ETSI TS 103 795-2 V1.1.1 (2024-03)



Core Network and Interoperability Testing (INT); Network Interoperability Test Description for emergency services over VoLTE; (3GPP™ Release 15); Part 2: Test Descriptions 2

Reference

DTS/INT-00187-2

Keywords

interoperability, testing, TSS&TP, VoLTE

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: <u>https://www.etsi.org/standards-search</u>

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 at www.etsi.org/deliver.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at <u>https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx</u>

If you find errors in the present document, please send your comment to one of the following services: <u>https://portal.etsi.org/People/CommiteeSupportStaff.aspx</u>

If you find a security vulnerability in the present document, please report it through our Coordinated Vulnerability Disclosure Program: https://www.etsi.org/standards/coordinated-vulnerability-disclosure

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 2024. All rights reserved.

Contents

Intelle	ectual Property Rights	5
Forew	/ord	5
Moda	l verbs terminology	5
1	Scope	6
2	References	6
2.1	Normative references	6
2.2	Informative references	7
3	Definition of terms, symbols and abbreviations	8
3.1	Terms	
3.2	Symbols	
3.3	Abbreviations	
4		
4	Test Environment	
4.1 4.2	Introduction	
4.2.1	Configuration CF_VoLTE_INT_ES	
4.2.2	Configuration CF_VoLTE_RMI_ES	
4.2.3	Configuration CF_VoLTE_RMI_S8HR	
4.3	Test infrastructure	
4.3.1	Introduction	
4.3.2	VoLTE component descriptions	11
4.3.2.1		
4.3.2.2		
4.3.2.3		
4.3.3	VoLTE Reference Points and Protocols	
4.3.3.1		
4.3.3.2	<u>r</u>	
4.3.3.4		
4.3.3.5		
4.3.3.6		
4.3.4	Applicable 3GPP Release Number	
4.4	Test pre-requisites	
4.4.1	IP Version	13
4.4.2	Number Resolution	
4.4.3	QoS aspects	
4.5	Test description overview	
4.6	TD naming convention	14
5	Test Descriptions (Interoperability at HPLMN)	15
5.0	General	
5.1	Network Attachment	
5.1.1	UE Emergency Network Attachment and Establishment of the Emergency Bearer with USIM	
5.1.2	UE Emergency Network Attachment and Establishment of the Emergency Bearer without USIM	
5.2	IMS Emergency Registration	
5.2.1	IMS Emergency Registration - Successful	
5.2.2	IMS Emergency Registration - Unsuccessful	
5.3 5.3.0	Emergency Session and Emergency Bearer Operations (Interoperability) Introduction	
5.3.1	Emergency Session Establishment	
5.3.1.1		
5.3.1.2		
5.3.1.3		
5.3.1.4	UE calling PSAP without any registration	29
5.3.1.5	e e	
5.3.1.6	5 UE calling PSAP in another network via IBCF	33

5.3.1.8 UE calling PSAP in PSTN via BGCF. 40 5.3.1.9 UE calling PSAP over AS with non-emergency registration 43 5.3.1.10 UE calling PSAP over AS with non-emergency registration 47 5.3.1.11 Callback from PSAP 49 5.3.2 Emergency Session Release. 53 5.3.2.1 UE Initiated Emergency Session Release 53 5.3.2.2 PSAP Initiated Emergency Session Release 56 5.3.3 Emergency Session Abort/Reject 58 5.3.3.1 Emergency Session Abort/Reject 58 5.3.3.1 Emergency Session Abort Reject - IMS not able to handle emergency sessions 65 5.3.3.4 Emergency Session Reject - IMS not able to handle emergency sessions 65 5.3.3.4 Emergency Session Reject - IMS not able to handle emergency sessions 65 5.3.3.4 Emergency Session Reject - IMS not able to handle emergency sessions 65 5.3.4 MG cCall tests 67 5.3.4 MG cCall tests 67 5.4.1 MSD sent during NG eCall 70 5.4 Emergency Network Detachment (with/without Emergency Registration) 73 5.5.1	5.3.1.7	UE calling PSAP in another network via IBCF, LRF derived PSAP URI	36
5.3.1.10 UE calling PSAP over AS with non-emergency registration 47 5.3.1.11 Callback from PSAP 49 5.3.2 Emergency Session Release 53 5.3.2.0 General 53 5.3.2.1 UE Initiated Emergency Session Release 53 5.3.2.2 PSAP Initiated Emergency Session Release 56 5.3.3 Emergency Session Abort/Reject 58 5.3.3.0 General 58 5.3.3.1 Emergency Session Abort 58 5.3.3.1 Emergency Session Reject 1MS not able to handle emergency sessions 65 5.3.3.4 Emergency Session Reject - due to wrong urn. 66 5.3.4.1 MSD send during NG eCall establishment 67 5.4.1 MSD update during NG eCall 70 5.4 Emergency Network Detachment (with/without Emergency Registration) 73 5.5.0 General 73 5.5.1 UE Emergency Network Detachment (with/without Emergency Registration) 74 6 Test Descriptions (Roaming) 77 6.1 Network Attachment and Establishment of the Emergency Registration & 80 80 6.1	5.3.1.8	UE calling PSAP in PSTN via BGCF	40
5.3.1.11 Callback from PSAP 49 5.3.2 Emergency Session Release 53 5.3.2.0 General 53 5.3.2.1 UE Initiated Emergency Session Release 53 5.3.2.2 PSAP Initiated Emergency Session Release 56 5.3.3 Emergency Session Abort/Reject 58 5.3.3 Emergency Session Abort 58 5.3.3 Emergency Session Reject from PSAP 61 5.3.3.1 Emergency Session Reject from PSAP 61 5.3.3.3 Emergency Session Reject - IMS not able to handle emergency sessions 65 5.3.3.4 Emergency Session Reject - due to wrong urn. 66 5.3.4.1 MSD update during NG eCall 70 5.4.4 MSD update during NG eCall 70 5.4.5 Emergency Network Detachment 73 5.5.0 General 73 5.5.1 UE Emergency Network Detachment with Previously Established Emergency Registration & Emergency Session 74 6 Test Descriptions (Roaming) 77 71 6.1.1 UE Emergency Network Attachment and Establishment of the Emergency Bearer without USIM 77	5.3.1.9	UE calling PSAP in PSTN via BGCF, LRF derived PSAP URI	43
5.3.2 Emergency Session Release 53 5.3.2.0 General 53 5.3.2.1 UE Initiated Emergency Session Release 53 5.3.2.2 PSAP Initiated Emergency Session Release 56 5.3.3 Emergency Session Abort/Reject 58 5.3.3.0 General 58 5.3.3.1 Emergency Session Abort 58 5.3.3.2 Emergency Session Reject from PSAP 61 5.3.3.3 Emergency Session Reject - IMS not able to handle emergency sessions 65 5.3.3.4 Emergency Session Reject - due to wrong urn. 66 5.3.4 NG eCall tests 67 5.3.4.1 MSD sent during NG eCall establishment 67 5.3.4 MS pudate during NG eCall establishment 70 5.4 Emergency Deregistration 73 5.5.1 UE Emergency Network Detachment (with/without Emergency Registration) 73 5.5.2 UE Emergency Network Detachment with Previously Established Emergency Registration & Emergency Session 74 6 Test Descriptions (Roaming) 77 71 6.1.1 UE Emergency Network Attachment and Establishment of the Emergency Bearer wit	5.3.1.10	UE calling PSAP over AS with non-emergency registration	47
5.3.2 Emergency Session Release 53 5.3.2.0 General 53 5.3.2.1 UE Initiated Emergency Session Release 53 5.3.2.2 PSAP Initiated Emergency Session Release 56 5.3.3 Emergency Session Abort/Reject 58 5.3.3.0 General 58 5.3.3.1 Emergency Session Abort 58 5.3.3.2 Emergency Session Reject from PSAP 61 5.3.3.3 Emergency Session Reject - IMS not able to handle emergency sessions 65 5.3.3.4 Emergency Session Reject - due to wrong urn. 66 5.3.4 NG eCall tests 67 5.3.4.1 MSD sent during NG eCall establishment 67 5.3.4 MS pudate during NG eCall establishment 70 5.4 Emergency Deregistration 73 5.5.1 UE Emergency Network Detachment (with/without Emergency Registration) 73 5.5.2 UE Emergency Network Detachment with Previously Established Emergency Registration & Emergency Session 74 6 Test Descriptions (Roaming) 77 71 6.1.1 UE Emergency Network Attachment and Establishment of the Emergency Bearer wit	5.3.1.11	Callback from PSAP	49
5.3.2.1 UE Initiated Emergency Session Release 53 5.3.2 PSAP Initiated Emergency Session Release 56 5.3.3 Emergency Session Abort/Reject 58 5.3.3 General 58 5.3.3 Emergency Session Reject from PSAP 61 5.3.3 Emergency Session Reject - IMS not able to handle emergency sessions 65 5.3.3.4 Emergency Session Reject - IMS not able to handle emergency sessions 66 5.3.4 Emergency Session Reject - due to wrong urn. 66 5.3.4 MSD ext during NG eCall establishment 67 5.3.4.1 MSD sent during NG eCall establishment 67 5.4.2 MSD update during NG eCall 70 5.4 Emergency Network Detachment 71 5.5.0 General 73 5.5.1 UE Emergency Network Detachment (with/without Emergency Registration) 73 5.5.2 UE Emergency Network Detachment and Establishment of the Emergency Registration & Emergency Session 74 6 Test Descriptions (Roaming) 77 76 6.1.1 UE Emergency Network Attachment and Establishment of the Emergency Bearer withu USIM 77	5.3.2		
5.3.2.2 PSAP Initiated Emergency Session Release 56 5.3.3 Emergency Session Abort/Reject 58 5.3.3.1 Emergency Session Abort 58 5.3.3.2 Emergency Session Reject from PSAP 61 5.3.3.3 Emergency Session Reject - IMS not able to handle emergency sessions 65 5.3.3.4 Emergency Session Reject - due to wrong urn. 66 5.3.4 MG eCall tests 67 5.3.4.1 MSD sent during NG eCall 67 5.4.2 MSD update during NG eCall 70 5.4 Emergency Network Detachment 73 5.5.0 General 73 5.5.1 UE Emergency Network Detachment (with/without Emergency Registration) 73 5.5.2 UE Emergency Network Detachment with Previously Established Emergency Registration & 74 6 Test Descriptions (Roaming) 77 71 6.1 UE Emergency Network Attachment and Establishment of the Emergency Bearer with USIM 77 6.1.1 UE Emergency Registration in a visited network 80 6.2.1 IMS Emergency Registration - Rejection 80 6.3.2 Roaming UE calling PSAP with	5.3.2.0	General	53
5.3.3 Emergency Session Abort/Reject 58 5.3.3.0 General 58 5.3.3.1 Emergency Session Reject from PSAP 61 5.3.3.2 Emergency Session Reject - IMS not able to handle emergency sessions 65 5.3.3.1 Emergency Session Reject - due to wrong urn. 66 5.3.3.4 Emergency Session Reject - due to wrong urn. 67 5.3.4.1 MSD sent during NG eCall establishment 67 5.3.4.2 MSD update during NG eCall. 70 5.4 Emergency Network Detachment. 73 5.5 General. 73 5.5.0 General. 73 5.5.1 UE Emergency Network Detachment (with/without Emergency Registration) 73 5.5.2 UE Emergency Network Detachment with Previously Established Emergency Registration & Emergency Network Detachment with Previously Established Emergency Registration & Emergency Session 74 6 Test Descriptions (Roaming) 77 6.1.1 UE Emergency Network Attachment and Establishment of the Emergency Bearer with USIM 77 6.1.1 UE Emergency Registration in a visited network. 80 6.3.2 IMS Emergency Registration - Rejection 80<	5.3.2.1	UE Initiated Emergency Session Release	53
5.3.3.0 General 58 5.3.3.1 Emergency Session Abort 58 5.3.3.2 Emergency Session Reject from PSAP 61 5.3.3.3 Emergency Session Reject - IMS not able to handle emergency sessions 65 5.3.3.4 Emergency Session Reject - due to wrong urn 66 5.3.4 NG eCall tests 67 5.3.4.1 MSD sent during NG eCall 70 5.4 Emergency Deregistration 73 5.5 Emergency Network Detachment. 73 5.5.0 General 73 5.5.1 UE Emergency Network Detachment (with/without Emergency Registration) 73 5.5.2 UE Emergency Network Detachment with Previously Established Emergency Registration & 74 6 Test Descriptions (Roaming) 77 71 6.1.1 UE Emergency Network Attachment and Establishment of the Emergency Bearer with USIM 77 6.2.1 IMS Emergency Registration in a visited network. 80 6.2.1 IMS Emergency Registration in a visited network. 80 6.3.2 Roaming UE calling PSAP with non-emergency registration 82 6.3.2.3 Roaming UE calling PSAP w	5.3.2.2	PSAP Initiated Emergency Session Release	56
5.3.3.0 General 58 5.3.3.1 Emergency Session Abort 58 5.3.3.2 Emergency Session Reject from PSAP 61 5.3.3.3 Emergency Session Reject - IMS not able to handle emergency sessions 65 5.3.3.4 Emergency Session Reject - due to wrong urn 66 5.3.4 NG eCall tests 67 5.3.4.1 MSD sent during NG eCall 70 5.4 Emergency Deregistration 73 5.5 Emergency Network Detachment. 73 5.5.0 General 73 5.5.1 UE Emergency Network Detachment (with/without Emergency Registration) 73 5.5.2 UE Emergency Network Detachment with Previously Established Emergency Registration & 74 6 Test Descriptions (Roaming) 77 71 6.1.1 UE Emergency Network Attachment and Establishment of the Emergency Bearer with USIM 77 6.2.1 IMS Emergency Registration in a visited network. 80 6.2.1 IMS Emergency Registration in a visited network. 80 6.3.2 Roaming UE calling PSAP with non-emergency registration 82 6.3.2 Roaming UE calling PSAP wit	5.3.3	Emergency Session Abort/Reject	58
5.3.2 Emergency Session Reject from PSAP 61 5.3.3.3 Emergency Session Reject - IMS not able to handle emergency sessions 65 5.3.4 Emergency Session Reject - due to wrong urn 66 5.3.4 Emergency Session Reject - due to wrong urn 66 5.3.4 NG eCall tests 67 5.4.1 MSD sent during NG eCall establishment 67 5.4.2 MSD update during NG eCall 70 5.4 Emergency Deregistration 73 5.5 Emergency Network Detachment 73 5.5.0 General 73 5.5.1 UE Emergency Network Detachment (with/without Emergency Registration) 73 5.5.2 UE Emergency Network Detachment with Previously Established Emergency Registration & Emergency Session 74 6 Test Descriptions (Roaming) 77 6.1 Network Attachment and Establishment of the Emergency Bearer with USIM 77 6.1.1 UE Emergency Registration in a visited network. 80 6.2.1 IMS Emergency Registration in a visited network. 80 6.3.2 Roaming UE calling PSAP with non-emergency registration 82 6.3.2 R	5.3.3.0		
5.3.3.3 Emergency Session Reject - IMS not able to handle emergency sessions	5.3.3.1	Emergency Session Abort	58
5.3.3.4 Emergency Session Reject - due to wrong urn. 66 5.3.4 NG eCall tests. 67 5.3.4.1 MSD sent during NG eCall establishment 67 5.3.4.2 MSD update during NG eCall. 70 5.4 Emergency Deregistration 73 5.5 Emergency Deregistration 73 5.5.0 General. 73 5.5.1 UE Emergency Network Detachment (with/without Emergency Registration) 73 5.5.2 UE Emergency Network Detachment (with/without Emergency Registration) 73 5.5.1 UE Emergency Network Detachment with Previously Established Emergency Registration & Emergency Session 74 6 Test Descriptions (Roaming) 77 71 6.1 Network Attachment 77 6.1.1 UE Emergency Network Attachment and Establishment of the Emergency Bearer without USIM 79 6.2.1 IMS Emergency Registration in a visited network 80 6.3.1 Roaming UE calling PSAP with emergency registration 82 6.3.2 Roaming UE calling PSAP with emergency registration 82 6.3.2.3 Roaming UE calling PSAP in home operator's network 86	5.3.3.2	Emergency Session Reject from PSAP	61
5.3.4 NG eCall tests 67 5.3.4.1 MSD sent during NG eCall establishment 67 5.3.4.2 MSD update during NG eCall 70 5.4 Emergency Deregistration 73 5.5 Emergency Network Detachment. 73 5.5.0 General 73 5.5.1 UE Emergency Network Detachment (with/without Emergency Registration) 73 5.5.2 UE Emergency Network Detachment with Previously Established Emergency Registration & Emergency Session 74 6 Test Descriptions (Roaming) 77 6.1 UE Emergency Network Attachment and Establishment of the Emergency Bearer with USIM 77 6.1.1 UE Emergency Registration in a visited network. 80 6.2.1 IMS Emergency Registration in a visited network. 80 6.3 Emergency Registration - Rejection 80 6.3 Emergency Session Establishment (Roaming) 82 6.3.2.1 Roaming UE calling PSAP with emergency registration 85 6.3.2.2 Roaming UE calling PSAP with non-emergency registration 86 6.3.2.3 Roaming UE calling PSAP in home operator's network. 86 6.3.2.3	5.3.3.3	Emergency Session Reject - IMS not able to handle emergency sessions	65
5.3.4.1 MSD sent during NG eCall establishment 67 5.3.4.2 MSD update during NG eCall 70 5.4 Emergency Deregistration 73 5.5 Emergency Network Detachment 73 5.5.0 General 73 5.5.1 UE Emergency Network Detachment (with/without Emergency Registration) 73 5.5.2 UE Emergency Network Detachment with Previously Established Emergency Registration & Emergency Registration & Emergency Session 74 6 Test Descriptions (Roaming) 77 6.1 Network Attachment 77 6.1.1 UE Emergency Network Attachment and Establishment of the Emergency Bearer with USIM 77 6.2.1 IMS Emergency Registration in a visited network 80 6.2.1 IMS Emergency Registration - Rejection 80 6.3.2 Roaming UE calling PSAP with emergency registration 82 6.3.2.1 Roaming UE calling PSAP with non-emergency registration 85 6.3.2.2 Roaming UE calling PSAP in same network 86 6.3.2.3 Roaming UE calling PSAP with non-registration 86 6.3.2.3 Roaming UE calling PSAP in home operator's network 86	5.3.3.4	Emergency Session Reject - due to wrong urn	66
5.3.4.2 MSD update during NG eCall 70 5.4 Emergency Deregistration 73 5.5 Emergency Network Detachment. 73 5.5.0 General. 73 5.5.1 UE Emergency Network Detachment (with/without Emergency Registration) 73 5.5.2 UE Emergency Network Detachment with Previously Established Emergency Registration & Emergency Session 74 6 Test Descriptions (Roaming) 77 6.1 Network Attachment 77 6.1.1 UE Emergency Network Attachment and Establishment of the Emergency Bearer with USIM 77 6.1.2 UE Emergency Registration in a visited network 80 6.2.1 IMS Emergency Registration - Rejection 80 6.3 Emergency Session Establishment (Roaming) 82 6.3.1 Roaming UE calling PSAP with emergency registration 85 6.3.2.1 Roaming UE calling PSAP with non-emergency registration 85 6.3.2.2 Roaming UE calling PSAP with non-registration 86 6.3.2.3 Roaming UE calling PSAP with non-registration 88 6.3.2.3 Roaming UE calling PSAP with non-registration 86 6.3.2.3	5.3.4		
5.4 Emergency Deregistration 73 5.5 Emergency Network Detachment 73 5.5.0 General 73 5.5.1 UE Emergency Network Detachment (with/without Emergency Registration) 73 5.5.2 UE Emergency Network Detachment with Previously Established Emergency Registration & Emergency Session 74 6 Test Descriptions (Roaming) 77 6.1 Network Attachment 77 6.1.1 UE Emergency Network Attachment and Establishment of the Emergency Bearer with USIM 77 6.1.2 UE Emergency Registration in a visited network 80 6.2.1 IMS Emergency Registration - Rejection 80 6.3 Emergency Session Establishment (Roaming) 82 6.3.1 Roaming UE calling PSAP with non-emergency registration 82 6.3.2.1 Roaming UE calling PSAP in same network 85 6.3.2.2 Roaming UE calling PSAP in home operator's network 86 6.3.2.3 Roaming UE calling PSAP with non-registration 88 Annex A (informative): Message Sequence Charts (MSCs) 90	5.3.4.1	MSD sent during NG eCall establishment	67
5.5 Emergency Network Detachment	5.3.4.2	MSD update during NG eCall	70
5.5.0 General	5.4	Emergency Deregistration	73
5.5.1 UE Emergency Network Detachment (with/without Emergency Registration) 73 5.5.2 UE Emergency Network Detachment with Previously Established Emergency Registration & Emergency Session 74 6 Test Descriptions (Roaming) 77 6.1 Network Attachment 77 6.1.1 UE Emergency Network Attachment and Establishment of the Emergency Bearer with USIM 77 6.1.2 UE Emergency Network Attachment and Establishment of the Emergency Bearer without USIM 79 6.2.1 IMS Emergency Registration in a visited network. 80 6.3 Emergency Session Establishment (Roaming) 82 6.3.1 Roaming UE calling PSAP with emergency registration 82 6.3.2.1 Roaming UE calling PSAP in same network 85 6.3.2.2 Roaming UE calling PSAP in home operator's network 86 6.3.2.3 Roaming UE calling PSAP with non-registration 88 Annex A (informative): Message Sequence Charts (MSCs) 90	5.5		
5.5.2 UE Emergency Network Detachment with Previously Established Emergency Registration & Emergency Session 74 6 Test Descriptions (Roaming) 77 6.1 Network Attachment 77 6.1.1 UE Emergency Network Attachment and Establishment of the Emergency Bearer with USIM 77 6.1.2 UE Emergency Network Attachment and Establishment of the Emergency Bearer without USIM 79 6.2 IMS Emergency Registration in a visited network. 80 6.3 Emergency Registration - Rejection 80 6.3 Emergency Session Establishment (Roaming) 82 6.3.1 Roaming UE calling PSAP with emergency registration 85 6.3.2.1 Roaming UE calling PSAP in same network 85 6.3.2.2 Roaming UE calling PSAP in home operator's network 86 6.3.2.3 Roaming UE calling PSAP with non-registration 88 Annex A (informative): Message Sequence Charts (MSCs) 90	5.5.0	General	73
Emergency Session746Test Descriptions (Roaming).776.1Network Attachment776.1.1UE Emergency Network Attachment and Establishment of the Emergency Bearer with USIM776.1.2UE Emergency Network Attachment and Establishment of the Emergency Bearer without USIM796.2IMS Emergency Registration in a visited network.806.3Emergency Registration - Rejection806.3Emergency Session Establishment (Roaming).826.3.1Roaming UE calling PSAP with emergency registration826.3.2Roaming UE calling PSAP in same network856.3.2.1Roaming UE calling PSAP in home operator's network866.3.2.3Roaming UE calling PSAP with non-registration88Annex A (informative):Message Sequence Charts (MSCs)90	5.5.1	UE Emergency Network Detachment (with/without Emergency Registration)	73
6Test Descriptions (Roaming).776.1Network Attachment776.1.1UE Emergency Network Attachment and Establishment of the Emergency Bearer with USIM776.1.2UE Emergency Network Attachment and Establishment of the Emergency Bearer without USIM796.2IMS Emergency Registration in a visited network.806.2.1IMS Emergency Registration - Rejection806.3Emergency Session Establishment (Roaming).826.3.1Roaming UE calling PSAP with emergency registration826.3.2.1Roaming UE calling PSAP with non-emergency registration856.3.2.2Roaming UE calling PSAP in same network856.3.2.3Roaming UE calling PSAP with non-registration866.3.2.3Roaming UE calling PSAP with non-registration88Annex A (informative):Message Sequence Charts (MSCs)90	5.5.2	UE Emergency Network Detachment with Previously Established Emergency Registration &	
6.1Network Attachment776.1.1UE Emergency Network Attachment and Establishment of the Emergency Bearer with USIM776.1.2UE Emergency Network Attachment and Establishment of the Emergency Bearer without USIM796.2IMS Emergency Registration in a visited network806.2.1IMS Emergency Registration - Rejection806.3Emergency Session Establishment (Roaming)826.3.1Roaming UE calling PSAP with emergency registration826.3.2Roaming UE calling PSAP with non-emergency registration856.3.2.1Roaming UE calling PSAP in same network856.3.2.2Roaming UE calling PSAP in home operator's network866.3.2.3Roaming UE calling PSAP with non-registration88Annex A (informative):Message Sequence Charts (MSCs)90		Emergency Session	74
6.1.1UE Emergency Network Attachment and Establishment of the Emergency Bearer with USIM776.1.2UE Emergency Network Attachment and Establishment of the Emergency Bearer without USIM796.2IMS Emergency Registration in a visited network806.2.1IMS Emergency Registration - Rejection806.3Emergency Session Establishment (Roaming)826.3.1Roaming UE calling PSAP with emergency registration826.3.2Roaming UE calling PSAP with non-emergency registration856.3.2.1Roaming UE calling PSAP in same network856.3.2.2Roaming UE calling PSAP with non-registration866.3.2.3Roaming UE calling PSAP with non-registration876.3.2.4Message Sequence Charts (MSCs)90	6 Te	est Descriptions (Roaming)	77
6.1.2UE Emergency Network Attachment and Establishment of the Emergency Bearer without USIM	6.1	Network Attachment	77
6.2IMS Emergency Registration in a visited network.806.2.1IMS Emergency Registration - Rejection806.3Emergency Session Establishment (Roaming)826.3.1Roaming UE calling PSAP with emergency registration826.3.2Roaming UE calling PSAP with non-emergency registration856.3.2.1Roaming UE calling PSAP in same network856.3.2.2Roaming UE calling PSAP in home operator's network866.3.2.3Roaming UE calling PSAP with non-registration88Annex A (informative):Message Sequence Charts (MSCs)90	6.1.1	UE Emergency Network Attachment and Establishment of the Emergency Bearer with USIM	77
6.2.1IMS Emergency Registration - Rejection.806.3Emergency Session Establishment (Roaming).826.3.1Roaming UE calling PSAP with emergency registration.826.3.2Roaming UE calling PSAP with non-emergency registration.856.3.2.1Roaming UE calling PSAP in same network.856.3.2.2Roaming UE calling PSAP in home operator's network.866.3.2.3Roaming UE calling PSAP with non-registration.88Annex A (informative):Message Sequence Charts (MSCs).90	6.1.2	UE Emergency Network Attachment and Establishment of the Emergency Bearer without USIM	79
6.3Emergency Session Establishment (Roaming).826.3.1Roaming UE calling PSAP with emergency registration.826.3.2Roaming UE calling PSAP with non-emergency registration856.3.2.1Roaming UE calling PSAP in same network856.3.2.2Roaming UE calling PSAP in home operator's network866.3.2.3Roaming UE calling PSAP with non-registration88Annex A (informative):Message Sequence Charts (MSCs)90	6.2		
6.3.1Roaming UE calling PSAP with emergency registration.826.3.2Roaming UE calling PSAP with non-emergency registration856.3.2.1Roaming UE calling PSAP in same network856.3.2.2Roaming UE calling PSAP in home operator's network866.3.2.3Roaming UE calling PSAP with non-registration88Annex A (informative):Message Sequence Charts (MSCs)90	6.2.1	IMS Emergency Registration - Rejection	80
6.3.2Roaming UE calling PSAP with non-emergency registration	6.3	Emergency Session Establishment (Roaming)	82
6.3.2.1Roaming UE calling PSAP in same network856.3.2.2Roaming UE calling PSAP in home operator's network866.3.2.3Roaming UE calling PSAP with non-registration88Annex A (informative):Message Sequence Charts (MSCs)90	6.3.1	Roaming UE calling PSAP with emergency registration	82
6.3.2.2Roaming UE calling PSAP in home operator's network866.3.2.3Roaming UE calling PSAP with non-registration88Annex A (informative):Message Sequence Charts (MSCs)90	6.3.2	Roaming UE calling PSAP with non-emergency registration	85
6.3.2.3Roaming UE calling PSAP with non-registration	6.3.2.1	Roaming UE calling PSAP in same network	85
Annex A (informative): Message Sequence Charts (MSCs)	6.3.2.2	Roaming UE calling PSAP in home operator's network	86
	6.3.2.3	Roaming UE calling PSAP with non-registration	88
$\mathbf{A} = 1 \mathbf{T} \mathbf{h} \mathbf{a} \mathbf{M} \mathbf{S} \mathbf{C} \mathbf{f} \mathbf{I} \mathbf{a} \mathbf{c} \mathbf{n} \mathbf{c} \mathbf{s} \mathbf{s} \mathbf{c} \mathbf{s} \mathbf{s} \mathbf{c} \mathbf{s} \mathbf{s} \mathbf{s} \mathbf{s} \mathbf{s} \mathbf{s} \mathbf{s} s$	Annex A	A (informative): Message Sequence Charts (MSCs)	90
A.1 The Wise files	A.1 Th	ne MSC files	90
History	History.		91

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 Web server (https://ipr.etsi.org/).

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.

DECTTM, **PLUGTESTSTM**, **UMTSTM** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPPTM** and **LTETM** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2MTM** 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.

Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Core Network and Interoperability Testing (INT).

The present document is part 2 of a multi-part deliverable. Full details of the entire series can be found in part 1 [1].

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 <u>ETSI Drafting Rules</u> (Verbal forms for the expression of provisions).

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

1 Scope

The present document provides the Test Descriptions (TDs) for network interoperability test description for emergency services over VoLTE in compliance with the relevant requirements and in accordance with the Test Purposes (TPs) presented in ETSI TS 103 795-1 [1].

