

NOKIA

S10.5ED E5 Release Test Plan

ETSI

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Summary of changes

Version	Date	Author	Comments
/2en	17-Apr-2003	P Hahl	First E5 version(/1en=E4 version)

1 Purpose

This plan contains guidelines for BSC S10.5ED software package release verification. The aim is to check that all the basic functionalities present in the network before the S10.5ED upgrade also remains there after the SW upgrade. The network's basic operational functions are verified through a set of tests, which have been saved in the TestMan database (Lotus Notes application). The remaining functionalities and optional features are tested in other S10.5ED program testing phases.

A new BSC software package is upgraded from S9 level according to the procedure described in the separate document '*DX200 BSC S9-S10.5ED Software Implementation Procedure, ETSI, DN03284067*'. Upgrade from S10.5 to S10.5ED is described in document '*DX200 BSC S10.5-S10.5ED Software Miniimplementation Procedure, ETSI&ANSI, DN03275091*'. The respective remote implementation procedures are '*DX200 BSC S9-S10.5ED SoftwareRemote Implementation Procedure, ETSI, DN03405648*' and '*DX200 BSC S10.5-S10.5ED Software Remote Miniimplementation Procedure, ETSI&ANSI, DN03405636*'.

After the upgrade, state transitions and restarts will be tested. The network functionality is tested through location registration, different call cases and handovers. All the call and handover tests are done with real mobile telephone sets. Finally, the stability tests are carried out to verify the traffic transmission capability.

The S10.5ED release test consists of several upgrade configurations covering basic software upgrade (S9 -> S10.5ED, Local/Remote), mini software upgrade (S10.5 -> S10.5ED, Local/Remote) and feature upgrades (GPRS/EDGE). The release test environment is described in this plan, together with the required network component SW levels.

2 Minimum S10.5ED upgrade requirements

2.1 S9 SW level prior to S10.5ED upgrade

S9 Feature Change Delivery 2.4 or S9 General Change Delivery 3.0 must be installed before the S10.5ED upgrade. This requirement is obligatory, because required PCU boot SW 1.12-0 has been delivered in these change deliveries.

In addition, it is recommended that all the accepted S9 Change Deliveries be installed in the BSC prior to the S10 upgrade.

Before starting the release testing, check the required HW versions of the BSC2A/i and TCSM2 from the document *'DX200 BSC And TCSM Hardware Revisions List, System Level S8- 10.5'*.

2.2 S10.5 SW level prior to S10.5ED upgrade

It is highly recommended that all the released S10.5 Change Deliveries (general) must be installed in the BSC prior to the S10.5ED upgrade.

Before starting the release testing, check the required HW versions of the BSC2A/i and TCSM2 from the document *'DX200 BSC And TCSM Hardware Revisions List, System Level S8- 10.5'*. The required HW

versions of BSC3i must be checked from the document '*BSC3i Hardware Revision List, System Level 10.5, CAE 105095*'

2.3 Winchester disk space

Taking into account the recommendation of three SW packages in BSC (S9 or S10.5, S10.5ED, a safecopy), the disk space requirement is altogether 250 MB. The disk space requirement includes all the temporary directories created during the upgrade as well as conversion programs.

2.4 CPU memory

CPU options and minimum acceptable memory requirement in S10.5 are the following:

CPU type	Micro-processor	Memory, Mbytes
CP4HX **	486	64 / 128
CP4HL **	486	64 / 128
CP6LX**	Pentium II	64 / 128
CP6MX *	Pentium III	128

