1 TRX-1 band1 BCCH
   TRX-2

3. Test execution
   Activating the features:
   1. Common BCCH and Multi BCF features are always active if the operator has bought them. You cannot activate/deactivate the features with the ZWOA command. At this moment, the system has assigned a SEGMENT object for each BTS. SEGMENT number is same as related BTS number. Check with:
      ZEEI:SEG=ALL;
   2. Creating a BTS in different BCF but same SEGMENT:
      create BCF-2 for UltraSite BTS:
      ZEFC:2,P,DNAME=<dname>;
      create BTS-3 - slave BTS -, with:
      ZEQC:BCF=2,BTS=3,SEG=1:BAND=<band2>;
      create TRX-1 for BTS-3 (BCCH already exist in SEGMENT-1 BTS-1), band2 TRX:
      ZERC:BTS=3,TRX=1::FREQ=<freq>,TSC=<tsc>, PCMTSL=<pcmtsl>:DNAME=<dname>;
      check outputs with BTS, NAME, SEG and SEGNAME:
      ZEEI:SEG=ALL;
      ZEFO:2:IDE;
      ZEQO:BTS=3:IDE;
      ZERO:SEG=1;
   3. Creating a BTS in different SEGMENT
      create BTS-2 in SEGMENT-2, master BTS:
      ZEQC:BCF=2,BTS=2,SEG=2:CI=<ci>,BAND=<band1>:NCC=<ncc>,BCC=<bcc>:MCC=<mcc>,MNC=<mnc>,LAC=<lac>;
      create power control parameters for BTS-2:
      ZEUC:BTS=2;

create handover control parameters for BTS-2:
ZEHC:BTS=2;
create TRX-1 for BTS-2 (BCCH TRX), band1:
ZERC:BTS=2,TRX=2::FREQ==<freq>,TSC=<tsc>,
PCMTSL==<pcmtsl>:DNAME=<dname>:CH0=MBCCHC;
unlock created TRXs in BTS-2 and BTS-3:
ZERS:BTS=2,TRX=2:U;
ZERS:BTS=3,TRX=1:U;
unlock BTS-2 and BTS-3:
ZEQS:BTS=2:U;
ZEQS:BTS=3:U;
unlock BCF-2 (UltraSite BTS):
ZEFS:BCF=2:U;

4. We have just created the structure:

	SEGMENT-1	SEGMENT-2	
BCF-1 TalkFamily	BTS-1		
	TRX-1band1BCCH		
	TRX-2		
BCF-2 UltraSite	BTS-3	BTS-2	
	TRX-1band2	TRX-2	band1 BCCH
		TRX-3	band1

5. check outputs with BTS, NAME, SEG and SEGNAME:
ZEEI:SEG=ALL;
ZEFO:2:IDE;
ZEQO:BTS=2:IDE;
ZERO:SEG=2;

6. establish a call between phones on SEGMENT-1 respectively SEGMENT-2

4.Expected results

The new SEGMENT-based structure is working, no problems during the radio network parameter handling.

48.2 STS1002O0002 BTS and SEGMENT parameter modification in Abis O&M (frequency hopping: BB, RF)

1. Test purpose

   Verification of radio network parameters by MML in the Multi BCF + Common BCCH environment, focusing on differences between SEGMENT and BTS specific parameters (LAC, CI <=> FH)

2. Required test environment
   - BSC: S10
   - BTS: Nokia TalkFamily DF 6.0, Nokia UltraSite CX 3.0, UltraSite and TalkFamily base stations are synchronized.
   - 2 multiband MS.
   - Common BCCH and Multi BCF features are always active if the operator has bought them. You cannot activate/deactivate the features with the ZWOA command.
   - MA lists are created.
   - Starting configuration is presented below:

	SEGMENT-1	SEGMENT-2	
BCF-1 TalkFamily	BTS-1		
	TRX-1band1BCCH		
	TRX-2		
BCF-2 UltraSite	BTS-3	BTS-2	
	TRX-1band2	TRX-2	band1 BCCH
		TRX-3	band1

3. Test execution

   Changing BTS-related parameters

   Set up BTS-1 with BB hopping, BTS-2 with RF hopping. The commands are shown below:

   lock BTSs:

   ZEQS:BTS=1:L;
   ZEQS:BTS=2:L;

   attach MA list to BTS-2:

   ZEQA:BTS=2:MAL=<mal>;

   modify frequency hopping parameters

   ZEQE:BTS=1:HOP=BB;
   ZEQE:BTS=2:HOP=RF;

   unlock BTSs:

   ZEQS:BTS=1:U;
   ZEQS:BTS=2:U;

   make a test call

   Changing SEGMENT-related parameters

   lock BTSs:

   ZEQS:BTS=1:L;
   ZEQS:BTS=3:L;

   modify SEGMENT identification parameters in BSDATA:

   ZEQE:SEG=1:LAC=<lac>,CI=<ci>;

unlock BTSs:

ZEQS:BTS=1:U;
ZEQS:BTS=3:U;

check system configuration:

ZEEI:SEG=ALL;

establish a call between the SEGMENTs

4. Expected results

   The new SEGMENT-based structure is working, no problems during the radio network parameter handling.

48.3 STS1002O0003 Moving BTS between SEGMENTs

1. Test purpose
   Verification of radio network object handling in Multi BCF + Common BCCH environment, like: move BTS object between SEGMENTs, split SEGMENT, delete BTS (master or slave), SEGMENT ID change.
2. Required test environment
   - BSC: S10
   - BTS: Nokia TalkFamily DF 6.0, Nokia UltraSite CX 3.0, UltraSite and TalkFamily base stations are synchronized.
   - 2 multiband MS.
   - Common BCCH and Multi BCF features are always active if the operator has bought them. You cannot activate/deactivate the features with the ZWOA command.
   - The starting configuration is presented below:

	SEGMENT-1	SEGMENT-2	
BCF-1 TalkFamily	BTS-1		
	TRX-1band1BCCH		
	TRX-2		
BCF-2 UltraSite	BTS-3	BTS-2	
	TRX-1band2	TRX-2	band1 BCCH
		TRX-3	band1