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at https://docbox.etsi.org/Reference/.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

[1]	ETSI TS 103 795-1: "Core Network and Interoperability Testing (INT); Network Interoperability Test Description for emergency services over VoLTE; (3GPP TM Release 15); Part 1: Test Purposes (TP)".
[2]	ETSI TS 124 229: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; 5G; IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3 (3GPP TS 24.229 Release 15)".
[3]	ETSI TS 129 165: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; 5G; Inter-IMS Network to Network Interface (NNI) (3GPP TS 29.165 Release 15)".
[4]	ETSI TS 129 228: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; IP Multimedia (IM) Subsystem Cx and Dx Interfaces; Signalling flows and message contents (3GPP TS 29.228 Release 15)".
[5]	ETSI TS 129 229: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Cx and Dx interfaces based on the Diameter protocol; Protocol details (3GPP TS 29.229 Release 15)".
[6]	ETSI TS 129 214: "Universal Mobile Telecommunications System (UMTS); LTE; Policy and charging control over Rx reference point (3GPP TS 29.214 Release 15)".
[7]	ETSI TS 129 212: "Universal Mobile Telecommunications System (UMTS); LTE; Policy and Charging Control (PCC); Reference points (3GPP TS 29.212 Release 15)".
[8]	ETSI TS 129 272: "Universal Mobile Telecommunications System (UMTS); LTE; 5G; Evolved Packet System (EPS); Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) related interfaces based on Diameter protocol (3GPP TS 29.272 Release 15)".
[9]	ETSI TS 129 215: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Policy and Charging Control (PCC) over S9 reference point; Stage 3 (3GPP TS 29.215 Release 15)".
[10]	ETSI TS 129 328: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; 5G; IP Multimedia (IM) Subsystem Sh interface; Signalling flows and message contents (3GPP TS 29.328 Release 15)".

- [11] <u>ETSI TS 129 329</u>: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Sh interface based on the Diameter protocol; Protocol details (3GPP TS 29.329 Release 15)".
- [12] <u>IETF RFC 3261</u>: "SIP: Session Initiation Protocol".
- [13] <u>ETSI TS 134 229-1</u>: "Universal Mobile Telecommunications System (UMTS); LTE; Internet Protocol (IP) multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); User Equipment (UE) conformance specification; Part 1: Protocol conformance specification (3GPP TS 34.229-1 Release 15)".
- [14] <u>ETSI TS 123 167</u>: "Universal Mobile Telecommunications System (UMTS); LTE; IP Multimedia Subsystem (IMS) emergency sessions (3GPP TS 23.167)".
- [15] <u>ETSI TS 103 653-1</u>: "Core Network and Interoperability Testing (INT); VoLTE/ViLTE interoperability test description over 4G/early 5G in physical/virtual environments; (3GPPTM Release 15); Part 1: Test Purposes (TP) and Protocol Implementation Conformance Statement (PICS) for VoLTE/ViLTE interoperability".
- [16] <u>ETSI TS 103 653-2</u>: "Core Network and Interoperability Testing (INT); VoLTE/ViLTE interoperability test description over 4G/early 5G in physical/virtual environments; (3GPPTM Release 15); Part 2: Test Descriptions for VoLTE/ViLTE interoperability".
- [17] <u>IETF RFC 7090</u>: "Public Safety Answering Point (PSAP) Callback".
- [18] <u>IETF RFC 5031</u>: "A Uniform Resource Name (URN) for Emergency and Other Well-Known Services".
- [19] <u>IETF RFC 8147</u>: "Next-Generation Pan-European eCall".

2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1]	ETSI TR 184 008: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Infrastructure ENUM Options for a TISPAN IPX".
[i.2]	IETF RFC 3761: "The E.164 to Uniform Resource Identifiers (URI); Dynamic Delegation Discovery System (DDDS) Application (ENUM)".
[i.3]	ETSI TS 103 189 (V1.2.1): "Core Network and Interoperability Testing (INT); Assessment of end-to-end Quality for VoLTE and RCS".
[i.4]	ISO/IEC 9646-1: "Information technology - Open Systems Interconnection - Conformance testing

methodology and framework - Part 1: General concepts".

3 Definition of terms, symbols and abbreviations

3.1 Terms

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

Abstract Test Method (ATM): Refer to ISO/IEC 9646-1 [i.4].

Abstract Test Suite (ATS): Refer to ISO/IEC 9646-1 [i.4].

Implementation Under Test (IUT): Refer to ISO/IEC 9646-1 [i.4].

Test Purpose (TP): Refer to ISO/IEC 9646-1 [i.4].

3.2 Symbols

Void.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI TS 124 229 [2], ETSI TS 129 165 [3], ETSI TS 129 228 [4], ETSI TS 129 229 [5], ETSI TS 129 214 [6], ETSI TS 129 212 [7], ETSI TS 129 272 [8], ETSI TS 129 215 [9], ETSI TS 129 328 [10], ETSI TS 129 329 [11] and the following apply:

SoftSubstantialACKSIP 'ACK' messageAGWAccess GateWayAN-GWAccess Network GatewayAS(IMS) Application ServerATSAbstract Test SuiteCF(Test) ConFigurationDL/ULDownLink/UpLinkENUME.164 Number MappingEPCEvolved Packet CoreE-UTRANEnhanced Universal Terrestrial Radio Access NetworkGSMAGSM AssociationIOPInterOPerabilityIPXInternet Packet eXchangeIUTImplementation Under TestMMIMan-Machine InterfaceMSCMessage Sequence ChartNAPTRNaming Authority Pointer RecordNASNon Access StratumNATNetwork Address TranslationNGNNext Generation NetworkNSName ServerNWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource ControlSGWServing Gateway	3GPP	3 rd Generation Partnership Project
AGWAccess GateWayAN-GWAccess Network GatewayAS(IMS) Application ServerATSAbstract Test SuiteCF(Test) ConFigurationDL/ULDownLink/UpLinkENUME.164 Number MappingEPCEvolved Packet CoreE-UTRANEnhanced Universal Terrestrial Radio Access NetworkGSMAGSM AssociationIOPInterOPerabilityIPXInternet Packet eXchangeIUTImplementation Under TestMMIMan-Machine InterfaceMSCMessage Sequence ChartNAPTRNaming Authority Pointer RecordNASNon Access StratumNATNetwork Address TranslationNGNNext Generation NetworkNSName ServerNWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control		1 0
AN-GWAccess Network GatewayAS(IMS) Application ServerATSAbstract Test SuiteCF(Test) ConFigurationDL/ULDownLink/UpLinkENUME.164 Number MappingEPCEvolved Packet CoreE-UTRANEnhanced Universal Terrestrial Radio Access NetworkGSMAGSM AssociationIOPInterOPerabilityIPXInternet Packet eXchangeIUTImplementation Under TestMMIMan-Machine InterfaceMSCMessage Sequence ChartNAPTRNaming Authority Pointer RecordNASNon Access StratumNATNetwork Address TranslationNGNNext Generation NetworkNSName ServerNWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITTProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of ObservationPO_UEPoint of ObservationPO_UEPoint of ObservationPO_UERadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control	-	6
AS(IMS) Application ServerATSAbstract Test SuiteCF(Test) ConFigurationDL/ULDownLink/UpLinkENUME.164 Number MappingEPCEvolved Packet CoreE-UTRANEnhanced Universal Terrestrial Radio Access NetworkGSMAGSM AssociationIOPInterOPerabilityIPXInternet Packet eXchangeIUTImplementation Under TestMMIMan-Machine InterfaceMSCMessage Sequence ChartNAPTRNaming Authority Pointer RecordNASNon Access StratumNATNetwork Address TranslationNGNNext Generation NetworkNSName ServerNWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control		
ATSAbstract Test SuiteCF(Test) ConFigurationDL/ULDownLink/UpLinkENUME.164 Number MappingEPCEvolved Packet CoreE-UTRANEnhanced Universal Terrestrial Radio Access NetworkGSMAGSM AssociationIOPInterOPerabilityIPXInternet Packet eXchangeIUTImplementation Under TestMMIMan-Machine InterfaceMSCMessage Sequence ChartNAPTRNaming Authority Pointer RecordNASNon Access StratumNATNetwork Address TranslationNGNNext Generation NetworkNSName ServerNWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control		
CF(Test) ConFigurationDL/ULDownLink/UpLinkENUME.164 Number MappingEPCEvolved Packet CoreE-UTRANEnhanced Universal Terrestrial Radio Access NetworkGSMAGSM AssociationIOPInterOPerabilityIPXInternet Packet eXchangeIUTImplementation Under TestMMIMan-Machine InterfaceMSCMessage Sequence ChartNAPTRNaming Authority Pointer RecordNASNon Access StratumNATNetwork Address TranslationNGNNext Generation NetworkNSName ServerNWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control		
DL/ULDownLink/UpLinkENUME.164 Number MappingEPCEvolved Packet CoreE-UTRANEnhanced Universal Terrestrial Radio Access NetworkGSMAGSM AssociationIOPInterOPerabilityIPXInternet Packet eXchangeIUTImplementation Under TestMMIMan-Machine InterfaceMSCMessage Sequence ChartNAPTRNaming Authority Pointer RecordNASNon Access StratumNATNetwork Address TranslationNGNNext Generation NetworkNSName ServerNWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control		
ENUME.164 Number MappingEPCEvolved Packet CoreE-UTRANEnhanced Universal Terrestrial Radio Access NetworkGSMAGSM AssociationIOPInterOPerabilityIPXInternet Packet eXchangeIUTImplementation Under TestMMIMan-Machine InterfaceMSCMessage Sequence ChartNAPTRNaming Authority Pointer RecordNASNon Access StratumNATNetwork Address TranslationNGNNext Generation NetworkNSName ServerNWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control	-	
EPCEvolved Packet CoreE-UTRANEnhanced Universal Terrestrial Radio Access NetworkGSMAGSM AssociationIOPInterOPerabilityIPXInternet Packet eXchangeIUTImplementation Under TestMMIMan-Machine InterfaceMSCMessage Sequence ChartNAPTRNaming Authority Pointer RecordNASNon Access StratumNATNetwork Address TranslationNGNNext Generation NetworkNSName ServerNWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control		
GSMAGSM AssociationIOPInterOPerabilityIPXInternet Packet eXchangeIUTImplementation Under TestMMIMan-Machine InterfaceMSCMessage Sequence ChartNAPTRNaming Authority Pointer RecordNASNon Access StratumNATNetwork Address TranslationNGNNext Generation NetworkNSName ServerNWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control	EPC	
IOPInterOPerabilityIPXInternet Packet eXchangeIUTImplementation Under TestMMIMan-Machine InterfaceMSCMessage Sequence ChartNAPTRNaming Authority Pointer RecordNASNon Access StratumNATNetwork Address TranslationNGNNext Generation NetworkNSName ServerNWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control	E-UTRAN	Enhanced Universal Terrestrial Radio Access Network
IPXInternet Packet eXchangeIUTImplementation Under TestMMIMan-Machine InterfaceMSCMessage Sequence ChartNAPTRNaming Authority Pointer RecordNASNon Access StratumNATNetwork Address TranslationNGNNext Generation NetworkNSName ServerNWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control	GSMA	GSM Association
IPXInternet Packet eXchangeIUTImplementation Under TestMMIMan-Machine InterfaceMSCMessage Sequence ChartNAPTRNaming Authority Pointer RecordNASNon Access StratumNATNetwork Address TranslationNGNNext Generation NetworkNSName ServerNWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRRCRadio Resource Control	IOP	InterOPerability
IUTImplementation Under TestMMIMan-Machine InterfaceMSCMessage Sequence ChartNAPTRNaming Authority Pointer RecordNASNon Access StratumNATNetwork Address TranslationNGNNext Generation NetworkNSName ServerNWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control	IPX	Internet Packet eXchange
MSCMessage Sequence ChartNAPTRNaming Authority Pointer RecordNASNon Access StratumNATNetwork Address TranslationNGNNext Generation NetworkNSName ServerNWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control	IUT	
NAPTRNaming Authority Pointer RecordNASNon Access StratumNATNetwork Address TranslationNGNNext Generation NetworkNSName ServerNWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control	MMI	Man-Machine Interface
NASNon Access StratumNATNetwork Address TranslationNGNNext Generation NetworkNSName ServerNWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control	MSC	Message Sequence Chart
NATNetwork Address TranslationNGNNext Generation NetworkNSName ServerNWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control	NAPTR	Naming Authority Pointer Record
NGNNext Generation NetworkNSName ServerNWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control	NAS	Non Access Stratum
NSName ServerNWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control	NAT	Network Address Translation
NWKNetworkPDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control	NGN	Next Generation Network
PDCPPacket Data Convergence ProtocolPGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control		Name Server
PGWPDN GatewayPHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control	NWK	Network
PHYPhysicalPIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control	PDCP	Packet Data Convergence Protocol
PIXITProtocol Implementation eXtra Information for TestingPMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control	PGW	PDN Gateway
PMNPublic Mobile NetworksPOPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control	PHY	
POPoint of ObservationPO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control		
PO_UEPoint of Observation on UERANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control		
RANRadio Access NetworkRCSRich Communication ServicesRELRELeaseRRCRadio Resource Control	-	
RCSRich Communication ServicesRELRELeaseRRCRadio Resource Control		
RELRELeaseRRCRadio Resource Control		
RRC Radio Resource Control		
SGW Serving Gateway		
	SGW	Serving Gateway

SIP UA	SIP User Agent
SUT	System Under Test
TD	Test Description
TN	Telephone Number
TP	Test Purpose
TSS	Test Suite Structure
UL	UpLink
UNI	User Network Interface

4 Test Environment

4.1 Introduction

The following architectural test configurations are referenced in the VoLTE NNI interoperability emergency TDs in the present document. They are intended to give a general rather than a specific view of the required connections between IMS and EPC network SUT(s) and associated UE(s), PSAP(s), AS(s), and DNS(s)/ENUM(s). Other configuration variants are currently not in the scope of the present document.

9

NOTE: Note that in the following figures observable Diameter interfaces are indicated as a solid green line, SIP interfaces are indicated as a solid blue line and user data interfaces are indicated as a solid yellow line. Non-observable interfaces are indicated as dashed lines.

4.2 Test configurations/architecture

4.2.1 Configuration CF_VoLTE_INT_ES

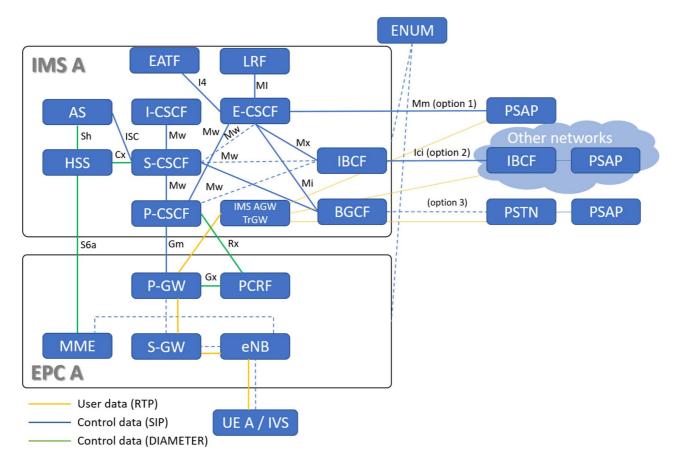
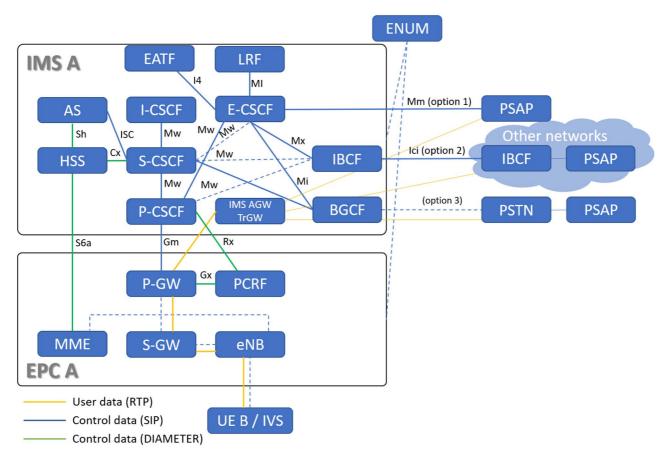


Figure 1: Configuration CF_VoLTE_INT_ES

Configuration CF_VoLTE_INT_ES is used for one home public line mobile network (HPLMN) where users are attached and registered to their home network. The suffix INT stands for home interoperability scenario and ES postfix stands for Emergency service. UE-A or IVS connects to home network represented by EPC A and IMS A. E-CSCF may route emergency IMS session directly to PSAP (option 1). Another option is routing of emergency IMS session from E-CSCF towards IBCF to another IP multimedia network towards PSAP (option 2 in the Figure 1) and to support legacy networks E-CSCF may route emergency IMS session to the BGCF via PSTN and towards PSAP (option 3 in the Figure 1). Attachment, Registration, Detachment and Deregistration procedures of user are performed locally in their own home network. For Call establishment, call modification and call release procedures signalling are going in HPLMN network and therefore all related TDs are named as home interoperability tests.

10

NOTE: It is assumed that operator emergency requests are forwarded from P-CSCF to E-CSCF as described in ETSI TS 124 229 [2], clause 5.2.10.3 (item 1B).

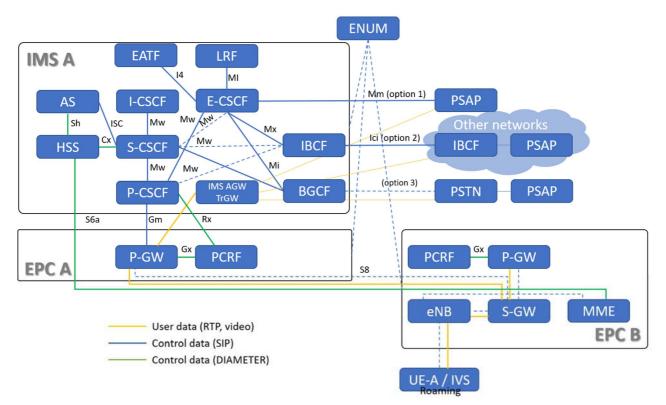


4.2.2 Configuration CF_VoLTE_RMI_ES



Configuration CF_VoLTE_RMI_ES describes roaming scenario. Within CF_VoLTE_RMI_ES, UE-B connects to the visited network A attached to the EPC A. Attachment and detachment of UE-B is performed at the visited network A and provides the ability to subsequently register the visiting user UE-B or IVS at the home network. For call establishment, call modification and call release procedures signalling are going via VPLMN network and therefore all related TDs are named as roaming interoperability tests. Visited E-CSCF may route emergency IMS session directly to PSAP (option 1). Another option is routing of emergency IMS session from visited E-CSCF towards IBCF to another IP multimedia network towards PSAP (option 2) and to support legacy networks visited E-CSCF may route emergency IMS session to the BGCF via PSTN and towards PSAP (option 3).

NOTE: It is assumed that operator emergency requests are forwarded from P-CSCF to E-CSCF as described in ETSI TS 124 229 [2], clause 5.2.10.3 (item 1B).



11

4.2.3 Configuration CF_VoLTE_RMI_S8HR

Figure 3: Configuration CF_VoLTE_RMI_S8HR

Configuration CF_VoLTE_RMI_S8HR describes an additional roaming scenario. Within CF_VoLTE_RMI_S8HR, UE-A connects to visited network B attached to the EPC B. Attachment and detachment of UE-A is performed at the visited network A and provides the ability to subsequently register the visited user UE-A at the home network over the S8 interface. UE_A or IVS acts as originating user and when an emergency call is trying to be established the signalling runs from UE_A or IVS over roaming/visited network B towards the home network A. The related roaming interoperability configuration is named CF_VoLTE_RMI_S8HR where 'S8' signifies routing over interface S8.

4.3 Test infrastructure

4.3.1 Introduction

The present clause covers the list of relevant emergency service components and interfaces used for testing interoperability between EPC, PCRF and IMS. VoLTE/ViLTE components are described in ETSI TS 103 653-2 [16] under clause 4.3. For components that are not present here or in ETSI TS 103 653-2 [16], standard functionality is assumed.

4.3.2 VoLTE component descriptions

4.3.2.1 E-CSCF

The E-CSCF is a component of the IP Multimedia Subsystem (IMS) network responsible for managing emergency sessions. When an emergency session request is received from a P-CSCF or an S-CSCF, the E-CSCF performs several functions, including validating the user's credentials and location information, requesting additional information if necessary, and determining the proper routing information for the session. The E-CSCF may also use the Location Retrieval Function (LRF) to retrieve or validate location information, and it may route the emergency session to an appropriate destination such as a Public Safety Answering Point (PSAP), including anonymous sessions. Overall, the E-CSCF ensures that emergency sessions are routed and managed appropriately throughout the IMS network and may generate Call Detail Records (CDRs) for billing or other purposes.

4.3.2.2 LRF

The LRF is responsible for managing location information in IMS networks. It receives location information from different sources such as the Home Subscriber Server (HSS), User Equipment (UE), and other network elements. The LRF processes this information to determine the location of a user or a device within the network.

4.3.2.3 EATF

EATF is a component of IMS that enables the transfer of emergency calls from a non-IMS network to an IMS network.

When a user initiates an emergency call from a non-IMS network (such as a traditional circuit-switched network), the call is first routed to a gateway that connects the non-IMS network to the IMS network. The gateway then sends the call to the EATF, which determines the appropriate IMS emergency service to handle the call.

The EATF is responsible for identifying the user's location, which is essential for routing the call to the appropriate emergency service. It also ensures that emergency calls receive priority treatment in the IMS network, including resource allocation and admission control.

4.3.3 VoLTE Reference Points and Protocols

4.3.3.1 The Mw reference point between x-CSCF and x-CSCF (SIP)

The Mw interface is between an x-CSCF and another x-CSCF within the IMS core network (e.g. P-CSCF to E-CSCF). The protocols used on the Mw interface are SIP and SDP and are defined in ETSI TS 124 229 [2].

4.3.3.2 The MI reference point between E-CSCF and LRF

MI is a reference point between an E-CSCF and an LRF. See ETSI TS 123 167 [14].

4.3.3.3 The Mx reference point between E-CSCF and IBCF

Mx is a reference point between an E-CSCF and an IBCF. See ETSI TS 123 167 [14].

4.3.3.4 The I4 reference point between E-CSCF and EATF

I4 is a reference point between an E-CSCF and an EATF. See ETSI TS 123 167 [14].

4.3.3.5 The Mm reference point between E-CSCF and PSAP

Mm is a reference point between an E-CSCF and an PSAP. See ETSI TS 123 167 [14].

4.3.3.6 The Mi reference point between E-CSCF and BGCF

Mm is a reference point between an E-CSCF and an BGCF. See ETSI TS 123 167 [14].

4.3.4 Applicable 3GPP Release Number

Considering that the purposes of these tests is to prove base IOP between two different systems from potentially different vendors, the functionality has been limited to common/typical procedures, while exhaustive conformance testing is out of the scope of the present document. The present document is aimed at Release 15 but (given its scope), Release 14 implementations should still be able to perform most of the tests without major difficulties.

13

4.4 Test pre-requisites

4.4.1 IP Version

Whether the EPC system uses Ipv4 or Ipv6 to transport (i.e. tunnelling method) the User Plane data inside the EPS is irrelevant to the outcome of the tests. Options for encapsulating either Ipv4 or Ipv6 packets into both Ipv4 and Ipv6 transported tunnels exist. There are no differences in the User Plane provided services by the EPC platform relevant to the used IP transport version, such that this decision can be taken by the EPC vendors as to maximize performance and optimize their platforms.

The UE attachment to the EPS is assumed to be a dual Ipv4 and Ipv6. It is assumed that for the test purposes, the IMS client software will be capable of SIP signalling and media transport over both protocol version. The choice will be a configuration parameter (e.g. P-CSCF provisioned address in ISIM, DHCP or DNS). The SDP media should use the same IP version protocol as discovered for SIP signalling.

The IMS-EPC IOP Test Suite will be executed once for IMS clients using Ipv4 and once for IMS clients using Ipv6.

4.4.2 Number Resolution

"ENUM (IETF RFC 3761 [i.2]) is a capability that transforms E.164 numbers into domain names and then uses the DNS (Domain Name System) to discover NAPTR records that specify the services available for a specific domain name" (ETSI TR 184 008 [i.1]).

The test infrastructure focuses on the use of Infrastructure ENUM to map a telephone number into a SIP URI that may identify a specific Point of Interconnection (PoI) to that communication provider's network that may enable the originating party to establish communication with the associated terminating party either directly or through an IPX.

The Infrastructure ENUM platform has a tiered structure and provides authoritative, service specific information to the querying party. A combination of Tier 0, Tier 1 and Tier 2 registries enables global discovery of ENUM data.

When returning the SIP URI of a PoI the ENUM solution acts a hosted T2 ENUM registry for the number range holder. When returning a NS record the ENUM solution acts as either a Tier 0 or Tier 1 registry.

4.4.3 QoS aspects

The present document describes only the functional signalling aspects of the interworking of IMS networks. ETSI TS 103 189 [i.3] defines a set of test descriptions that allow the evaluation of the Quality of Service (QoS) that is available on a connection established via the NNI interface between two Ues following the use cases and test descriptions described in the present document. Wherever QoS testing can be applied a link is given to the relevant clause of ETSI TS 103 189 [i.3].

4.5 Test description overview

The test descriptions are documented in clauses 5 and 6.

Clause 5 represents test descriptions in the single network (non-roaming) case and clauses 6 in the roaming case respectively. For each clause, the test descriptions are presented in the following groupings:

- Emergency attachment and Emergency Registration;
- Emergency SIP Session/Emergency Bearer Operations:
 - Emergency SIP Session Establishment.

- Emergency SIP Session Modification.
- Emergency SIP Session Release.
- Emergency SIP Session Abort/Reject.
- Emergency De-registration (with/without Emergency sessions).
- Emergency Detachment (with/without SIP sessions, with/without Emergency registration).

The Test Descriptions present a definitive signalling and procedural flow through the test's execution. As a very high number of test variations may be generated, here only the most common scenarios are approached.

Each Test Description can be reconfigured to test various aspects (e.g. Ipv4 and Ipv6 IMS registrations). Yet these reconfigurations are to be regarded only as specific to the individual test executions as they should not affect the test descriptions.

4.6 TD naming convention

TDs are numbered, starting at 01, within each group.

Identifier: <td></td>		Identifier: <td>_<type>_<group>_<network>_<scope>_<nn></nn></scope></network></group></type></td>						_ <type>_<group>_<network>_<scope>_<nn></nn></scope></network></group></type>
	= Test Description:	fixed to "TD"						
<type></type>	= Communication:	VoLTE						
<group></group>	= Emergency:	EMC - Emergency Call						
		NGC - NG eCall						
		ECO - Emergency Call or NG eCall (common)						
<network></network>	= Network:	INT - Interoperability						
		RMI - Roaming						
<scope></scope>	= Group	ATT - Attachment						
		REG - Registration						
		INI - Session establishment and modification						
		REL - Session Release						
		ABT - Session Abort						
		REJ - Session Rejection						
		DRG - Deregistration						
		DTC - Detachment						
<nn></nn>	= Sequential number	(01 to 99)						

Table 1: TD identifier naming convention scheme

5 Test Descriptions (Interoperability at HPLMN)

5.0 General

The Interoperability Test Descriptions (TDs) defined in the following clauses are derived from the Emergency Test Purposes (TPs) specified in ETSI TS 103 795-1 [1] (ones containing ECO, EMC or NGC identifier are related to the emergency TPs) and common VoLTE/ViLTE Test Purposes (TPs) specified in ETSI TS 103 653-1 [15], where each TD may realize one or more TPs.

15

Each TD contains three parts:

- 1) The TD itself in tabular format.
- 2) The call flow associated to the TD.
- 3) A textual description of the call flow.