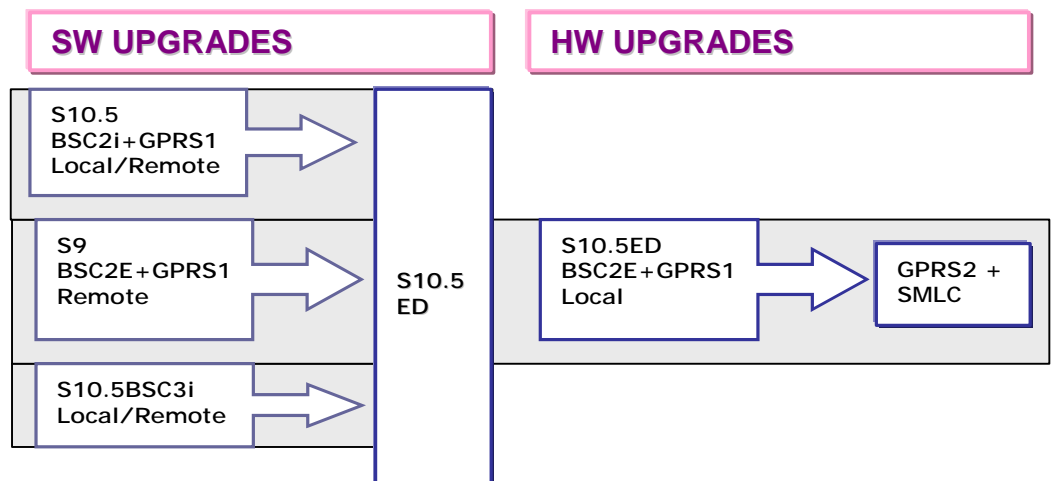
*) With the BSC Optional feature BSS10012, MS Location Services

***) OMU and MCMU with 128 MB memory, BCSU with 64 MB memory

3 Test configurations and cases

The test configurations in S10.5ED are clearly divided to the basic SW and HW upgrades. SW upgrade procedure available in S10.5ED are upgrades from S9 and S10.5 to S10.5ED.

3.1 ETSI-configurations:



GPRS1=1xPCU/PCU-S/PCU-T
 GPRS2=2xPCU/2xPCU-S/2xPCU-T/PCU+PCU-S/PCU+PCU-T/PCU-S+PCU-T

STABILITY TESTS

Traffic Generator

BSC2E
 BSC3i

The release test cases are stored in TestMan, which is a Lotus Notes database for the testware. The test reports are also available in TestMan. Each test group responsible for a certain test configuration fills in the test execution report, which is the basis for upper level test reports. All deviations from the predefined test environment, as well as other observations, should be mentioned in test case comments. To keep track on the release testing, test logs should be available from all the test configurations. In addition to TestMan, release test cases are included in a document *S10.5 Release Test Cases, DN02105604*.

The test cases, which are to be run for a specific test configuration, are listed in chapter 6. The basic tests to be carried out include state transition and restart cases, call cases and handover cases.

3.2 SW upgrades

The S9 – S10.5ED SW upgrade is described in a document '*DX200 BSC S9-S10.5ED Software Implementation Procedure, ETSI, DN03284067*', the respective remote implementation procedure is '*DX200 BSC S9-S10.5ED SoftwareRemote Implementation Procedure, ETSI, DN03405648*'.

The S10.5 – S10.5ED SW upgrade is described in a document '*DX200 BSC S10.5ED Software Miniimplementation Procedure, ETSI&ANSI, DN03275091*', the respective remote implementation procedure is '*DX200 BSC S10.5-S10.5ED Software Remote Miniimplementation Procedure, ETSI&ANSI, DN03405636*'.

Upgrade macros implemented with a PC program HIT (Holistic Integrated Tester) are available for the software upgrades.

3.3 HW upgrades

Altogether three different HW related feature implementations are available on S10.5ED. These are High Capacity BSC, GPRS/EDGE and MS Location Services. MS Location Services feature is launched in S10 whereas the others already been published in previous releases. The HW upgrade procedures are described in the following documents:

-DX200 BSC S10 MS Location Services Hardware Implementation Procedure, DN02105694

-DX200 BSC S10.5 High Capacity Feature Implementation Procedure, ETSI, DN02105631

-DX200 BSC S10.5 GPRS/EDGE Hardware Implementation Procedure, ETSI, DN02105628

In this S10.5ED E5 regression release testing the emphasis is on GPRS/EDGE feature implementation. The same set of basic test cases are run for each configuration (see test logs in chapter 6).

