

ETSI TS 125 450 V19.0.0 (2025-10)



**Universal Mobile Telecommunications System (UMTS);
UTRAN Iu-PS interface general aspects and principles
(3GPP TS 25.450 version 19.0.0 Release 19)**



ReferenceRTS/TSGR-0325450vj00

KeywordsUMTS

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° w061004871

Important notice

The present document can be downloaded from the
[ETSI Search & Browse Standards application](#).

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format on [ETSI deliver repository](#).

Users should be aware that the present document may be revised or have its status changed,
this information is available in the [Milestones listing](#).

If you find errors in the present document, please send your comments to
the relevant service listed under [Committee Support Staff](#).

If you find a security vulnerability in the present document, please report it through our
[Coordinated Vulnerability Disclosure \(CVD\)](#) program.

Notice of disclaimer & limitation of liability

The information provided in the present deliverable is directed solely to professionals who have the appropriate degree of experience to understand and interpret its content in accordance with generally accepted engineering or other professional standard and applicable regulations.

No recommendation as to products and services or vendors is made or should be implied.

No representation or warranty is made that this deliverable is technically accurate or sufficient or conforms to any law and/or governmental rule and/or regulation and further, no representation or warranty is made of merchantability or fitness for any particular purpose or against infringement of intellectual property rights.

In no event shall ETSI be held liable for loss of profits or any other incidental or consequential damages.

Any software contained in this deliverable is provided "AS IS" with no warranties, express or implied, including but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement of intellectual property rights and ETSI shall not be held liable in any event for any damages whatsoever (including, without limitation, damages for loss of profits, business interruption, loss of information, or any other pecuniary loss) arising out of or related to the use of or inability to use the software.

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2025.
All rights reserved.

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the [ETSI IPR online database](#).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™**, **LTE™** and **5G™** logo are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM®** and the GSM logo are trademarks registered and owned by the GSM Association.

Legal Notice

This Technical Specification (TS) has been produced by ETSI 3rd Generation Partnership Project (3GPP).

The present document may refer to technical specifications or reports using their 3GPP identities. These shall be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between 3GPP and ETSI identities can be found at [3GPP to ETSI numbering cross-referencing](#).

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Contents

Intellectual Property Rights	2
Legal Notice	2
Modal verbs terminology.....	2
Foreword.....	4
1 Scope	5
2 References	5
3 Definitions and abbreviations.....	5
3.1 Definitions	5
3.2 Abbreviations	6
3.3 Specification Notations	6
4 General Aspects.....	7
4.1 Introduction	7
4.2 Iupc Interface General Principles	7
4.3 Iupc Interface Specification Objectives.....	8
4.4 Iupc Interface Capabilities.....	8
4.4.1 General.....	8
4.4.2 Position Calculation Services	8
4.4.3 Information Exchange Services	8
4.4.4 SAS Centric Position Services.....	8
4.5 Iupc Interface Characteristics	8
4.5.1 Uses of SCCP	8
4.5.1.1 General	8
4.5.1.2 SCCP Addressing.....	8
4.5.1.3 SCCP connection establishment.....	9
4.5.1.4 SCCP connection release	9
4.5.1.5 General SCCP Abnormal Conditions.....	10
5 Functions of the Iupc Interface Protocols.....	10
5.1 List of Functions.....	10
5.2 Management of GPS Related Data	10
5.3 Management of Position Calculation Functions.....	10
5.4 Management of SAS Centric Position Functions	10
5.5 Management of GANSS Related Data	11
6 Other Iupc Interface Specifications	11
6.1 UTRAN Iupc Interface: Layer 1 (TSG RAN 25.451)	11
6.2 UTRAN Iupc Interface: Signalling Transport (TSG RAN 25.452).....	11
6.3 PCAP Specification (TSG RAN 25.453)	11
6.4 Summary of UTRAN Iupc Interface Technical Specifications	11
Annex A (informative): Change history	12
History	13