3. Test execution
   1. Move BTS object between SEGMENTs Move BTS-2 (master) to SEGMENT-1:
      lock BTSs:
         ZEQS:BTS=3:L;
         ZEQS:BTS=2:L;
         ZEQS:BTS=1:L;
      delete BCCH from BTS-2:
         ZERS:BTS=2,TRX=2:L;
         ZERM:BTS=2,TRX=2:CH0=TCHF;
         ZERS:BTS=2,TRX=2:U;
      move BTS-2 to SEGMENT-1 with command:
         ZEQU:BTS=2,SEG=1;
      unlock BTSs:
         ZEQS:BTS=1:U;
         ZEQS:BTS=2:U;
         ZEQS:BTS=3:U;
      check system configuration:
         ZEEI:SEG=ALL;
      establish a test call between BTS-1 and BTS-2
   2. Split SEGMENT
      lock BTSs:
         ZEQS:BTS=3:L;
         ZEQS:BTS=2:L;
         ZEQS:BTS=1:L;

split SEGMENT-1 by moving BTS-1 to SEGMENT-2 (moving BTS containing BCCH TRX is not allowed):

ZERS:BTS=1,TRX=1:L;
ZERM:BTS=1,TRX=1:CH0=TCHF;
ZEQU:BTS=1,SEG=2:CI=<ci>:NCC=<ncc>,BCC=<bcc>:
MCC=<mcc>,MNC=<mnc>,LAC=<lac>;

create BCCH in BTS-1 and BTS-2, create power control and handover control parameters for BTS-1:

ZERS:BTS=2,TRX=2:L;
ZERM:BTS=1,TRX=1:CH0=MBCCHC;
ZERM:BTS=2,TRX=2:CH0=MBCCHC;
ZERS:BTS=1,TRX=1:U;
ZERS:BTS=2,TRX=2:U;
ZEUC:BTS=1;
ZEHC:BTS=1;

unlock BTSs:

ZEQS:BTS=1:U;
ZEQS:BTS=2:U;
ZEQS:BTS=3:U;

check system configuration:

ZEEI:SEG=ALL;

make a test call from BTS-1 to BTS-2

3. Delete BTS (master)

Delete BTS-1:

lock BTS-1:

ZEQS:BTS=1:L;

delete BTS-1:

ZEQD:BTS=1:Y;

check system configuration:

ZEEI:SEG=ALL;

4. Delete BTS (slave)

Delete BTS-3:

lock BTS-3:

ZEQS:BTS=3:L;

delete BTS-3:

ZEQD:BTS=3;

check system configuration:

ZEEI:SEG=ALL;

5. Segment ID change

move BTS-2 to SEGMENT-5 (SEGMENT ID change):

ZEQS:BTS=2:L;
ZERS:BTS=2,TRX=2:L;
ZERM:BTS=2,TRX=2:CH0=TCHF;
ZERS:BTS=2,TRX=2:U;
ZEQU:BTS=2,SEG=5:CI=<ci>:NCC=<ncc>,BCC=<bcc>:
MCC=<mcc>,MNC=<mnc>,LAC=<lac>;
NACK, because SEGMENT with one BTS cannot be moved to a non existing SEGMENT.

4. Expected results

The new SEGMENT-based structure is working, no problems during the radio network object handling.

48.4 STS1002O0004 Adjacent cell handling in SEGMENT environment

1. Test purpose

   Verification of adjacent cell parameter handling in the new environment given by Multi BCF + Common BCCH features.

2. Required test environment
   - BSC: S10
   - BTS: Nokia TalkFamily DF 6.0, Nokia UltraSite CX 3.0, UltraSite and TalkFamily base stations are synchronized.
   - 2 multiband MS.
   - Common BCCH and Multi BCF features are always active if the operator has bought them. You cannot activate/deactivate the features with the ZWOA command.
   - Starting configuration is presented below:

	BCF-1 (UltraSite)	BCF-2 (TalkFamily)
SEGMENT-1	BTS-1 > band1 CommonBCCH	
SEGMENT-2	BTS-2 > band1 CommonBCCH	
SEGMENT-3	BTS-4 > band2	BTS-3 > band1 Com BCCH

3. Test execution
   - set up SEGMENT-1 and SEGMENT-2 to be adjacent cells:
     ZEAC:BTS=1:ABTS=2;
   - check adjacent cell information using command:
     ZEAO;
   - establish a call in BTS-1
   - do a handover to SEGMENT-2 using forced handover procedure (inter-cell handover):
     ZEQS:BTS=1:L:FHO,5;
   - delete the adjacent cell parameters between SEGMENTs 1 and 2:
     ZEAD:BTS=1:ABTS=2;
   - set up SEGMENT-2 and SEGMENT-3 to be adjacent cells:
     ZEAC:SEG=2:ASEG=3;
   - check adjacent cell information using command:
     ZEAO;
   - the call must be on SEGMENT-2, and do a handover to SEGMENT-3 using forced handover procedure (inter-cell handover):
     ZEQS:BTS=2:L:FHO,5;
   - call is on SEG-3
   - delete the adjacent cell parameters between SEGMENTs 2 and 3:
     ZEAD:SEG=2:ASEG=3;

4. Expected results

   The new SEGMENT-based structure is working, no problems during the radio network object handling.

48.5 STS1002O0005 New alarms in SEGMENT environment

1. Test purpose
   In Multi BCF + Common BCCH environment, some alarm descriptions are updated. The goal is to check the most important ones.
2. Required test environment BSC: S10 BTS: BCFs are synchronized
   - Common BCCH and Multi BCF features are always active if the operator has bought them. You cannot activate/deactivate the features with the ZWOA command.
   - The starting configuration is presented below:

BCF-1	BCF-2
SEGMENT-1 BTS-1 Common BCCH	BTS-3
	BTS-2

   - STM (site test monitor) equipment is connected to BTSs.

