

Device Field and Lab Test Guidelines

Cover

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# I Introduction

This document contains a set of guidelines for the tests that should be performed in the course of Field Test and Lab Test carried out on a Terminal Device.

The test guidelines are applicable for Single SIM device or a Multi-SIM device with only one active subscription. For Multi-SIM devices please refer to TS.42

Field Tests are tests undertaken during later phases of the terminal development against a real live deployed network (i.e. in the field) to prove of a feature or technology.

Lab Tests are tests undertaken during later phases of the terminal development against laboratory based network components, representative of a real deployed network, to prove a feature or technology.

Field Tests are required to ensure confidence in the performance of Terminal Devices in the operational network environment. Lab Tests usually complement Field Tests for scenarios which cannot be easily executed in a live network.

Field Tests have proven to be a valuable test tool, which exercise terminals under live conditions. Field Tests do address the terminal behaviour in a dynamic environment, which cannot be achieved by simulator tests under laboratory conditions.

Additionally, experience has shown that comparable results are achieved in multiple network(s) infrastructures.

Last, but not least, Field Tests do give an insight into customer experience/satisfaction which has been, and will be, the main driver for performing Field Tests. This also implies that certain equipment/configuration requirements can be applicable to perform Field Tests.

In order to support the development of Terminal Devices to the maximum extent possible, the GSMA Terminal Steering Group (TSG) has put considerable effort in applying the experience and knowledge of the operator community into a set of Device Field and Lab Test Guidelines i.e. this document. Due to a continuous stream of innovations, which includes new standards, features and test experiences, this document shall be a living document.

Although it is the Terminal Manufacturer’s responsibility to define their own Field Test procedures, TSG do believe that the Device Field and Lab Test Guidelines will assist them to achieve an operational process.

It is assumed that Field Tests shall be performed without direct support from the network operator. However, TSG and its operator delegates do offer their assistance, if required by any Manufacturer in terms of drafting Field and/or Lab Tests, providing network specific information, etc.

In order to provide visibility on the applicability, extent and the result of Field and/or Lab Tests conducted on a Terminal Device, Annex G has been included in this document.

# II Contents

The main part of the document consists of nine annexes.

**Annex A** contains the description of test scenarios for a 2G/2.5G GSM Terminal Device, and is divided into the following sections:

1 Cell Selection / Reselection

2 Network Selection / Reselection

3 Network Registration - CS

4 Network Registration - PS

5 PS Data (GPRS / EGPRS)

6 Mobility

7 A5/3 Ciphering

8 FAX Call

9 CS Data.

10 A5/4 Ciphering

**Annex B** contains the description of test scenarios for a W-CDMA Single RAT (=Radio Access Technology) or Multi RAT User Equipment (UE), is counted from section 20 upwards in order to differentiate them from the 2G/2.5G test scenarios and is divided into the following sections:

15 Cell Selection/Reselection

16 Network Selection / Reselection

17 Network Registration - CS

18 Network Registration - PS

19 PS Data

20 Mobility

21 Security Mode (Integrity and Ciphering)

22 Equivalent PLMN functionality

23 Multi Operator Core Network (MOCN)

24 Physical Radio Layer FDD

**Annex C** contains the description of test scenarios for an E-UTRA Single RAT (=Radio Access Technology) or Multi RAT User Equipment (UE), is counted from section 30 upwards in order to differentiate them from the 2G/2.5G and W-CDMA test scenarios and is divided into the following sections:

30 System Access & Registration

31 Mobility

32 PS Data

33 VOID

34 E-UTRA Voice

35 SMS over E-UTRA

36 Data Retry.

37 Carrier Aggregation

38 UE Performance in HST Scenario

39 Single User Multiple-Input-Multiple-Output

39-1 Minimization of Drive Test

**Annex D** contains the description of test scenarios for RAT independent Services, is counted from section 40 upwards and is divided into the following sections:

40 CS Voice Call

41 Short Message Service (SMS)

42 Supplementary services

43 Multimedia Message Service (MMS)

44 Browsing

45 CS Video Call

46 JAVA and J2ME

47 Streaming

48 Camera Interworking

49 E-Mail Sending/Receiving

50 DRM Usability

51 VOID

52 IPv6

53 Identification of Network Names

54 Test of Ciphering Indicator

55 VOID

56 Steering of Roaming (Managed Roaming), Reject Cause #17 ‘Network Failure’

57 UICC with SIM and USIM

58 Rich Communication Services Blackbird (RCS BB)

58-1 Rich Communication Services Crane Priority Release (RCS CPR)

58-2 Rich Communication Services Universal Profile 1.0 (RCS UP1.0)

59 VOID

**Annex E** contains the description of test scenarios for Additional Terminal Performance Aspects, is counted from section 60 upwards and is divided into the following proposed sections:

60 Operation in areas of poor signal

61 Speech quality

62 General performance monitoring.

**Annex F** contains the description of test scenarios for Services based on non-3GPP Radio Access Technologies, is counted from section 80 upwards and is divided into the following proposed sections:

80 Digital Video Broadcasting for Handheld Terminals (DVB-H)

81 Generic Access Network (GAN)

82 Global Positioning System (GPS).

**Annex G** contains an embedded classification and proforma table, which identifies whether an individual test scenario is a Field Test or a Lab Test or both. Furthermore, this table can be completed by the personnel carrying out the tests, in order to indicate the results of the tests.

**Annex H** contains a Glossary defining terms used in this document.

**Annex I** contains a Change Request form which shall be used to add or delete a test scenario or to modify this PRD.

**Annex J** contains the Detailed Document Change Record.

**Annex K** contains the detailed procedures that are recommended to be used for Field and Lab Tests of a Single RAT / Multi RAT CDMA2000 User Equipment. Aspects, is counted from section 70 upwards and is divided into the following proposed sections:

This Annex has been archived. Please refer to TS.11 v22.0 for the full test procedure. A copy of which can be requested by emailing [terminals@gsma.com](mailto:terminals@gsma.com)

**Annex L** contains the description of test scenarios for IMS services, is counted from section 90 upwards and is divided into the following proposed sections:

90 IP Multimedia Subsystem (IMS)-IP-CAN Independent

91 IP Multimedia Subsystem (IMS)-VxLTE

92 IP Multimedia Subsystem (IMS)-VxWi-Fi

93 IP Multimedia Subsystem (IMS)-VxNR

**Annex M** contains the description of test scenarios for 5G NR User Equipment, is counted from section 100 upwards and is divided into the following proposed sections:

100 Attach and Detach Related Test Cases

101 PS Data/ Services

102 Mobility

103 Performance

104 DL Data Transfer

105 Interworking with Legacy Networks

# III General

The Field and/or Lab Tests in this document may be performed in any order that is convenient. Only the features supported by the DUT shall be tested.

It is recommended to use a logging tool, if available, to take log files when running the tests. The log files and their indication of network conditions/behaviour during the tests will help to remove any ambiguity that may come out of the test results.

Also more specifically about the performances tests, it is recommended to run the tests with the terminal to be certified and with a reference terminal such as, for instance, a competitive terminal available on the market. The behaviour of the reference platform will help to remove any ambiguity about the test results.

# IV Classification of Individual Test Scenarios

Every individual test scenario is classified in Field Test, Lab Test or both. This classification should adhere to the following criteria:

Field Test only:

* Confidence is only given that this feature works correctly when it has been tested in the field on real live commercial networks.
* It is possible to execute this test in the field (assuming there are live commercial network deployments).
* The only exception to this rule is when a vendor wishes to test a feature for which there are no commercial network deployments. In this case the feature MAY be lab tested for the purpose of gaining some basic confidence in the feature. If this option is used by the vendor then only a ‘provisional pass’ of the test can be achieved and this must clearly be marked in the vendors test report.

Lab Test only:

* Technically, it is only practical for this test to be executed in a lab.
* Executing this test in the lab MAY not give the same level of confidence that the feature will work correctly on real live networks, however it may provide some basic confidence in the feature.
* For the identification of absolute performance of the handset, it is better to perform this test in a controlled (Lab-) environment, where resources are allocated only for the handset.