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document is an introduction to the TSG RAN TS 25.45z series of UMTS Technical Specifications that define the Iupc Interface. The Iupc interface is a logical interface for the interconnection of Stand-Alone SMLC (SAS) and Radio Network Controller (RNC) components of the Universal Terrestrial Radio Access Network (UTRAN) for the UMTS system.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- | | |
|------|---|
| [1] | Void |
| [2] | 3GPP TS 25.451: "UTRAN Iupc Interface: Layer 1". |
| [3] | 3GPP TS 25.452: "UTRAN Iupc Interface: Signalling Transport". |
| [4] | 3GPP TS 25.453: "UTRAN Iupc Interface PCAP Signalling". |
| [5] | ITU-T Recommendation Q.711 (1996-07): "Functional description of the signalling connection control part". |
| [6] | ITU-T Recommendation Q.712 (1996-07): "Definition and function of signalling connection control part messages". |
| [7] | ITU-T Recommendation Q.713 (1996-07): "Signalling connection control part formats and codes". |
| [8] | ITU-T Recommendation Q.714 (1996-07): "Signalling connection control part procedures". |
| [9] | 3GPP TS 23.003: "Numbering, Addressing and Identification". |
| [10] | Void |
| [11] | 3GPP TS 25.305: "Stage 2 functional specification of UE positioning in UTRAN" |

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

Stand-Alone SMLC (SAS): As defined in TS 25.305 [11].

RNC Centric: In this mode of operation (defined in TS 25.305 [11]), the RNC is responsible for position method selection and initiation of the selected positioning method. Once a position method is selected, the RNC may interact with the SAS to exchange data as well as for execution of the selected positioning method.

SAS Centric: In this mode of operation (defined in TS 25.305 [11]), the SAS is responsible for position method selection and initiation of the selected positioning method. Once a position method is selected, the SAS may interact with the RNC to exchange data to enable it to execute the selected positioning method.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

GANSS	Galileo and Additional Navigation Satellite Systems
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GT	Global Title
M3UA	SS7 MTP3 User Adaptation Layer
PCAP	Position Calculation Application Part
RNC	Radio Network Controller
SAS	Stand-Alone SMLC
SCCP	Signalling Connection Control Part
SMLC	Serving Mobile Location Centre
SPC	Signalling Point Code
SRNC	Serving Radio Network Controller
SS7	Signalling System N° 7
SSN	Sub-System Number
UE	User Equipment
UMTS	Universal Mobile Telecommunication System
UTRAN	Universal Terrestrial Radio Access Network

3.3 Specification Notations

For the purposes of the present document, the following notations apply:

[FDD]	This tagging of a word indicates that the word preceding the tag "[FDD]" applies only to FDD. This tagging of a heading indicates that the heading preceding the tag "[FDD]" and the section following the heading applies only to FDD.
[TDD]	This tagging of a word indicates that the word preceding the tag "[TDD]" applies only to TDD, including 7.68 Mcps TDD, 3.84Mcps TDD and 1.28Mcps TDD. This tagging of a heading indicates that the heading preceding the tag "[TDD]" and the section following the heading applies only to TDD, including 7.68 Mcps TDD, 3.84Mcps TDD and 1.28Mcps TDD.
[7.68Mcps TDD]	This tagging of a word indicates that the word preceding the tag "[7.68Mcps TDD]" applies only to 7.68Mcps TDD. This tagging of a heading indicates that the heading preceding the tag "[7.68Mcps TDD]" and the section following the heading applies only to 7.68Mcps TDD.
[3.84Mcps TDD]	This tagging of a word indicates that the word preceding the tag "[3.84Mcps TDD]" applies only to 3.84Mcps TDD. This tagging of a heading indicates that the heading preceding the tag "[3.84Mcps TDD]" and the section following the heading applies only to 3.84Mcps TDD.
[1.28Mcps TDD]	This tagging of a word indicates that the word preceding the tag "[1.28Mcps TDD]" applies only to 1.28Mcps TDD. This tagging of a heading indicates that the heading preceding the tag "[1.28Mcps TDD]" and the section following the heading applies only to 1.28Mcps TDD.
[FDD - ...]	This tagging indicates that the enclosed text following the "[FDD - " applies only to FDD. Multiple sequential paragraphs applying only to FDD are enclosed separately to enable insertion of TDD specific (or common) paragraphs between the FDD specific paragraphs.
[TDD - ...]	This tagging indicates that the enclosed text following the "[TDD - " applies only to TDD including 7.68 Mcps TDD, 3.84Mcps TDD and 1.28Mcps TDD. Multiple sequential paragraphs applying only to TDD are enclosed separately to enable insertion of FDD specific (or common) paragraphs between the TDD specific paragraphs.
[7.68Mcps TDD - ...]	This tagging indicates that the enclosed text following the "[7.68Mcps TDD - " applies only to 7.68Mcps TDD. Multiple sequential paragraphs applying only to 7.68Mcps TDD are enclosed separately to enable insertion of FDD and TDD specific (or common) paragraphs between the 7.68Mcps TDD specific paragraphs.