3.4 Stability Tests

Stability test is run in traffic generator environment. A 24 h stability test with traffic generator will be carried out with BSC2E and BSC3i for ETSI. The BSC stability test is used to check the BSC's traffic transmission stability. The traffic generator makes the calls from the Abis-interface through the BSC via real MSC and back to the traffic generator. Calls will be automatically generated and the traffic cases like incoming call, outgoing call, handovers and location update requests are part of testing.

4 Test environment

The release test environment is set up according to figure 1a and 1b. Figure 1a is demonstrating the CS traffic configuration and figure 1b PS traffic configuration.

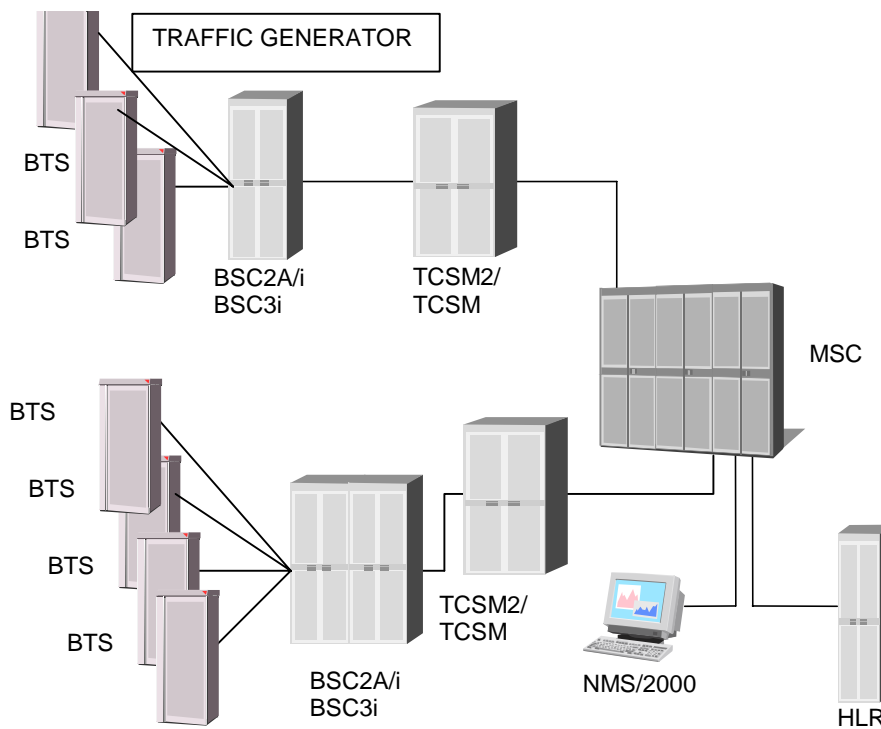


Figure 1a. Release Test Environment for CS traffic

The traffic generator is used to produce supervised test traffic for the stability test. A tracer (Protocol Analyser) and a PC are required for tracing the A- and Abis –interfaces in order to verify correct working of the interfaces.

At least two BTSs are connected to BSC for handover tests.

Release tests include the testing of all configuration options on A- and Abis -interfaces. Therefore 16 kbit, 32 kbit and 64 kbit D-channel links must be created on the Abis -interface.

Also, the following special configurations should be taken into account:

The release test configuration must include both the 2nd, 3rd and 4th generation BTSs.

The ETs are to be connected so that the whole ET range will be tested, i.e. the first and last ET is in use.

At least two TCSM2/TCSM units are to be connected to each BSC.

All accepted eeprom versions are to be tested during the release testing (one BSC equipped with the newest eeproms, other BSC with a mix of older eeprom versions).

The network configuration must include the whole range of BCFs and BTSs, i.e. the first and last possible BTS and BCF values are used.