Both, Field Test and Lab Test:

* If there are severe practical difficulties in executing this test in the field then this test MAY be executed in a lab.
* There is equal confidence in the proper function of this feature regardless of whether it is tested in the Field or Lab environment. Passing the test in the lab is therefore equally valid as passing the test in the field.

The individual classification of a test scenario is listed in Annex G.

# V References

The following may be cited or referenced in this document.

1. 3GPP Technical Specifications and Technical Reports (GSM xx.yy, TS xx.yyy, TR xx.yyy)

Available via <http://www.3gpp.org>

1. OMA Technical Specifications

Available via <http://www.openmobilealliance,org>

1. ETSI Technical Specifications

Available via <http://www.etsi.org>

1. Global Certification Forum PRDs

Available via <http://www.globalcertificationforum.org>

1. GSM Association PRDs

- TSG Technical Notes (TN.xx)

- TSG PRDs (TS.xx)

Available via <https://infocentre.gsm.org> and <http://www.gsma.com>

1. Wi-Fi Alliance for WLAN equipment

Available via [http://www.WiFi.org/discover-WiFi/WiFi-certified-n](http://www.wi-fi.org/discover-wi-fi/wi-fi-certified-n) and GSMA TSG TS.22 "Minimum requirements for Wi-Fi"

1. Detailed Test Procedures for a 2G/2.5G Terminal Device

This Annex contains the detailed procedures that are recommended to be used for tests of a 2G/2.5G Terminal Device.

1. Detailed Test Procedures for a Single RAT / Multi RAT W-CDMA User Equipment

This Annex contains the detailed procedures that are recommended to be used for Field and Lab Tests of a Single RAT / Multi RAT W-CDMA User Equipment.

To ensure that all features supported by the UE operate correctly on all supported frequency bands, an appropriate selection of frequency bands shall be used for the following tests.

1. Detailed Test Procedures for a Single RAT / Multi RAT E‑UTRA User Equipment

This Annex contains the detailed procedures that are recommended to be used for Field and Lab Tests of a Single RAT / Multi RAT E-UTRA User Equipment.

To ensure that all features supported by the UE operating correctly on all supported frequency bands, an appropriate selection of frequency bands shall be used for the following test scenarios.

The 3GPP requirements for E-UTRA provide support for paired and unpaired spectrum, enabling a single radio-access technology that can support frequency-division duplex (FDD) as well as time-division duplex (TDD) operation.

It is expected that the lab test and field test scenarios specified in this document will be applicable for both FDD and TDD operation, unless a test case specifies TDD or FDD operation only.

1. Detailed Test Procedures for RAT independent services

This Annex contains the detailed procedures that are recommended to be used for Field and Lab Tests of RAT independent services.

Note: For a Dual or Multi RAT Terminal Device, all RAT independent Test Scenarios should be executed as specified below:

- Devices supporting GERAN/UTRA technology shall be tested in UTRA network and subset of test scenarios shall be executed in GERAN network as a regression test.

- Devices supporting GERAN/UTRA/E-UTRA technology shall be tested in E-UTRA network and a subset of Test Scenarios shall be executed in a GERAN & UTRA network as a regression test.

1. Detailed Test procedures for Additional Terminal Performance Aspects

This Annex contains the detailed procedures that are recommended to be used for Additional Terminal Performance Aspects.

Note: For a Dual RAT Terminal Device, all RAT independent Test Scenarios shall be executed at an UMTS network, and a subset of Test Scenarios shall be executed in a 2G/2.5G network as a regression.

1. Detailed Test procedures for Services based on non-3GPP Radio Access Technologies

This Annex contains the detailed procedures that are recommended to be used for tests of services based on non-3GPP Radio Access Technologies.

1. Individual Test Scenario Classification and Proforma

This Annex contains the individual classification (i.e. whether a test applies to Field Test, Lab Test or both) of every single test scenario. It can also be used as a blank proforma to record the results of an individual test scenario.