[3.84Mcps TDD - ...] This tagging indicates that the enclosed text following the "[3.84Mcps TDD - " applies only to 3.84Mcps TDD. Multiple sequential paragraphs applying only to 3.84Mcps TDD are enclosed separately to enable insertion of FDD and TDD specific (or common) paragraphs between the 3.84Mcps TDD specific paragraphs.

[1.28Mcps TDD - ...] This tagging indicates that the enclosed text following the "[1.28Mcps TDD - " applies only to 1.28Mcps TDD. Multiple sequential paragraphs applying only to 1.28Mcps TDD are enclosed separately to enable insertion of FDD and TDD specific (or common) paragraphs between the 1.28Mcps TDD specific paragraphs.

Procedure When referring to a procedure in the specification, the Procedure Name is written with the first letters in each word in upper case characters followed by the word "procedure", e.g. RNSAP Basic Mobility Procedures.

Message When referring to a message in the specification, the MESSAGE NAME is written with all letters in upper case characters followed by the word "message", e.g. RADIO LINK SETUP REQUEST message.

Frame When referring to a control or data frame in the specification, the CONTROL/DATA FRAME NAME is written with all letters in upper case characters followed by the words "control/data frame", e.g. DCH data frame.

4 General Aspects

4.1 Introduction

The logical interface between a RNC and a SAS within the UTRAN is referred to the Iupc interface.

4.2 Iupc Interface General Principles

The general principles for the specification of the Iupc interface are as follows:

- the Iupc interface should be open;
- complex functionality shall as far as possible be avoided over Iupc. Advanced optimisation solutions may be added in later versions of the standard;
- from a logical standpoint, the Iupc is a point-to-point signalling interface between an RNC and SAS within the UTRAN, even though there may not be a direct physical connection between these two nodes;
- one RNC may connect to one SAS. One SAS may provide services to one RNC;
- neither the physical structure nor any internal protocols of the RNC or SAS shall be visible over Iupc and are thus not limiting factors, e.g., when introducing future technology.

4.3 Iupc Interface Specification Objectives

The Iupc interface specifications shall facilitate the following:

- inter-connection of RNCs and SASs from different manufacturers;
- separation of Iupc interface Application functionality and Transport Network functionality to facilitate introduction of future technology.

4.4 Iupc Interface Capabilities

4.4.1 General

The Iupc interface connects a RNC and a SAS.

4.4.2 Position Calculation Services

The Iupc interface enables an SRNC and a SAS to exchange information that is related to the positioning of a single UE. These exchanges involve the transfer of UE Positioning measurement data or UE position estimate data.

4.4.3 Information Exchange Services

The Iupc interface enables an RNC to request specific GNSS (GPS or GANSS) related data from an SAS on demand, on modification, or at regular intervals.

4.4.4 SAS Centric Position Services

The Iupc interface enables an RNC and a SAS to exchange information that is related to the positioning of a single UE, using SAS Centric mode of operation.

4.5 Iupc Interface Characteristics

4.5.1 Uses of SCCP

4.5.1.1 General

The SCCP, ITU-T Rec. Q.711 [5], ITU-T Rec. Q.712 [6], ITU-T Rec. Q.713 [7] and ITU-T Rec. Q.714 [8], is used to transport messages between the RNC and SAS. One user function of the SCCP, called Positioning Calculation Application Part (PCAP), is defined TS 25.453 [4].

Both connectionless and connection-oriented procedures are used to support PCAP. TS 25.453 [4] explain whether connection oriented or connectionless services should be used for a layer 3 procedure.

4.5.1.2 SCCP Addressing

The inclusion of caller party address in SCCP message is mandatory. PCAP may use SSN, SPC and/or GT and any combination of them as addressing schemes for the SCCP. When GT addressing is utilised, the following settings shall be used:

- SSN Indicator = 1 (PCAP SSN as defined in TS 23.003 [9]).
- Global Title Indicator = 0100 (GT includes translation type, numbering plan, encoding scheme and nature of address indicator).
- Translation Type = 0000 0000 (not used).
- Numbering Plan = 0001 (E.163/4).