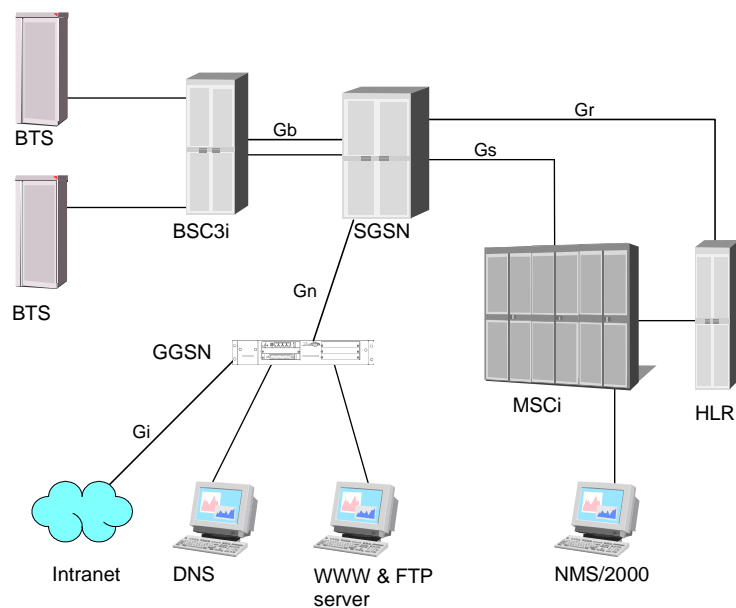


Figure 1b. Release Test Environment for PS traffic

4.1 Network components and software levels

SW levels of network elements in the test environment must be the following:

DX 200 HLR	SW	M11 6.2-0
DX 200 MSC / VLR	SW	M11 6.2-0
Nokia SGSN	SW	SG2 J2 2.22-0
Nokia Artus SMSC	SW	SC5B.0-24
DX 200 BSC	SW	S10.5 13.13-0
Nokia TCSM	SW	1.10-0
Nokia NMS/2000	SW	T12 03.3 OSS3.1
Ultrasite BTS	SW	CX3.0, CX3.3, CX4.0
Metrosite BTS	SW	CXM 3.0, CXM 3.3, CXM 4.0
Talk family BTS	SW	DF6.0, DF7.0
Second generation BTS	SW	B13.0, B13.1
Insite BTS	SW	I3.0

The feature related compatibilities for individual NE elements are described in the document '*BSS10 Features Under Development*'.

Other Nokia SW release combinations are tested according to BSC Compatibility Test Specification.

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Related documents

- BSS Integration Manual, Commissioning Manual, 2.2
- DX200 BSC S9-S10.5ED Software Implementation Procedure, ETSI
- DX200 BSC S9-S10.5ED Software Remote Implementation Procedure, ETSI
- DX200 BSC S10.5-S105.ED Software Miniimplementation Procedure, ETSI&ANSI
- DX200 BSC S10.5-S10.5ED Software Remote Miniimplementation Procedure, ETSI&ANSI
- DX200 BSC S10.5 GPRS/EDGE Hardware Implementation Procedure, ETSI
- DX200 BSC S10 MS Location Services Hardware Implementation Procedure
- DX200 BSC And TCSM Hardware Revision List, System Level S8-S10.5
- BSC3i Hardware Revision List, System Level 10.5
- BSS10 Features Under Development
- BSC S10.5 Release Test Cases
- BSC S10.5 Compatibility Test Specification

6 TEST LOGS

Test Team 1&2: S10.5 BSC2i+GPRS1 -> S10.5ED, Local/Remote

	TestMan ID	Local		Remote
		Version	Status/Sign	Status/Sign
1. Checking BSC & TCSM/TCSM2 HW versions	RT000TC00001	3.1-0		
2. Checking SW levels of other Nes / chapter 4.1	RT000TC00002	3.1-0		
3. Checking installed Change Notes	RT000SW00001	3.1-0		
4. BSC S10.5ED software upgrade	RT000SW00005	1.1-0		
5. BSC system restart	RT000SD00001	2.0-0		
6. Power break in the system	RT000SD00002	1.1-0		
7. OMU state change and diagnostics	RT000SD00003	2.0-0		
8. BCSU state change and diagnostics	RT000SD00004	2.0-0		
9. MCMU state change and diagnostics	RT000SD00005	2.0-0		
10. MB state change and diagnostics	RT000SD00006	2.0-0		
11. Location Update	RT000CC00001	1.0-0		
12. MS to MS call	RT000CC00002	2.0-0		
13. MS to PSTN call	RT000CC00003	1.0-0		
14. PSTN to MS call	RT000CC00004	1.0-0		
15. Emergency call	RT000CC00005	1.0-0		
16. Data call	RT000CC00006	2.0-0		
17. SMS from MS to MS	RT000CC00007	1.1-0		
18. Inter cell handover	RT000HO00001	2.0-0		
19. Inter BSC handover S10.5 – S10.5ED	RT000HO00008	1.0-0		
20. Inter BSC handover S10.5ED – S10.5ED	RT000HO00009	1.0-0		
21. Radio resource queuing in handover	RT000HO00004	1.1-0		
22. GPRS/EDGE call	RT000FE00005	1.0-0		