For details of classification criteria refer to section IV.



1. Glossary

For the purposes of this document, the following terms are defined.

Acceptable Cell:

A cell that the MS may camp on to make emergency calls

Allowed NSSAI:

Indicating the S-NSSAIs values the UE could use in the Serving PLMN in the current Registration Area.

AP:

Access Point (Wi-Fi)

**CA:**

Carrier Aggregation (CA) is the aggregation of two or moreComponent Carriers (CC).

Client:

Any device that is used to help fulfil the field trial requirement.

A Client may be a cellular device, software client, a server, a system simulator or other device used to complete a test, if not defined otherwise in Initial Configuration

These additional devices are by default identified as Client-1, Client-2, Client-3, … etc

See also Reference

Configured NSSAI:

NSSAI provisioned in the UE applicable to one or more PLMNs.

DC:

Intra-E-UTRA Dual Connectivity

DUT:

The term DUT refers to the "Device Under Test". The terms MS and UEUT may also refer to the DUT. DUT cannot be **Client** or **Reference**, see these definitions.

eMBB:

Enhanced Mobile BroadBand

EN-DC:

E-UTRA-NR Dual Connectivity: Radio configuration used with 5G Architecture Option 3 in NSA configuration. The gNB requires LTE eNB as anchor for control plane to EPC.

eLTE eNB:

The eLTE eNB is the evolution of eNB that supports connectivity to EPC and 5G Core NW (5GC).

Engineering Test Mode Display:

A mechanism to extract real time radio data from a Terminal to aid the testing and debugging of the Terminal. Typically, this mechanism may either be internal to the Terminal via a built-in test application, or external to the Terminal via a PC based tool.

Externally Initiated Packet Data Session:

A PDP context that was established via the device under test from an external device such as a notebook with a suitable connection such as for example:

* A connection over USB and the use of the dial-up networking stack of the external device.
* A connection over USB and the use of a virtual network card driver
* Wireless connectivity via Bluetooth.
* Use of the device under test as a Wi-Fi Access Point to which the external device connects as a Wi-Fi client.

Flight Mode:

A setting for mobile phones and other portable devices that switches off all radio transmitters - including cellular, Wi-Fi and Bluetooth functions.

eUICC:

A removable or non-removable UICC which enables the remote and/or local management of Profiles in a secure way.

NOTE: The term originates from "embedded UICC".

gNB:

NR (5G) Node-B

GPS:

Global Positioning System

ICC:

Integrated Circuit Card (ICC). It is always a physical and logical entity and, in the context of this document, either a SIM or a UICC (Please check TS 31.900 for more details). If it is a UICC it can contain other applications.

ISIM:

ISIM (IP Multimedia Services Subscriber Identity Module) is an application that resides on a UICC that can provide access to IP Multimedia Services. It is specified in TS 31.103.

MEC:

Mobile (or Multi Access) Edge Computing (both expressions are possible.

MC-PTT:

Mission Critical Push-to-Talk

MR-DC:

Multi-RAT Dual Connectivity

Network Slice:

A logical network that provides specific network capabilities and network characteristics.

Network Slice instance:

A set of Network Function instances and the required resources (e.g. compute, storage and networking resources) which form a deployed Network Slice.

NSSAI

Network Slice Selection Assistance Information

NE-DC:

NR-E-UTRA Dual Connectivity: Radio configuration used with 5G Architecture Option 4 in NSA configuration. The eLTE eNB requires gNB as anchor for control plane to 5GC.

NGEN-DC:

NG-RAN E-UTRA-NR Dual Connectivity: Radio configuration used with 5G Architecture Option 7 in NSA configuration. The gNB requires eLTE eNB as anchor for control plane to 5GC.

NR:

New Radio (5G)

NSA:

Non-Standalone, a 5G deployment configuration where the gNB or eNB requires an LTE or NR gNB as anchor for control plane connectivity to core NW

Option 2:

5G Architecture Option with standalone configuration. The 5G gNB are connected to 5G core NW.