5.1 Network Attachment

5.1.1 UE Emergency Network Attachment and Establishment of the Emergency Bearer with USIM

Interoperability Test Description					
Identifier:	TD_VoLTE_ECO_INT_ATT_01				
Objective:	To perform UE emergency attachment to the network with USIM and establish an				
	emergency bearer.				
Summary:	On successful emergency attachment, the UE/IVS should discover the P-CSCF IP				
	address.				
	The EPC will create the Emergency Bearers which will allow communication only				
	between the UE and the P-CSCF and allowed forwarding towards E-CSCF.				
Configuration:	CF_VoLTE_INT_ES				
SUT:	IMS A and EPC A				
Interfaces:	Gx, S6a				
References:	ETSI TS 124 229 [2], clauses 9.2.1 and L.2.2.6				
	Gx ETSI TS 129 212 [7], clauses 4.5.15 and 4a.5.12				
	S6a ETSI TS 129 272 [8], clause 5.2.1.1 (MME shall proceed even if Update				
	Location fails)				
Pre-test	Network emergency attachment credential provisioned in UE A, HSS/SPR and				
conditions:	PCRF.				
	HSS/SPR and UE A provisioned with selectable emergency APN configurations				
	for Ipv4, Ipv6 or Ipv4&Ipv6 PDN types.				
	P-CSCF address provisioned in the PCRF for the purpose of delivery to UE on				
	emergency attachment.				
	Emergency Bearer PCRF policies set to allow UE A - P-CSCF communication				
	Default EPC Gating Policy set to "Deny".				
	UE A contains USIM and is not attached to network and EPC.				
Test Sequence:	Step				
	1 UE A starts emergency network attachment to EPC				
	2 Verify that the message sequence is correct				
	3 Verify that EPC establishes Emergency Bearer for allowing UE A - P-CSCF				
	communication, by starting at UE A an Emergency registration				
	4 Verify that UE A attached successfully and received the following information:				
	 suitable lpv4 and/or lpv6 address(es) 				
	DNS configuration information				
	P-CSCF IP address or FQDN				
	5 Verify that arbitrary IP packets from UE A to arbitrary node, other than the				
	P-CSCF, are filtered-out by EPC and not visible on PO_Sgi				
	6 Verify that arbitrary IP packets from another node (e.g. PSAP sent over				
	PO_Sgi) to UE A, are filtered-out by EPC and not visible on PO_UE A				

			Interoperability Test Description
Conformance	2	S6a	TP_S6A_MME_ULR_01 (ULR - Event 2)
criteria of test		S6a	TP_S6A_HSS_ECO_ULA_01 (ULA - Event 3)
sequence step:		Gx	TP_GX_PCRF_ECO_CCA_01 (CCR, CCA - Events 4, 5)

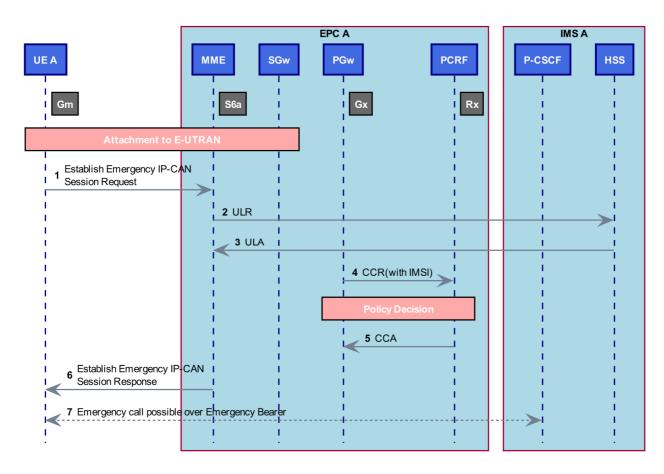


Figure 4: Emergency network attachment with USIM

- 1) The UE-A requests IP-CAN emergency session establishment to the EPC (MME).
- 2) The MME sends a ULR message to the HSS/SPR.
- 3) The HSS responds with ULA.
- 4) The PGW sends a CCR message with IMSI to the PCRF to request the emergency bearer.
- 5) The PCRF responds with a CCA.
- 6) The MME responds to the UE A, confirming that the emergency IP-CAN has been successfully set up.
- 7) User is informed that the emergency bearer has been successfully set up.

5.1.2 UE Emergency Network Attachment and Establishment of the Emergency Bearer without USIM

17

Interoperability Test Description					
dentifier: TD_VoLTE_EMC_INT_ATT_02					
Objective:	To perform UE emergency attachment to the network without USIM (related only to emergency call) and establish an emergency bearer.				
Summary:	On successful emergency attachment, the UE/IVS should discover the P-CSCF IP address. The EPC will create the Emergency Bearers which will allow communication only between the UE and the P-CSCF and allowed forwarding towards E-CSCF.				
Configuration:	CF Volte INT ES				
SUT:	IMS A and EPC A				
Interfaces:	Gx, S6a				
References:	ETSI TS 124 229 [2], clauses 9.2.1 and L.2.2.6 Gx ETSI TS 129 212 [7], clause 4.5.15 S6a ETSI TS 129 272 [8], clause 5.2.1.1 (MME shall proceed even if Update Location fails)				
Pre-test conditions:	 Network emergency attachment credential provisioned in UE A, HSS/SPR and PCRF. HSS/SPR and UE A provisioned with selectable emergency APN configurations for Ipv4, Ipv6 or Ipv4&Ipv6 PDN types. 				
	 P-CSCF address provisioned in the PCRF for the purpose of delivery to UE on emergency attachment. Emergency Bearer PCRF policies set to allow UE A - P-CSCF communication. Default EPC Gating Policy set to "Deny". UE A does not contain USIM and is not attached to network and EPC. 				
Test Sequence:	Step 1 UE A starts emergency network attachment to EPC 2 Verify that the message sequence is correct 3 Verify that EPC establishes Emergency Bearer for allowing UE A - P-CSCF communication, by starting at UE A an Emergency registration 4 Verify that UE A attached successfully and received the following information: suitable lpv4 and/or lpv6 address(es) DNS configuration information P-CSCF IP address or FQDN 5 Verify that arbitrary IP packets from UE A to arbitrary node, other than the P-CSCF, are filtered-out by EPC and not visible on PO_Sgi 6 Verify that arbitrary IP packets from another node (e.g. PSAP sent over PO_Sgi) to UE A, are filtered-out by EPC and not visible on PO_UE A				
Conformance criteria of test sequence step:	2 S6a TP_S6A_MME_ULR_01 (ULR - Event 2) S6a TP_S6A_HSS_ECO_ULA_01 (ULA - Event 3) Gx TP_GX_PCRF_EMC_CCA_01 (CCR, CCA - Events 4, 5)				

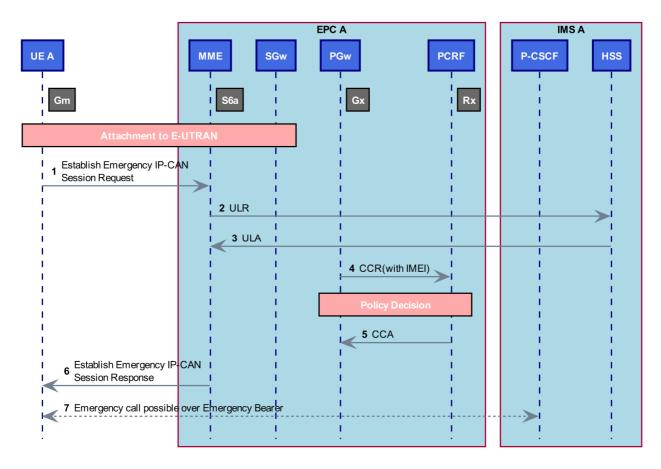


Figure 5: Emergency network attachment without USIM

- 1) The UE-A requests IP-CAN emergency session establishment to the EPC (MME).
- 2) The MME sends a ULR message to the HSS/SPR.
- 3) The HSS responds with ULA.
- 4) The PGW sends a CCR message with IMEI to the PCRF to request the emergency bearer.
- 5) The PCRF responds with a CCA.
- 6) The MME responds to the UE A, confirming that the emergency IP-CAN has been successfully set up.
- 7) User is informed that the emergency bearer has been successfully set up.

5.2 IMS Emergency Registration

5.2.1 IMS Emergency Registration - Successful

	Interoperability Test Description				
Identifier:	TD_VoLTE_ECO_INT_REG_01				
Objective:	To perform emergency registration via the established emergency bearer. Note that some Ues perform emergency registration automatically on attachment - in which case this test becomes merged with the previous ones.				
Summary:	During emergency registration, the P-CSCF shall request the PCRF to perform session binding onto the underlying emergency bearer. The PCRF should act on the request and modify the bearer. Subsequent signalling should make use of the respective bearer's QoS and priority characteristics.				
Configuration:	CF_VoLTE_INT_ES				
SUT:	IMS A and EPC A				
Interfaces:	Gm, Mw, Cx, Rx				

18

References: Gm, Mw ETSI TS 124 229 [2], clauses 5.1.1 and 5.1.6.1 Mw Mw ETSI TS 134 229-1 [13], clauses C.20 and 19.1.1.3 (items 2 and 3) Cx ETSI TS 129 228 [4], clauses 6.1.1, 6.1.2 and 6.3 and Annex G ETSI TS 129 229 [5], clause 6.1.1 Rx ETSI TS 129 229 [5], clause 6.1.1 Pre-test conditions: UE A previously attached to EPC and may be previously initially registered to IMS(see TD_VkLTE_INT_REG_01 in ETSI 103 653-2 [16], and an emergency bearer has been established. An emergency bearer allowing UE A - P-CSCF-E- CSCF IP communication. • UE A discovered the P-CSCF address. Test Sequence: I UE A triggers Emergency registration. 2 Verify that the message sequence is correct. 3 3 Verify that IMS included a Media Description for emergency signalling according to UE A.IP_Address, UE A.SIP_Port, PCSCF.IP_Address, PCSCF.SIP_Port. 4 Verify that UE A can exchange subsequent signalling with IMS. 6 Verify that UE A subsequent signalling is transported with appropriate PCC characteristics.	Interoperability Test Description				
Pre-test conditions: • UE A previously attached to EPC and may be previously initially registered to IMS(see TD_VkLTE_INT_REG_01 in ETSI 103 653-2 [16], and an emergency bearer has been established. An emergency bearer allowing UE A - P-CSCF-E- CSCF IP communication. • HSS provisioned with UE A' subscription. • UE A discovered the P-CSCF address. Test Sequence: 1 UE A triggers Emergency registration. 2 Verify that the message sequence is correct. 3 Verify that IMS included a Media Description for emergency signalling according to UE A.IP_Address, UE A.SIP_Port, PCSCF.IP_Address, PCSCF.SIP_Port. 4 Verify that UE PCRF successfully provisioned QOS rules to the EPC on the emergency bearer. 5 Verify that UE A subsequent signalling is transported with appropriate PCC characteristics. Conformance criteria of test sequence step: 2 2 Gm TP_GM_PCSCF_ECO_REGISTER_01 (Events 1, 12) Gm Mw TP_MW_PCSCF_ECO_REGISTER_02 (Events 14, 21) Mw Mw TP_MW_PCSCF_ECO_REGISTER_02 (Events 14, 21) Mw Mw TP_MW_ICSCF_ECO_REGISTER_01 (Events 7, 10) Mw Mw TP_MW_ICSCF_ECO_REGISTER_01 (Events 17, 20) Cx	References:	Mw	ETSI TS 124 229 [2], clauses 5.1.1 and 5.1.6.1 ETSI TS 134 229-1 [13], clauses C.20 and 19.1.1.3 (items 2 and 3) ETSI TS 129 228 [4], clauses 6.1.1, 6.1.2 and 6.3 and Annex G		
conditions: IMS(see TD_VXLTE_INT_REG_01 in ETSI 103 653-2 [16], and an emergency bearer has been established. An emergency bearer allowing UE A - P-CSCF-E-CSCF IP communication. • HSS provisioned with UE A' subscription. • UE A discovered the P-CSCF address. Test Sequence: 1 UE A triggers Emergency registration. 2 Verify that the message sequence is correct. 3 Verify that IMS included a Media Description for emergency signalling according to UE A.IP_Address, UE A.SIP_Port, PCSCF.IP_Address, PCSCF.SIP_Port. 4 Verify that the PCRF successfully provisioned QOS rules to the EPC on the emergency bearer. 5 Verify that UE A can exchange subsequent signalling with IMS. 6 Verify that UE A subsequent signalling is transported with appropriate PCC characteristics. Conformance criteria of test sequence step: 2 Mw TP_GM_PCSCF_ECO_REGISTER_01 (Events 1, 12) Gm Mw TP_MW_PCSCF_ECO_REGISTER_01 (Events 1, 21) Mw Mw TP_MW_PCSCF_ECO_REGISTER_02 (Events 14, 21) Mw Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 14, 21) Mw Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 14, 21) Mw Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 17, 20) Cx Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 17, 20) Cx Mw		Rx	ETSI TS 129 214 [6], clause A.5		
conditions: IMS(see TD_VXLTE_INT_REG_01 in ETSI 103 653-2 [16], and an emergency bearer has been established. An emergency bearer allowing UE A - P-CSCF-E-CSCF IP communication. • HSS provisioned with UE A' subscription. • UE A discovered the P-CSCF address. Test Sequence: 1 UE A triggers Emergency registration. 2 Verify that the message sequence is correct. 3 Verify that IMS included a Media Description for emergency signalling according to UE A.IP_Address, UE A.SIP_Port, PCSCF.IP_Address, PCSCF.SIP_Port. 4 Verify that the PCRF successfully provisioned QOS rules to the EPC on the emergency bearer. 5 Verify that UE A can exchange subsequent signalling with IMS. 6 Verify that UE A subsequent signalling is transported with appropriate PCC characteristics. Conformance criteria of test sequence step: 2 Mw TP_GM_PCSCF_ECO_REGISTER_01 (Events 1, 12) Gm Mw TP_MW_PCSCF_ECO_REGISTER_01 (Events 1, 21) Mw Mw TP_MW_PCSCF_ECO_REGISTER_02 (Events 14, 21) Mw Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 14, 21) Mw Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 14, 21) Mw Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 17, 20) Cx Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 17, 20) Cx Mw	P				
UE A discovered the P-CSCF address. Test Sequence: Step 1 UE A triggers Emergency registration. 2 Verify that the message sequence is correct. 3 Verify that IMS included a Media Description for emergency signalling according to UE A.IP_Address, UE A.SIP_Port, PCSCF.IP_Address, PCSCF.SIP_Port. 4 Verify that the PCRF successfully provisioned QOS rules to the EPC on the emergency bearer. 5 Verify that UE A can exchange subsequent signalling with IMS. 6 Verify that UE A subsequent signalling is transported with appropriate PCC characteristics. Conformance criteria of test sequence step: 2 Gm TP_GM_PCSCF_ECO_REGISTER_01 (Events 1, 12) Gm TP_GM_PCSCF_ECO_REGISTER_02 (Events 13, 22) Mw TP_MW_PCSCF_ECO_REGISTER_01 (Events 4, 11) Mw TP_MW_PCSCF_ECO_REGISTER_02 (Events 14, 21) Mw TP_MW_ICSCF_ECO_REGISTER_01 (Events 7, 10) Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 17, 20) Cx TP_CX_HSS_ECO_UAA_01 (UAR, UAA - Events 5, 6)	conditions:	IN be	IS(see TD_VxLTE_INT_REG_01 in ETSI 103 653-2 [16], and an emergency earer has been established. An emergency bearer allowing UE A - P-CSCF- E-		
Step 1 UE A triggers Emergency registration. 2 Verify that the message sequence is correct. 3 Verify that IMS included a Media Description for emergency signalling according to UE A.IP_Address, UE A.SIP_Port, PCSCF.IP_Address, PCSCF.SIP_Port. 4 Verify that the PCRF successfully provisioned QOS rules to the EPC on the emergency bearer. 5 Verify that UE A can exchange subsequent signalling with IMS. 6 Verify that UE A subsequent signalling is transported with appropriate PCC characteristics. Conformance criteria of test sequence step: 2 Gm TP_GM_PCSCF_ECO_REGISTER_01 (Events 1, 12) Gm Gm TP_GM_PCSCF_ECO_REGISTER_02 (Events 13, 22) Mw Mw TP_MW_PCSCF_ECO_REGISTER_01 (Events 4, 11) Mw Mw TP_MW_ICSCF_ECO_REGISTER_01 (Events 7, 10) Mw Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 17, 20) Cx Cx TP_CX_HSS_ECO_UAA_01 (UAR, UAA - Events 5, 6)		• H	SS provisioned with UE A' subscription.		
1 UE A triggers Emergency registration. 2 Verify that the message sequence is correct. 3 Verify that IMS included a Media Description for emergency signalling according to UE A.IP_Address, UE A.SIP_Port, PCSCF.IP_Address, PCSCF.SIP_Port. 4 Verify that the PCRF successfully provisioned QOS rules to the EPC on the emergency bearer. 5 Verify that UE A can exchange subsequent signalling with IMS. 6 Verify that UE A subsequent signalling is transported with appropriate PCC characteristics. Conformance 2 Gm TP_GM_PCSCF_ECO_REGISTER_01 (Events 1, 12) Gm TP_GM_PCSCF_ECO_REGISTER_02 (Events 13, 22) Mw TP_MW_PCSCF_ECO_REGISTER_02 (Events 14, 21) Mw TP_MW_PCSCF_ECO_REGISTER_02 (Events 14, 21) Mw TP_MW_ICSCF_ECO_REGISTER_01 (Events 7, 10) Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 17, 20) Cx TP_CX_HSS_ECO_UAA_01 (UAR, UAA - Events 5, 6)		• U	E A discovered the P-CSCF address.		
1 UE A triggers Emergency registration. 2 Verify that the message sequence is correct. 3 Verify that IMS included a Media Description for emergency signalling according to UE A.IP_Address, UE A.SIP_Port, PCSCF.IP_Address, PCSCF.SIP_Port. 4 Verify that the PCRF successfully provisioned QOS rules to the EPC on the emergency bearer. 5 Verify that UE A can exchange subsequent signalling with IMS. 6 Verify that UE A subsequent signalling is transported with appropriate PCC characteristics. Conformance 2 Gm TP_GM_PCSCF_ECO_REGISTER_01 (Events 1, 12) Gm TP_GM_PCSCF_ECO_REGISTER_02 (Events 13, 22) Mw TP_MW_PCSCF_ECO_REGISTER_02 (Events 14, 21) Mw TP_MW_PCSCF_ECO_REGISTER_02 (Events 14, 21) Mw TP_MW_ICSCF_ECO_REGISTER_01 (Events 7, 10) Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 17, 20) Cx TP_CX_HSS_ECO_UAA_01 (UAR, UAA - Events 5, 6)					
2 Verify that the message sequence is correct. 3 Verify that IMS included a Media Description for emergency signalling according to UE A.IP_Address, UE A.SIP_Port, PCSCF.IP_Address, PCSCF.SIP_Port. 4 Verify that the PCRF successfully provisioned QOS rules to the EPC on the emergency bearer. 5 Verify that UE A can exchange subsequent signalling with IMS. 6 Verify that UE A subsequent signalling is transported with appropriate PCC characteristics. Conformance criteria of test sequence step: 2 Gm TP_GM_PCSCF_ECO_REGISTER_01 (Events 1, 12) Gm Gm TP_GM_PCSCF_ECO_REGISTER_02 (Events 13, 22) Mw Mw TP_MW_PCSCF_ECO_REGISTER_01 (Events 4, 11) Mw Mw TP_MW_PCSCF_ECO_REGISTER_01 (Events 7, 10) Mw Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 14, 21) Mw Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 17, 20) Cx TP_CX_HSS_ECO_UAA_01 (UAR, UAA - Events 5, 6) 10	Test Sequence:	Step			
3 Verify that IMS included a Media Description for emergency signalling according to UE A.IP_Address, UE A.SIP_Port, PCSCF.IP_Address, PCSCF.SIP_Port. 4 Verify that the PCRF successfully provisioned QOS rules to the EPC on the emergency bearer. 5 Verify that UE A can exchange subsequent signalling with IMS. 6 Verify that UE A subsequent signalling is transported with appropriate PCC characteristics. Conformance criteria of test sequence step: 2 Gm TP_GM_PCSCF_ECO_REGISTER_01 (Events 1, 12) Gm Mw TP_MW_PCSCF_ECO_REGISTER_02 (Events 13, 22) Mw Mw TP_MW_PCSCF_ECO_REGISTER_01 (Events 4, 11) Mw Mw TP_MW_PCSCF_ECO_REGISTER_02 (Events 14, 21) Mw Mw TP_MW_ICSCF_ECO_REGISTER_01 (Events 7, 10) Mw Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 17, 20) Cx Cx TP_CX_HSS_ECO_UAA_01 (UAR, UAA - Events 5, 6)					
Conformance criteria of test sequence step: 2 Gm TP_GM_PCSCF_ECO_REGISTER_01 (Events 1, 12) Gm TP_GM_PCSCF_ECO_REGISTER_02 (Events 13, 22) Mw Mw TP_MW_PCSCF_ECO_REGISTER_01 (Events 4, 11) Mw TP_MW_PCSCF_ECO_REGISTER_02 (Events 14, 21) Mw TP_MW_ICSCF_ECO_REGISTER_01 (Events 7, 10) Mw Mw TP_MW_ICSCF_ECO_REGISTER_01 (Events 7, 20) Cx TP_CA_HSS_ECO_UAA_01 (UAR, UAA - Events 5, 6)					
PCSCF.SIP_Port. 4 Verify that the PCRF successfully provisioned QOS rules to the EPC on the emergency bearer. 5 Verify that UE A can exchange subsequent signalling with IMS. 6 Verify that UE A subsequent signalling is transported with appropriate PCC characteristics. Conformance criteria of test sequence step: 2 Gm TP_GM_PCSCF_ECO_REGISTER_01 (Events 1, 12) Gm TP_GM_PCSCF_ECO_REGISTER_02 (Events 13, 22) Mw TP_MW_PCSCF_ECO_REGISTER_01 (Events 4, 11) Mw TP_MW_PCSCF_ECO_REGISTER_02 (Events 14, 21) Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 14, 21) Mw TP_MW_ICSCF_ECO_REGISTER_01 (Events 7, 10) Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 17, 20) Cx TP_CX_HSS_ECO_UAA_01 (UAR, UAA - Events 5, 6)		3			
emergency bearer. 5 Verify that UE A can exchange subsequent signalling with IMS. 6 Verify that UE A subsequent signalling is transported with appropriate PCC characteristics. Conformance criteria of test sequence step: 2 Gm TP_GM_PCSCF_ECO_REGISTER_01 (Events 1, 12) Gm TP_GM_PCSCF_ECO_REGISTER_02 (Events 13, 22) Mw TP_MW_PCSCF_ECO_REGISTER_01 (Events 4, 11) Mw TP_MW_PCSCF_ECO_REGISTER_01 (Events 4, 11) Mw TP_MW_PCSCF_ECO_REGISTER_02 (Events 14, 21) Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 17, 20) Cx TP_CX_HSS_ECO_UAA_01 (UAR, UAA - Events 5, 6)			PCSCF.SIP_Port.		
5 Verify that UE A can exchange subsequent signalling with IMS. 6 Verify that UE A subsequent signalling is transported with appropriate PCC characteristics. Conformance criteria of test sequence step: 2 Gm TP_GM_PCSCF_ECO_REGISTER_01 (Events 1, 12) Gm TP_GM_PCSCF_ECO_REGISTER_02 (Events 13, 22) Mw TP_MW_PCSCF_ECO_REGISTER_01 (Events 4, 11) Mw TP_MW_PCSCF_ECO_REGISTER_01 (Events 4, 11) Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 14, 21) Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 17, 20) Cx TP_CX_HSS_ECO_UAA_01 (UAR, UAA - Events 5, 6)		4	,		
characteristics. Conformance criteria of test sequence step: 2 Gm TP_GM_PCSCF_ECO_REGISTER_01 (Events 1, 12) Gm TP_GM_PCSCF_ECO_REGISTER_02 (Events 13, 22) Mw Mw TP_MW_PCSCF_ECO_REGISTER_01 (Events 4, 11) Mw TP_MW_PCSCF_ECO_REGISTER_02 (Events 14, 21) Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 14, 21) Mw Mw TP_MW_ICSCF_ECO_REGISTER_01 (Events 7, 10) Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 17, 20) Cx TP_CX_HSS_ECO_UAA_01 (UAR, UAA - Events 5, 6)		5			
Conformance 2 Gm TP_GM_PCSCF_ECO_REGISTER_01 (Events 1, 12) criteria of test Gm TP_GM_PCSCF_ECO_REGISTER_02 (Events 13, 22) sequence step: Mw TP_MW_PCSCF_ECO_REGISTER_01 (Events 4, 11) Mw TP_MW_PCSCF_ECO_REGISTER_02 (Events 14, 21) Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 14, 21) Mw TP_MW_ICSCF_ECO_REGISTER_01 (Events 7, 10) Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 17, 20) Cx TP_CX_HSS_ECO_UAA_01 (UAR, UAA - Events 5, 6)		6	Verify that UE A subsequent signalling is transported with appropriate PCC		
criteria of test sequence step:GmTP_GM_PCSCF_ECO_REGISTER_02 (Events 13, 22)MwTP_MW_PCSCF_ECO_REGISTER_01 (Events 4, 11)MwTP_MW_PCSCF_ECO_REGISTER_02 (Events 14, 21)MwTP_MW_ICSCF_ECO_REGISTER_02 (Events 7, 10)MwTP_MW_ICSCF_ECO_REGISTER_02 (Events 17, 20)CxTP_CX_HSS_ECO_UAA_01 (UAR, UAA - Events 5, 6)					
MwTP_MW_ICSCF_ECO_REGISTER_01 (Events 7, 10)MwTP_MW_ICSCF_ECO_REGISTER_02 (Events 17, 20)CxTP_CX_HSS_ECO_UAA_01 (UAR, UAA - Events 5, 6)	Conformance criteria of test sequence step:	2	Gm TP_GM_PCSCF_ECO_REGISTER_02 (Events 13, 22)		
Mw TP_MW_ICSCF_ECO_REGISTER_02 (Events 17, 20) Cx TP_CX_HSS_ECO_UAA_01 (UAR, UAA - Events 5, 6)					
Cx TP_CX_HSS_ECO_UAA_01 (UAR, UAA - Events 5, 6)					
Cx TP_CX_HSS_ECO_UAA_02 (UAR, UAA - Events 15, 16)					
Cx TP_CX_HSS_ECO_0AA_02 (0AR, 0AA - Events 15, 16) Cx TP_CX_HSS_SAA_01 (SAR, SAA - Events 18, 19)					
3 Rx TP_RX_PCSCF_ECO_AAR_01 (AAR - Event 2)		3			
Rx TP_RX_PCRF_ECO_AAA_01 (AAA - Event 3)		Ŭ			

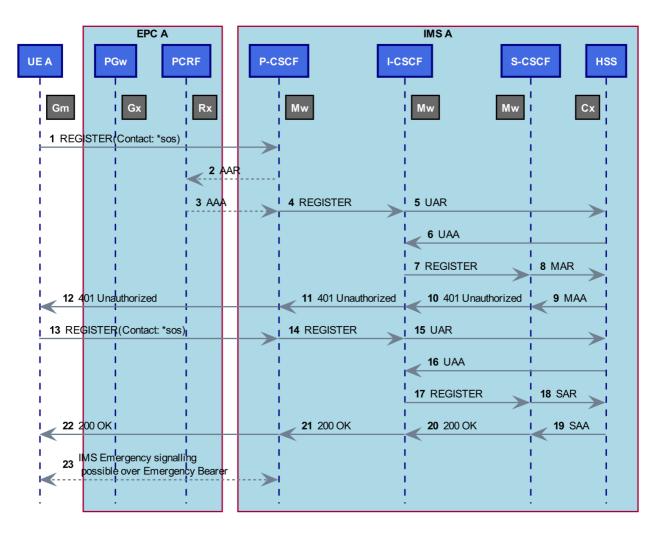


Figure 6: Emergency Registration (success)

- 1) The UE-A requests IMS A Registration.
- 2) P-CSCF optionally sent AAR to PCRF to provide EPC-level identities (MSISDN, IMSI, IMEI).
- 3) PSRF responds with AAA.
- 4) P-CSCF forwards the REGISTER to I-CSCF.
- 5) I-CSCF sends UAR to HSS.
- 6) HSS responds with UAA.
- 7) I-CSCF forwards the REGISTER to S-CSCF.
- 8) S-CSCF sends MAR to HSS.
- 9) HSS responds with MAA.
- 10) IMS A rejects the REGISTER and issues a challenge.
- 11) I-CSCF forwards 401 response to P-CSCF.
- 12) P-CSCF forwards 401 response to UE-A.
- 13) The REGISTER is re-sent with an Authorization header.
- 14) P-CSCF forwards the REGISTER to I-CSCF.
- 15) I-CSCF sends UAR to HSS.

ETSI

20

- 16) HSS responds with UAA.
- 17) I-CSCF forwards the REGISTER to S-CSCF.
- 18) S-CSCF sends SAR to HSS.
- 19) HSS responds with SAA.
- 20) The IMS registration is successful.
- 21) I-CSCF forwards 200 response to P-CSCF.
- 22) P-CSCF forwards 200 response to UE-A.
- 23) IMS Emergency signalling possible over Emergency Bearer.

5.2.2 IMS Emergency Registration - Unsuccessful

		Interoperability Test Description	
Identifier:	TD_VoLT	E_ECO_INT_REG_02	
Objective:	case, the Emergen	ot initial emergency registration via the established emergency bearer. In this emergency registration is not successful due to not accepted UE credentials. cy call can be established without emergency registration (see E_ECO_INT_INI_02).	
Summary:	On failed UE emergency Registration to IMS, IMS will be able to transport emergency signalling.		
Configuration:		E_INT_ES	
SUT:	IMS A an	d EPC A	
Interfaces:	Gm, Mw,	Cx, Rx	
References:	Gm, Mw Rx Cx	ETSI TS 124 229 [2], clauses 5.1.6.2, 5.2.10.5 ETSI TS 134 229-1 [13], clause 19.4.5 ETSI TS 129 214 [6], clause A.5 ETSI TS 129 228 [4], clause 6.1.1.1	
Pre-test conditions:	• EF • HS	E A previously attached to EPC, but not registered to IMS. PC established a Default Bearer allowing UE A - P-CSCF IP communication. SS of IMS not provisioned with UE A's subscription. E A discovered the P-CSCF address.	
Test Sequence:	Step		
	1 2 3	UE A triggers Emergency registration with not acceptable credentials. Verify that the Emergency registration has been rejected. Verify that the PCRF is not invoked.	
Conformance criteria of test sequence step:	2	GmTP_GM_PCSCF_ECO_REGISTER_01 (Events 1, 12)GmTP_GM_PCSCF_ECO_REGISTER_03 (Events 13, 22)MwTP_MW_PCSCF_ECO_REGISTER_01 (Events 4, 11)MwTP_MW_PCSCF_ECO_REGISTER_03 (Events 14, 21)MwTP_MW_ICSCF_ECO_REGISTER_01 (Events 7, 10)MwTP_MW_ICSCF_ECO_REGISTER_03 (Events 17, 20)CxTP_CX_HSS_ECO_UAA_01 (UAR, UAA - Events 5, 6)CxTP_CX_HSS_ECO_UAA_01 (MAR, MAA - Events 8, 9)CxTP_CX_HSS_ECO_UAA_02 (UAR, UAA - Events 15, 16)CxTP_CX_HSS_ECO_SAA_01 (SAR, SAA - Events 18, 19)RxTP_RX_PCSCF_ECO_AAR_01 (AAR - Event 3)	

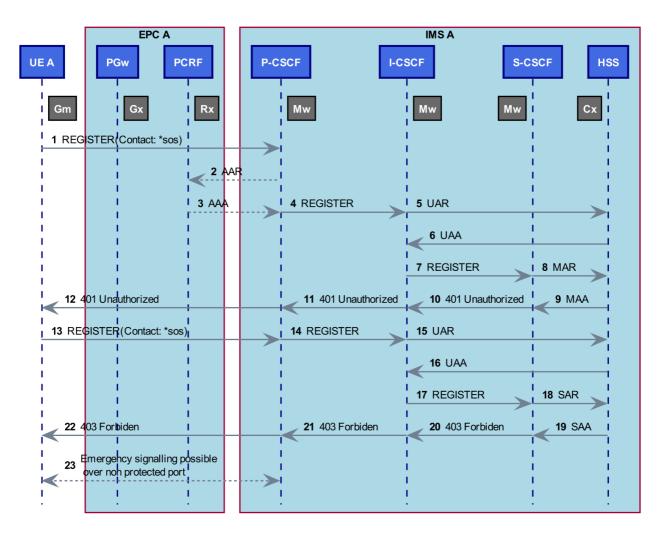


Figure 7: IMS Initial Registration (unsuccessful)

- 1) The UE-A requests IMS A Registration.
- 2) P-CSCF optionally sent AAR to PCRF to provide EPC-level identities (MSISDN, IMSI, IMEI).
- 3) PCRF responds with AAA.
- 4) P-CSCF forwards the REGISTER to I-CSCF.
- 5) I-CSCF sends UAR to HSS.
- 6) HSS responds with UAA.
- 7) I-CSCF forwards the REGISTER to S-CSCF.
- 8) S-CSCF sends MAR to HSS.
- 9) HSS responds with MAA.
- 10) IMS A rejects the REGISTER and issues a challenge.
- 11) I-CSCF forwards 401 response to P-CSCF.
- 12) P-CSCF forwards 401 response to UE-A.
- 13) The REGISTER is re-sent with an Authorization header.
- 14) P-CSCF forwards the REGISTER to I-CSCF.
- 15) I-CSCF sends UAR to HSS.