1. NTC CAE 101408/3 en Base Station Controller and Transcoder,
Hardware Revisions List, System Release S8 – S10

3. S10.5 CDs up to 2.0 GEN.

4. Used BTSs: TALK FAMILY GSM900 DF6.0-1
INSITE GSM1800 I2.0-0

5. - BSC S10.5-S10.5ED software implementation procedure, ETSI,
DN0297706/1en
- BSC S10.5 HIT upgrading macros for S10.5ED, ETSI disk version 2.0-0
- BSC S10.5 GPRS/EDGE Hardware Implementation Procedure, ETSI,
DN02105628/1en

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Findings:

- 1) PCU diagnostic did not work
 - Pronto 708146
 - Correction: FRHTORSX 3.3-4
 - Correction availability: S10.5 General CD 0.1

Test Team 3&4: S9 BSC2E+GPRS1 -> S10.5ED, Remote

S10.5ED BSC2E+GPRS1 -> GPRS2+SMLC, Local

		TestMan ID	S9 BSC2E-S10.5ED	S10.5ED BSC2E-GPRS2+SMLC
		Version	Status/Sign	Status/Sign
1. Checking BSC & TCSM/TCSM2 HW versions	RT000TC00001	3.1-0		
2. Checking SW levels of other NEs / chapter 4.1	RT000TC00002	3.1-0		
3. Checking installed Change Notes	RT000SW00001	3.1-0		
4. BSC S10.5ED software upgrade	RT000SW00005	1.1-0		
5. S10.5 GPRS feature Implementation	RT000FE00003	2.2-0		
6.S10.5 MS locationing feature implementation	RT000FE00004	1.1-0		
7. BSC system restart	RT000SD00001	2.0-0		
8. Power break in the system	RT000SD00002	1.1-0		
9. OMU state change and diagnostics	RT000SD00003	2.0-0		
10. BCSU state change and diagnostics	RT000SD00004	2.0-0		
11. MCMU state change and diagnostics	RT000SD00005	2.0-0		
12. MB state change and diagnostics	RT000SD00006	2.0-0		
13. Location Update	RT000CC00001	1.0-0		
14. MS to MS call	RT000CC00002	2.0-0		
15. MS to PSTN call	RT000CC00003	1.0-0		
16. PSTN to MS call	RT000CC00004	1.0-0		
17. Emergency call	RT000CC00005	1.0-0		
18. Data call	RT000CC00006	2.0-0		
19. SMS from MS to MS	RT000CC00007	1.1-0		
20. Inter cell handover	RT000HO00001	2.0-0		
21. Inter BSC handover S9 – S10.5ED	RT000HO00008	1.0-0		
22. Inter BSC handover S10.5ED – S10.5ED	RT000HO00009	1.0-0		
23. Radio resource queuing in handover	RT000HO00004	1.1-0		
24. GPRS/EDGE call	RT000FE00005	1.0-0		

1. NTC CAE 101408/3 en Base Station Controller and Transcoder,
Hardware Revisions List, System Release S8 – S10

3. S9 CDs up to 9.0 GEN.

4. Used BTSs: INSITE GSM1800 I 2.0-0
 PRIMESITE GSM900 DF6.0-1
5. - BSC S9-S10.5ED software implementation procedure, ETSI, DN0297706/1en
 - BSC S10.5 HIT upgrading macros for S10.5, ETSI disk version 2.0-0