Option 3:

5G Architecture Option with non-standalone configuration. The gNB require LTE eNB as anchor for control plane to EPC.

Option 4:

5G Architecture Option with non-standalone configuration. The eLTE eNB require gNB as anchor for control plane to 5G core NW

Option 5:

5G Architecture Option with standalone configuration. The eLTE eNB are connected to 5G core NW

Option 7:

5G Architecture Option with non-standalone configuration. The gNB require eLTE eNB as anchor for control plane to 5G core NW.

**Pcell:**

The Pcell is the Primary Cell. It is thecell, operating on the primary frequency, in which the UE either performs the initial connection establishment procedure or initiates the connection re-establishment procedure, or the cell indicated as the primary cell in the handover procedure.

Reference:

A specific device with similar capabilities as the DUT that has already been successfully field trialled for the test being performed, if not defined otherwise in Initial Configuration.

This is used when a performance or behaviour comparison is required to confirm the pass criteria of the DUT.

These additional devices are by default identified as Reference-1, Reference-2,  Reference-3, … etc

See also Client.

RAT:

Radio Access Technology, e.g. GSM, W-CDMA, …

S-NSSAI

Single Network Slice Selection Assistance Information

SA:

Standalone, a 5G deployment configuration, where e.g. gNB are connected to 5GC (Option 2) or eLTE eNB are connected to 5GC (Option 5).

**Scell:**

The SCell is the Secondary Cell: It is a cell, operating on a secondary frequency, which may be configured once an RRC connection is established and which may be used to provide additional radio resources.

SIM:

SIM (Subscriber Identity Module) is the ICC defined for 2G. The SIM can also be an application on the UICC. If the SIM application is active, the UICC is functionally identical to a 2G SIM. The SIM (or SIM application on a UICC) only accepts 2G commands. It is specified in GSM TS 11.11 / TS 51.011.

Suitable cell:

A cell that the MS may camp on to make any calls

SUL:

Supplementary Uplink

Test Route:

A route preferably provided by the operator and contains ideally all mobility scenarios supported by the operator’s network.

In case no Test Route is or can be provided by the operator a test route will follow the limited set below.

In both cases the test route should not exceed 50 km in length or can be completed in approximately 30 min. during off-peak hours and normal road traffic conditions.

TTFF:

Time To First Fix

UICC:

The UICC is in the context of this document a physical platform that can contain a USIM application. It can also contain other applications (e.g. SIM, ISIM, CSIM application, mobile banking or mobile commerce applications, if these fit with the basic physical and logical characteristics of the UICC). It is specified in 3GPP TS 31.101.

UR-LLC:

Ultra-Reliable and Low Latency Communications

USIM:

USIM is an application that resides on a UICC. It only accepts 3G commands. The USIM may provide mechanisms to support 2G authentication and key agreement to allow a 3G ME to access a 2G network. It is specified in 3GPP TS 31.102.

VILTE:

Video over LTE

VINR:

Video over NR

VOLTE:

Voice over LTE

VONR:

Voice over NR

Wi-Fi

Wi-Fi is a wireless local area network (WLAN) based on Institute of Electrical and Electronics Engineers (IEEE) 802.11 standards.

5GC

5G Core Network

5QI

5G QoS Identifier

Other definitions may be found in 3GPP TRs:

21.905 "Vocabulary for 3GPP Specifications"

24.301 “Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3”

24.501 “Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3”

36.331, “Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification”

38.331 “NR; Radio Resource Control (RRC); Protocol specification”

1. Change Request Form

It is essential that formal Change Requests are raised to the GSM Association Terminal Steering Group if the Device Field and Lab Test Guidelines shall be modified.

A CR template is included in this document; just double-click the icon below to open it.



## An example of how to complete the CR template is provided below.

1. parts of the document which are not relevant to the change request.