3. Test execution
   1. start the BCCH measurement procedure on BTS-1:
      ZUBH:BTS=1;
      Measurement works without problems, results are displayed.
      start the BCCH measurement procedure on BTS-2:
      ZUBH:BTS=2;
      In this case the test is made still for the BCCH in BTS-1, because BTS-2 has not BCCH, but they are in the same SEGMENT.
   2. set SDCCH availability threshold to 100 with command:
      ZEEQ:ALSDC=100;
      check the setting with command:
      ZEEO:MIS;
   3. reset BCF-1:
      ZEFR:1;
      The 7767 BCCH MISSING alarm will appear on the alarm terminal, verify the alarm refers to the BTS, not to the SEGMENT.
      Later appears the 7712 alarm,
      WORKING SDCCH CHANNEL RATIO BELOW THRESHOLD,
      and it's referring to BTS-1.
   4. set SDCCH availability threshold back to 80 (default) with command:
      ZEEQ:ALSDC=80;

4. Expected results
   The new SEGMENT-based structure is working, no problems during the radio network object handling.

48.6 STS1002O0006 Background database downloading (RF and BB hopping used)

1. Test purpose
   Background database downloading procedure has special implications in Multi BCF + Common BCCH environment, because there are such parameters whose activation require SEGMENT blocked, and parameters which need BCF locked. Checking the procedure in the given conditions.

2. Required test environment
   - BSC: S10
   - BTS: Nokia TalkFamily DF 6.0, Nokia UltraSite CX 3.0, UltraSite and TalkFamily base stations are synchronized.
   - 2 multiband MS.
   - Common BCCH and Multi BCF features are always active if the operator has bought them. You cannot activate/deactivate the features with the ZWOA command.
   - Starting configuration is presented below:

BCF-1 (UltraSite)		BCF-2 (TalkFamily)
SEGMENT-1	BTS-1 > band1 Common BCCH	BTS-4 > band2
SEGMENT-2	BTS-5 > band2	BTS-2 > band1 Com BCCH
SEGMENT-3	BTS-3 > band1 Common BCCH (2TRXs at least)	

MA list is created and attached to BTS-5.

3.Test execution
1. verify the initialization:
   ZEEP;
   if the database is not initialized, clear the background data in the BSDATA with command:
   ZEER;
   The background data state of the BSC must be CLEAR and the background data state of every BTS must be NOT DEFINED. Modify the radio network background parameters with MML commands.
2. setting BTS-3 hopping mode:
   ZEQE:BTS=3:BHOP=BB;
3. setting BTS-5 hopping mode:
   ZEQE:BTS=5:BHOP=RF;
4. setting SEGMENT-1 NCC and BCC parameters:
   ZEQE:SEG=1:BNCC=<bncc>,BBCC=<bbcc>;
5. check the background data is semantically correct:
   ZEEG:CHK;
6. activate the background data:
   ZEEG;
7. after the activation is completed, check that there are no BTSs left in the SWAPPING state.
   ZEEP;
8. when the restarting procedure is over, make a test call from SEGMENT-1 to SEGMENT-3.

4. Expected results

The new SEGMENT-based structure is working, no problems during the radio network object handling.

48.7 STS1002O0007 Multi BCF site restart by user

1. Test purpose
   Verify multi BCF site restarting procedure in Multi BCF + Common BCCH environment.
2. Required test environment
   - BSC: S10
   - BTS: Nokia TalkFamily DF 6.0, Nokia UltraSite CX 3.0, UltraSite and TalkFamily base stations are synchronized.
   - 2 multiband MS.
   - Common BCCH and Multi BCF features are always active if the operator has bought them. You cannot activate/deactivate the features with the ZWOA command.
   - The starting configuration is presented below:

	BCF-1 (UltraSite)	BCF-2 (TalkFamily)
SEGMENT-1	BTS-1 > band1Common BCCH	
SEGMENT-2	BTS-2 > band1Common BCCH	BTS-4 > band1
SEGMENT-3	BTS-5 > band2	BTS-3 > band1Com BCCH

3. Test execution
   1. restart each BCF, using command ZEFR (restart first the TalkFamily BCF, then the UltraSite) ZEFR:2; ZEFR:1;
   2. when the restarting procedure is over, make a test call between SEGMENT-1 and SEGMENT-3.

4. Expected results
   The new SEGMENT-based structure is working, no problems during the radio network object handling.

48.8 STS1003O0001 Initial SDCCH allocation in SEGMENT environment (BB and RF hopping used)

1. Test purpose

   Initial SDCCH allocation has some particularities in Multi BCF + Common BCCH environment, mainly in configurations which are containing TalkFamily and UltraSite BCFs. We have to verify that, the initial SDCCH is allocated always in the PGSM band, and depending from the NonBcchLayerOffset parameter, mainly in the UltraSite BCF.

2. Required test environment
   - BSC: S10
   - BTS: Nokia TalkFamily DF 6.0, Nokia UltraSite CX 3.0, UltraSite and TalkFamily base stations are synchronized.
   - Different types of MSs.
   - Common BCCH and Multi BCF features are always active if the operator has bought them. You cannot activate/deactivate the features with the ZWOA command.
   - Starting configuration is presented below:

	BCF-1 > TalkFamily, BB	BCF-2 > UltraSite, RF
SEGMENT-1	BTS-1 > band1 Common BCCH	BTS-3 > band1
	BTS-2 > band1	BTS-4 > band2
	BTS-5 > band2	

All BTSs must have at least 1 SDCCH channel.

3. Test execution
   1. disable SDCCH handover in SEGMENT-1:
      ZEHG:SEG=<seg>:ESD=N;
   2. set NonBcchLayerOffset parameter value to 0 dB in all TalkFamily BTSs, and to -2 dB in the UltraSite BTSs:
      ZEQM:BTS=<bts_id>:NBL=<nbl>;
   3. set the IntraSegSdcchHoGuard to max value, avoiding a SDCCH handover:
      ZEEQ:ISS=255;
   4. check settings with:
      ZEEO:MIS;
   5. start radio resource monitor from service terminal, to follow the initial SDCCH allocation
   6. establish some calls. In the given structure, the initial SDCCH mainly is appearing on BTS-3 because of better link budget
   7. reconfigure the SEGMENT, as below:

	BCF-1 > TalkFamily, RF	BCF-2 > UltraSite, BB
SEGMENT-1	BTS-2 > band1	BTS-1 > band1Com BCCH
	BTS-3 > band1	BTS-4 > band2
	BTS-5 > band2	

   8. set NonBcchLayerOffset parameter value to +2 dB in all TalkFamily BTSs, and to 0 dB in the UltraSite BTSs:
      ZEQM:BTS=<bts_id>:NBL=<nbl>;
   9. start radio resource monitor from service terminal, to follow the initial SDCCH allocation

10. make some calls
    in the given structure, the initial SDCCH should appear always on BTS-1

4. Expected results
   The initial SDCCH is always allocated in the band1, and taking in account the 2dB link budget difference between the TalkFamily and UltraSite BTSs, mainly in the UltraSite band1 TRXs.