Findings:

- 2) 10.5 ASA_12_12_3 Slogan 8.24-0 process freeze in BCSU after power break
- Pronto: 725146
 - Correction: SLOGANGX 8.26-0
 - Correcton availability: S10.5 General CD 0.1

Test Team 5&6 : S10.5 BSC3i → S10.5ED, Local/Remote

	TestMan ID	Local		Remote
		Version	Status/Sign	Status/Sign
1. Checking BSC & TCSM/TCSM2 HW versions	RT000TC00001	3.1-0		
2. Checking SW levels of other Nes / chapter 4.1	RT000TC00002	3.1-0		
3. Checking installed Change Notes	RT000SW00001	3.1-0		
4. BSC S10.5ED software upgrade	RT000SW00005	1.1-0		
5. BSC system restart	RT000SD00001	2.0-0		
6. Power break in the system	RT000SD00002	1.1-0		
7. OMU state change and diagnostics	RT000SD00003	2.0-0		
8. BCSU state change and diagnostics	RT000SD00004	2.0-0		
9. MCMU state change and diagnostics	RT000SD00005	2.0-0		
10. MB state change and diagnostics	RT000SD00006	2.0-0		
11. Location Update	RT000CC00001	1.0-0		
12. MS to MS call	RT000CC00002	2.0-0		
13. MS to PSTN call	RT000CC00003	1.0-0		
14. PSTN to MS call	RT000CC00004	1.0-0		
15. Emergency call	RT000CC00005	1.0-0		
16. Data call	RT000CC00006	2.0-0		
17. SMS from MS to MS	RT000CC00007	1.1-0		
18. Inter cell handover	RT000HO00001	2.0-0		
19. Inter BSC handover S10.5 – S10.5ED	RT000HO00008	1.0-0		
20. Inter BSC handover S10.5ED – S10.5ED	RT000HO00009	1.0-0		
21. Radio resource queuing in handover	RT000HO00004	1.1-0		
22. GPRS/EDGE call	RT000FE00005	1.0-0		

1. BSC3i Hardware Revision List, System Level 10.5, CAE 105095

4. S10.5 CDs up to 2.0 GEN.

4. Used BTSs: TALK FAMILY GSM900 DF6.0-1
 INSITE GSM1800 I2.0-0
5. - BSC S10.5-S10.5ED software implementation procedure, ETSI,
 DN0297706/1en
 - BSC S10.5 HIT upgrading macros for S10.5ED, ETSI disk version 2.0-0

Findings:

- 3) PCU diagnostic did not work
- Pronto 708146
 - Correction: FRHTORSX 3.3-4
 - Correction availability: S10.5 General CD 0.1

TEST LOGS

Test Team 7 : Stability tests

BSC2E

BSC3i

	Version	Status/Sign
1. 24 h stability test with traffic generator (BSC2E)	RT000ST00006	1.1-0
2. 24 h stability test with traffic generator (BSC3i)	RT000ST00006	1.1-0

RESULTS:(this is an example, the actual results are listed in S10.5ED Release Test Results documet !)

1. 24 h stability test with traffic generator (BSC2i)

Measurement period: From 26-Nov-02 21:00
To 27-Nov-02 20:00

During test execution no serious alarms or disturbances occurred in BSC. No unit restarts occurred during the stability test.

The following results are compiled from MSC measurements:

Number of calls: IN 604796
OUT 604794 Total: 1209590

Accepted calls: IN 604796
OUT 604794 Total: 1209590

Unsuccessful calls: 1209590 – 1209590 = 0

Call failure rate: $(0/1209594) * 100 \% = 0,000 \%$

Number of successful location updates:	2211834
Number of unsuccessful location updates:	0
Location update failure rate:	0,0 %
Number of successful intra BSC handovers:	2378998
Number of unsuccessful intra BSC handovers:	0
Intra BSC handover failure rate:	0,0 %
Average traffic in Erlangs/hour:	1636 Erlangs
Average traffic in BHCA:	50400

Based on the above results, the 24 h stability test with traffic generator for BSC2i (large) is classified as **PASSED**.