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| Change Request Form | |
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|  | FTDG<Meeting ID>\_<Doc Number>  TS11v<XX> CR<XXXX>v<version>  Title |

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| Meeting Information | |
| Meeting Name and Number | TSG Field Test Subgroup |
| Meeting Date | 31/08/22 |
| Meeting Location | Click or tap here to enter text. |

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| Current version number |  | Final Document Version Number |  |
| Change Request Number | Click or tap here to enter text. | | |
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| Editor e-mail | Click or tap here to enter text. | | |
| Additional Contributors | Momar Goumballe (Orange), Scott Probasco (Sprint Corporation) | | |
| Issuing Group/Project | TSG | | |
| Approving Group/Project | TSG | | |
| Change Request Creation Date | 03/07/2019 | | |

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| Document Summary | |
| What are the reasons for and benefits of creating this new document or Change Request? | Improving the test coverage of TS.11 |
| Which Annex and/or Section of the document are affected? |  |
| |  | | --- | | Field Test | | Field and Lab Test | | Lab Test | | |  | | --- | | Default, no need to indicate number/s | | Test case number/s | | Test case number/s | |

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| Document History | | |
| Date | Version | Comments |
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## How to create CRs using this form:

1. Fill out the above form.
2. Obtain the latest version of TS.11 to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes.
3. With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into TS.11 just in front of the clause containing the first piece of changed text. Delete those parts of the document which are not relevant to the change request.

[Start change…]

## 58.1 Title 2

### 58.1.1 Title 3

#### 58.1.1.1 Title 4

##### 58.1.1.1.1. Title 5

Description (H6)

Normal

Related core specifications (H6)

Normal

Reason for test (H6)

Normal

Initial configuration (H6)

Normal

Test procedure (H6)

1. Normal.
2. Normal.
3. Normal.
4. Normal.

Expected behaviour (H6)

1. Normal.
2. Normal.
3. Normal.
4. Normal.

[….End change]

1. Detailed Document Change Record
2. This Annex has been archived. See TS11V22.0 for details

This Annex contains the detailed procedures that are recommended to be used for Field and Lab Tests of a Single RAT / Multi RAT CDMA2000 User Equipment. Aspects, is counted from section 70 upwards and is divided into the following proposed sections.

Note: To ensure that all features supported by the UE operate correctly on all supported frequency bands, an appropriate selection of frequency bands shall be used for all tests.

1. Annex L Detailed Test Procedures for IMS services

This Annex contains the detailed procedures that are recommended to be used for Field and Lab Tests of IMS services.

1. Annex M Detailed Test Procedures for 5G NR User Equipment

This Annex contains the detailed procedures that are recommended to be used for Field and Lab Tests for 3GPP 5G NR User Equipment.