- 16) HSS responds with UAA.
- 17) I-CSCF forwards the REGISTER to S-CSCF.
- 18) S-CSCF sends SAR to HSS.
- 19) HSS responds with SAA.
- 20) The IMS registration is unsuccessful.
- 21) I-CSCF forwards 403 Forbidden response to P-CSCF.
- 22) P-CSCF forwards 403 Forbidden response to UE-A.
- 23) Emergency signalling possible over non protected port.

5.3 Emergency Session and Emergency Bearer Operations (Interoperability)

5.3.0 Introduction

5.3.1 Emergency Session Establishment

5.3.1.1 General

The term "initiates an emergency call" or "initiates an NG eCall" used in the test descriptions describes the use of a service URN with a top-level service type "sos", which marks the user intends to establish an emergency call.

Some examples of the services with a top-level service type "sos" and the short descriptions provided in IETF RFC 5031 [18] and IETF RFC 8147 [19] can be found in Table 1.

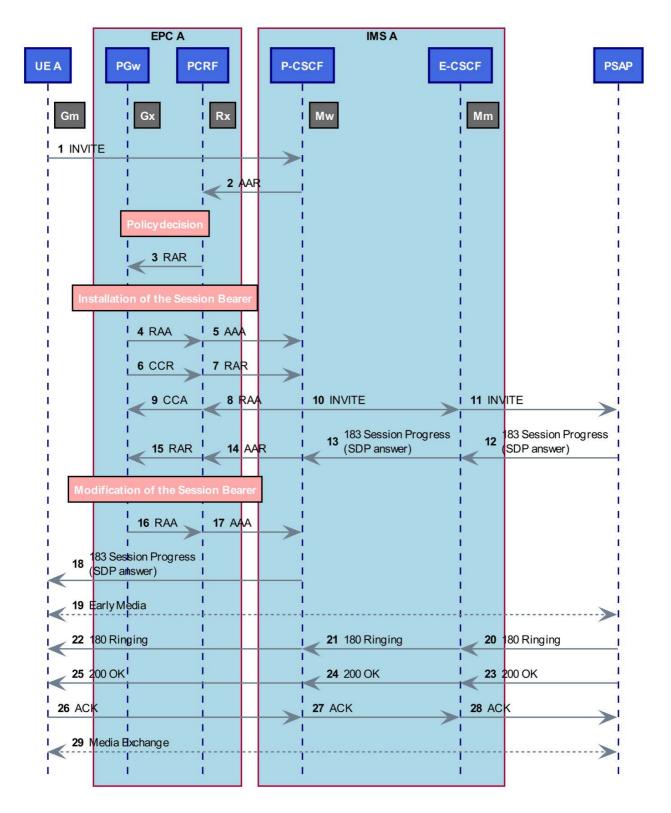
Table 1: URN services

URN-Service	Short Description (see IETF RFC 5031 [18] and IETF RFC 8147 [19])
urn:service:sos	The generic 'sos' service reaches a Public Safety Answering Point (PSAP)
urn:service:sos.ambulance	This service identifier reaches an ambulance service that provides emergency medical assistance and transportation.
urn:service:sos.fire	The 'fire' service identifier summons the fire service, also known as the fire brigade or fire department.
urn:service:sos.gas	The 'gas' service allows the reporting of natural gas leaks or other natural gas emergencies.
urn:service:sos.police	The 'police' service refers to the police department or other law enforcement authorities.
urn:service:sos.ecall.automatic	The 'ecall' service indicating automatically triggered eCall.
urn:service:sos.ecall.manual	The 'ecall' service indicating manually triggered eCall.

5.3.1.2 UE calling PSAP with emergency registration

Identifier:	TD_VoL	TE_ECO_INT_INI_01			
Objective:		nstrate the establishment of dedicated bearers at the originating EPC due to			
,	SIP emergency session establishment within an emergency registration.				
	PSAP is located in the IM CN subsystem of IMS A.				
Summary:		gency call is setup between UE A and the PSAP located in the IM CN			
	subsystem of IMS A.				
	UE-A is attached to EPC A and registered to IMS A, has performed the emergency				
	registration to IMS A, and requests emergency session establishment using an				
	emergency URN.				
	The P-CSCF derives descriptions of the Service Data Flow from the SDP data, requests				
	creation of adequate bearers from PCRF and EPC, and forwards the request to the E-				
	CSCF.				
	to this PS	SCF retrieves the PSAP URI from local configuration and forwards the request			
		-			
	Media na	ansport is possible only after the successful establishment of the session.			
		egotiation happens during INVITE/200 OK (UE A sends SDP-offer, PSAP			
0		s with SDP-answer).			
Configuration:		TE_INT_ES option 1			
SUT:		PC A and PSAP			
Interfaces:		Rx, Gx, Mm			
References:	Mm	ETSI TS 124 229 [2], clause 5.11.2			
		ETSI TS 123 167 [14]			
	Gm,	ETSI TS 124 229 [2], clauses 5.1.6.8.3, 5.1.6.11, 5.2.6.3.3, 5.2.10.3 and			
	Mw	5.11.2			
	Rx	ETSI TS 129 214 [6], clauses 4.4.1, A.1, A.2 and annex B			
	Gx	ETSI TS 129 212 [7], clause 4.5.2			
Pre-test	• U	E A previously attached to EPC A.			
conditions:		E A previously registered to IMS A.			
	 EPC established an emergency Bearer allowing UE A - P-CSCF IP 				
		ommunication.			
	A F	PC established an IMS signalling bearer			
		PC established an IMS signalling bearer.			
	• P	SAP is registered or connected to the IMS A and ready to accept the session			
	• P:	SAP is registered or connected to the IMS A and ready to accept the session stablishment.			
	• P:	SAP is registered or connected to the IMS A and ready to accept the session			
Test Sequence:	• P es • U	SAP is registered or connected to the IMS A and ready to accept the session stablishment.			
Test Sequence:	• P: es • U Step	SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration.			
Test Sequence:	• P es • U	SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration.			
Test Sequence:	• Pi es • U <u>Step</u> 1	SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment.			
Test Sequence:	• P: es • U Step	 SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using 			
Test Sequence:	• P- es • U <u>Step</u> 1 2	 SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. 			
Test Sequence:	• Pi es • U <u>Step</u> 1	 SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that 			
Test Sequence:	• P- es • U <u>Step</u> 1 2	 SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the 			
Test Sequence:	• P- es • U <u>Step</u> 1 2	SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency			
Test Sequence:	• P- es • U <u>Step</u> 1 2	SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency URNs defined in			
Test Sequence:	• P- es • U Step 1 2 3	SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency URNs defined in Table 1.			
Test Sequence:	• P- es • U <u>Step</u> 1 2	SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency URNs defined in Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP			
Test Sequence:	• P- es • U Step 1 2 3	SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency URNs defined in Table 1.			
Test Sequence:	• P- es • U Step 1 2 3	 SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency URNs defined in Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. 			
Test Sequence:	• P- es • U Step 1 2 3 4	 SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency URNs defined in Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. 			
Test Sequence:	• P- es • U Step 1 2 3 4	 SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency URNs defined in Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. 			
Test Sequence:	 Preserved U Step 1 2 3 4 5 	 SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency URNs defined in Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a 			
Test Sequence:	 Preserved U Step 1 2 3 4 5 6 	 SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency URNs defined in Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. 			
Test Sequence:	 Preserved U Step 1 2 3 4 5 	 SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency URNs defined in Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC 			
Test Sequence:	 Preserved U Step 1 2 3 4 5 6 	 SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency URNs defined in Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the 			
Test Sequence:	 Preserved U Step 1 2 3 4 5 6 7 	 SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency URNs defined in Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF. 			
Test Sequence:	 Preserved U Step 1 2 3 4 5 6 	 SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency URNs defined in Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the 			
Test Sequence:	 Provide the second se	 SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency URNs defined in Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that PCRF requested media. Verify that PCRF requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. 			
Test Sequence:	 Preserved U Step 1 2 3 4 5 6 7 	 SAP is registered or connected to the IMS A and ready to accept the session stablishment. E A previously performed emergency registration. Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency uRNs defined in Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that PCRF requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the 			

Conformance	2	Gm	TP_GM_PCSCF_ECO_INVITE_02 (Event1)
criteria of test	3	Gm	TP_GM_PCSCF_ECO_REGISTER_02 (Pre-test)
sequence step:	4	Mw	TP_MW_PCSCF_ECO_INVITE_02 (Event 10)
		Mm	TP_MM_ECSCF_ECO_INVITE_01 (Event 11)
	6/7	Rx	TP_RX_PCSCF_AAR_03 (AAR - Event 2)
		Rx	TP_RX_PCSCF_AAR_04 (AAR - Event 14)
		Rx	TP_RX_PCRF_AAA_02 (AAA - Events 5, 17)
		Gx	TP_GX_PCRF_RAR_01 (RAR - Events 3, 15)
		Rx	TP_RX_PCSCF_RAA_01 (RAR, RAA - Events 7, 8)
		Gx	TP_GX_PGW_RAA_02 (RAA - Events 4, 16)
		Gx	TP_GX_PCRF_CCA_06 (CCR, CCA - Events 6, 9)
	8	Rtp	TP_RTP_ECO_03 (Event 29)



NOTE 1: The interaction in above figure is the same for emergency registered and non-emergency registered UE. NOTE 2: In the above figure, the Gx interaction may take place after completion of the Rx interaction.

Figure 8: Emergency Session Establishment with emergency registration, PSAP in same IM CN subsystem

- 1) UE A initiates the emergency session with an INVITE request. The From header field includes the public user identity (registered via emergency registration) or the tel URI associated with the public user identity (registered via emergency registration).
- 2) The IMS A P-CSCF invokes the PCRF.

- 3) PCRF sends RAR to EPC A PGW.
- 4) EPC A PGW responds with RAA.
- 5) PCRF responds to IMS A P-CSCF with AAA.
- 6) EPC A P- GW sends CCR.
- 7) PCRF sends RAR to P-CSCF.
- 8) P-CSCF responds with RAA.
- 9) PCRF responds with CCA to PGW.
- 10) P-CSCF sends the INVITE to E-CSCF.
- 11) E-CSCF sends the INVITE to PSAP.
- 12) PSAP responds with the 183 response with SDP answer to E-CSCF.
- 13) E-CSCF sends the 183 response to P-CSCF.
- 14) The IMS A P-CSCF invokes the PCRF to modify the bearer with AAR.
- 15) PCRF sends RAR to EPC A PGW.
- 16) EPC A PGW responds with RAA.
- 17) PCRF responds to IMS A P-CSCF with AAA.
- 18) P-CSCF forwards the SIP 183 (SDP) to UE A.
- 19) Early media may flow between the UE A and PSAP.
- 20) The PSAP responds with the 180 Ringing to E-CSCF.
- 21) E-CSCF forwards the 180 to P-CSCF.
- 22) P-CSCF forwards the SIP 180 to UE A.
- 23) PSAP sends 200 OK to E-CSCF.
- 24) E-CSCF forwards the 200 OK to P-CSCF.
- 25) P-CSCF forwards the 200 OK towards UE A.
- 26) UE A sends ACK to P-CSCF.
- 27) P-CSCF sends ACK to E-CSCF.
- 28) E-CSCF sends ACK to PSAP.
- 29) Media Exchange.

5.3.1.3 UE calling PSAP with non-emergency registration

Interoperability Test Description		
Identifier:	TD_VoLTE_ECO_INT_INI_02	
Objective:	To demonstrate the establishment of dedicated bearers at the originating EPC due to SIP emergency session establishment within non-emergency registration. PSAP is located in the IM CN subsystem of IMS A.	

		Interoperability Test Description	
Summary:	An emer	gency call is setup between UE A and the PSAP located in the IM CN	
-		em of IMS A.	
		attached to EPC A and registered to IMS A, has NOT performed the emergency	
	registrati	ion to IMS A, and requests emergency session establishment using an	
		ncy URN.	
	The P-C	SCF derives descriptions of the Service Data Flow from the SDP data, requests	
	creation	of adequate bearers from PCRF and EPC, and forwards the request to the E-	
	CSCF.		
	The E-C	SCF retrieves the PSAP URI from local configuration and forwards the request	
	to this P		
	Media transport is possible only after the successful establishment of the session.		
	Media ne	egotiation happens during INVITE/200 OK (UE A sends SDP-offer, PSAP	
	responde	s with SDP-answer).	
Configuration:		TE_INT_ES option 1	
SUT:	IMS A ar	nd EPC A	
Interfaces:	Gm, Mw	, Rx, Gx, Mm	
References:	Mm	ETSI TS 124 229 [2], clause 5.11.2	
		ETSI TS 123 167 [14]	
	Gm,	ETSI TS 124 229 [2], clauses 5.1.6.8.4, 5.2.6.3.3, 5.2.10.4 and 5.11.2	
	Mw		
	Rx	ETSI TS 129 214 [6], clauses 4.4.1, A.1, A.2 and annex B	
	Gx	ETSI TS 129 212 [7], clause 4.5.2	
Pre-test	• U	IE A previously attached to EPC A.	
conditions:		IE A previously registered to IMS A.	
		PC established a non-emergency Bearer allowing UE A - P-CSCF IP	
		ommunication.	
	-	IE A previously registered to IMS A.	
		PC established an IMS signalling bearer.	
		SAP is registered or connected to the IMS A and ready to accept the session	
		stablishment.	
		IE A has not performed emergency registration.	
	- 0		
Test Sequence:	Step		
Test Sequence:	Step	Verify that media between UE A and PSAP is not delivered in any direction	
Test Sequence:		Verify that media between UE A and PSAP is not delivered in any direction before call establishment.	
Test Sequence:			
Test Sequence:	1	before call establishment. UE A initiates an emergency call to establish a communication session using	
Test Sequence:	1	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency	
Test Sequence:	1	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1).	
Test Sequence:	1 2	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP	
Test Sequence:	1 2	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1).	
Test Sequence:	1 2 3	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF.	
Test Sequence:	1 2 3	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to	
Test Sequence:	1 2 3 4	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media.	
Test Sequence:	1 2 3 4	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC	
Test Sequence:	1 2 3 4 5	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC	
Test Sequence:	1 2 3 4 5	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media.	
Test Sequence:	1 2 3 4 5	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and emergency bearers are established and that a RA-Answer is sent to the	
Test Sequence:	1 2 3 4 5 6	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and emergency bearers are established and that a RA-Answer is sent to the PCRF.	
Test Sequence:	1 2 3 4 5 6	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and emergency bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer.	
Test Sequence:	1 2 3 4 5 6 7	before call establishment.UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1).Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network.Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF.Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media.Verify that PCRF requested media description was found acceptable by EPC and emergency bearers are established and that a RA-Answer is sent to the PCRF.Verify that media between UE A and PSAP is successfully routed over the	
Test Sequence:	1 2 3 4 5 6 7	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and emergency bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. Verify that media between UE A and PSAP is transported with appropriate	
Test Sequence:	1 2 3 4 5 6 7	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and emergency bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. Verify that media between UE A and PSAP is transported with appropriate	
	1 2 3 4 5 6 7 8	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and emergency bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. Verify that media between UE A and PSAP is transported with appropriate PCC characteristics.	
Conformance	1 2 3 4 5 6 7 8 2	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and emergency bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. Verify that media between UE A and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_03 (Event1) Mw TP_MW_PCSCF_ECO_INVITE_03 (Event 10)	
Conformance criteria of test	1 2 3 4 5 6 7 8 2	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and emergency bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. Verify that media between UE A and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_03 (Event1) Mw TP_MW_PCSCF_ECO_INVITE_01 (Event 11)	
Conformance criteria of test	1 2 3 4 5 6 7 8 8 2 4	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and emergency bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. Verify that media between UE A and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_03 (Event1) Mw TP_MW_PCSCF_ECO_INVITE_01 (Event 11) Rx TP_RX_PCSCF_AAR_03 (AAR - Event 2)	
Conformance criteria of test	1 2 3 4 5 6 7 8 8 2 4	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and emergency bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. Verify that media between UE A and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_03 (Event1) Mw TP_MW_PCSCF_ECO_INVITE_01 (Event 10) Mm TP_RX_PCSCF_AAR_03 (AAR - Event 2) Rx TP_RX_PCSCF_AAR_04 (AAR - Event 14)	
Conformance criteria of test	1 2 3 4 5 6 7 8 8 2 4	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and emergency bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. Verify that media between UE A and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_03 (Event1) Mw TP_MM_ECSCF_ECO_INVITE_01 (Event 11) Rx TP_RX_PCSCF_AAR_03 (AAR - Event 2) Rx TP_RX_PCRF_AAA_02 (AAA - Event 14) Rx TP_RX_PCRF_AAA_02 (AAA - Event 5, 17)	
Conformance criteria of test	1 2 3 4 5 6 7 8 8 2 4	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and emergency bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. Verify that media between UE A and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_03 (Event1) Mw TP_MM_ECSCF_ECO_INVITE_01 (Event 11) Rx TP_RX_PCSCF_AAR_03 (AAR - Event 2) Rx TP_RX_PCSCF_AAR_02 (AAA - Event 5, 17) Gx TP_GX_PCRF_RAR_01 (RAR - Events 3, 15)	
Conformance criteria of test	1 2 3 4 5 6 7 8 8 2 4	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and emergency bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. Verify that media between UE A and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_03 (Event1) Mw TP_MM_PCSCF_ECO_INVITE_01 (Event 10) Mm TP_RX_PCSCF_AAR_04 (AAR - Event 2) Rx TP_RX_PCSF_AAR_02 (AAA - Event 14) Rx TP_RX_PCRF_AAA_02 (AAA - Event 3, 15) Rx TP_RX_PCSCF_RAA_01 (RAR, RAA - Events 7, 8)	
Conformance criteria of test	1 2 3 4 5 6 7 8 8 2 4	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and emergency bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. Verify that media between UE A and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_03 (Event1) Mw TP_MM_PCSCF_ECO_INVITE_01 (Event 11) Rx TP_RX_PCSCF_AAR_03 (AAR - Event 2) Rx TP_RX_PCSCF_AAR_02 (AAA - Event 3, 15) Rx TP_RX_PCSCF_RAA_01 (RAR, RAA - Events 7, 8) Gx TP_GX_PCW_RAA_02 (RAA - Events 4, 18)	
Conformance criteria of test	1 2 3 4 5 6 7 8 8 2 4	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1). Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. Verify that IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and emergency bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. Verify that media between UE A and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_03 (Event1) Mw TP_MW_PCSCF_ECO_INVITE_01 (Event 10) Mm TP_RX_PCSCF_AAR_04 (AAR - Event 2) Rx TP_RX_PCSF_AAR_02 (AAA - Event 14) Rx TP_RX_PCSF_RAR_01 (RAR - Events 3, 15) Rx TP_RX_PCSCF_RAA_01 (RAR, RAA - Events 7, 8)	

The message sequence as depicted in Figure 8 applies without changes.

5.3.1.4 UE calling PSAP without any registration

	Interoperability Test Description			
Identifier:	TD_VoLTE_ECO_INT_INI_03			
Objective:	To demonstrate the establishment of emergency bearers at the originating EPC due to SIP emergency session establishment without any registration. PSAP is located in the IM CN subsystem of IMS A.			
Summary:	An emergency call is setup between UE A and the PSAP located in the IM CN subsystem of IMS A.			
	UE-A is attached to EPC A but NOT registered to IMS A, has NOT performed the emergency registration to IMS A, and requests emergency session establishment using an emergency URN. The P-CSCF derives descriptions of the Service Data Flow from the SDP data, requests			
	creation of adequate bearers from PCRF and EPC, and forwards the request to the E- CSCF. The E-CSCF retrieves the PSAP URI from local configuration and forwards the request			
	to this PSAP. Media transport is possible only after the successful establishment of the session. Media negotiation happens during INVITE/200 OK (UE A sends SDP-offer, PSAP responds with SDP-answer).			
Configuration:	CF_VoLTE_INT_ES option 1			
SUT:	IMS A and EPC A			
Interfaces:	Gm, Mw, Rx, Gx, Mm			
References:	Mm ETSI TS 124 229 [2], clause 5.11.2 ETSI TS 123 167 [14]			
	Gm, ETSI TS 124 229 [2], clauses 5.1.6.8.2, 5.2.6.3.3, 5.2.10.2 and 5.11.2 Mw			
	Rx ETSI TS 129 214 [6], clauses 4.4.1, A.1, A.2 and annex B			
	Gx ETSI TS 129 212 [7], clause 4.5.2			
Pre-test	UE A previously emergency attached to EPC A.			
conditions:	• EPC established a default bearer allowing UE A - P-CSCF IP communication.			
	 PSAP is registered or connected to the IMS A and ready to accept the session establishment. 			
	UE A previously not registered to IMS A.			
	UE A has not performed emergency registration.			
	UE A discovered the P-CSCF address.			
Test Sequence:	Step			
	1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment.			
	2 UE A initiates an emergency call to establish a communication session using an emergency service URN.			
	3 Verify that the UE A sets the From header field of the INVITE request to "Anonymous" as specified in IETF RFC 3261 [12] and a To header indicating one of the emergency URNs defined in Table 1.			
	 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. 			
	5 Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF.			
	 6 Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media. 			
	 Verify that PCRF requested media description was found acceptable by EPC and emergency bearers are established and that a RA-Answer is sent to the PCRF. 			
	8 Verify that media between UE A and PSAP is successfully routed over the dedicated bearer.			
	9 Verify that media between UE A and PSAP is transported with appropriate			

Interoperability Test Description			
Conformance	2/3	Gm	TP_GM_PCSCF_ECO_INVITE_01 (Event 1)
criteria of test	4	Mw	TP_MW_PCSCF_ECO_INVITE_01 (Event 10)
sequence step:		Mm	TP_MM_ECSCF_ECO_INVITE_01 (Event 11)
	6/7	Rx	TP_RX_PCSCF_AAR_03 (AAR - Event 2)
		Rx	TP_RX_PCSCF_AAR_04 (AAR - Event 14)
		Rx	TP_RX_PCRF_AAA_02 (AAA - Events 5, 17)
		Gx	TP_GX_PCRF_RAR_01 (RAR - Events 3, 15)
		Rx	TP_RX_PCSCF_RAA_01 (RAR, RAA - Events 7, 8)
		Gx	TP_GX_PGW_RAA_02 (RAA - Events 4, 18)
		Gx	TP_GX_PCRF_CCA_06 (CCR, CCA - Events 6, 9)
	8	Rtp	TP_RTP_ECO_03 (Event 29)

30

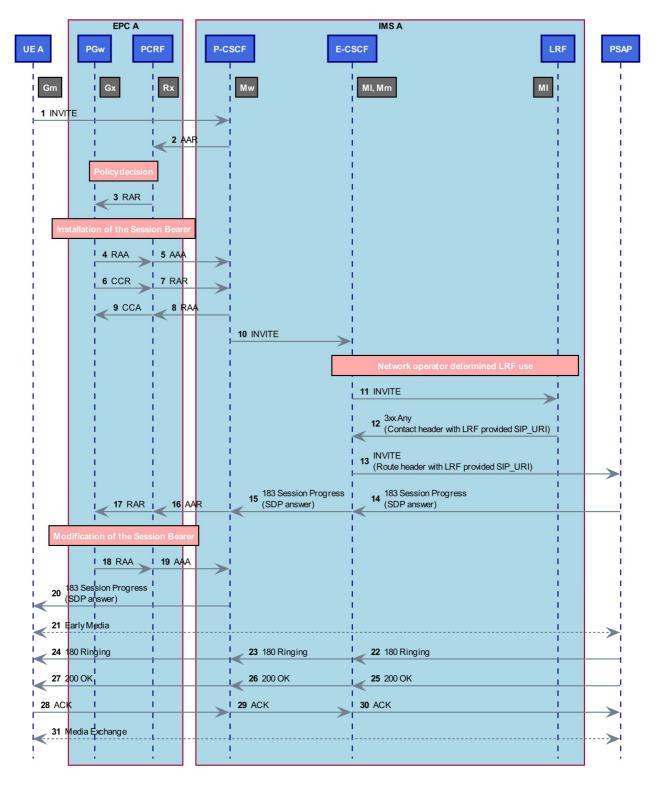
The message sequence as depicted in Figure 8 applies with the following changes:

- 1) UE A initiates the emergency session with an INVITE request. The From header field of the INVITE request is set to "Anonymous" as specified in IETF RFC 3261 [12].
- 10) P-CSCF sends the INVITE to E-CSCF. The From header field of the INVITE request is set to "Anonymous".

5.3.1.5 UE calling PSAP in same network, LRF derived PSAP URI

Identifier:	TD_VoLTE_ECO_INT_INI_04
Objective:	To demonstrate the establishment of dedicated bearers at the originating EPC due to SIP emergency session establishment within an emergency registration.
	PSAP is located in the IM CN subsystem of IMS A. The PSAP URI is delivered by the LRF.
Summary:	An emergency call is setup between UE A and the PSAP located in the IM CN subsystem of IMS A. UE-A is attached to EPC A and registered to IMS A, has performed the emergency registration to IMS A, and requests emergency session establishment using an emergency URN. The P-CSCF derives descriptions of the Service Data Flow from the SDP data, requests creation of adequate bearers from PCRF and EPC, and forwards the request to the E- CSCF. The E-CSCF, where the network operator determines that an LRF is to be used, routes the emergency session establishment request to the LRF, derives the PSAP URI from the LRF response and forwards the request to this PSAP. Media transport is possible only after the successful establishment of the session. Media negotiation happens during INVITE/200 OK (UE A sends SDP-offer, PSAP responds with SDP-answer).
Configuration:	CF_VoLTE_INT_ES option 1
SUT:	IMS A, EPC A and PSAP
Interfaces:	Gm, Mw, Rx, Gx, Mm, Ml
References:	Mm ETSI TS 124 229 [2], clause 5.11.2 ETSI TS 123 167 [14] Gm, ETSI TS 124 229 [2], clauses 5.1.6.8.3, 5.1.6.11, 5.2.6.3.3, 5.2.10.3 and
	Mw 5.11.2 MI ETSI TS 124 229 [2], clause 5.11.3 Rx ETSI TS 129 214 [6], clauses 4.4.1, A.1, A.2 and annex B Gx ETSI TS 129 212 [7], clause 4.5.2
Pre-test conditions:	 UE A previously attached to EPC A. UE A previously registered to IMS A. EPC established an emergency Bearer allowing UE A - P-CSCF IP communication. EPC established an IMS signalling bearer. PSAP is registered or connected to the IMS A and ready to accept the session establishment. UE A previously successful performed emergency registration.
	Network operator policy determines that an LRF is to be used.