- Nature of Address Indicator = 000 0100 (International Significant Number).
- Encoding Scheme = 0001 or 0010 (BCD, odd or even).
- Routing indicator = 0 or 1 (route on GT or PC/SSN).

When used, the GT shall be the E.164 address of the relevant node.

4.5.1.3 SCCP connection establishment

Information Exchange services

A new SCCP connection is established when the RNC initiates a class-1 elementary procedure for Information Exchange services and there is no signalling bearer existing for this purpose.

An SCCP connection is always established by the RNC.

SAS Centric Position services

A new SCCP connection is established when the RNC initiates a class-1 elementary procedure, with respect to each new positioning request, for SAS Centric Position services.

An SCCP connection is always established by the RNC.

Initiation

The RNC sends SCCP CONNECTION REQUEST message to the SAS. A PCAP message is included in the user data field of the SCCP CONNECTION REQUEST message.

Termination

- **successful outcome:**
 - The SCCP CONNECTION CONFIRM message, which may optionally contain a PCAP message in the user data field, is returned to the RNC.
- **unsuccessful outcome:**
 - If the SCCP signalling connection establishment fails, an SCCP CONNECTION REFUSAL message will be sent back to the RNC. This message may contain a PCAP message.

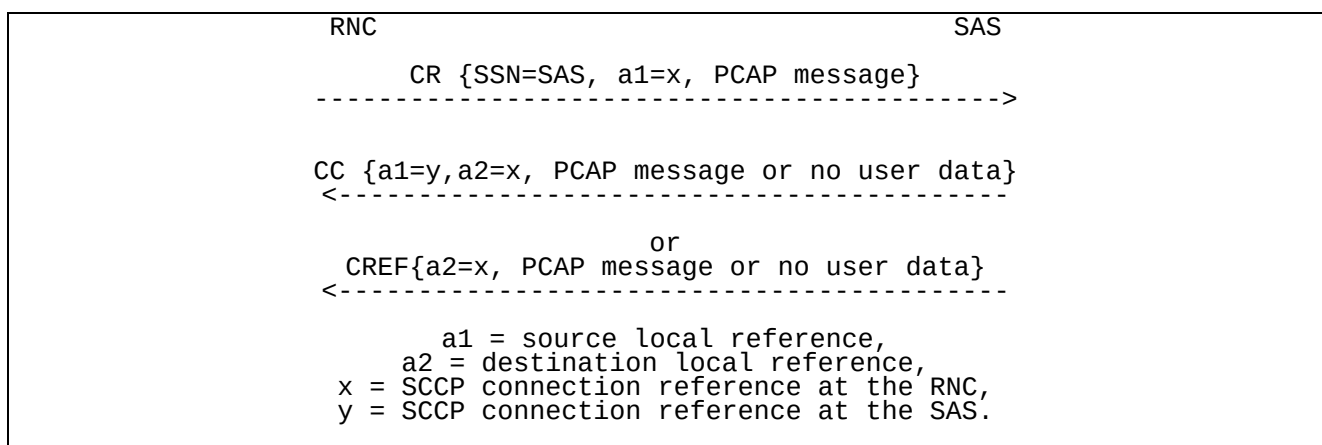


Figure 1: Setting-up of RNC Initiated SCCP Signalling Connection with SAS

4.5.1.4 SCCP connection release

This procedure is always initiated by the RNC. An SCCP connection is released when the RNC realises that a given signalling connection is no longer required. This is accomplished by the RNC sending a SCCP RELEASED message.

4.5.1.5 General SCCP Abnormal Conditions

If a user-out-of-service information or signalling-point-inaccessible information is received by the RNC, no new attempt to establish SCCP connections towards the affected point code will be started until the corresponding user-in-service information or signalling-point-accessible information is received.

When a user-out-of-service information or signalling-point-inaccessible is received by the RNC, an optional timer may be started. When the timer expires, all the SCCP connections towards the affected point code will be released. When the user-in-service or signalling-point-accessible is received, the timer is stopped.

If for any reason an SCCP connection is released, the optional timer expires or a connection refusal is received while any of the SAS procedures are being performed or while a dedicated resource is still allocated, the procedures associated to that SCCP connection shall be terminated (at both the RNC side and the SAS side).