# VI Document Management

## Document History

| Version | Date | Brief Description of Change | Approval Authority | Editor / Company |
| --- | --- | --- | --- | --- |
| 6.0 | 03/12/2009 | Rev. of this PRD as described in Annex I, approved at DG #23 | DG#23, DAG#67, EMC#81 | Hajo Schulze / Vodafone GmbH |
| 7.0 | 19/03/2010 | Rev. of this PRD as described in Annex J, approved at DG #24 | DG#24, DAG#68, EMC#82 | Hajo Schulze / Vodafone GmbH |
| 8.0 | 11/06/2010 | Rev. of this PRD as described in Annex J, approved at DG #25 | DG#25, DAG#71, EMC#85 | Hajo Schulze / Vodafone GmbH |
| 9.0 | 30/09/2010 | Rev. of this PRD as described in Annex J, approved at DG #26 | DG#26, DAG#75, EMC#88 | Hajo Schulze / Vodafone GmbH |
| 10.0 | 16/12/2010 | Rev. of this PRD as described in Annex J, approved at TSG FT#32 | TSG#02 | Hajo Schulze / Vodafone GmbH |
| 10.1 | 17/03/2011 | Rev. of this PRD as described in Annex J, approved at TSG FT#33 | TSG#03 | Hajo Schulze / Vodafone GmbH |
| 10.2 | 26/05/2011 | Rev. of this PRD as described in Annex J, approved at TSG FT#34 | TSG#04 | Hajo Schulze / Vodafone GmbH |
| 10.3 | 28/09/2011 | Rev. of this PRD as described in Annex J, approved at TSG FT#35 | TSG#05 | Hajo Schulze / Vodafone GmbH |
| 10.4 | 15/12/2011 | Rev. of this PRD as described in Annex J, approved at TSG FT#36 | TSG#06 | Hajo Schulze / Vodafone GmbH |
| 10.5 | 15/03/2012 | Rev. of this PRD as described in Annex J, approved at TSG FT#37 | TSG#07 | Hajo Schulze / Vodafone GmbH |
| 11.0 | 31/07/2012 | Rev. of this PRD as described in Annex J, approved at TSG FT#38 | TSG#08, DAG#96, PSMC#105 | Hajo Schulze / Vodafone GmbH |
| 11.1 | 27/09/2012 | Rev. of this PRD as described in Annex J, approved at TSG FT#39 | TSG#09 | Hajo Schulze / Vodafone GmbH |
| 11.2 | 13/12/2012 | Rev. of this PRD as described in Annex J, approved at TSG FT#40 | TSG#10 | Hajo Schulze / Vodafone GmbH |
| 11.3 | 14/03/2013 | Rev. of this PRD as described in Annex J, approved at TSG FT#41 | TSG#11 | Hajo Schulze / Vodafone GmbH |
| 11.4 | 13/06/2013 | Rev. of this PRD as described in Annex J, approved at TSG FT#42 | TSG#12 | Hajo Schulze / Vodafone GmbH |
| 11.5 | 19/09/2013 | Rev. of this PRD as described in Annex J, approved at TSG FT#43 | TSG#13 | Hajo Schulze / Vodafone GmbH |
| 11.6 | 29/11/2013 | Rev. of this PRD as described in Annex J, approved at TSG FT#44 | TSG#14 | Hajo Schulze / Vodafone GmbH |
| 11.7 | 26/03/2014 | Rev. of this PRD as described in Annex J, approved at TSG FT#45 | TSG#15 | Momar Goumballe /  Orange |
| 11.8 | 26/06/2014 | Rev. of this PRD as described in Annex J, approved at TSG FT#46 | TSG#16 | Momar Goumballe /  Orange |
| 12.0 | 07/10/2014 | Rev. of this PRD as described in Annex J, approved at TSG FT#47 | TSG#17 | Momar Goumballe /  Orange |
| 12.1 | 19/12/2014 | Rev. of this PRD as described in Annex J, approved at TSG FT#48 | TSG#18 | Momar Goumballe /  Orange |
| 12.2 | 18/03/2015 | Rev. of this PRD as described in Annex J, approved at TSG FT#49 | TSG#19 | Momar Goumballe /  Orange |
| 13.0 | 05/08/2015 | Rev. of this PRD as described in Annex J, approved at TSG FT#50 | TSG#20 | Momar Goumballe /  Orange |
| 14.0 | 16/09/2015 | Rev. of this PRD as described in Annex J, approved at TSG FT#51 | TSG#21 | Momar Goumballe /  Orange |
| 14.1 | 09/12/2015 | Rev. of this PRD as described in Annex J, approved at TSG FT#52 | TSG#22 | Momar Goumballe /  Orange |
| 15.0 | 16/03/2016 | Rev. of this PRD as described in Annex J, approved at TSG FT#53 | TSG#23 | Momar Goumballe /  Orange |
| 16.0 | 08/06/2016 | Rev. of this PRD as described in Annex J, approved at TSG FT#54 | TSG#24 | Momar Goumballe /  Orange |