48.9 STS1003O0002 SDCCH channel triggering, SDCCH handover

1. Test purpose
   Testing the SDCCH triggering from an UltraSite BTS to a TalkFamily BTS in case of intra-cell and inter-cell SDCCH handovers.

2. Required test environment
   - BSC: S10
   - BTS: Nokia TalkFamily DF 6.0, Nokia UltraSite CX 3.0, UltraSite and TalkFamily base stations are synchronized.
   - Different types of MSs.
   - SDCCH handover feature is active in PRFILE: ZWOC:10,22,FF;
   - Disable fast averaging call setup: ZWOC:10,15,00;
   - Common BCCH and Multi BCF features are always active if the operator has bought them. You cannot activate/deactivate the features with the ZWOA command.
   - Starting configuration is presented below:

	BCF-1 > TalkFamily	BCF-2 > UltraSite
SEGMENT-1	BTS-3 > band2	BTS-1 > band1 CommonBCCH
SEGMENT-2	BTS-2 > band1 BCCH	

   Each BTS has at least one SDCCH channel configured.

3. Test execution
   1. disable BSC from executing external handover:
      ZEEQ:DINHO=N;
   2. enable SDCCH handovers in SEG-1 (disable any other handover type):
      ZEHG:SEG=1:ESD=Y;
   3. set HO quality threshold:
      ZEHQ:SEG=1:QDR=0,QDP=1,QDN=1;
   4. set signal interference threshold level:
      ZEHI:SEG=1:IDR=-110;
   5. delay the TCH assignment by sending the next command to every active BCSU (service terminal):
      ZOS:*,<bcsu_id>,14E,,,,,6034,,,5,10,03,E8
      (may be ended with 01,F4 to give a delay > 5 sec)
   6. setting up IntraSegSdcchHoGuard parameter:
      ZEEQ:ISS=0;
   7. check parameter value:
      ZEEO:MIS;
   8. configuring the NonBcchLayerOffset parameter in BTS-3 to handle the 2dB link difference ZEQM:BTS=3:NBL=-2;
   9. check the settings:
      ZEQO:BTS=3:MIS;
   10. start HO measurement
   11. establish some calls in SEGMENT-1 with single band mobile. The SDCCH should not be triggered to the TalkFamily BTS-3, because the mobile doesn’t have the capacity to work on the 1800MHz TRX.

12. establish some calls in SEGMENT-1 with dual band mobiles. The SDCCH should be triggered to the TalkFamily BTS-3. Verify counters in the generated measurement file (counter numbers 4133, 4137 in BTS-1, 4131, 4134, 4138 in BTS-3).
13. delete the SDCCH channel from BTS-3:
    ZERM:BTS=3,TRX=<trx>:CH0=TCHF,CH1=TCHF,CH2=TCHF,
    CH3=TCHF,CH4=TCHF,CH5=TCHF,CH6=TCHF,CH7=TCHF;
    SEGMENT-2 will be adjacent for SEGMENT-1:
    ZEAC:SEG=1:ASEG=2:QMRG=-24,MRGS=Y;
14. establish some calls in SEGMENT-1 with dual band mobiles. The SDCCH should be triggered to the TalkFamily BTS-2. Verify counters in the generated measurement file (counter numbers 4066, 4069 in BTS-1, 4058, 4061 in BTS-2).
15. stop handover measurement
16. cancel the assignment delay:
    ZOS:*,<bcsu_id>,14E,,,,,6034,,,5,10,FF,FF

4. Expected results

The SDCCH triggering from the UltraSite BTS to TalkFamily BTS should work without problems, counters have reasonable values.

48.10 STS1003O0003 Modification of BTSLoadInSEG parameter, handover for balancing load

1. Test purpose
   Modification of BTSLoadInSEG parameter and testing the handover procedures for balancing load. Check the measurements updating on the NMS/2000 site.
2. Required test environment BSC: S10 Dual band MSs.
   - Common BCCH and Multi BCF features are always active if the operator has bought them. You cannot activate/deactivate the features with the ZWOA command.
   - Starting configuration is presented below:

     SEGMENT-1 BTS-1 > band1 Common BCCH BTS-2 > band2

     BTS-1 has all the TCHs locked, and BTS-2 has 5 TCH timeslots unlocked.
3. Test execution
   1. setting up BTSLoadInSEG parameter for BTSs:
      ZEQM:BTS=1:LSEG=0;
      ZEQM:BTS=2:LSEG=30;
   2. check the settings:
      ZEQO:BTS=<bts_id>:MIS;
   3. modify handover measurement settings:
      ZTPM:MEASUR,HO:ALL,0-0-24-0,15;
   4. verify measurement settings:
      ZTPI:MEASUR,HO;
   5. start the measurement:
      ZTPS:MEASUR,HO;
   6. establish a call. The call is assigned in BTS-2.
   7. unlock 5 TCH timeslots in BTS-1:
      ZERS:BTS=1,TRX=<trx_id>,CH=<ch_id>:U;
   8. establish new calls until you have 3 TSLs occupied in BTS-1 (calls which are assigned in BTS-2 during immediate assignment should be cleared).
      make a new call (immediate assignment in BTS-1). This should be handed over to BTS-2 because the load in BTS-1 was exceeded.
   9. clear the last call;
   10. modify BTSLoadInSEG parameter for BTS-2:
       ZEQM:BTS=2:LSEG=10;
   11. make a new call (immediate assignment in BTS-1). This should remain in BTS-1 because the BTSLoadInSEG parameter in BTS-2 is banning the handover.
   12. stop handover measurement:
       ZTPE:MEASUR,HO;
   13. check the measurement results from the NMS/2000 site.