Test Sequence:	Step	
	1	Verify that media between UE A and PSAP is not delivered in any direction
		before call establishment.
	2	UE A initiates an emergency call to establish a communication session using
		an emergency service URN.
	3	Verify that the UE A inserts in the INVITE request, a From header field that
		includes the public user identity registered via emergency registration or the
		tel URI associated with the public user identity registered via emergency
		registration and a To header indicating one of the emergency URNs defined in
		Table 1Table 1.
	4	Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI.
	5	Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in the
		same IM CN subsystem of the own network with the PSAP URI received from
		the LRF.
	6	Verify that the IMS produced a Media Description for the session according to
		SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF.
	7	Verify that the PCRF invokes the EPC PGW with a RA-Request to create a
		new bearer for the requested media.
	8	Verify that PCRF requested media description was found acceptable by EPC
		and dedicated bearers are established and that a RA-Answer is sent to the PCRF.
	9	Verify that media between UE A and PSAP is successfully routed over the dedicated bearer.
	10	Verify that media between UE A and PSAP is transported with appropriate
		PCC characteristics.
Conformance	2	Gm TP_GM_PCSCF_ECO_INVITE_02 (Event1)
criteria of test		Gm TP_GM_PCSCF_ECO_INVITE_04 for eCall (Event 1)
sequence step:	3	Gm TP_GM_PCSCF_ECO_REGISTER_02 (Pre-test)
	4	Mw TP_MW_PCSCF_ECO_INVITE_02 (Event 10)
		MI TP_ML_ECSCF_ECO_INVITE_01 (Event 11)
	5	MI/Mm TP_MM_ECSCF_ECO_INVITE_02 (Events 12, 13)
	7/8	Rx TP_RX_PCSCF_AAR_03 (AAR - Event 2)
		Rx TP_RX_PCSCF_AAR_04 (AAR - Event 16)
		Rx TP_RX_PCRF_AAA_02 (AAA - Events 5, 19)
		Gx TP_GX_PCRF_RAR_01 (RAR - Events 3, 17)
		Rx TP_RX_PCSCF_RAA_01 (RAR, RAA - Events 7, 8)
		Gx TP_GX_PGW_RAA_02 (RAA - Events 4, 18)
	9	GxTP_GX_PCRF_CCA_06 (CCR, CCA - Events 6, 9)RtpTP_RTP_ECO_03 (Event 31)
	Э	Rtp TP_RTP_ECO_03 (Event 31)



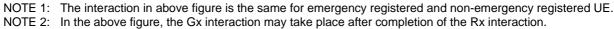


Figure 9: Emergency Session Establishment with LRF, PSAP in same IM CN subsystem

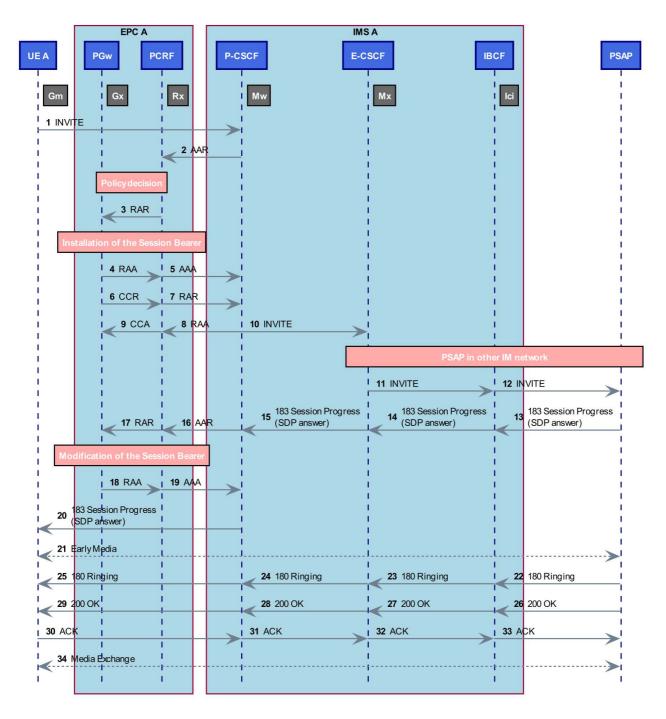
- 1) UE A initiates the emergency session with an INVITE request. The From header field includes the public user identity (registered via emergency registration) or the tel URI associated with the public user identity (registered via emergency registration).
- 2) The IMS A P-CSCF invokes the PCRF.
- 3) PCRF sends RAR to EPC A PGW.

- 4) EPC A PGW responds with RAA.
- 5) PCRF responds to IMS A P-CSCF with AAA.
- 6) EPC A P- GW sends CCR.
- 7) PCRF sends RAR to P-CSCF.
- 8) P-CSCF responds with RAA.
- 9) PCRF responds with CCA to PGW.
- 10) P-CSCF sends the INVITE to E-CSCF.
- 11) E-CSCF forwards the INVITE to LRF.
- 12) LRF responds with 3xx and includes PSAP URI in the Contact header.
- 13) E-CSCF sends the INVITE to PSAP with LRF provided PSAP URI in Route header.
- 14) PSAP responds with the 183 response with SDP answer to E-CSCF.
- 15) E-CSCF sends the 183 response to P-CSCF.
- 16) The IMS A P-CSCF invokes the PCRF to modify the bearer with AAR.
- 17) PCRF sends RAR to EPC A PGW.
- 18) EPC A PGW responds with RAA.
- 19) PCRF responds to IMS A P-CSCF with AAA.
- 20) P-CSCF forwards the SIP 183 (SDP) to UE A.
- 21) Early media may flow between the UE A and PSAP.
- 22) The PSAP responds with the 180 Ringing to E-CSCF.
- 23) E-CSCF forwards the 180 to P-CSCF.
- 24) P-CSCF forwards the SIP 180 to UE A.
- 25) PSAP sends 200 OK to E-CSCF.
- 26) E-CSCF forwards the 200 OK to P-CSCF.
- 27) P-CSCF forwards the 200 OK towards UE A.
- 28) UE A sends ACK to P-CSCF.
- 29) P-CSCF sends ACK to E-CSCF.
- 30) E-CSCF sends ACK to PSAP.
- 31) Media Exchange.

5.3.1.6 UE calling PSAP in another network via IBCF

Identifier:	TD_VoLTE_ECO_INT_INI_05
Objective:	To demonstrate the establishment of dedicated bearers at the originating EPC due to
	SIP emergency session establishment within an emergency registration.
	PSAP is located in the IM CN subsystem of another network connected via IBCF.

Summary: Configuration: SUT: Interfaces:	subsyste UE-A is a registration emergen The P-CS creation of CSCF. The E-CS to this PS Media tra Media ne responds CF_VoLT IMS A, E Gm, Mw,	SCF derives descriptions of the Service Data Flow from the SDP data, requests of adequate bearers from PCRF and EPC, and forwards the request to the E- SCF retrieves the PSAP URI from local configuration and forwards the request SAP in the other network via the IBCF. ansport is possible only after the successful establishment of the session. egotiation happens during INVITE/200 OK (UE A sends SDP-offer, PSAP is with SDP-answer). TE_INT_ES option 2 PC A and PSAP Rx, Gx, Mx
	Gm, Mw Mx Rx Gx	ETSI TS 124 229 [2], clauses 5.1.6.8.3, 5.1.6.11, 5.2.6.3.3, 5.2.10.3 and 5.11.2 ETSI TS 124 229 [2], clause 5.11.2 ETSI TS 129 214 [6], clauses 4.4.1, A.1, A.2 and annex B ETSI TS 129 212 [7], clause 4.5.2
Pro-toct		E A province by attached to EDC A
Pre-test conditions:	U El cc El F	E A previously attached to EPC A. E A previously registered to IMS A. PC established an emergency Bearer allowing UE A - P-CSCF IP ommunication. PC established an IMS signalling bearer. SAP is located outside of IMS A in another network. E A previously performed emergency registration.
Test Sequence:	Step 1 2 3 4 5 6 7 8 9	Verify that media between UE A and PSAP is not delivered in any direction before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in another network via the IBCF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. Verify that media between UE A and PSAP is transported with appropriate PCC characteristics.
Conformance	2	Cm TP CM PCSCE ECO INIVITE 02 (Event1)
	2	Gm TP_GM_PCSCF_ECO_INVITE_02 (Event1)
criteria of test		Gm TP_GM_PCSCF_ECO_INVITE_04 for eCall (Event 1)
sequence step:	3	Gm TP_GM_PCSCF_ECO_REGISTER_02 (Pre-test)
	4 6/7	Mw TP_MW_PCSCF_ECO_INVITE_02 (Event 10) Mx TP_MX_ECSCF_ECO_INVITE_01 (Event 11) Rx TP_RX_PCSCF_AAR_03 (AAR - Event 2)
		Rx TP_RX_PCSCF_AAR_04 (AAR - Event 16) Rx TP_RX_PCRF_AAA_02 (AAA - Events 5, 19) Gx TP_GX_PCRF_RAR_01 (RAR - Events 3, 17) Rx TP_RX_PCSCF_RAA_01 (RAR, RAA - Events 7, 8) Gx TP_GX_PGW_RAA_02 (RAA - Events 4, 18)
		Gx TP_GX_PCRF_CCA_06 (CCR, CCA - Events 6, 9)
	8	Rtp TP_RTP_ECO_03 (Event 34)



NOTE 1: The interaction in above figure is the same for emergency registered and non-emergency registered UE. NOTE 2: In the above figure, the Gx interaction may take place after completion of the Rx interaction.

Figure 10: Emergency Session Establishment, PSAP in another IM CN subsystem

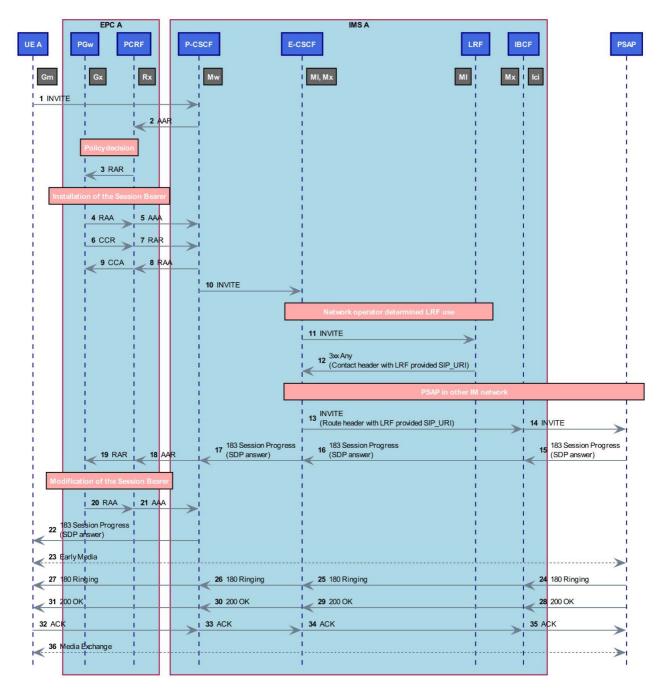
- 1) UE A initiates the emergency session with an INVITE request. The From header field includes the public user identity (registered via emergency registration) or the tel URI associated with the public user identity (registered via emergency registration).
- 2) The IMS A P-CSCF invokes the PCRF.
- 3) PCRF sends RAR to EPC A PGW.
- 4) EPC A PGW responds with RAA.
- 5) PCRF responds to IMS A P-CSCF with AAA.
- 6) EPC A P- GW sends CCR.

- 7) PCRF sends RAR to P-CSCF.
- 8) P-CSCF responds with RAA.
- 9) PCRF responds with CCA to PGW.
- 10) P-CSCF sends the INVITE to E-CSCF.
- 11) E-CSCF sends the INVITE to IBCF.
- 12) IBCF forwards the INVITE to PSAP.
- 13) PSAP responds with the 183 response with SDP answer to IBCF.
- 14) IBCF forwards the 183 response to E-CSCF.
- 15) E-CSCF sends the 183 response to P-CSCF.
- 16) The IMS A P-CSCF invokes the PCRF to modify the bearer with AAR.
- 17) PCRF sends RAR to EPC A PGW.
- 18) EPC A PGW responds with RAA.
- 19) PCRF responds to IMS A P-CSCF with AAA.
- 20) P-CSCF forwards the SIP 183 (SDP) to UE A.
- 21) Early media may flow between the UE A and PSAP.
- 22) The PSAP responds with the 180 Ringing to IBCF.
- 23) The IBCF forwards the 180 Ringing to E-CSCF.
- 24) E-CSCF forwards the 180 to P-CSCF.
- 25) P-CSCF forwards the SIP 180 to UE A.
- 26) The PSAP responds with the 200 OK to IBCF.
- 27) IBCF forwards the 200 OK to E-CSCF.
- 28) E-CSCF forwards the 200 OK to P-CSCF.
- 29) P-CSCF forwards the 200 OK towards UE A.
- 30) UE A sends ACK to P-CSCF.
- 31) P-CSCF sends ACK to E-CSCF.
- 32) E-CSCF sends ACK to IBCF.
- 33) IBCF forwards ACK to PSAP.
- 34) Media Exchange.

5.3.1.7 UE calling PSAP in another network via IBCF, LRF derived PSAP URI

Identifier:	TD_VoLTE_ECO_INT_INI_06
	To demonstrate the establishment of dedicated bearers at the originating EPC due to SIP emergency session establishment within an emergency registration. PSAP is located in the IM CN subsystem of another network connected via IBCF. The PSAP URI is delivered by the LRF.

-		
Summary:	An emer	gency call is setup between UE A and the PSAP located in the IM CN
Gammary.		
		em of another network.
		attached to EPC A and registered to IMS A, has performed the emergency
	registrati	ion to IMS A, and requests emergency session establishment using an
		ncy URN.
		SCF derives descriptions of the Service Data Flow from the SDP data, requests
	creation	of adequate bearers from PCRF and EPC, and forwards the request to the E-
	CSCF.	
	The E-C	SCF retrieves the PSAP URI from local configuration and forwards the request
		SAP in the other network via the IBCF.
	Media tra	ansport is possible only after the successful establishment of the session.
	Media ne	egotiation happens during INVITE/200 OK (UE A sends SDP-offer, PSAP
		s with SDP-answer).
O		
Configuration:		TE_INT_ES option 2
SUT:	IMS A, E	PC A and PSAP
Interfaces:	Gm Mw	, Rx, Gx, Mx, MI
Internacio.		
	Gm,	ETSI TS 124 229 [2], clauses 5.1.6.8.3, 5.1.6.11, 5.2.6.3.3, 5.2.10.3 and
	Mw	5.11.2
	MI	ETSI TS 124 229 [2], clause 5.11.3
	Mx	ETSI TS 124 229 [2], clause 5.11.2
	Rx	ETSI TS 129 214 [6], clauses 4.4.1, A.1, A.2 and annex B
	Gx	ETSI TS 129 212 [7], clause 4.5.2
Dre test		
Pre-test		E A previously attached to EPC A.
conditions:	• U	E A previously registered to IMS A.
		PC established an emergency Bearer allowing UE A - P-CSCF IP
		ommunication.
	• E	PC established an IMS signalling bearer.
	• P	SAP is located outside of IMS A in another network.
	• U	E A previously performed emergency registration.
Test Sequence:	Step	
	1	Verify that media between UE A and PSAP is not delivered in any direction
	1	
		before call establishment.
	2	UE A initiates an emergency call to establish a communication session using
		an emergency service URN.
	3	Verify that the UE A inserts in the INVITE request, a From header field that
	3	
		includes the public user identity registered via emergency registration or the
		tel URI associated with the public user identity registered via emergency
		tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in
		tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1.
	4	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in
	4	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to
	· ·	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI.
	4	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another
	5	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF.
	· ·	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another
	5	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to
	5 6	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF.
	5	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a
	5 6 7	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media.
	5 6	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a
	5 6 7	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC
	5 6 7	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the
	5 6 7 8	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF.
	5 6 7	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the
	5 6 7 8	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF.
	5 6 7 8 9	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer.
	5 6 7 8	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer.
	5 6 7 8 9	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer.
	5 6 7 8 9	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer.
Conformance	5 6 7 8 9 10	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer.
Conformance	5 6 7 8 9	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. Verify that media between UE A and PSAP is transported with appropriate PCC characteristics.
criteria of test	5 6 7 8 9 10 2	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. Verify that media between UE A and PSAP is transported with appropriate PCC characteristics.
	5 6 7 8 9 10	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. Verify that media between UE A and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_02 (Event1) Gm TP_GM_PCSCF_ECO_INVITE_04 for eCall (Event 1) Gm TP_GM_PCSCF_ECO_REGISTER_02 (Pre-test)
criteria of test	5 6 7 8 9 10 2	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. Verify that media between UE A and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_02 (Event1) Gm TP_GM_PCSCF_ECO_INVITE_04 for eCall (Event 1) Gm TP_GM_PCSCF_ECO_REGISTER_02 (Pre-test)
criteria of test	5 6 7 8 9 10 2 3	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. Verify that media between UE A and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_02 (Event1) Gm TP_GM_PCSCF_ECO_INVITE_04 for eCall (Event 1) Gm TP_GM_PCSCF_ECO_REGISTER_02 (Pre-test) Mw TP_MW_PCSCF_ECO_INVITE_02 (Event 10)
criteria of test	5 6 7 8 9 10 2 3	tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LRF to retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in another network with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. Verify that media between UE A and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_02 (Event1) Gm TP_GM_PCSCF_ECO_INVITE_04 for eCall (Event 1) Gm TP_GM_PCSCF_ECO_REGISTER_02 (Pre-test)



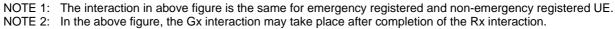


Figure 11: Emergency Session Establishment with LRF, PSAP in another IM CN subsystem

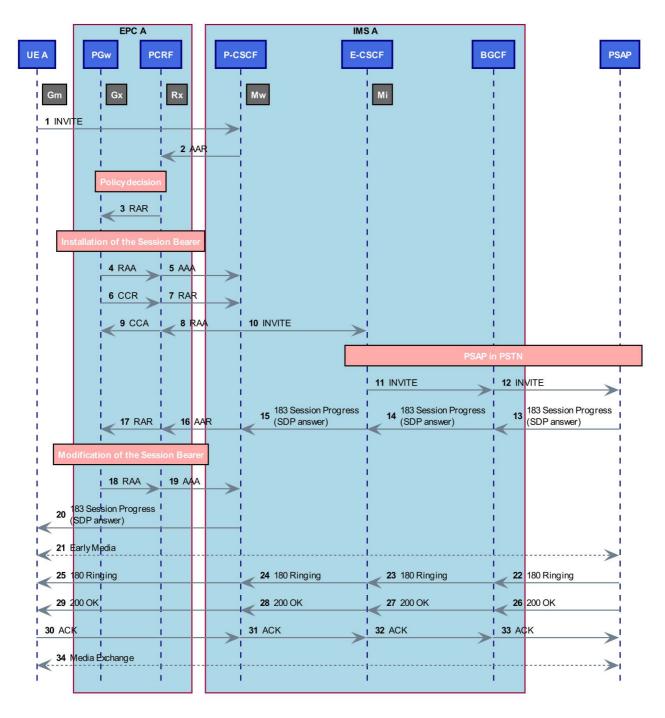
1) UE A initiates the emergency session with an INVITE request. The From header field includes the public user identity (registered via emergency registration) or the tel URI associated with the public user identity (registered via emergency registration).

- 2) The IMS A P-CSCF invokes the PCRF.
- 3) PCRF sends RAR to EPC A PGW.
- 4) EPC A PGW responds with RAA.
- 5) PCRF responds to IMS A P-CSCF with AAA.
- 6) EPC A P- GW sends CCR.
- 7) PCRF sends RAR to P-CSCF.
- 8) P-CSCF responds with RAA.
- 9) PCRF responds with CCA to PGW.
- 10) P-CSCF sends the INVITE to E-CSCF.
- 11) E-CSCF forwards the INVITE to LRF.
- 12) LRF responds with 3xx and includes PSAP URI in the Contact header.
- 13) E-CSCF sends the INVITE to IBCF with LRF provided PSAP URI in Route header.
- 14) IBCF forwards INVITE to PSAP.
- 15) PSAP responds with the 183 response with SDP answer to IBCF.
- 16) IBCF forwards the 183 response to E-CSCF.
- 17) E-CSCF sends the 183 response to P-CSCF.
- 18) The IMS A P-CSCF invokes the PCRF to modify the bearer with AAR.
- 19) PCRF sends RAR to EPC A PGW.
- 20) EPC A PGW responds with RAA.
- 21) PCRF responds to IMS A P-CSCF with AAA.
- 22) P-CSCF forwards the SIP 183 (SDP) to UE A.
- 23) Early media may flow between the UE A and PSAP.
- 24) The PSAP responds with the 180 Ringing to IBCF.
- 25) IBCF forwards the 180 to E-CSCF.
- 26) E-CSCF forwards the 180 to P-CSCF.
- 27) P-CSCF sends the SIP 180 to UE A.
- 28) PSAP sends 200 OK to IBCF.
- 29) IBCF forwards the 200 OK to E-CSCF.
- 30) E-CSCF forwards the 200 OK to P-CSCF.
- 31) P-CSCF forwards the 200 OK towards UE A.
- 32) UE A sends ACK to P-CSCF.
- 33) P-CSCF sends ACK to E-CSCF.
- 34) E-CSCF sends ACK to IBCF.
- 35) IBCF forwards ACK to PSAP.
- 36) Media Exchange.

5.3.1.8 UE calling PSAP in PSTN via BGCF

Identifier:						
		TE_ECO_INT_INI_07				
Objective:		instrate the establishment of dedicated bearers at the originating EPC due to				
		ergency session establishment within an emergency registration.				
		located in the PSTN connected via BGCF.				
Summary:		gency call is setup between UE A and the PSAP located in the PSTN.				
		attached to EPC A and registered to IMS A, has performed the emergency				
	registrat	ion to IMS A, and requests emergency session establishment using an				
		ncy URN.				
	The P-C	SCF derives descriptions of the Service Data Flow from the SDP data, requests				
	creation	of adequate bearers from PCRF and EPC, and forwards the request to the E-				
	CSCF.					
	The E-C	SCF retrieves the PSAP URI from local configuration and forwards the request				
		SAP in the PSTN via the BGCF.				
	Media tra	ansport is possible only after the successful establishment of the session.				
		egotiation happens during INVITE/200 OK (UE A sends SDP-offer, PSAP				
	responds with SDP-answer).					
Configuration:		TE_INT_ES option 3				
SUT:		PC A and PSAP				
Interfaces:		, Rx, Gx, Mi				
	Gm, MM	ETSI TS 124 229 [2], clauses 5.1.6.8.3, 5.1.6.11, 5.2.6.3.3, 5.2.10.3 and				
	СШ, Mw	5.11.2				
	Mi	ETSI TS 124 229 [2], clause 5.11.2				
	Rx	ETSI 15 124 229 [2], clause 5.11.2 ETSI TS 129 214 [6], clauses 4.4.1, A.1, A.2 and annex B				
	-					
	Gx	ETSI TS 129 212 [7], clause 4.5.2				
Due (eet						
Pre-test		IE A previously attached to EPC A.				
conditions:		IE A previously registered to IMS A.				
	EPC established an emergency Bearer allowing UE A - P-CSCF IP					
	communication.					
		PC established an IMS signalling bearer.				
	• P	SAP is located outside of IMS A in the PSTN.				
	• U	IE A previously performed emergency registration.				
Test Sequence:	Step					
Test Sequence:	Step 1	Verify that media between UE A and PSAP is not delivered in any direction				
Test Sequence:		before call establishment.				
Test Sequence:						
Test Sequence:	1	before call establishment.				
Test Sequence:	1	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN.				
Test Sequence:	1	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that				
Test Sequence:	1	before call establishment.UE A initiates an emergency call to establish a communication session using an emergency service URN.Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the				
Test Sequence:	1	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency				
Test Sequence:	1	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency uRNs defined in				
Test Sequence:	1 2 3	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1.				
Test Sequence:	1	before call establishment.UE A initiates an emergency call to establish a communication session using an emergency service URN.Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1.Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP				
Test Sequence:	1 2 3 4	before call establishment.UE A initiates an emergency call to establish a communication session using an emergency service URN.Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1.Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the PSTN via the BGCF.				
Test Sequence:	1 2 3	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the PSTN via the BGCF. Verify that the IMS produced a Media Description for the session according to				
Test Sequence:	1 2 3 4 5	before call establishment. UE A initiates an emergency call to establish a communication session using an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the PSTN via the BGCF. Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF.				
Test Sequence:	1 2 3 4	before call establishment.UE A initiates an emergency call to establish a communication session using an emergency service URN.Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency uregistration and a To header indicating one of the emergency URNs defined in Table 1.Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the PSTN via the BGCF.Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF.Verify that the PCRF invokes the EPC PGW with a RA-Request to create a				
Test Sequence:	1 2 3 4 5 6	before call establishment.UE A initiates an emergency call to establish a communication session using an emergency service URN.Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency uregistration and a To header indicating one of the emergency URNs defined in Table 1.Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the PSTN via the BGCF.Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF.Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media.				
Test Sequence:	1 2 3 4 5	before call establishment.UE A initiates an emergency call to establish a communication session using an emergency service URN.Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1.Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the PSTN via the BGCF.Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF.Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media.Verify that PCRF requested media description was found acceptable by EPC				
Test Sequence:	1 2 3 4 5 6	before call establishment.UE A initiates an emergency call to establish a communication session using an emergency service URN.Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1.Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the PSTN via the BGCF.Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF.Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media.Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the				
Test Sequence:	1 2 3 4 5 6 7	before call establishment.UE A initiates an emergency call to establish a communication session using an emergency service URN.Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1.Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the PSTN via the BGCF.Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF.Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media.Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF.				
Test Sequence:	1 2 3 4 5 6	before call establishment.UE A initiates an emergency call to establish a communication session using an emergency service URN.Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1.Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the PSTN via the BGCF.Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF.Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media.Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF.Verify that media between UE A and PSAP is successfully routed over the				
Test Sequence:	1 2 3 4 5 6 7 8	before call establishment.UE A initiates an emergency call to establish a communication session using an emergency service URN.Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1.Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the PSTN via the BGCF.Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF.Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media.Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF.Verify that media between UE A and PSAP is successfully routed over the dedicated bearer.				
Test Sequence:	1 2 3 4 5 6 7	before call establishment.UE A initiates an emergency call to establish a communication session using an emergency service URN.Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1.Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the PSTN via the BGCF.Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF.Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media.Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF.Verify that media between UE A and PSAP is successfully routed over the				

Conformance	2	Gm	TP_GM_PCSCF_ECO_INVITE_02 (Event1)
criteria of test		Gm	TP_GM_PCSCF_ECO_INVITE_04 for eCall (Event 1)
sequence step:	3	Gm	TP_GM_PCSCF_ECO_REGISTER_02 (Pre-test)
	4	Mw	TP_MW_PCSCF_ECO_INVITE_02 (Event 10)
		Mi	TP_MI_ECSCF_ECO_INVITE_01 (Event 11)
	6/7	Rx	TP_RX_PCSCF_AAR_03 (AAR - Event 2)
		Rx	TP_RX_PCSCF_AAR_04 (AAR - Event 16)
		Rx	TP_RX_PCRF_AAA_02 (AAA - Events 5, 19)
		Gx	TP_GX_PCRF_RAR_01 (RAR - Events 3, 17)
		Rx	TP_RX_PCSCF_RAA_01 (RAR, RAA - Events 7, 8)
		Gx	TP_GX_PGW_RAA_02 (RAA - Events 4, 18)
		Gx	TP_GX_PCRF_CCA_06 (CCR, CCA - Events 6, 9)
	8	Rtp	TP_RTP_ECO_03 (Event 34)



NOTE 1: The interaction in above figure is the same for emergency registered and non-emergency registered UE. NOTE 2: In the above figure, the Gx interaction may take place after completion of the Rx interaction.

Figure 12: Emergency Session Establishment, PSAP in the PSTN

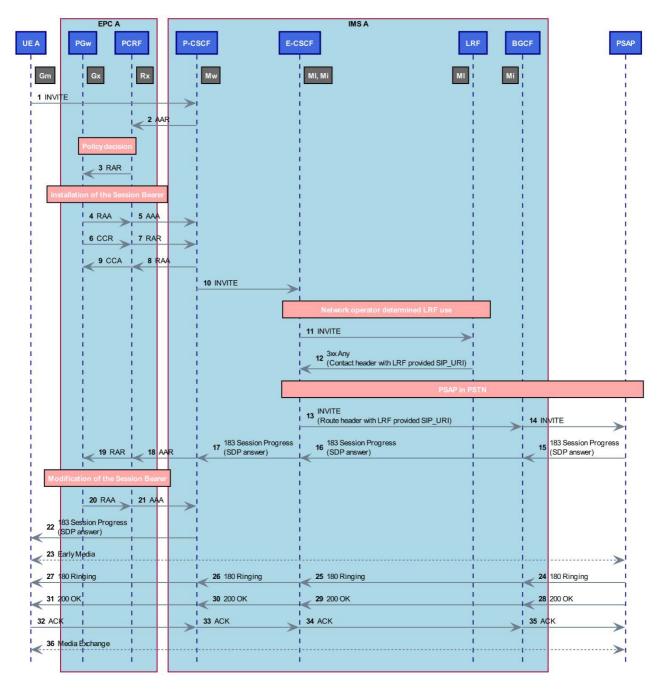
- 1) UE A initiates the emergency session with an INVITE request. The From header field includes the public user identity (registered via emergency registration) or the tel URI associated with the public user identity (registered via emergency registration).
- 2) The IMS A P-CSCF invokes the PCRF
- 3) PCRF sends RAR to EPC A PGW.
- 4) EPC A PGW responds with RAA.
- 5) PCRF responds to IMS A P-CSCF with AAA.
- 6) EPC A P- GW sends CCR.

- 7) PCRF sends RAR to P-CSCF.
- 8) P-CSCF responds with RAA.
- 9) PCRF responds with CCA to PGW.
- 10) P-CSCF sends the INVITE to E-CSCF.
- 11) E-CSCF sends the INVITE to BGCF.
- 12) BGCF forwards the INVITE to PSAP.
- 13) PSAP responds with the 183 response with SDP answer to BGCF.
- 14) BGCF forwards the 183 response to E-CSCF.
- 15) E-CSCF sends the 183 response to P-CSCF.
- 16) The IMS A P-CSCF invokes the PCRF to modify the bearer with AAR.
- 17) PCRF sends RAR to EPC A PGW.
- 18) EPC A PGW responds with RAA.
- 19) PCRF responds to IMS A P-CSCF with AAA.
- 20) P-CSCF forwards the SIP 183 (SDP) to UE A.
- 21) Early media may flow between the UE A and PSAP.
- 22) The PSAP responds with the 180 Ringing to BGCF.
- 23) The BGCF forwards the 180 Ringing to E-CSCF.
- 24) E-CSCF forwards the 180 to P-CSCF.
- 25) P-CSCF forwards the SIP 180 to UE A.
- 26) The PSAP responds with the 200 OK to BGCF.
- 27) BGCF forwards the 200 OK to E-CSCF.
- 28) E-CSCF forwards the 200 OK to P-CSCF.
- 29) P-CSCF forwards the 200 OK towards UE A.
- 30) UE A sends ACK to P-CSCF.
- 31) P-CSCF sends ACK to E-CSCF.
- 32) E-CSCF sends ACK to BGCF.
- 33) BGCF forwards ACK to PSAP.
- 34) Media Exchange.