5 Functions of the Iupc Interface Protocols

5.1 List of Functions

The list of functions on the Iupc interface is the following:

1. Management of GPS Related Data;
2. Management of Position Calculation Functions;
3. Management of SAS Centric Position Functions;
4. Management of GANSS Related Data,

5.2 Management of GPS Related Data

An RNC may request GPS related data from an SAS in order to provide GPS assistance data to a single UE. Alternatively, an RNC may request GPS related data from an SAS in order to support the broadcast of GPS assistance data to multiple UEs in a particular area via system information messages. Each type of GPS related data may be requested on demand, on modification, or at regular intervals.

5.3 Management of Position Calculation Functions

To support a *UE-assisted* positioning attempt involving a single UE, an RNC provides an SAS with one or more sets of

- GPS or GANSS measurement data,
- ODTOA measurement data,
- Cell ID measurement data.

Subsequently, the SAS calculates the position estimate of the specific UE and returns this result to the RNC.

5.4 Management of SAS Centric Position Functions

In the SAS Centric mode of operation, the RNC may initiate a positioning event, the SAS may activate a positioning method requesting the RNC for relevant data, and on completion of the position determination process the SAS may return the final response to the RNC. In addition, during an ongoing positioning event, the RNC may send the SAS a modified set of positioning parameters, or the RNC may even instruct the SAS to abort the positioning process itself.

5.5 Management of GANSS Related Data

This management of the GANSS Related Data is the same as the management of the GPS Related Data described in section 5.2, except that it is applicable to Galileo and Additional Navigation Satellite Systems instead of GPS.

6 Other Iupc Interface Specifications

6.1 UTRAN Iupc Interface: Layer 1 (TSG RAN 25.451)

TS 25.451 [2] specifies the standards allowed for implementation of Layer 1 (physical layer) on the Iupc interface.

6.2 UTRAN Iupc Interface: Signalling Transport (TSG RAN 25.452)

TS 25.452 [3] specifies the signalling transport related to PCAP signalling to be used across the Iupc interface.

6.3 PCAP Specification (TSG RAN 25.453)

TS 25.453 [4] specifies the standards for PCAP specification to be used over the Iupc interface.

6.4 Summary of UTRAN Iupc Interface Technical Specifications

The relationship between the technical specifications that define the UTRAN Iupc interface is shown in figure 2.

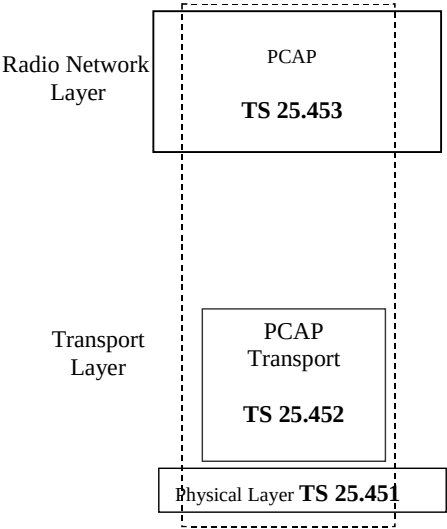


Figure 2: Iupc Interface Technical Specifications.

Annex A (informative): Change history

Date / TSG	TSG Doc.	CR	Rev	Subject/Comment	New
12/2008	-	-	-	Creation of Rel-8 version based on v7.2.0	8.0.0
12/2009	-	-	-	Creation of Rel-9 version based on v8.0.0	9.0.0
SP-49	SP-100629			Clarification on the use of References (TS 21.801 CR#0030)	9.0.1
03/2011				Creation of Rel-10 version based on v9.0.1	10.0.0
52	RP-110685	0010	1	References cleanup (25.450)	10.1.0
09/2012				Update to Rel-11 version (MCC)	11.0.0
09/2014				Update to Rel-12 version (MCC)	12.0.0
12/2015				Update to Rel-13 version (MCC)	13.0.0

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2017-03	SA#75					Promotion to Release 14 without technical change	14.0.0
2018-07	SA#80	-	-	-	-	Promotion to Release 15 without technical change	15.0.0
2020-07	SA#88-e	-	-	-	-	Update to Rel-16 version (MCC)	16.0.0
2022-03	SA#95-e					Promotion to Release 17 without technical change	17.0.0
2024-03	SA#103	-	-	-	-	Update to Rel-18 version (MCC)	18.0.0
2025-09	SA#109	-	-	-	-	Update to Rel-19 version (MCC)	19.0.0

History

Document history		
V19.0.0	October 2025	Publication