4. Expected results
   Load balancing works, measurement results should appear on NMS/2000 site, counters 4132,4135,4136 are updated in measurement file and values are reasonable (4135 is source BTS related, 4132 and 4136 destination BTS related)

48.11 STS1003O0004 Self-regulation of NonBcchLayerOffset parameter (RF hopping is used)

1. Test purpose

   In the new, SEGMENT given environment, we have to find information about the non-BCCH layer of the adjacent cell, to know its parameters and use it in a handover attempt. Check the functionality of the NonBcchLayerOffset self-regulation, and verify if the handover which is using it (power budget handover), is working.

2. Required test environment NMS: OSS3.1 BSC: S10
   - BTS: Nokia TalkFamily DF 6.0, Nokia UltraSite CX 3.0. TalkFamily and UltraSite BTSs are synchronized.
   - Multiband MSs.
   - Common BCCH and Multi BCF features are always active if the operator has bought them. You cannot activate/deactivate the features with the ZWOA command.
   - Starting configuration is presented below:

	BCF-2 (UltraSite)	BCF-1 (TalkFamily)
SEGMENT-1	BTS-1 > band1 Common BCCH	BTS-3 > band2
SEGMENT-2	BTS-2 > band1 Common BCCH	BTS-4 > band2

   Each BTS has RF hopping.

3. Test execution
   1. setting up NonBcchLayerOffset measurement:
      ZTPM:MEASUR,NBL_OFFSET:ALL,0-0-24-0,15;
   2. starting NonBcchLayerOffset measurement:
      ZTPS:MEASUR,NBL_OFFSET;
   3. verify measurement:
      ZTPS:MEASUR,NBL_OFFSET;
   4. lock each TCH in BTS-1 and BTS-2:
      ZERS:BTS=1,TRX=<trx>,CH=<ch>:L;
      ZERS:BTS=2,TRX=<trx>,CH=<ch>:L;
   5. establish some calls with dual band mobiles in SEGMENT-1 and SEGMENT-3.
   6. follow up the channel allocation procedure in BTS-3 and BTS-4 with radio resource monitor on service terminal.
   7. define SEGMENT-2 as adjacent cell for SEGMENT-1:
      ZEAC:SEG=1:ASEG=2;
   8. after - at least - 2 measurement periods (establishing couple of calls in this time in SEGMENT-1) check measurements, and the counters updated to the NMS/2000 site. The Auto BSS functionality in NMS/2000 calculates a better offset value for BTS-4.
      ZEQO:BTS=4:MIS;
   9. decrease the power level, and force the calls in SEGMENT-1 in a handover attempt to SEGMENT-2.
      ZEUG:BTS=3:PMAX=30;
   10. calls will be handed over to BTS-4 based on calculated NonBcchLayerOffset parameter value, verify with radio resource monitor on service terminal.
   11. stop measurements:
       ZTPE:MEASUR,NBL_OFFSET;

12. check measurement results, and the counters updated to the NMS/2000 site

4. Expected results
The NonBcchLayerOffset should be set up automatically, values are calculated by the NMS/2000. Power budget handover using the parameter value is working.

48.12 STS1003O0005 Initial assignment on non-BCCH layer

1. Test purpose
   In the new, SEGMENT given environment, a specific situation could occur, when all the resources are occupied in the BCCH layer. In this case the initial assignment should be made on the non-BCCH layer.
2. Required test environment
   - BSC: S10
   - BTS: Nokia TalkFamily DF 6.0, Nokia UltraSite CX 3.0. TalkFamily and UltraSite BTSs are synchronized.
   - Multiband MS.
   - Common BCCH and Multi BCF features are always active if the operator has bought them. You cannot activate/deactivate the features with the ZWOA command.
   - Starting configuration is presented below:

	BCF-1 (TalkFamily)	BCF-2 (UltraSite)
SEGMENT-1	BTS-1 > band1 Common BCCH	BTS-2 > band2

3. Test execution
   1. all TCH resources should be locked in BTS-1, so initial assignment on BTS-2 can happen:
      ZERS
   2. modify super reuse good Rx level threshold CGR= -110 dBm:
      ZEHY
   3. establish some calls with dual band mobiles in SEGMENT-1, follow up the initial assignment procedure in BTS-2

4. Expected results
   TCHs should be assigned in BTS-2 without problems.

48.13 STS1003O0006 Power optimization in Common BCCH environment

1. Purpose

Verification of power optimization parameter handling in Common BCCH environment. Feature is ANSI specific.

2. Required test environment

- BSC: S10.5 CD (in S11 all SEGMENTs can have different offset values, but in S10.5 there is only one parameter for all SEGs).
- Common BCCH and Multi BCF features are always active if the operator bought them. You cannot activate/deactivate the features with ZWOA command.
- Starting configuration is presented below:

SEG 1	SEG 2
BTS 1 – 1900MHz Common BCCH	BTS 3 – 1900MHz BCCH
BTS 2 – 800MHz	

- PMAX is 0 in SEG 1 and 10 in SEG 2. SEG 2 is adjacent to SEG 1. BTS power optimization is disabled in SEG 1.

3. Test execution

1. Set up a call in SEG 1 (initial assignment in BTS 1). Check used power value in Abis from tracer.

2. Set up a call in SEG 1 (initial assignment in BTS 2). Check used power value in Abis from tracer. This value is 6dB bigger than it was in the previous step.

3. Modify offset value to 0 (it can be modified between 0 and 15 which means 0 to 30 dB attenuation):
   Check for a free record:
   ZDFD:MCMU,<active unit> :5AC006B,<record nr>,,W;
   Substitute the parameter value:
   ZDFS:MCMU,<active unit>:5AC006B,<record nr>,,W;
   MCMU-0 FILE N:O 5AC006B RECORD N:O 00000000 DISPLACEMENT 00000000

   0000-1BF 0000-4D 0000-0 0000-
   Substitute the parameter value in the next record:
   ZDFS:MCMU,<active unit>:5AC006B,<record nr>,,W;
   MCMU-0 FILE N:O 5AC006B RECORD N:O 00000000 DISPLACEMENT 00000000

   0000-1B3 0000-74 0000-0 0000-
   Wait for 15 minutes until the updated value is distributed to all computer units.