5.3.1.9 UE calling PSAP in PSTN via BGCF, LRF derived PSAP URI

Identifier:	TD_VoLTE_ECO_INT_INI_08
	To demonstrate the establishment of dedicated bearers at the originating EPC due to SIP emergency session establishment within an emergency registration. PSAP is located in the PSTN connected via BGCF. The PSAP URI is delivered by the LRF.

Summary: An emergency call is setup between UE A and the PSAP located in the PSTN. UE-A is attached to EPC A and registered to IMS A, has performed the emergency registration to IMS A, and requests emergency session establishment using an emergency URN. The P-CSCF derives descriptions of the Service Data Flow from the SDP data, req creation of adequate bearers from PCRF and EPC, and forwards the request to the CSCF. The E-CSCF retrieves the PSAP URI from local configuration and forwards the req to this PSAP in the PSTN via the BGCF. Media transport is possible only after the successful establishment of the session. Media negotiation happens during INVITE/200 OK (UE A sends SDP-offer, PSAP responds with SDP-answer). Configuration: CF_VoLTE_INT_ES option 3 SUT: IMS A, EPC A and PSAP	uests e E-
registration to IMS A, and requests emergency session establishment using an emergency URN. The P-CSCF derives descriptions of the Service Data Flow from the SDP data, req creation of adequate bearers from PCRF and EPC, and forwards the request to the CSCF. The E-CSCF retrieves the PSAP URI from local configuration and forwards the req to this PSAP in the PSTN via the BGCF. Media transport is possible only after the successful establishment of the session. Media negotiation happens during INVITE/200 OK (UE A sends SDP-offer, PSAP responds with SDP-answer). Configuration: CF_VoLTE_INT_ES option 3 SUT: IMS A, EPC A and PSAP	uests e E-
emergency URN. The P-CSCF derives descriptions of the Service Data Flow from the SDP data, req creation of adequate bearers from PCRF and EPC, and forwards the request to the CSCF. The E-CSCF retrieves the PSAP URI from local configuration and forwards the req to this PSAP in the PSTN via the BGCF. Media transport is possible only after the successful establishment of the session. Media negotiation happens during INVITE/200 OK (UE A sends SDP-offer, PSAP responds with SDP-answer). Configuration: CF_VoLTE_INT_ES option 3 SUT: IMS A, EPC A and PSAP	e E-
The P-CSCF derives descriptions of the Service Data Flow from the SDP data, req creation of adequate bearers from PCRF and EPC, and forwards the request to the CSCF. The E-CSCF retrieves the PSAP URI from local configuration and forwards the req to this PSAP in the PSTN via the BGCF. Media transport is possible only after the successful establishment of the session. Media negotiation happens during INVITE/200 OK (UE A sends SDP-offer, PSAP responds with SDP-answer). Configuration: CF_VoLTE_INT_ES option 3 SUT: IMS A, EPC A and PSAP	e E-
creation of adequate bearers from PCRF and EPC, and forwards the request to the CSCF. The E-CSCF retrieves the PSAP URI from local configuration and forwards the req to this PSAP in the PSTN via the BGCF. Media transport is possible only after the successful establishment of the session. Media negotiation happens during INVITE/200 OK (UE A sends SDP-offer, PSAP responds with SDP-answer). Configuration: CF_VoLTE_INT_ES option 3 SUT: IMS A, EPC A and PSAP	e E-
CSCF. The E-CSCF retrieves the PSAP URI from local configuration and forwards the req to this PSAP in the PSTN via the BGCF. Media transport is possible only after the successful establishment of the session. Media negotiation happens during INVITE/200 OK (UE A sends SDP-offer, PSAP responds with SDP-answer). Configuration: CF_VoLTE_INT_ES option 3 SUT: IMS A, EPC A and PSAP	
The E-CSCF retrieves the PSAP URI from local configuration and forwards the req to this PSAP in the PSTN via the BGCF. Media transport is possible only after the successful establishment of the session. Media negotiation happens during INVITE/200 OK (UE A sends SDP-offer, PSAP responds with SDP-answer). Configuration: CF_VoLTE_INT_ES option 3 SUT: IMS A, EPC A and PSAP	uest
to this PSAP in the PSTN via the BGCF. Media transport is possible only after the successful establishment of the session. Media negotiation happens during INVITE/200 OK (UE A sends SDP-offer, PSAP responds with SDP-answer). Configuration: CF_VoLTE_INT_ES option 3 SUT: IMS A, EPC A and PSAP	uest
Media transport is possible only after the successful establishment of the session. Media negotiation happens during INVITE/200 OK (UE A sends SDP-offer, PSAP responds with SDP-answer). Configuration: CF_VoLTE_INT_ES option 3 SUT: IMS A, EPC A and PSAP	
Media negotiation happens during INVITE/200 OK (UE A sends SDP-offer, PSAP responds with SDP-answer). Configuration: CF_VoLTE_INT_ES option 3 SUT: IMS A, EPC A and PSAP	
configuration: CF_VoLTE_INT_ES option 3 SUT: IMS A, EPC A and PSAP	
Configuration: CF_VoLTE_INT_ES option 3 SUT: IMS A, EPC A and PSAP	
SUT: IMS A, EPC A and PSAP	
Interfaces: Gm, Mw, Rx, Gx, Mi, MI	
Gm, ETSI TS 124 229 [2], clauses 5.1.6.8.3, 5.1.6.11, 5.2.6.3.3, 5.2.10.3 and	
Mw 5.11.2	
MI ETSI TS 124 229 [2], clause 5.11.3	
Mi ETSI TS 124 229 [2], clause 5.11.2	
Rx ETSI TS 129 214 [6], clauses 4.4.1, A.1, A.2 and annex B	
Gx ETSI TS 129 212 [7], clause 4.5.2	
Pre-test UE A previously attached to EPC A.	
• UE A previously registered to IMS A.	
EPC established an emergency Bearer allowing UE A - P-CSCF IP	
communication.	
EPC established an IMS signalling bearer.	
 PSAP is located outside of IMS A in the PSTN. 	
UE A previously performed emergency registration.	
Test Segueneeu Sten	
Test Sequence: Step	
1 Verify that media between UE A and PSAP is not delivered in any direction	 on
 Verify that media between UE A and PSAP is not delivered in any directi before call establishment. 	
1 Verify that media between UE A and PSAP is not delivered in any direction	
 Verify that media between UE A and PSAP is not delivered in any directive before call establishment. UE A initiates an emergency call to establish a communication session u an emergency service URN. 	sing
 Verify that media between UE A and PSAP is not delivered in any directive before call establishment. UE A initiates an emergency call to establish a communication session u an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field the transmission of transmission of the transmission of the transmission of the transmission of transmission of the transmission of transmission	sing
1 Verify that media between UE A and PSAP is not delivered in any directive before call establishment. 2 UE A initiates an emergency call to establish a communication session u an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or	sing
1 Verify that media between UE A and PSAP is not delivered in any directi before call establishment. 2 UE A initiates an emergency call to establish a communication session u an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency	sing hat the
1 Verify that media between UE A and PSAP is not delivered in any directi before call establishment. 2 UE A initiates an emergency call to establish a communication session u an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field th includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency uRNs defining one of the emergency URNs defining one of the emergency users defining one of the emergency	sing hat the
1 Verify that media between UE A and PSAP is not delivered in any directive before call establishment. 2 UE A initiates an emergency call to establish a communication session us an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency uRNs definite the transmission and a To header indicating one of the emergency URNs definite the term of term o	sing hat the ned in
1 Verify that media between UE A and PSAP is not delivered in any directive before call establishment. 2 UE A initiates an emergency call to establish a communication session us an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency URNs define Table 1. 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF	sing hat the ned in
1 Verify that media between UE A and PSAP is not delivered in any directive before call establishment. 2 UE A initiates an emergency call to establish a communication session us an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency URNs define Table 1. 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF retrieve PSAP URI.	sing hat the ned in RF to
1 Verify that media between UE A and PSAP is not delivered in any directive before call establishment. 2 UE A initiates an emergency call to establish a communication session us an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency URNs define Table 1. 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF retrieve PSAP URI. 5 Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in the emergency call to the psace call to the psace calles call to the	sing hat the ned in RF to
1 Verify that media between UE A and PSAP is not delivered in any directive before call establishment. 2 UE A initiates an emergency call to establish a communication session us an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency user registration and a To header indicating one of the emergency URNs define Table 1. 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF retrieve PSAP URI. 5 Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in the PSTN with the PSAP URI received from the LRF.	sing lat the ned in RF to
1 Verify that media between UE A and PSAP is not delivered in any directive before call establishment. 2 UE A initiates an emergency call to establish a communication session us an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency URNs define Table 1. 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF retrieve PSAP URI. 5 Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in the PSTN with the PSAP URI received from the LRF. 6 Verify that the IMS produced a Media Description for the session according the term of term of the term of term of the term of te	sing lat the ned in RF to e ng to
1 Verify that media between UE A and PSAP is not delivered in any directide before call establishment. 2 UE A initiates an emergency call to establish a communication session us an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency uregistration and a To header indicating one of the emergency URNs define Table 1. 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF retrieve PSAP URI. 5 Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in the PSTN with the PSAP URI received from the LRF. 6 Verify that the IMS produced a Media Description for the session according SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PC	sing lat the ned in RF to e ng to RF.
1 Verify that media between UE A and PSAP is not delivered in any directive before call establishment. 2 UE A initiates an emergency call to establish a communication session us an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency URNs define Table 1. 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF retrieve PSAP URI. 5 Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in the PSTN with the PSAP URI received from the LRF. 6 Verify that the IMS produced a Media Description for the session according SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PC 7 Verify that the PCRF invokes the EPC PGW with a RA-Request to created	sing lat the ned in RF to e ng to RF.
1 Verify that media between UE A and PSAP is not delivered in any directive before call establishment. 2 UE A initiates an emergency call to establish a communication session us an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency user registration and a To header indicating one of the emergency URNs define Table 1. 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF retrieve PSAP URI. 5 Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in the PSTN with the PSAP URI received from the LRF. 6 Verify that the IMS produced a Media Description for the session according SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PC 7 Verify that the PCRF invokes the EPC PGW with a RA-Request to create new bearer for the requested media.	sing at the ned in RF to mg to RF. e a
 Verify that media between UE A and PSAP is not delivered in any directive before call establishment. UE A initiates an emergency call to establish a communication session uran emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency URNs define Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in the PSTN with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PC retrieve produced media. Verify that PCRF requested media description was found acceptable by the produced media. 	sing at the ned in RF to RF. a EPC
 Verify that media between UE A and PSAP is not delivered in any directive before call establishment. UE A initiates an emergency call to establish a communication session us an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency URNs defined the table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in the PSTN with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PC rew bearer for the requested media. Verify that PCRF requested media description was found acceptable by and dedicated bearers are established and that a RA-Answer is sent to the term of the term is the te	sing at the ned in RF to RF. a EPC
 Verify that media between UE A and PSAP is not delivered in any directive before call establishment. UE A initiates an emergency call to establish a communication session used an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency URNs defined the trable 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in the PSTN with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PC Verify that PCRF requested media. Verify that PCRF requested media. 	sing at the ned in RF to RF. a EPC ne
 Verify that media between UE A and PSAP is not delivered in any directive before call establishment. UE A initiates an emergency call to establish a communication session u an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency URNs defined the table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in the PSTN with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PC Verify that PCRF requested media. Verify that PCRF requested media description was found acceptable by and dedicated bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is successfully routed over the PCRF. 	sing at the ned in RF to RF. a EPC ne
 Verify that media between UE A and PSAP is not delivered in any directive before call establishment. UE A initiates an emergency call to establish a communication session usen an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency URNs definitable 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the LF retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in the PSTN with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PC Verify that the PCRF invokes the EPC PGW with a RA-Request to create new bearer for the requested media. Verify that PCRF requested media. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. 	sing at the ned in RF to RF. a EPC ne ne
 Verify that media between UE A and PSAP is not delivered in any directive before call establishment. UE A initiates an emergency call to establish a communication session us an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency URNs define Table 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the LF retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in the PSTN with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PC Verify that the PCRF invokes the EPC PGW with a RA-Request to created new bearer for the requested media. Verify that PCRF requested media description was found acceptable by and dedicated bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is transported with approprial 	sing at the ned in RF to RF. a EPC ne ne
 Verify that media between UE A and PSAP is not delivered in any directive before call establishment. UE A initiates an emergency call to establish a communication session usen an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency URNs definitable 1. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the LF retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in the PSTN with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PC Verify that PCRF requested media. Verify that PCRF requested media. Verify that PCRF requested media. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. 	sing at the ned in RF to RF. a EPC ne ne
 Verify that media between UE A and PSAP is not delivered in any directid before call establishment. UE A initiates an emergency call to establish a communication session u an emergency service URN. Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency uregistration and a To header indicating one of the emergency URNs defined the traitieve PSAP URI. Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF retrieve PSAP URI. Verify that IMS A (E-CSCF) routes the emergency call to the PSTN with the PSAP URI received from the LRF. Verify that the IMS produced a Media Description for the session according SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PC Verify that the PCRF invokes the EPC PGW with a RA-Request to create new bearer for the requested media. Verify that PCRF requested media description was found acceptable by and dedicated bearers are established and that a RA-Answer is sent to the PCRF. Verify that media between UE A and PSAP is transported with appropria PCC characteristics. 	sing at the ned in RF to RF. a EPC ne ne
1 Verify that media between UE A and PSAP is not delivered in any directide before call establishment. 2 UE A initiates an emergency call to establish a communication session us an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency urgistration and a To header indicating one of the emergency URNs definitable 1. 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF retrieve PSAP URI. 5 Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in the PSTN with the PSAP URI received from the LRF. 6 Verify that tMS produced a Media Description for the session according SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PC 7 Verify that the PCRF invokes the EPC PGW with a RA-Request to create new bearer for the requested media. 8 Verify that PCRF requested media. 9 Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. 10 Verify that media between UE A and PSAP is transported with appropria PCC characteristics.	sing at the ned in RF to RF. a EPC ne ne
1 Verify that media between UE A and PSAP is not delivered in any directide before call establishment. 2 UE A initiates an emergency call to establish a communication session u an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency user registration and a To header indicating one of the emergency URNs definitable 1. 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF retrieve PSAP URI. 5 Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in the PSTN with the PSAP URI received from the LRF. 6 Verify that the NS produced a Media Description for the session according SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PC 7 Verify that PCRF invokes the EPC PGW with a RA-Request to create new bearer for the requested media. 8 Verify that PCRF requested media description was found acceptable by and dedicated bearers are established and that a RA-Answer is sent to the PCRF. 9 Verify that media between UE A and PSAP is transported with appropria PCC characteristics. Conformance 2 Gm TP_GM_PCSCF_ECO_INVITE_02 (Event1) Gm TP_GM_PCSCF_ECO_INVITE_04 for eCall (Event 1)	sing at the ned in RF to RF. a EPC ne ne
1 Verify that media between UE A and PSAP is not delivered in any directide before call establishment. 2 UE A initiates an emergency call to establish a communication session u an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined the table 1. 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF retrieve PSAP URI. 5 Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in the PSTN with the PSAP URI received from the LRF. 6 Verify that the IMS produced a Media Description for the session accord SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PC 7 Verify that the PCRF invokes the EPC PGW with a RA-Request to create new bearer for the requested media. 8 Verify that PCRF requested media description was found acceptable by and dedicated bearers are established and that a RA-Answer is sent to the PCRF. 9 Verify that media between UE A and PSAP is transported with appropria PCC characteristics. Conformance criteria of test sequence step: 3 Gm TP_GM_PCSCF_ECO_INVITE_04 for eCall (Event 1) 3 Gm TP_GM_PCSCF_ECO_REGISTER_02 (Pre-test) 3	sing at the ned in RF to RF. a EPC ne ne
1 Verify that media between UE A and PSAP is not delivered in any directi 2 UE A initiates an emergency call to establish a communication session u 3 Verify that the UE A inserts in the INVITE request, a From header field th includes the public user identity registered via emergency registration or tel UR associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defin Table 1. 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF 5 Verify that IMS A (E-CSCF) routes the emergency call to the PSAP URI. 5 Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in the PSTN with the PSAP URI received from the LRF. 6 Verify that the IMS produced a Media Description for the session accordin SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PC 7 Verify that the PCRF invokes the EPC PGW with a RA-Request to create new bearer for the requested media. 8 Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. 9 Verify that media between UE A and PSAP is transported with appropria PCC characteristics. Conformance 2 Gm 9 Verify that media between UE A and PS	sing at the ned in RF to RF. a EPC ne ne
1 Verify that media between UE A and PSAP is not delivered in any directide before call establishment. 2 UE A initiates an emergency call to establish a communication session u an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field the includes the public user identity registered via emergency registration or tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined the table 1. 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the LF retrieve PSAP URI. 5 Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in the PSTN with the PSAP URI received from the LRF. 6 Verify that the IMS produced a Media Description for the session accord SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PC 7 Verify that the PCRF invokes the EPC PGW with a RA-Request to create new bearer for the requested media. 8 Verify that PCRF requested media description was found acceptable by and dedicated bearers are established and that a RA-Answer is sent to the PCRF. 9 Verify that media between UE A and PSAP is transported with appropria PCC characteristics. Conformance criteria of test sequence step: 3 Gm TP_GM_PCSCF_ECO_INVITE_04 for eCall (Event 1) 3 Gm TP_GM_PCSCF_ECO_REGISTER_02 (Pre-test) 3	sing at the ned in RF to RF. a EPC ne ne



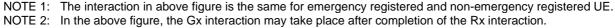


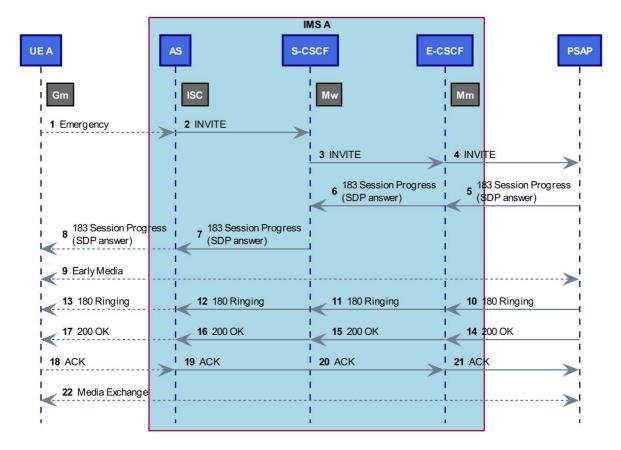
Figure 13: Emergency Session Establishment with LRF, PSAP in the PSTN

1) UE A initiates the emergency session with an INVITE request. The From header field includes the public user identity (registered via emergency registration) or the tel URI associated with the public user identity (registered via emergency registration).

- 2) The IMS A P-CSCF invokes the PCRF.
- 3) PCRF sends RAR to EPC A PGW.
- 4) EPC A PGW responds with RAA.
- 5) PCRF responds to IMS A P-CSCF with AAA.
- 6) EPC A P- GW sends CCR.
- 7) PCRF sends RAR to P-CSCF.
- 8) P-CSCF responds with RAA.
- 9) PCRF responds with CCA to PGW.
- 10) P-CSCF sends the INVITE to E-CSCF.
- 11) E-CSCF forwards the INVITE to LRF.
- 12) LRF responds with 3xx and includes PSAP URI in the Contact header.
- 13) E-CSCF sends the INVITE to BGCF with LRF provided PSAP URI in Route header.
- 14) BGCF forwards INVITE to PSAP.
- 15) PSAP responds with the 183 response with SDP answer to BGCF.
- 16) BGCF forwards the 183 response to E-CSCF.
- 17) E-CSCF sends the 183 response to P-CSCF.
- 18) The IMS A P-CSCF invokes the PCRF to modify the bearer with AAR.
- 19) PCRF sends RAR to EPC A PGW.
- 20) EPC A PGW responds with RAA.
- 21) PCRF responds to IMS A P-CSCF with AAA.
- 22) P-CSCF forwards the SIP 183 (SDP) to UE A.
- 23) Early media may flow between the UE A and PSAP.
- 24) The PSAP responds with the 180 Ringing to BGCF.
- 25) BGCF forwards the 180 to E-CSCF.
- 26) E-CSCF forwards the 180 to P-CSCF.
- 27) P-CSCF sends the SIP 180 to UE A.
- 28) PSAP sends 200 OK to BGCF.
- 29) BGCF forwards the 200 OK to E-CSCF.
- 30) E-CSCF forwards the 200 OK to P-CSCF.
- 31) P-CSCF forwards the 200 OK towards UE A.
- 32) UE A sends ACK to P-CSCF.
- 33) P-CSCF sends ACK to E-CSCF.
- 34) E-CSCF sends ACK to BGCF.
- 35) BGCF forwards ACK to PSAP.
- 36) Media Exchange.

5.3.1.10	UE calling PSAP over AS with non-emergency registration	

		Interoperability Test Description					
Identifier:		TE_EMC_INT_INI_09					
Objective:	SIP eme	onstrate the establishment of dedicated bearers at the originating EPC due to ergency session establishment over AS with non-emergency registration. s located in the IM CN subsystem of IMS A.					
Summary:	An eme	rgency call is setup between UE A and the PSAP located in the IM CN					
	UE-A is registrat	em of IMS A over AS. attached to EPC A and registered to IMS A, has NOT performed the emergency tion to IMS A, and requests emergency session by requesting the AS.					
	The S-C creation	generates an emergency session establishment request. CSCF derives descriptions of the Service Data Flow from the SDP data, requests of adequate bearers from PCRF and EPC, and forwards the request to the E-					
		The E-CSCF retrieves the PSAP URI from local configuration and forwards the request to this PSAP.					
	Media transport is possible only after the successful establishment of the session. Media negotiation happens during INVITE/200 OK.						
Configuration:		CF_VoLTE_INT_ES option 1					
SUT:		IMS A					
Interfaces:		n, Mw, Rx, Gx, Mm					
References:	Mm	ETSI TS 124 229 [2], clause 5.11.2					
		ETSI TS 123 167 [14]					
	ISC	ETSI TS 124 229 [2], clauses 4.7.3, 5.7.1.14 ETSI TS 123 167 [14], clause 6.2.8					
	Gm, Mw	ETSI TS 124 229 [2], clauses 5.1.6.8.4, 5.2.6.3.3, 5.2.10.4 and 5.11.2					
	Rx	ETSI TS 129 214 [6], clauses 4.4.1, A.1, A.2 and annex B					
	Gx	ETSI TS 129 212 [7], clause 4.5.2					
	0.	[LTOF TO 129 212 [7], Glause 4.5.2					
Pre-test		LIE A maximum attack attack atta EDO A					
conditions:	•	UE A previously attached to EPC A.					
contantions.	•	UE A previously registered to IMS A.					
	•	UE A has not performed emergency registration.					
	•	UE A is in the same network as the S-CSCF (UE A is not roaming).					
	•	AS is part of the trust domain of the network.					
	•	EPC established a non-emergency Bearer allowing UE A - P-CSCF IP communication.					
	•	EPC established an IMS signalling bearer.					
		PSAP is registered or connected to the IMS A and ready to accept the session					
	-	establishment.					
Test Sequence:	Step						
	1	The AS detect an emergency session establishment request from UE A.					
	2	AS initiates an emergency session to establish a communication session using an emergency service URN with a top-level service type of "sos" and a Route header field with the topmost Route header field set to the URI associated with					
	3	an E-CSCF Verify that the P-Asserted-Identity header field containing the identity of the UE					
	4	Verify that IMS A (E-CSCF) routes the emergency call to the PSAP in the same					
	5	IM CN subsystem of the own network. Verify that the IMS produced a Media Description for the session according to					
	6	SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. Verify that the PCRF invokes the EPC PGW with RA-Request to create a new					
	7	bearer for the requested media. Verify that PCRF requested media description was found acceptable by EPC					
		and emergency bearers are established and that a RA-Answer is sent to the PCRF.					
Contorrar							
	2	ISC TP_ISC_SCSCF_EMC_INVITE_01 (Event 2)					
Conformance criteria of test sequence step:	2 3 4	ISC TP_ISC_SCSCF_EMC_INVITE_01 (Event 2) MwTP_MW_PCSCF_ECO_INVITE_02 (Event 3) Mm TP_MM_ECSCF_ECO_INVITE_02 (Event 4)					



NOTE: How the interaction between UE A and AS proceeds in detail is beyond the scope of this test description and depends on the supported application.

Figure 14: Emergency Session Establishment without emergency registration over AS

- 1) UE A initiates an emergency session establishment request (see note of Figure 14).
- 2) AS detect an emergency session establishment request and generates an INVITE request to S-CSCF include in the Request-URI an emergency service URN, i.e. a service URN with a top-level service type of "sos" as specified in IETF RFC 5031 and a Route header field with the topmost Route header field set to the URI associated with an E-CSCF.
- 3) S-CSCF sends the INVITE to E-CSCF.
- 4) E-CSCF sends the INVITE to PSAP.
- 5) PSAP responds with the 183 response with SDP answer to E-CSCF.
- 6) E-CSCF sends the 183 response to S-CSCF.
- 7) S-CSCF forwards the SIP 183 (SDP answer) to AS.
- 8) AS forwards the SIP 183 to UE A.
- 9) Early media may flow between the UE A and PSAP.
- 10) The PSAP responds with the 180 Ringing to E-CSCF.
- 11) E-CSCF forwards the 180 to S-CSCF.
- 12) S-CSCF forwards the SIP 180 to AS.
- 13) AS forwards the SIP 180 to UE A.
- 14) PSAP sends 200 OK to E-CSCF.

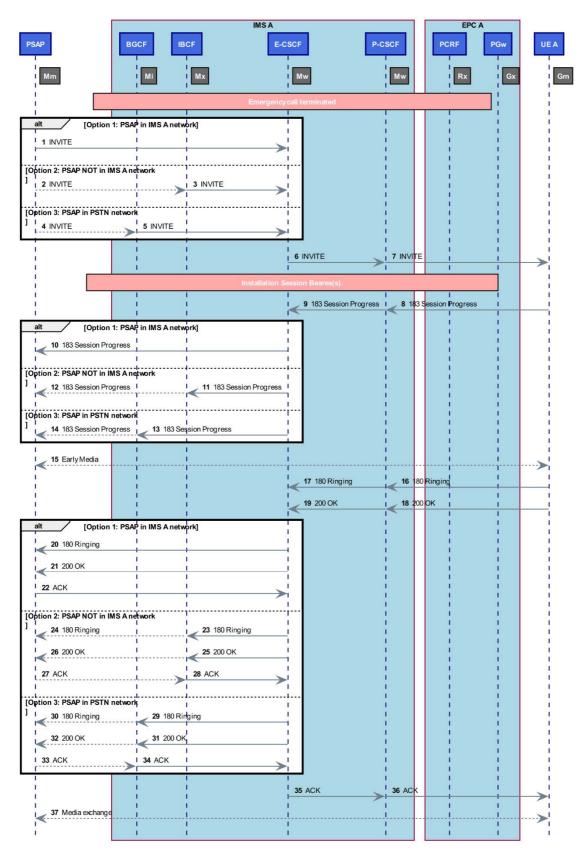
- 15) E-CSCF forwards the 200 OK to S-CSCF.
- 16) S-CSCF forwards the 200 OK towards AS.
- 17) AS forwards the 200 OK towards UE A.
- 18) UE A sends ACK to AS.
- 19) AS sends ACK to E-CSCF.
- 20) S-CSCF sends ACK to E-CSCF.
- 21) E-CSCF sends ACK to PSAP.
- 22) Media Exchange.