| 17.0 | 14/09/2016 | Rev. of this PRD as described in Annex J, approved at TSG FT#55 | TSG#25 | Momar Goumballe /  Orange |
| 18.0 | 30/11/2016 | Rev. of this PRD as described in Annex J, approved at TSG FT#56 | TSG#26 | Momar Goumballe /  Orange |
| 19.0 | 14/03/2017 | Rev. of this PRD as described in Annex J, approved at TSG FT#57 | TSG#27 | Momar Goumballe /  Orange |
| 20.0 | 11/07/2017 | Rev. of this PRD as described in Annex J, approved at TSG FT#58 | TSG#28 | Momar Goumballe /  Orange |
| 21 | 03/10/2017 | Rev. of this PRD as described in Annex J, approved at TSG FT#59 | TSG#29 | Momar Goumballe /  Orange |
| 22 | 26/12/2017 | Rev. of this PRD as described in Annex J, approved at TSG FT#60 | TSG#30 | Momar Goumballe /  Orange |
| 23 | 26/03/2018 | Rev. of this PRD as described in Annex J, approved at TSG FT#61 | TSG#31 | Momar Goumballe /  Orange |
| 24 | 26/06/2018 | Rev. of this PRD as described in Annex J, approved at TSG FT#62 | TSG#32 | Momar Goumballe /  Orange |
| 25 | 26/09/2018 | Rev. of this PRD as described in Annex J, approved at TSG FT#63 | TSG#33 | Momar Goumballe /  Orange |
| 26 | 19/12/2018 | Rev. of this PRD as described in Annex J, approved at TSG FT#64 | TSG#34 | Momar Goumballe /  Orange |
| 27 | 27/03/2019 | Rev. of this PRD as described in Annex J, approved at TSG FT#65 | TSG#35 | Momar Goumballe /  Orange |
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| 28 | 03/07/2019 | Rev. of this PRD as described in Annex J, approved at TSG FT#66 | TSG#36 | Momar Goumballe /  Orange |
| 29 | 25/09/2019 | Rev. of this PRD as described in Annex J, approved at TSG FT#67 | TSG#37 | Momar Goumballe /  Orange |
| 30 | 24/12/2019 | Rev. of this PRD as described in Annex J, approved at TSG FT#68 | TSG#38 | Momar Goumballe /  Orange |
| 31 | 10/06/2020 | Rev. of this PRD as described in Annex J, approved at TSG FT#69 | TSG#39 | Momar Goumballe /  Orange |
| 32 | 04/10/2020 | Rev. of this PRD as described in Annex J, approved at TSG FT#71 | TSG#41 | Momar Goumballe /  Orange |
| 33 | 18/12/2020 | Rev. of this PRD as described in Annex J, approved at TSG FT#72 | TSG#42 | Momar Goumballe / Orange |
| 34 | 7/04/2021 | Rev. of this PRD as described in Annex J, approved at TSG FT#73 | TSG#43 | Momar Goumballe / Orange |
| 35 | 18/06/2021 | Rev. of this PRD as described in Annex J, approved at TSG FT#74 | TSG#44 | Momar Goumballe / Orange |
| 36 | 20/09/2021 | Rev. of this PRD as described in Annex J, approved at TSG FT#75 | TSG#45 | Momar Goumballe / Orange |
| 37 | 3/01/2022 | Rev. of this PRD as described in Annex J, approved at TSG FT#76 | TSG#46 | Momar Goumballe / Orange |
| 38 | 8/03/2022 | Rev. of this PRD as described in Annex J, approved at TSG FT#77 | TSG#47 | Momar Goumballe / Orange |
| 39 | 18/07/2022 | Rev. of this PRD as described in Annex J, approved at TSG FT#78 | TSG#48 | Momar Goumballe / Orange |
| 40 | 18/10/2022 | Rev. of this PRD as described in Annex J, approved at TSG FT#79 | TSG#49 | Momar Goumballe / Orange |
| 41 | 27/01/2023 | Rev. of this PRD as described in Annex J, approved at TSG FT#80 | TSG#50 | Momar Goumballe / Orange |
| 42 | 08/03/2023 | Rev. of this PRD as described in Annex J, approved at TSG FT#81 | TSG#51 | Momar Goumballe / Orange |
| 43 | 08/07/2023 | Rev. of this PRD as described in Annex J, approved at TSG FT#82 | TSG#52 | Momar Goumballe / Orange |
| 44 | 04/10/2023 | Rev. of this PRD as described in Annex J, approved at TSG FT#83 | TSG#53 | Momar Goumballe / Orange |
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## Other Information

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