4. Enable power optimization for BTSs in SEG 1 (ZEUG:PENA).

5. Set up a call in SEG 1 (initial assignment in BTS 2). Check used power value in Abis from tracer (wait until the value is stabilizing). We will refer to this value later as A.

6. Modify offset value so, the attenuation given is smaller than A (it can be modified between 0 and 15 which means 0 to 30 dB attenuation).
   Edit the previously used records:
   ZDFS:MCMU,<active unit>:5AC006B,<record nr>,,W;
   MCMU-0 FILE N:O 5AC006B RECORD N:O 00000000 DISPLACEMENT 00000000

   0000-1BF 0000-4D 0000-2 0000- (any value smaller than A)
   Substitute the parameter value in the next record:
   ZDFS:MCMU,<active unit>:5AC006B,<record nr>,,W;
   MCMU-0 FILE N:O 5AC006B RECORD N:O 00000000 DISPLACEMENT 00000000

   0000-1B3 0000-74 0000-2 0000- (any value smaller than A)
   Wait for 15 minutes until the updated value is distributed to all computer units.

7. Set up a call in SEG 1 (initial assignment in BTS 2). Check used power value in Abis from tracer (it starts to increase from the above-given offset value until A – in this case the BTS power optimization will be taken in account because needs bigger attenuation).

8. Set up a call in SEG 1 (initial assignment in BTS 1). Do handover to BTS-2. Check used power value in Abis from tracer during handover (it starts to increase from the above-given offset value until A – in this case the BTS power optimization will be taken in account because needs bigger attenuation).

9. Set up a call in SEG 2. Do handover to BTS-2. Check used power value in Abis from tracer during handover (it starts to increase from the above-given offset value until A – it uses the power optimization value at BTS-2).

10. Modify offset value so, the attenuation given is bigger than A (it can be modified between 0 and 15 which means 0 to 30 dB attenuation).
    Edit the previously used records:
    ZDFS:MCMU,<active unit>:5AC006B,<record nr>,,W;
    MCMU-0 FILE N:O 5AC006B RECORD N:O 00000000 DISPLACEMENT 00000000

    0000-1BF 0000-4D 0000-8 0000- (any value bigger than A)
    Substitute the parameter value in the next record:
    ZDFS:MCMU,<active unit>:5AC006B,<record nr>,,W;
    MCMU-0 FILE N:O 5AC006B RECORD N:O 00000000 DISPLACEMENT 00000000

    0000-1B3 0000-74 0000-8 0000- (any value bigger than A)
    Wait for 15 minutes until the updated value is distributed to all computer units.

11. Set up a call in SEG 1 (initial assignment in BTS 2). Check used power value in Abis from tracer (should be the above-given offset).
12. Set up a call in SEG 2. Do handover to BTS-2. Check used power value in Abis from tracer during handover (should be the above-given offset).

13. Set up a call in SEG 1 (initial assignment in BTS 1). Modify PMAX value to 14. Do handover to BTS-2. Check used power value in Abis from tracer during handover (should be the above-given offset).

4. Expected results

Parameter can be changed smoothly and the correct values can be found from tracer.

49. TEXT TELEPHONE, TTY

49.1 STS1012O0001 Activation of text telephone (TTY) feature

1. Test purpose

Purpose of this test case is to verify that it is possible to activate TTY feature.

2. Required test environment

The feature is made for ANSI environment
- BSC (S10)
- TCSM2 (S10)

3. Test execution

1. Check that TD4_PXMX, TD5_PXMX, TD6_PXMX are in LFILES directory of BSC disks
2. Activate TTY (2,702) feature (ZWOA, ZWOS)
3. Restart TCSM2 because of TCSM2 make decision which software modules will be loaded in restart phase based on TC_PCM configuration and the state of TTY feature (ZUSU)
4. Check that TTY codec is supported by taking remote session to TCSM2 (ZDDT, ZRD) or by using MML (ZDDX:TCSM,<id>:"ZGW"). Check that new TCSM2 software (TD4_PXMX, TD5_PXMX or TD6_PXMX) is correctly loaded to TCSM depending on TC_PCM configuration.

TCSM2 software	supported A-interface pools
TD4_PXMX	3, 7, 10, 13, 20, 21, 22
TD5_PXMX	1, 5
TD6_PXMX	23

5.Before running TCSM diagnostic change TCSM state WO-EX->BL-EX. After 5 minutes TCSM state will change to BL-ID automatically. Change state BL-ID->TE-EX and run TCSM diagnostic.

4. Expected results

1. TTY feature is activated successfully and the new software of TCSM2 is correctly loaded to TCSM.
2. TCSM diagnostic is successful.

49.2 STS1012O0002 TTY call, MOC and MTC

1. Test purpose

   Verify TTY calls are successful.

2. Required test environment

   - TTY phone
   - ANSI BTS
   - working TTY environment, A-if pool 2 (HR) does not support TTY

3. Test execution

   1. Check TTY codec is supported (ZDDX:TCSM,<id>:"ZGW";)
   2. Make the call
   3. Check that the speech circuits are release after call (ZCEL:CGR=<cgr number>;)

4. Expected results

   1. Reliable transmission of TTY conversation through the traffic channels.
   2. Speech circuits are released after call.

49.3 STS1012O0004 Inter cell HO with TTY

1. Test purpose
   Verify the working of TTY in case of inter cell HO

2. Required test environment
   - Working TTY environment
   - 2 BTS (adjacencies, ZEAC)

3. Test execution
   1. Enable PWRBUDGET HO and define HO interval (EPB=Y, HPP=0, MIH=15, ZEHG)
   2. Set HO margin PMRG=-24 (ZEAM)
   3. Check TTY codec is supported (ZDDX:TCSM,<id>:"ZGW";)
   4. Make TTY call

4. Expected results
   1. The call is handed over to target cell and back to source cell.
   2. Reliable transmission of TTY conversation through the traffic channels is possible during HO.