5.3.1.11 Callback from PSAP

1		Interoperability Test Description
Identifier:	TD_VoL	TE_ECO_INT_INI_010
Objective:	To demo	nstrate that if an emergency call has been terminated, the attempt by the ill taker to communicate back to the emergency caller shall be answered.
Summary:	successf	the functionality of the PSAP callback feature, ensuring that the callback is ully initiated, routed and that media is correctly transmitted over the dedicated The callback shall use the same media as the original emergency call.
Configuration:	CF_VoL	TE_INT_ES (Option 1, Option 2 and Option 3)
SUT:	IMS A an	nd EPC A
Interfaces:	Gm, Mw,	Rx, Gx, Mm, Mx, Mi
	Mm, Mx, Mi,	ETSI TS 123 167 [14], clause 5.2 ETSI TS 124 229 [2], clause 5.10.1 IETF RFC 7090 [17], clause 5.3
	Gm, Mw	ETSI TS 124 229 [2], clauses 5.2.7.2, 5.3.2.1, 5.3.2.1A, 5.4.4.1 and 5.4.4.2 ETSI TS 134 229-1 [13], clause C.11
	Rx	ETSI TS 129 214 [6], clauses 4.4.1, A.1, A.2 and annex B
	Gx	ETSI TS 129 212 [7], clause 4.5.2
Pre-test conditions:	IM al cl: • H	E A previously attached to EPC and shall be previously initially registered to //S and an emergency call has been established with emergency bearer lowing UE A - P-CSCF- E-CSCF IP communication. One of tests from auses 5.3.1.2 to 5.3.1.10 need to be executed as precondition. SS provisioned with UE A subscription. E A discovered the P-CSCF address.
	• P3	SAP release the call. Release the call with test from 5.3.2.2 after emergency all establishment.
Toot Soquenee	• P: ca	SAP release the call. Release the call with test from 5.3.2.2 after emergency
Test Sequence:	• Paca	SAP release the call. Release the call with test from 5.3.2.2 after emergency all establishment.
Test Sequence:	• P: ca	SAP release the call. Release the call with test from 5.3.2.2 after emergency
Test Sequence:	• P2 ca Step 1 2 3	SAP release the call. Release the call with test from 5.3.2.2 after emergency all establishment. UE A initiates an emergency session. Verify that the emergency session between UE A and PSAP is successfully established. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer.
Test Sequence:	• P2 ca Step 1 2 3 4	SAP release the call. Release the call with test from 5.3.2.2 after emergency all establishment. UE A initiates an emergency session. Verify that the emergency session between UE A and PSAP is successfully established. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. PSAP initiates a Call-Release (BYE) operation to UE A, ending the session.
Test Sequence:	• P2 ca Step 1 2 3	SAP release the call. Release the call with test from 5.3.2.2 after emergency all establishment. UE A initiates an emergency session. Verify that the emergency session between UE A and PSAP is successfully established. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. PSAP initiates a Call-Release (BYE) operation to UE A, ending the session. Verify that media between UE A and PSAP is not delivered in any direction.
Test Sequence:	• P2 ca Step 1 2 3 4	SAP release the call. Release the call with test from 5.3.2.2 after emergency all establishment. UE A initiates an emergency session. Verify that the emergency session between UE A and PSAP is successfully established. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. PSAP initiates a Call-Release (BYE) operation to UE A, ending the session. Verify that media between UE A and PSAP is not delivered in any direction. PSAP initiates a callback using UE A callback number, SIP identifier or IP address.
Test Sequence:	Paca Ca Ca Step 1 2 3 4 5	SAP release the call. Release the call with test from 5.3.2.2 after emergency all establishment. UE A initiates an emergency session. Verify that the emergency session between UE A and PSAP is successfully established. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. PSAP initiates a Call-Release (BYE) operation to UE A, ending the session. Verify that media between UE A and PSAP is not delivered in any direction. PSAP initiates a callback using UE A callback number, SIP identifier or IP address. Verify that the SIP Priority header field value "psap-callback" may be set, which allows blacklists to be bypass and ignore call-forwarding procedures and other similar features.
Test Sequence:	 Pacal Step 1 2 3 4 5 6 	SAP release the call. Release the call with test from 5.3.2.2 after emergency all establishment. UE A initiates an emergency session. Verify that the emergency session between UE A and PSAP is successfully established. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. PSAP initiates a Call-Release (BYE) operation to UE A, ending the session. Verify that media between UE A and PSAP is not delivered in any direction. PSAP initiates a callback using UE A callback number, SIP identifier or IP address. Verify that the SIP Priority header field value "psap-callback" may be set, which allows blacklists to be bypass and ignore call-forwarding procedures and other similar features. Verify that the IMS produces the same Media Description as the original emergency call.
Test Sequence:	 P2 Step 1 2 3 4 5 6 7 	SAP release the call. Release the call with test from 5.3.2.2 after emergency all establishment. UE A initiates an emergency session. Verify that the emergency session between UE A and PSAP is successfully established. Verify that media between UE A and PSAP is successfully routed over the dedicated bearer. PSAP initiates a Call-Release (BYE) operation to UE A, ending the session. Verify that media between UE A and PSAP is not delivered in any direction. PSAP initiates a callback using UE A callback number, SIP identifier or IP address. Verify that the SIP Priority header field value "psap-callback" may be set, which allows blacklists to be bypass and ignore call-forwarding procedures and other similar features. Verify that the IMS produces the same Media Description as the original

			Interoperability Test Description
Conformance	6	Mm	TP_MM_ECSCF_ECO_INVITE_03 (Event 1)
criteria of test		Mx	TP_MX_ECSCF_ECO_INVITE_03 (Event 3)
sequence step:		Mi	TP_MI_ECSCF_ECO_INVITE_03 (Event 5)
		Mw	TP_MW_PCSCF_ECO_INVITE_05 (Event 6)
	10	Rtp	TP_RTP_ECO_03 (Event 37)

50



NOTE: For reasons of readability, only the SIP messages are shown in the figure. The message exchange between PGW, PCRF and P-CSCF remains the same as in Figure 8.

Figure 15: Callback from PSAP

1) (Option 1) PSAP initiates a callback using UE A callback number, SIP identifier or IP address. PSAP sends the INVITE to E-CSCF.

- 2) (Option 2) PSAP initiates a callback using UE A callback number, SIP identifier or IP address. PSAP sends the INVITE towards IBCF.
- 3) (Option 2) IBCF forwards the INVITE to E-CSCF.
- 4) (Option 3) PSAP initiates a callback using UE A callback number, SIP identifier or IP address. PSAP sends the INVITE towards BGCF.
- 5) (Option 2) BGCF forwards the INVITE to E-CSCF.
- 6) E-CSCF forwards the INVITE to P-CSCF.
- 7) P-CSCF forwards the INVITE to UE A.
- 8) UE A responds with the 183 response with SDP answer to P-CSCF.
- 9) P-CSCF sends the 183 response to E-CSCF.
- 10) (Option 1) E-CSCF forwards the 183 Session Progress to PSAP.
- 11) (Option 2) E-CSCF forwards the 183 Session Progress to IBCF.
- 12) (Option 2) IBCF forwards the 183 Session Progress towards PSAP.
- 13) (Option 3) E-CSCF forwards the 183 Session Progress to BGCF.
- 14) (Option 3) BGCF forwards the 183 Session Progress towards PSAP over PSTN (may not be a SIP message).
- 15) Early media may flow between the UE A and PSAP.
- 16) The UE A responds with the 180 Ringing to E-CSCF.
- 17) P-CSCF forwards the 180 to E-CSCF.
- 18) UE A sends 200 OK to P-CSCF.
- 19) P-CSCF forwards the 200 OK to E-CSCF.
- 20) (Option 1) E-CSCF forwards the 180 Ringing to PSAP.
- 21) (Option 1) E-CSCF forwards the 200 OK to PSAP.
- 22) (Option 1) PSAP sends ACK to E-CSCF
- 23) (Option 2) E-CSCF forwards the 180 Ringing to IBCF.
- 24) (Option 2) IBCF forwards 180 Ringing towards PSAP.
- 25) (Option 2) E-CSCF forwards the 200 OK to IBCF.
- 26) (Option 2) IBCF forwards 200 OK towards PSAP.
- 27) (Option 2) PSAP sends ACK to IBCF
- 28) (Option 2) IBCF sends ACK to E-CSCF
- 29) (Option 3) E-CSCF forwards 180 Ringing to BGCF.
- 30) (Option 3) BGCF forwards the 180 Ringing towards PSAP over PSTN (may not be a SIP message).
- 31) (Option 3) E-CSCF forwards the 200 OK to BGCF.
- 32) (Option 3) BGCF forwards 200 OK towards PSAP.
- 33) (Option 3) PSAP sends ACK to BGCF.
- 34) (Option 3) BGCF sends ACK to E-CSCF.
- 35) E-CSCF forwards the ACK P-CSCF.

- 36) P-CSCF forwards the ACK towards UE A.
- 37) Media Exchange.

5.3.2 Emergency Session Release

5.3.2.0 General

These tests show the removal of the session bearers during the normal release procedures of an already established emergency session.

53

The test assumes that the UE A has been previously attached to EPC and registered to IMS. An emergency call is assumed to have been successfully established.

The test procedure will follow the Call Release procedures, terminating any bearers that have been previously created as part of the call.

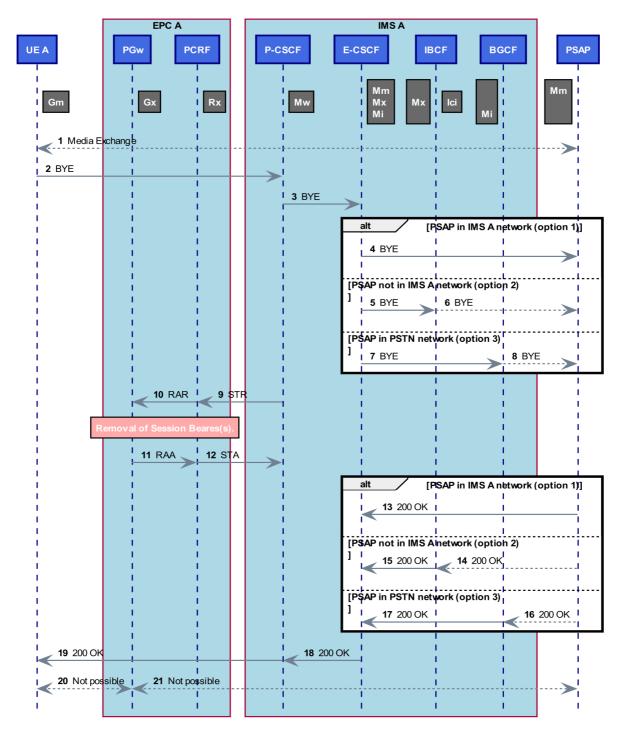
These tests will verify that:

- 1) The P-CSCF will act on call release and trigger release of call bearers.
- 2) The PCRF/EPC will remove the call's media bearers accordingly.
- 3) Media will not be transported after the session termination. Tests will continue transmitting media after the session release and verify that the default EPC gating policy of "Deny" will stop all media.

5.3.2.1 UE Initiated Emergency Session Release

	Interoperability Test Description
Identifier:	TD_VoLTE_EMC_INT_REL_01
Objective:	To perform originating UE session release and the tear down of related dedicated
Summony	bearers. On call release, the P-CSCF A should trigger the removal of all relevant previously
Summary:	created bearers.
	EPC A removes the bearers for media.
	Media transport is no longer possible, after the session release.
Configuration:	CF_VoLTE_INT_ES (Option 1, Option 2 and Option 3)
SUT:	IMS A and EPC A
Interfaces:	Gm, Mw, Gx, Rx, Mm, Mx, Mi
References:	Gm, ETSI TS 124 229 [2], clauses 5.1.5 (1 st paragraph), 5.1.6.9, 5.2.7, 5.2.8.1.2,
	Mw 5.4.5.2 and 6.2
	Mm ETSI TS 123 167 [14], clause 5.2
	Mx ETSI TS 124 229 [2], clause 5.11.2
	Mi
	Gx ETSI TS 129 212 [7], clause 4.5.2
	Rx ETSI TS 129 214 [6], clauses 4.4.4, 4.4.5 and A.8
Pre-test	UE A previously attached to EPC A.
conditions:	EPC A established an emergency Bearer allowing UE A to P-CSCF IP
	communication and PSAP to P-CSCF IP communication.
	UE A previously registered to IMS and IMS signalling bearers provisioned.
	UE A previously established an emergency session with PSAP.
Test Sequence:	Step
	1 Verify that media between UE A and PSAP is delivered in both directions and
	for all negotiated media stream types after the call establishment.
	2 UE A initiates a Call-Release (BYE) operation, ending the session.
	3 Verify that P-CSCF terminates the Rx session, triggering removal of all
	session related bearers.
	4 Verify that EPC A removes all session related bearers. 5 Verify that media between UE A and PSAP can no longer be exchanged and
	5 Verify that media between UE A and PSAP can no longer be exchanged and is filtered out by EPC A.

			Interoperability Test Description
Conformance	1	Rtp	TP_RTP_ECO_03 (Event 1)
criteria of test	2	Gm	TP_GM_PCSCF_ECO_BYE_01 (Event 2)
sequence step:		Mw	TP_MW_PCSCF_ECO_BYE_01 (Event 3)
		Mm	TP_MM_ECSCF_ECO_BYE_01 (Event 4)
		Mx	TP_MX_ECSCF_ECO_BYE_01 (Events 5 and 6)
		Mi	TP_MI_ECSCF_ECO_BYE_01 (Event 7 and 8)
	3	Gm	TP_GM_PCSCF_ECO_200OK_BYE_01 (Event 19)
		Mw	TP_MW_PCSCF_ECO_2000K_BYE_01 (Event 18)
		Rx	TP_RX_PCSCF_STR_01 (STR - Event 9)
		Gx	TP_GX_PCRF_RAR_02 (RAR - Event 10)
	4	Gx	TP_GX_PGW_RAA_03 (RAA - Event 11)
		Rx	TP_RX_PCRF_STA_01 (STA - Event 12)
	5	Rtp	TP_RTP_ECO_01 (Events 20, 21)



NOTE 1: In the above figure, the Gx interaction may take place after completion of the Rx interaction. NOTE 2: Emergency Session Release from UE side is not possible for eCall.

Figure 16: Emergency Session Tear-down - UE Initiated Emergency Session Release

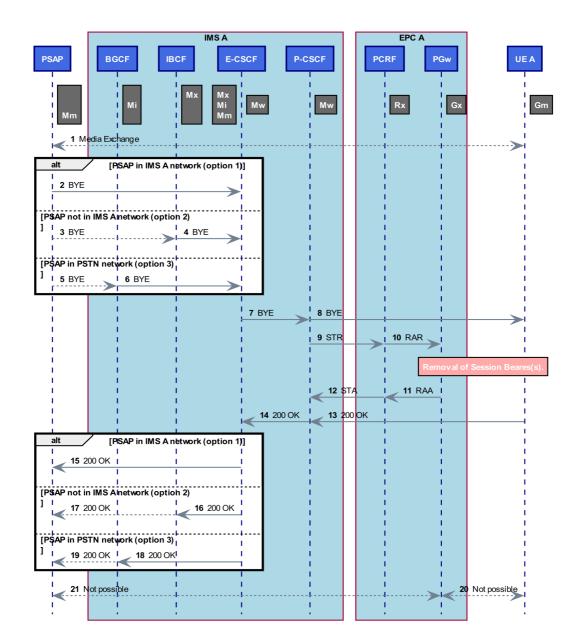
- 1) Media can be exchanged between UE A and PSAP.
- 2) UE A initiates the emergency session release with a BYE.
- 3) P-CSCF forwards the BYE to E-CSCF.
- 4) (Option 1) E-CSCF forwards the BYE to PSAP.
- 5) (Option 2) E-CSCF forwards the BYE to IBCF.
- 6) (Option 2) IBCF forwards the BYE towards PSAP.

- 7) (Option 3) E-CSCF forwards the BYE to BGCF.
- 8) (Option 3) BGCF forwards the BYE towards PSAP over PSTN (may not be a SIP message).
- 9) P-CSCF sends a ST-Request to the PCRF (Session-Termination request).
- 10) PCRF sends a RA-Request to the PGW (Re-Auth request).
- 11) PGW responds P-CSCF.
- 12) PCRF responds to P-CSCF.
- 13) (Option 1) PSAP sends 200 OK (BYE) to E-CSCF.
- 14) (Option 2) PSAP sends 200 OK (BYE) towards IBCF.
- 15) (Option 2) IBCF sends 200 OK (BYE) to E-CSCF.
- 16) (Option 3) PSAP sends 200 OK (BYE) to BGCF over PSTN (may not be a SIP message).
- 17) (Option 3) BGCF sends 200 OK (BYE) to E-CSCF.
- 18) E-CSCF forwards the 200 OK (BYE) to P-CSCF.
- 19) P-CSCF forwards the 200 OK (BYE) towards UE A.
- 20) The dedicated bearer(s) is/are down.
- 21) No media can flow between the Ues.

5.3.2.2 PSAP Initiated Emergency Session Release

Identifier:	TD Vol 1	TE_ECO_INT_REL_02
Objective:		m originating PSAP session release and the tear down of related dedicated
	bearers.	In originaling 1 6/11 boobien foldade and the toal down of folded dedicated
Summary:		elease initiated bye PSAP, the P-CSCF A should trigger the removal of all
e annual y l		previously created bearers.
		emoves the bearers for media.
		ansport is no longer possible, after the session release.
Configuration:		TE_INT_ES (Option 1, Option 2 and Option 3)
SUT:		Ind EPC A
Interfaces:		Gx, Rx, Mm, Mx, Mi
References:	Gm.	ETSI TS 124 229 [2], clauses 5.1.5, 5.2.7, 6.1 and 6.2
	Mw	
	Mm,	ETSI TS 123 167 [14], clause 5.2
	Mx.	
	Mi,	
	Gx	ETSI TS 129 212 [7], clause 4.5.2
	Rx	ETSI TS 129 214 [6], clause 4.4.4
Pre-test	• U	E A and PSAP previously attached to EPC A.
conditions:		PC A established an emergency Bearer allowing UE A to P-CSCF IP
		ommunication.
	• U	E A previously registered to IMS and IMS signalling bearers provisioned.
		E A previously established an emergency session with PSAP.
	1	
Test Sequence:	Step	
•	1	Verify that media between UE A and PSAP is delivered in both directions and
		for all negotiated media stream types after the call establishment.
	2	PSAP initiates a Call-Release (BYE) operation, ending the session.
	3	Verify that P-CSCF terminates the Rx session, triggering removal of all
		session related bearers.
	4	Verify that EPC A removes all session related bearers.
	5	Verify that media between UE A and PSAP can no longer be exchanged and
		is filtered out by EPC A.

Conformance	1	Rtp	TP_RTP_ECO_03 (Event 1)
criteria of test	2	Mm	TP_MM_ECSCF_ECO_BYE_02 (Events 2, 7)
sequence step:		Mx	TP_MX_ECSCF_ECO_BYE_02 (Events 4, 7)
		Mi	TP_MI_ECSCF_ECO_BYE_02 (Events 6, 7)
	3	Gm	TP_GM_PCSCF_ECO_200OK_BYE_02 (Event 13)
		Mw	TP_MW_PCSCF_ECO_2000K_BYE_02 (Event 14)
		Rx	TP_RX_PCSCF_STR_01 (STR - Event 9)
		Gx	TP_GX_PCRF_RAR_02 (RAR - Event 10)
	4	Gx	TP_GX_PGW_RAA_03 (RAA - Event 11)
		Rx	TP_RX_PCRF_STA_01 (STA - Event 12)
	5	Rtp	TP_RTP_ECO_01 (Events 20, 21)



NOTE: In the above figure, the Gx interaction may take place after completion of the Rx interaction.

Figure 17: Emergency Session Tear-down - PSAP Initiated Emergency Session Release

- 1) Media can be exchanged between UE A and PSAP.
- 2) (Option 1) PSAP initiates the emergency session release with sending BYE to E-CSCF.
- 3) (Option 2) PSAP initiates the emergency session release with sending BYE to IBCF.

5) (Option 3) PSAP initiates the session release with sending BYE to BGCF over PSTN (may not be a SIP message).

58

- 6) (Option 3) BGCF forwards the E-CSCF.
- 7) E-CSCF forwards the BYE to P-CSCF.
- 8) P-CSCF forwards the BYE to UE A.
- 9) P-CSCF sends a ST-Request to the PCRF (Session-Termination request).
- 10) PCRF sends a RA-Request to the PGW (Re-Auth request).
- 11) PGW responds with RAA.

4)

- 12) PCRF responds to P-CSCF with STA.
- 13) UE A sends 200 OK (BYE) to P-CSCF.
- 14) P-CSCF forwards 200 OK (BYE) to E-CSCF.
- 15) (Option 1) E-CSCF forwards 200 OK (BYE) to.
- 16) (Option 2) E-CSCF forwards 200 OK (BYE) to IBCF.
- 17) (Option 2) IBCF forwards the 200 OK (BYE) towards PSAP.
- 18) (Option 3) E-CSCF forwards 200 OK (BYE) to BGCF.
- 19) (Option 3) BGCF forwards the 200 OK (BYE) towards PSAP over PSTN (may not be a SIP message).
- 20) The dedicated bearer(s) is/are down.
- 21) No media can flow between the Ues.

5.3.3 Emergency Session Abort/Reject

5.3.3.0 General

These test cases cover unsuccessful emergency session setup. Either the emergency call is aborted in the UE side or rejected on the PSAP side. The test assumes that the UE A has been previously attached to EPC and registered to IMS.

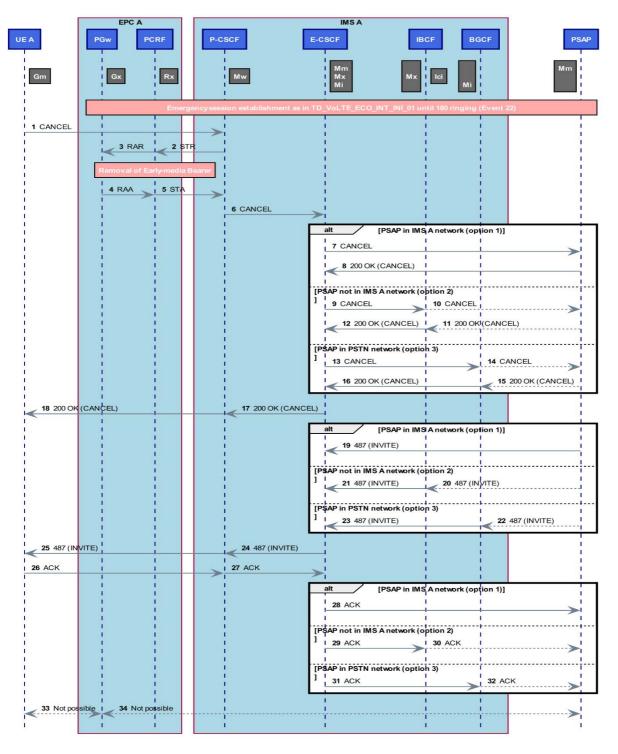
For emergency session abort, it is assumed that a call is established to the ringing phase prior to the originating UE initiating session release. Early media is possible in the backward direction prior to session abort.

For emergency session reject, the INVITE is delivered to the P-CSCF but is rejected (e.g. PSAP is busy). In both cases, dedicated media bearers are established prior to being turn down after session abort/reject.

	Interoperability Test Description		
Identifier:	TD_VoLTE_EMC_INT_ABT_01		
Objective:	To perform SIP session abort (originating side) and the related interactions with PCRF A and EPC A.		
Summary:	On session abort, the P-CSCF A should trigger the removal of all relevant previously created early media bearers. EPC A removes the bearers for early media. Media transport is no longer possible, after the session abort.		
Configuration:	CF_VoLTE_INT_ES (Option 1, Option 2 and Option 3)		
SUT:	IMS A and EPC A		
Interfaces:	Gm, Mw, Gx, Rx, Mm		
References:	Gm, ETSI TS 124 229 [2], clauses 5.1.3, 5.2.7, 5.11.2, 6.1 and 6.2 Mw		

5.3.3.1 Emergency Session Abort

Interoperability Test Description				
	Mm	ETSI TS 123 167 [14], clause 5.2		
	Mx	ETSI TS 124 229 [2], clause 5.11.2		
	Mi			
	Gx	ETSI TS 129 212 [7], clause 4.5.2		
	Rx	ETSI TS 129 214 [6], clause 4.4.4		
	ΓX	L13113129214[0], clause 4.4.4		
Pre-test	• U	E A previously attached to EPC A.		
conditions:		PC A established an emergency Bearer allowing UE A to P-CSCF IP		
		ommunication.		
		E A & PSAP previously registered to IMS and IMS signalling bearers		
		ovisioned.		
	pi	ovisioned.		
Test Sequence:	Step			
	1	Verify that media between UE A and PSAP is not delivered in any direction.		
	2	UE A initiates an emergency session establishment operation.		
	3	PSAP answers with SIP 183 Session Progress INVITE Response and starts		
	Ũ	sending early media.		
	4	Verify that early media is delivered from PSAP to UE A.		
	5	UE A cancels the session establishment.		
	6	Verify that P-CSCF A terminates the Rx session, triggering removal of all		
	-	early media related bearers.		
	7	Verify that EPC A removes all early media related bearers.		
	8	Verify that media between UE A and PSAP can no longer be exchanged and		
	-	is filtered out by EPC A.		
Conformance	5	Gm TP_GM_PCSCF_EMC_CANCEL_01 (Event 1)		
criteria of test		Mw TP_MW_PCSCF_EMC_CANCEL_01 (Event 6)		
sequence step:		Mm TP_MM_ECSCF_EMC_CANCEL_01 (Events 7, 8)		
		Mx TP_MX_ECSCF_EMC_CANCEL_01 (Events 9, 12)		
		Mi TP_MI_ECSCF_EMC_CANCEL_01 (Events 13, 16)		
	6	Rx TP_RX_PCSCF_STR_03 (STR - Event 2)		
		Gx TP_GX_PCRF_RAR_02 (RAR - Event 3)		
	7	Gx TP_GX_PGW_RAA_03 (RAA - Event 4)		
		Rx TP_RX_PCRF_STA_01 (STA - Event 5)		
		Gm TP_GM_PCSCF_EMC_200OK_CANCEL_01 (Event 18)		
		Mw TP_MW_PCSCF_EMC_200OK_CANCEL_01 (Event 17)		
		Mm TP_MM_ECSCF_EMC_487INVITE_01 (Events 19)		
		Mx TP_MX_ECSCF_EMC_487INVITE_01 (Events 21)		
		Mi TP_MI_ECSCF_EMC_487INVITE_01 (Events 23)		
		Gm TP_GM_PCSCF_EMC_487INVITE_01 (Event 25)		
		Mw TP_MW_PCSCF_EMC_487INVITE_01 (Event 24)		
	8	Rtp TP_RTP_ECO_01 (Events 33, 34)		



NOTE 1: In the above figure, the Gx interaction may take place after completion of the Rx interaction. NOTE 2: Emergency Session Abort is not possible for eCall.

Figure 18: Emergency Session Abort

- 1) The UE A responds 180 Ringing with CANCEL.
- 2) P-CSCF sends a ST-Request to the PCRF (Session-Termination request).
- 3) PCRF sends a RA-Request to the PGW (Re-Auth request).
- 4) PGW responds with RA-Answer to PCRF.
- 5) PCRF responds with ST-Answer to P-CSCF.

60

- 6) P-CSCF sends CANCEL to E-CSCF.
- 7) (Option 1) E-CSCF sends CANCEL to PSAP.
- 8) (Option 1) PSAP sends 200 OK (CANCEL) to E-CSCF.
- 9) (Option 2) E-CSCF sends CANCEL to IBCF.
- 10) (Option 2) IBCF forwards the CANCLE towards PSAP.
- 11) (Option 2) PSAP sends 200 OK (CANCEL) to IBCF.
- 12) (Option 2) IBCF sends 200 OK (CANCEL) to E-CSCF.
- 13) (Option 3) E-CSCF sends CANCEL to BGCF.
- 14) (Option 3) BGCF forwards CANCLE towards PSAP over PSTN (may not be a SIP message).
- 15) (Option 3) PSAP sends 200 OK (CANCEL) to BGCF over PSTN.
- 16) (Option 3) BGCF forwards 200 OK (CANCEL) to E-CSCF.
- 17) E-CSCF sends 200 OK (CANCEL) to P-CSCF.
- 18) P-CSCF forwards 200 OK (CANCEL) to UE A.
- 19) (Option 1) PSAP sends 487 (INVITE) to E-CSCF.
- 20) (Option 2) PSAP sends 487 (INVITE)) to IBCF.
- 21) (Option 2) IBCF sends 487 (INVITE) to E-CSCF.
- 22) (Option 3) PSAP sends 487 (INVITE) to BGCF over PSTN (may not be a SIP message).
- 23) (Option 3) BGCF forwards 487 (INVITE) to E-CSCF.
- 24) E-CSCF sends 487 (INVITE) to P-CSCF.
- 25) P-CSCF forwards 487 (INVITE) to UE A.
- 26) UE A sends ACK to IMS A P-CSCF.
- 27) P-CSCF sends ACK to E-CSCF.
- 28) (Option 1) E-CSCF forwards ACK to PSAP.
- 29) (Option 2) E-CSCF forwards ACK to IBCF.
- 30) (Option 2) IBCF forwards the ACK towards PSAP.
- 31) (Option 3) E-CSCF forwards ACK to BGCF.
- 32) (Option 3) BGCF forwards the ACK towards PSAP over PSTN (may not be a SIP message).
- 33) The dedicated bearer(s) is/are down.
- 34) No media can flow between the UEs.

5.3.3.2 Emergency Session Reject from PSAP

Interoperability Test Description			
Identifier:	TD_VoLTE_ECO_INT_REJ_01		
Objective:	To demonstrate interaction between UE A and PSAP when an emergency session is rejected.		
Summary:	On session reject, the P-CSCF A should trigger the removal of all relevant previously created early media bearers. EPC A removes the bearers for early media. Media transport is no longer possible, after the rejected session.		