50. WIRELESS PRIORITY SERVICE, WPS

50.1 STS1007O0001 Testing the queuing for a WPS user

1. Test purpose:
   Testing the queuing for a WPS user

2. Required test environment:
   - 1 MSC supporting the WPS feature.
   - 1 BSC supporting the WPS feature.
   - 1 BTS with the following channel configuration: BCCH, SDCCH/8, 2 FTCHs.
   - 6 MSs.
   - 3 normal SIMs and 3 SIMs that are able to make WPS call (access classes 12-14).

3. Test execution:
   1. Lock BTS/TRX
   2. Create channel cofiguration
      ZERM:BTS=1,TRX=1:CH0=MBCCH,CH1=SDCCH;
   3. Unlock BTS/TRX
   4. Lock TCHs 4-7
   5. Modify queueing parameters
      ZEQH:BTS=1:MQL=100,QPU=Y, QPC=14,QPH=14,
      QPN=14,MPU=Y,TLC=28;
   6. Make three normal speech calls.
   7. Make one WPS call.
   8. Activate the WPS feature
      ZWOA:2,791,A;
   9. Make three WPS call. Lowest priority call first.
   10. Release one normal speech call.
   11. Relase second normal speech call.

4. Expected results:

   1. The first two calls are successful. Third call is put to queue.
   2. The first WPS call is unsuccessful.
   3. Normal speech call and lowest priority WPS call are removed from the queue.
   4. The released TCH is given to a queuing WPS call with highest priority.

NOTE: Steps 10 and 11 must be executed whitin 28 seconds after step 9, because the queuing time for WPS calls is 28 seconds.

50.2 STS1007O0002 Activating, deactivating and testing the supervision of access class control in WPS

1. Test purpose:
   Testing the WPS feature activation, deactivation and the supervision of access class control.

2. Required test environment:
   - 1 BSC supporting the WPS feature.

3. Test execution:
   1. Activate the WPS feature
      ZWOA:2,791,A;
   2. Check the feature activation:
      ZWOS:2,791;
   3. Set access class 12 barred in one BTS
      ZEQF:BTS=1:ACC=12;
   4. Print out active alarms of the BCF
      ZEOL:BCF=1:NR=ALL;
   5. Set access class 12 allowed in the BTS
      ZEQF:BTS=1:ACC;
   6. Print out active alarms of the BCF
      ZEOL:BCF=1:NR=ALL;
   7. Deactivate the WPS feature
      ZWOA:2,791,D;
   8. Check the feature deactivation:
      ZWOS:2,791;
   9. Set access class 12 barred in one BTS
      ZEQF:BTS=1:ACC=12;
   10. Print out active alarms of the BCF
      ZEOL:BCF=1:NR=ALL;

4. Expected results:
   1. WPS feature activation can be done
   2. Alarm 7763 is set by the BSC
   3. Alarm 7763 is cancelled by the BSC
   4. WPS feature deactivation can be done.
   5. Alarm is not given

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50.3 STS1007O0003 Queuing and directed retry

1. Test purpose
   To verify that queuing continues after max time limit directed retry (MADR) expires.
2. Required test environment
   - 2 BTSs
   - 2 MSs
   - WPS SIM

3. Test execution
   1. Activate DR feature
      ZWOC:10,5,FF;
   2. Disable external HOs
      ZEEQ:DINHO=N;
   3. Allow DR for BTS1
      ZEQF:BTS=<BTS1>:DR=Y;
   4. Block all TCH:s at the BTS1
      ZERS:BTS=<BTS1>,TRX=<>,CH=<>:L;
   5. Allow queuing at the BTS1
      ZEQH:BTS=<BTS1>:MQL=50;
   6. Change MaxTimeLimitDR value
      ZEQF:BTS=<BTS1>:MADR=10;
   7. Block all TCH:s except one in BTS2
      ZERS:BTS=<BTS2>,TRX=<>, CH=2&&7;
   8. Make one WPS call to BTS1
   9. Make WPS call

4. Expected results
   1. The first call is successful with DR to BTS2.
   2. The second call is put to queue (BTS1). Call stays in queue untill queuing timer expires.

50.4 STS1007O0004 Testing the queuing for a non-WPS user

1. Test purpose:
   Testing the queuing for a non-WPS user

2. Required test environment:
   - 1 MSC supporting the WPS feature.
   - 1 BSC supporting the WPS feature.
   - 1 BTS with the following channel configuration: BCCH, SDCCH/8, 2 FTCHs.
   - 5 MSs.
   - 4 normal SIMs and 1 SIM that are able to make WPS call.

3. Test execution:

   1. Lock BTS/TRX
   2. Create channel cofiguration
      ZERM:BTS=1,TRX=1:CH0=MBCCH,CH1=SDCCH;
   3. Unlock BTS/TRX
   4. Lock TCHs 4-7
   5. Modify queueing parameters
      ZEQH:BTS=1:MQL=100,QPU=Y,QPC=14,QPH=14,
      QPN=14,MPU=Y,TLC=28;
   6. Activate the WPS feature
      ZWOA:2,791,A;
   7. Make four normal speech calls
   8. Make one WPS call.
   9. Release one normal speech call.
   10. Relase second normal speech call.

4. Expected results:
   1. The first two calls are successful. Third and fourth calls are put to queue.
   2. WPS call is put to queue. Recent normal call is removed trom the queue.
   3. The released TCH is given to a queuing WPS call.
   4. The released TCH is given to a queuing normal call.

NOTE: Steps 9 and 10 must be executed whitin 28 seconds after step 7, because the queuing time for WPS calls is 28 seconds.

51. ANSI SPECIFIC TEST CASES

51.1 STS0622O0003 TCSM2A converter configuration

1. Test purpose

   Configure TCSM2A converter remotely

2. Required test environment

   - TCSM2 with ET2A, ET2E and TR12 cards

3. Test execution

   1. Set the type of ET index 1 to NU
      ZWGC:32,1:TYPE=NU:BCSU,x;
   2. Set the type of ET index 2 to FR or EFR
      ZWGC:32,2:POOL=1:BCSU,x;
   3. Connect TRCO
      ZWUC:TCSM,32:TRCO,0;
   4. Start remote session to transcoder:
      ZDDT:TCSM,32;
   5. Change the TCSM2A unit into converter mode by using command
      ZGL:ANSI:CONV
      NOTE: The ZGL command always causes a reset to the unit.
   6. You can modify functional modes of the PCM circuits with the ZEC command. The help text for the ZEC command displays how to configure both E1 and T1 type PCM circuits.

4. Expected results

   TCSM2A converter can be configured remotely

51.2 STS0704B0001 Three digit Mobile Network Code

1. Test purpose

Ensure that three digit Mobile Network Code works

2. Required test environment

Three digit Mobile Network Code is used only in ANSI environment.

- MSC: M7B
- BSC: S7 with PRFILE option three digit MNC on
- MS: DCS1900 MS, which supports tree digit MNC

3. Test execution

1. Modify (ZEQE) some BTS to have MNC greater than 99 or create new BTS (ZEQC). Make the needed changes also to MSC to support new three digit MNC. Make test calls thru the modified BTS. Test also that handovers are made correctly.
2. Modify BTS which MNC code was greater than 99 to two digit mode (ZEQE). Make the needed changes also to MSC to support new two digit MNC. Make test calls thru the modified BTS. Test also that handovers are made correctly.
3. Create new BTS from NMS/2000 with three digit MNC. (T11 software for NMS/2000 is needed.) Make test calls throw new BTS. Test also that handovers are made correctly.

4. Expected results

1. Three digit MNC modification or creation should succeed.
2. Events are sent correctly to Q3.
3. Calls are successful.

51.3 STS0705B0002 UNLOCK BTS which has attenuated channel

1. Test purpose

   Check attenuated BTS unlocking

2. Required test environment

   - Guard channel feature is made only for ANSI environment
   - The radio network is created and working but 1 BTS is locked.
   - Attenuated channels are: 585,587,610,612,685,687,710,712,735,737,810
     Forbidden channels are: 586, 611,686,711,736
   - 2nd GEN BTS: attenuation should be 10 dB
   - 2nd generation BTS requires new prom for CU to deblock guard channels
   - 3rd GEN BTS: attenuation should be 8 dB
   - PrimeSite: no attenuation is needed at all

3. Test execution

   1. Configure one TRX to have attenuated channel. (ZERS, ZERM)
   2. Check BSC and BTS alarms (ZAHO, ZEOL). Set TX power value to be too high (e.g. PMAX <10dB in 2nd generation BTS).(ZEUG) Modify the BTS administrative state to UNLOCKED.
   3. Set TX power enough to be low enough (e.g. PMAX >=10dB in 2nd generation BTS). Modify the BTS administrative state to UNLOCKED.
   4. Test also case when you have forbidden channel in TRX. Modify the BTS administrative state to UNLOCKED.

4. Expected results

   1. The BTS UNLOCK fails. The administrative state of BTS is not changed.
      DX ERROR :13161 appears: (Maximum TX Power Of The Too High Due To Attenuated Channels)
   2. The administrative state of the BTS is changed to WO.
   3. Operational state is changed but BTS blocks TRX.

51.4 STS0705B0001 UNLOCK TRX which has attenuated channel

1. Test purpose

   Check attenuated TRX unlocking

2. Required test environment

   - Guard channel feature is made only for ANSI environment
   - The radio network is created and working but 1 TRX is locked.
   - Attenuated channels are: 585,587,610,612,685,687,710,712,735,737,810
     Forbidden channels are: 586, 611,686,711,736
   - 2^{nd} GEN BTS: attenuation should be 10 dB
   - 2^{nd} generation BTS requires new prom for CU to deblock guard channels
   - 3^{rd} GEN BTS: attenuation should be 8 dB
   - PrimeSite: no attenuation is needed at all

3. Test execution

   1. Configure one TRX to have attenuated channel. (ZERM)
   2. Check BSC and BTS alarms (ZAHO, ZEOL). SET TX power value to be too high (e.g. PMAX <10dB in 2^{nd} generation BTS).(ZEUG) Modify the attenuated channel TRX administrative state to UNLOCKED (ZERS).
      Check BSC and BTS alarms (ZAHO, ZEOL).
   3. Set TX power to be enough low (e.g. PMAX >=10dB in 2^{nd} generation BTS). Modify the attenuated channel TRX administrative state to UNLOCKED. Check BSC and BTS alarms (ZAHO, ZEOL).
   4. Test also case when you try to configure forbidden channel to TRX.
      Modify the attenuated channel TRX administrative state to UNLOCKED.

4. Expected results

   1. Attenuated channel TRX UNLOCK fails. The administrative state of the attenuated channel TRX is not changed. DX ERROR :13161 appears: (Maximum TX Power Of The Too High Due To Attenuated Channels)
   2. The operational state of the attenuated channel TRX changes from BL-RST to WO.
   3. Operational state is changed but BTS blocks TRX.

51.5 STS0705B0003 Modify PMAX online to BTS having TRX with attenuated channel

1. Test purpose

   Check PMAX online value modification

2. Required test environment

   - Guard channel feature is made only for ANSI environment
   - The radio network is created and working but 1 BTS is locked.
   - Attenuated channels are: 585,587,610,612,685,687,710,712,735,737,810
     Forbidden channels are: 586, 611,686,711,736
   - 2nd GEN BTS: attenuation should be 10 dB
   - 2nd generation BTS requires new prom for CU to deblock guard channels
   - 3rd GEN BTS: attenuation should be 8 dB
   - PrimeSite: no attenuation is needed at all

3. Test execution

   1. Configure one TRX to have attenuated channel. (ZERS, ZERM)
   2. Check BSC and BTS alarms (ZAHO, ZEOL). Modify BTS PMAX online too high (e.g. PMAX <10dB in 2nd generation BTS).(ZEUG) Check BSC and BTS alarm (ZAHO, ZEOL).
   3. Check BSC and BTS alarms (ZAHO, ZEOL). Modify online BTS PMAX value enough low (e.g. PMAX >10dB in 2nd generation BTS)..

   Check BSC and BTS alarms (ZAHO, ZEOL).

4. Expected results

   1. Attenuated channel TRX modify fails. DX ERROR :13161 appears:
   (Maximum TX Power Of The Too High Due To Attenuated Channels)
   2. Modify succeeds.