		Interoperability Test Description	
Configuration:	CF_VoLTE_INT_ES (Option 1, Option 2 and Option 3)		
SUT:	IMS A and EPC A		
Interfaces:	Gm, Mw, Gx, Rx, Mm		
References:	Gm, Mw	ETSI TS 124 229 [2], clauses 5.1.3, 5.2.10.5, 5.10.3.2, 5.11.2, 6.1 and 6.2	
	Mm, Mx,	ETSI TS 123 167 [14], clause 5.2	
	Mi,		
	Gx	ETSI TS 129 212 [7], clause 4.5.2	
	Rx	ETSI TS 129 214 [6], clause 4.4.4	
	· · ·		
Pre-test		E A previously attached to EPC A.	
conditions:		PC A established an emergency Bearer allowing UE A to P-CSCF IP ommunication.	
	• U	E A & PSAP previously registered to IMS and IMS signalling bearers	
		ovisioned. SAP not available (turn off)	
Test Sequence:	Step		
	1	Verify that media between UE A and PSAP is not delivered in any direction.	
	2	UE A initiates an emergency session establishment operation.	
	3	PSAP rejects session establishment with 480 "Temporary Unavailable"	
	4	Verify that P-CSCF reject the request by returning a 380 (Alternative Service) response	
	5	Verify that P-CSCF A terminates the Rx session, triggering removal of all early media related bearers.	
	6	Verify that EPC A removes all early media related bearers.	
	7	Verify that media between UE A and PSAP can not be exchanged and is	
		filtered out by EPC A.	
Conformance	4		
Conformance criteria of test	1	Rtp TP_RTP_ECO_01 (Events 1, 2)	
	2	Gm TP_GM_PCSCF_ECO_INVITE_01 (Event 3)	
sequence step:		Gm TP_GM_PCSCF_ECO_INVITE_02 (Event 3)	
		Gm TP_GM_PCSCF_ECO_INVITE_03 (Event 3) Gm TP_GM_PCSCF_ECO_INVITE_04 (Event 3)	
		Gm TP_GM_PCSCF_ECO_INVITE_05 (Event 3)	
		Gm TP_GM_PCSCF_ECO_INVITE_06 (Event 3)	
		Gm TP_GM_PCSCF_ECO_INVITE_07 (Event 3)	
		Gm TP_GM_PCSCF_ECO_INVITE_08 (Event 3)	
	3	Ic TP_IC_IBCF_ECO_480INVITE_01 (Event 16)	
	5	Mm TP_MM_ECSCF_ECO_480INVITE_01 (Events 14, 23)	
		Mx TP_MX_ECSCF_ECO_480INVITE_01 (Events 18, 23)	
		Mi TP_MI_ECSCF_ECO_480INVITE_01 (Events 22, 23)	
	4	Mw TP_MW_PCSCF_ECO_480INVITE_01 (Events 23, 28)	
	5, 6, 7	Rx TP_RX_PCSCF_STR_05 (STR - Event 24)	
	5, 0, 7	Gx TP_GX_PCRF_RAR_02 (RAR - Event 25)	
		Gx TP_GX_PCKF_KAK_02 (KAR - Event 25) Gx TP_GX_PGW_RAA_03 (RAA - Event 26)	
		Rx TP_RX_PCRF_STA_01 (STA - Event 27)	
		Rtp TP_RTP_ECO_01 (Events 36, 37)	
	L	Λιμ IT_ΛΙΕ_ΕΟΟ_01 (Ενθιιδ 30, 37)	

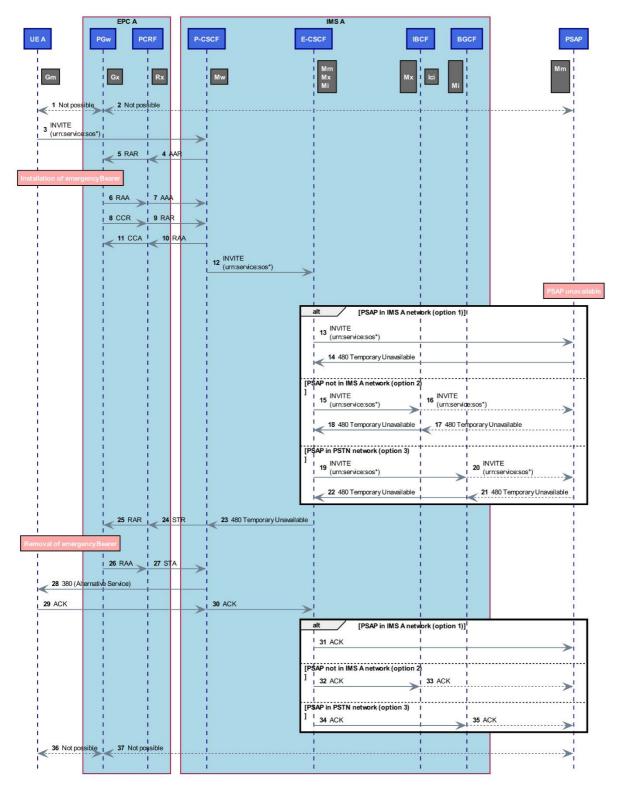




Figure 19: Emergency Session Reject - PSAP unavailable

- 1) The dedicated bearer(s) is/are down.
- 2) No media can flow between the Ues.
- 3) UE A initiates the SIP session with an INVITE containing the service URN "sos".
- 4) The IMS A P-CSCF invokes the PCRF.

- 5) PCRF sends RAR to EPC A PGW.
- 6) EPC A PGW responds with RAA.
- 7) PCRF responds to IMS A P-CSCF with AAA.
- 8) EPC A PGW sends CCR to PCRF.
- 9) PCRF sends RAR to P-CSCF.
- 10) P-CSCF responds with RAA.
- 11) PCRF responds with CCA to PGW.
- 12) P-CSCF sends the INVITE to E-CSCF.
- 13) (Option 1) E-CSCF forwards the INVITE to PSAP.
- 14) (Option 1) PSAP response with 480 Temporary Unavailable to E-CSCF.
- 15) (Option 2) E-CSCF forwards the INVITE to IBCF.
- 16) (Option 2) IBCF forwards the INVITE towards PSAP.
- 17) (Option 2) PSAP response with 480 Temporary Unavailable to IBCF.
- 18) (Option 2) IBCF forwards the response with 480 Temporary Unavailable to E-CSCF.
- 19) (Option 3) E-CSCF forwards the INVITE to BGCF.
- 20) (Option 3) BGCF forwards the INVITE towards PSAP over PSTN (may not be a SIP message).
- 21) (Option 3) PSAP response with 480 Temporary Unavailable to BGCF over PSTN (may not be a SIP message).
- 22) (Option 3) BGCF forwards the response with 480 Temporary Unavailable to E-CSCF
- 23) E-CSCF sends the 480 Temporary Unavailable to P-CSCF.
- 24) The IMS A P-CSCF invokes the PCRF to remove the bearer.
- 25) PCRF sends RAR to EPC A PGW.
- 26) EPC A PGW responds with RAA.
- 27) PCRF responds to IMS A P-CSCF with STA.
- 28) P-CSCF 64ends the 380 (Alternative Service) to UE A.
- 29) UE A sends ACK to IMS A P-CSCF.
- 30) P-CSCF sends ACK to E-CSCF.
- 31) (Option 1) E-CSCF forwards ACK to PSAP.
- 32) (Option 2) E-CSCF forwards ACK to IBCF.
- 33) (Option 2) IBCF forwards the ACK towards PSAP.
- 34) (Option 3) E-CSCF forwards ACK to BGCF.
- 35) (Option 3) BGCF forwards the ACK towards PSAP over PSTN (may not be a SIP message).
- 36) The dedicated bearer(s) is/are down.
- 37) No media can flow between the UE and PSAP.

5.3.3.3 Emergency Session Reject - IMS not able to handle emergency sessions

		Interoperability Test Description		
Identifier:	TD_VoLT	E_ECO_INT_REJ_02		
Objective:	To demonstrate interaction between UE A and P-CSCF when an emergency session is rejected.			
Summary:	On session reject, the P-CSCF A should trigger the removal of all relevant previously created early media bearers. EPC A removes the bearers for early media. Media transport is no longer possible, after the rejected session.			
Configuration:	CF_VoLT	E_INT_ES		
SUT:	IMS A and	J EPC A		
Interfaces:	Gm			
References:	Gm	ETSI TS 124 229 [2], clause 5.2.10.5		
Pre-test conditions:	 UE A previously attached to EPC A. EPC A established default Bearer allowing UE A to P-CSCF IP communication. UE A & PSAP previously registered to IMS and IMS signalling bearers provisioned. The IMS A is not capable or does not handle emergency sessions 			
Test Sequence:	2	UE A initiates an emergency session establishment operation. Verify that P-CSCF reject the request by returning a 380 (Alternative Service) response.		
Conformance criteria of test sequence step:		Gm TP_GM_PCSCF_ECO_INVITE_01 (Event 1) Mw TP_MW_PCSCF_ECO_380INVITE_01 (Events 2)		

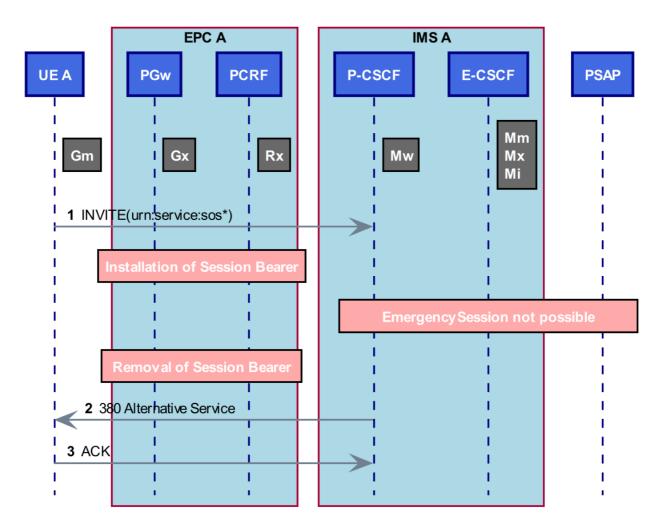


Figure 20: Emergency Session Reject - Network Rejection

- 1) UE A initiates the emergency session with an INVITE containing the service URN "sos".
- 2) P-CSCF sends 380 (Alternative Service) to UE-A.
- 3) UE A sends ACK to P-CSCF.

5.3.3.4 Emergency Session Reject - due to wrong urn

	Interoperability Test Description		
Identifier:	TD_VoLTE_ECO_INT_REJ_03		
Objective:	To demonstrate interaction between UE A and P-CSCF when an emergency session is rejected due to wrong urn.		
Summary:	On session reject, the P-CSCF A should trigger the removal of all relevant previously created early media bearers. EPC A removes the bearers for early media. Media transport is no longer possible, after the rejected session.		
Configuration:	CF_VoLTE_INT_ES		
SUT:	IMS A and EPC A		
Interfaces:	Gm		
References:	Gm ETSI TS 124 229 [2], clauses 5.2.10.4 and 5.2.10.5		
Pre-test conditions:	 UE A previously attached to EPC A. EPC A established default Bearer allowing UE A to P-CSCF IP communication. UE A & PSAP previously registered to IMS and IMS signalling bearers provisioned. The IMS A rejects emergency session due to wrong urn. 		

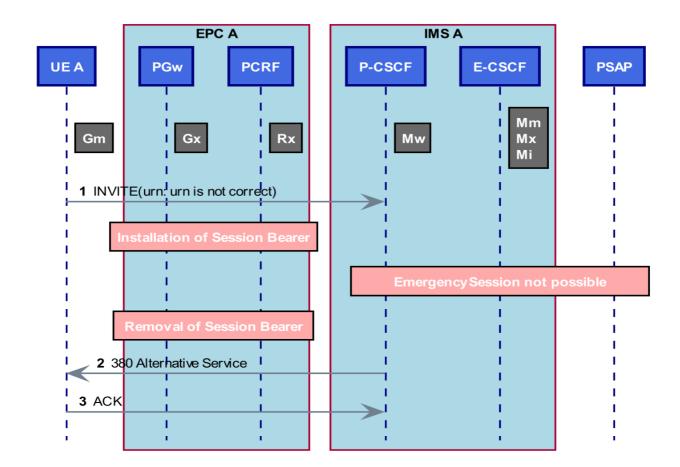


Figure 21: Emergency Session Reject - Wrong urn

- 1) UE A initiates the emergency session with an INVITE containing wrong service URN.
- 2) P-CSCF sends 380 (Alternative Service) to UE-A.
- 3) UE A sends ACK to P-CSCF.

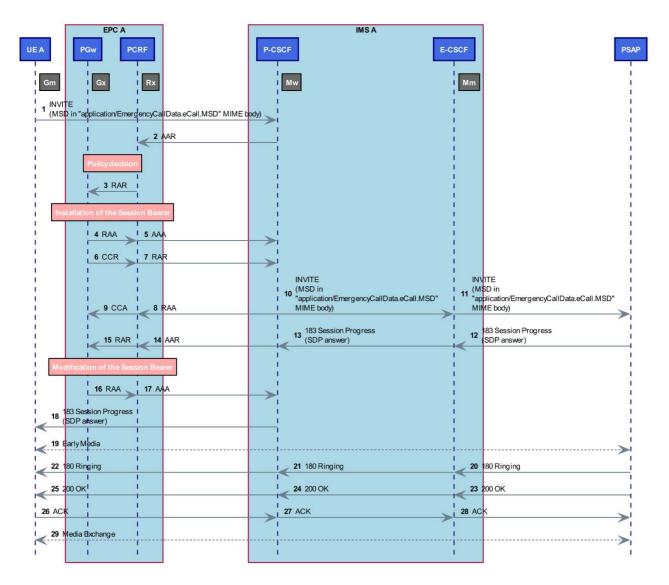
5.3.4 NG eCall tests

5.3.4.1 MSD sent during NG eCall establishment

Identifier:	TD_VoLTE_NGC_INT_INI_01
	To demonstrate the establishment of IMS emergency call of the (automatically or manually) initiated eCall type of emergency service within an emergency registration. PSAP is located in the IM CN subsystem of IMS A.

Summary:	An eCall type of emergency service is setup between UE A and the PSAP located in the				
	IM CN subsystem of IMS A.				
	UE-A is attached to EPC A and registered to IMS A, has performed the emergency				
	registration to IMS A, and requests emergency session establishment using an emergency URN.				
	The P-CSCF derives descriptions of the Service Data Flow from the SDP data, requests				
	creation of adequate bearers from PCRF and EPC, and forwards the request to the E-				
	CSCF.				
	The E-CSCF retrieves the PSAP URI from local configuration and forwards the request				
	to this PSAP.				
	Media transport is possible only after the successful establishment of the session.				
	Media negotiation happens during INVITE/200 OK (UE A sends SDP-offer, PSAP				
Configurations	responds with SDP-answer).				
Configuration: SUT:	CF_VoLTE_INT_ES option 1 IMS A, EPC A and PSAP				
Interfaces:	Gm, Mw, Rx, Gx, Mm				
References:	Mm ETSI TS 124 229 [2], clause 5.11.2				
	ETSI TS 123 167 [14]				
	Gm, ETSI TS 124 229 [2], clauses 5.1.6.8.3, 5.1.6.11, 5.2.6.3.3, 5.2.10.3 and				
	Mw 5.11.2				
	Rx ETSI TS 129 214 [6], clauses 4.4.1, A.1, A.2 and annex B				
	Gx ETSI TS 129 212 [7], clause 4.5.2				
Pre-test	UE A previously attached to EPC A.				
conditions:	UE A previously registered to IMS A.				
	EPC established an emergency Bearer allowing UE A - P-CSCF IP				
	communication.				
	• EPC established an IMS signalling bearer.				
	 PSAP is registered or connected to the IMS A and ready to accept the session establishment. 				
	UE A previously performed emergency registration.				
	• OE A previously performed emergency registration.				
Test Sequence:	Step				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment.				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN.				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the NG eCall URNs defined in Table 1.				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the NG eCall URNs defined in Table 1. Verify also that the UE A inserts a multipart/mixed body containing an				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the NG eCall URNs defined in Table 1. Verify also that the UE A inserts a multipart/mixed body containing an "application/EmergencyCallData.eCall.MSD" MIME body part containing the				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the NG eCall URNs defined in Table 1. Verify also that the UE A inserts a multipart/mixed body containing an "application/EmergencyCallData.eCall.MSD" MIME body part containing the MSD not exceeding 140 bytes and encoded in binary ASN.1 PER, a Content-				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the NG eCall URNs defined in Table 1. Verify also that the UE A inserts a multipart/mixed body containing an "application/EmergencyCallData.eCall.MSD" MIME body part containing the MSD not exceeding 140 bytes and encoded in binary ASN.1 PER, a Content-Disposition header field with the handling parameter set to optional, an Accept				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the NG eCall URNs defined in Table 1. Verify also that the UE A inserts a multipart/mixed body containing an "application/EmergencyCallData.eCall.MSD" MIME body part containing the MSD not exceeding 140 bytes and encoded in binary ASN.1 PER, a Content-Disposition header field with the handling parameter set to optional, an Accept header field indicating "application/EmergencyCallData.Control+xml"is				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the NG eCall URNs defined in Table 1. Verify also that the UE A inserts a multipart/mixed body containing an "application/EmergencyCallData.eCall.MSD" MIME body part containing the MSD not exceeding 140 bytes and encoded in binary ASN.1 PER, a Content-Disposition header field with the handling parameter set to optional, an Accept header field indicating "application/EmergencyCallData.Control+xml"is acceptable, and a Recv-Info header field set to				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the NG eCall URNs defined in Table 1. Verify also that the UE A inserts a multipart/mixed body containing an "application/EmergencyCallData.eCall.MSD" MIME body part containing the MSD not exceeding 140 bytes and encoded in binary ASN.1 PER, a Content-Disposition header field with the handling parameter set to optional, an Accept header field indicating "application/EmergencyCallData.Control+xml"is				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the NG eCall URNs defined in Table 1. Verify also that the UE A inserts a multipart/mixed body containing an "application/EmergencyCallData.eCall.MSD" MIME body part containing the MSD not exceeding 140 bytes and encoded in binary ASN.1 PER, a Content-Disposition header field with the handling parameter set to optional, an Accept header field indicating "application/EmergencyCallData.Control+xml"is acceptable, and a Recv-Info header field set to "EmergencyCallData.eCall.MSD". 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network.				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the NG eCall URNs defined in Table 1. Verify also that the UE A inserts a multipart/mixed body containing an "application/EmergencyCallData.eCall.MSD" MIME body part containing the MSD not exceeding 140 bytes and encoded in binary ASN.1 PER, a Content-Disposition header field with the handling parameter set to optional, an Accept header field indicating "application/EmergencyCallData.Control+xml"is acceptable, and a Recv-Info header field set to "EmergencyCallData.eCall.MSD". 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network.				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the NG eCall URNs defined in Table 1. Verify also that the UE A inserts a multipart/mixed body containing an "application/EmergencyCallData.eCall.MSD" MIME body part containing the MSD not exceeding 140 bytes and encoded in binary ASN.1 PER, a Content-Disposition header field with the handling parameter set to optional, an Accept header field indicating "application/EmergencyCallData.cOntrol+xml"is acceptable, and a Recv-Info header field set to "EmergencyCallData.eCall.MSD". 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. 5 Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF.				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the NG eCall URNs defined in Table 1. Verify also that the UE A inserts a multipart/mixed body containing an "application/EmergencyCallData.eCall.MSD" MIME body part containing the MSD not exceeding 140 bytes and encoded in binary ASN.1 PER, a Content-Disposition header field with the handling parameter set to optional, an Accept header field indicating "application/EmergencyCallData.cOntrol+xml"is acceptable, and a Recv-Info header field set to "EmergencyCallData.eCall.MSD". 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. 5 Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF.				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the NG eCall URNs defined in Table 1. Verify also that the UE A inserts a multipart/mixed body containing an "application/EmergencyCallData.eCall.MSD" MIME body part containing the MSD not exceeding 140 bytes and encoded in binary ASN.1 PER, a Content-Disposition header field with the handling parameter set to optional, an Accept header field indicating "application/EmergencyCallData.Control+xml"is acceptable, and a Recv-Info header field set to "EmergencyCallData.eCall.MSD". 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. 5 Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. 6 Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media.				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the NG eCall URNs defined in Table 1. Verify also that the UE A inserts a multipart/mixed body containing an "application/EmergencyCallData.eCall.MSD" MIME body part containing the MSD not exceeding 140 bytes and encoded in binary ASN.1 PER, a Content-Disposition header field with the handling parameter set to optional, an Accept header field indicating "application/EmergencyCallData.Control+xml"is acceptable, and a Recv-Info header field set to "EmergencyCallData.eCall.MSD". 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. 5 Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. 6 Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. 7 Verify that PCRF requested media description was found acceptable by EPC				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the NG eCall URNs defined in Table 1. Verify also that the UE A inserts a multipart/mixed body containing an "application/EmergencyCallData.eCall.MSD" MIME body part containing the MSD not exceeding 140 bytes and encoded in binary ASN.1 PER, a Content-Disposition header field with the handling parameter set to optional, an Accept header field indicating "application/EmergencyCallData.Control+xml"is acceptable, and a Recv-Info header field set to "EmergencyCallData.eCall.MSD". 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. 5 Verify that IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. 6 Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. 7 Verify that PCRF requested media.				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the NG eCall URNs defined in Table 1. Verify also that the UE A inserts a multipart/mixed body containing an "application/EmergencyCallData.eCall.MSD" MIME body part containing the MSD not exceeding 140 bytes and encoded in binary ASN.1 PER, a Content-Disposition header field with the handling parameter set to optional, an Accept header field indicating "application/EmergencyCallData.Control+xml"is acceptable, and a Recv-Info header field set to "EmergencyCallData.eCall.MSD". 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. 5 Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. 6 Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. 7 Verify that PCRF requested media.				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the NG eCall URNs defined in Table 1. Verify also that the UE A inserts a multipart/mixed body containing an "application/EmergencyCallData.eCall.MSD" MIME body part containing the MSD not exceeding 140 bytes and encoded in binary ASN.1 PER, a Content-Disposition header field with the handling parameter set to optional, an Accept header field indicating "application/EmergencyCallData.Control+xml"is acceptable, and a Recv-Info header field set to "EmergencyCallData.eCall.MSD". 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. 5 Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. 6 Verify that PCRF requested media. 7 Verify that PCRF requested media. 8 Verify that media between UE A and PSAP is successfully routed over the				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the NG eCall URNs defined in Table 1. Verify also that the UE A inserts a multipart/mixed body containing an "application/EmergencyCallData.eCall.MSD" MIME body part containing the MSD not exceeding 140 bytes and encoded in binary ASN.1 PER, a Content-Disposition header field with the handling parameter set to optional, an Accept header field indicating "application/EmergencyCallData.Control+xml"is acceptable, and a Recv-Info header field set to "EmergencyCallData.eCall.MSD". 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. 5 Verify that the IDS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. 6 Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media. 7 Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF. 8 Verify that media between UE A and PSAP is successfully routed				
Test Sequence:	Step 1 Verify that media between UE A and PSAP is not delivered in any direction before call establishment. 2 UE A initiates an eCall type of emergency call to establish a communication session using an emergency service URN. 3 Verify that the UE A inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the NG eCall URNs defined in Table 1. Verify also that the UE A inserts a multipart/mixed body containing an "application/EmergencyCallData.eCall.MSD" MIME body part containing the MSD not exceeding 140 bytes and encoded in binary ASN.1 PER, a Content-Disposition header field with the handling parameter set to optional, an Accept header field indicating "application/EmergencyCallData.Control+xml"is acceptable, and a Recv-Info header field set to "EmergencyCallData.eCall.MSD". 4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network. 5 Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF. 6 Verify that PCRF requested media. 7 Verify that PCRF requested media. 8 Verify that media between UE A and PSAP is successfully routed over the				

Conformance	2	Gm	TP_GM_PCSCF_NGC_INVITE_01 (Event 1)
criteria of test	3	Gm	TP_GM_PCSCF_ECO_REGISTER_02 (Pre-test)
sequence step:	4	Mw	TP_MW_PCSCF_ECO_INVITE_02 (Event 10)
		Mm	TP_MM_ECSCF_ECO_INVITE_01 (Event 11)
	6/7	Rx	TP_RX_PCSCF_AAR_03 (AAR - Event 2)
		Rx	TP_RX_PCSCF_AAR_04 (AAR - Event 14)
		Rx	TP_RX_PCRF_AAA_02 (AAA - Events 5, 17)
		Gx	TP_GX_PCRF_RAR_01 (RAR - Events 3, 15)
		Rx	TP_RX_PCSCF_RAA_01 (RAR, RAA - Events 7, 8)
		Gx	TP_GX_PGW_RAA_02 (RAA - Events 4, 16)
		Gx	TP_GX_PCRF_CCA_06 (CCR, CCA - Events 6, 9)
	8	Rtp	TP_RTP_ECO_03 (Event 29)



NOTE 1: The interaction in above figure is the same for emergency registered and non-emergency registered UE. NOTE 2: In the above figure, the Gx interaction may take place after completion of the Rx interaction.

Figure 22: NG eCall establishment with emergency registration, PSAP in same IM CN subsystem

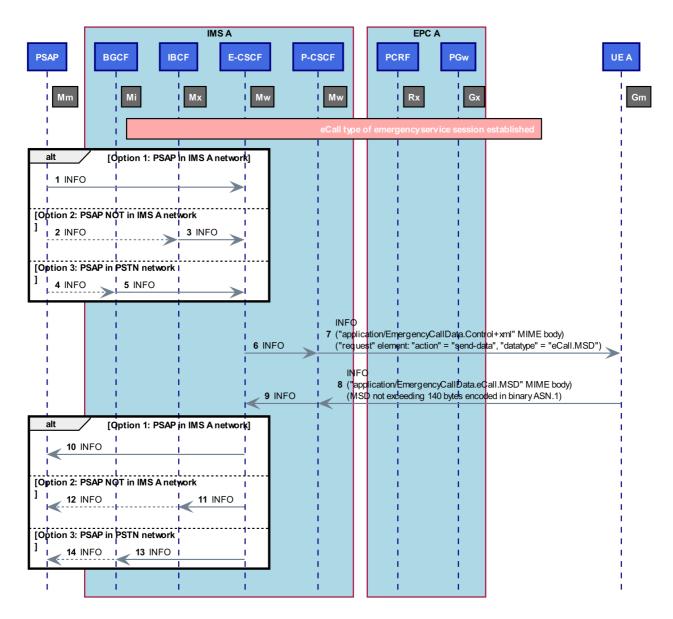
 UE A initiates the emergency session with an INVITE request. The From header field includes the public user identity (registered via emergency registration) or the tel URI associated with the public user identity (registered via emergency registration). The multipart/mixed body contains an "application/EmergencyCallData.eCall.MSD" MIME body part containing the MSD not exceeding 140 bytes and encoded in binary ASN.1 PER.

- 2) The IMS A P-CSCF invokes the PCRF.
- 3) PCRF sends RAR to EPC A PGW.
- 4) EPC A PGW responds with RAA.
- 5) PCRF responds to IMS A P-CSCF with AAA.
- 6) EPC A P- GW sends CCR.
- 7) PCRF sends RAR to P-CSCF.
- 8) P-CSCF responds with RAA.
- 9) PCRF responds with CCA to PGW.
- 10) P-CSCF sends the INVITE including the MSD MIME body to E-CSCF.
- 11) E-CSCF sends the INVITE including the MSD MIME body to PSAP.
- 12) PSAP responds with the 183 response with SDP answer to E-CSCF.
- 13) E-CSCF sends the 183 response to P-CSCF.
- 14) The IMS A P-CSCF invokes the PCRF to modify the bearer with AAR.
- 15) PCRF sends RAR to EPC A PGW.
- 16) EPC A PGW responds with RAA.
- 17) PCRF responds to IMS A P-CSCF with AAA.
- 18) P-CSCF forwards the SIP 183 (SDP) to UE A.
- 19) Early media may flow between the UE A and PSAP.
- 20) The PSAP responds with the 180 Ringing to E-CSCF.
- 21) E-CSCF forwards the 180 to P-CSCF.
- 22) P-CSCF forwards the SIP 180 to UE A.
- 23) PSAP sends 200 OK to E-CSCF.
- 24) E-CSCF forwards the 200 OK to P-CSCF.
- 25) P-CSCF forwards the 200 OK towards UE A.
- 26) UE A sends ACK to P-CSCF.
- 27) P-CSCF sends ACK to E-CSCF.
- 28) E-CSCF sends ACK to PSAP.
- 29) Media Exchange.

5.3.4.2 MSD update during NG eCall

	Interoperability Test Description
Identifier:	TD_VoLTE_NGC_INT_INF_01
Objective:	To demonstrate that if an IMS emergency call of the (automatically or manually) initiated eCall type of emergency service has been established, the attempt by the PSAP to request transfer of an updated MSD shall be answered.
Summary:	Verifying the complete message stream related to the transfer of an updated MSD requested by the PSAP and answered by the UE having established the eCall session. The updated MSD is transferred in the "application/EmergencyCallData.eCall.MSD" MIME body of an INFO request message.
Configuration:	CF_VoLTE_INT_ES (Option 1, Option 2 and Option 3)

		Interoperability Test Description
SUT:	IMS A ar	nd EPC A
Interfaces:	Gm, Mw,	Mm, Mx, Mi
	Mm,	ETSI TS 124 229 [2], clause 5.11.2
	Mx,	ETSI TS 123 167 [14]
	Mi	
	Gm,	ETSI TS 124 229 [2], clauses 5.1.6.8, 5.1.6.11.3, 5.2.6.3, 5.2.6.4, 5.2.10.3
	Mw	and 5.11.2
	T	
Pre-test		E A previously established an emergency call of the (automatically or manually)
conditions:	in	itiated eCall type of emergency service as described in clause 5.3.4.1.
Test Sequence:	Step	
	1	PSAP initiates a request for the transfer of an updated MSD to UE A.
		Verify that the PSAP request for the transfer of an updated MSD is
		successfully routed to the UE A. (INFO request including Info-Package header
		field set to "EmergencyCallData.eCall.MSD", a multipart/mixed body including
		"application/EmergencyCallData.Control+xml" MIME body part containing a
	2	"request" element with an "action" attribute set to "send-data" and a
		"datatype" attribute set to "eCall.MSD", a Content-Disposition header field set
		to "By-Reference" associated with the MIME body part, and a Content-
		Disposition header field set to "Info-Package" associated with the
		multipart/mixed body).
		Verify that UE A answers the request for the transfer of an updated MSD
		(INFO request including Info-Package header field set to
		"EmergencyCallData.eCall.MSD", a Content-Disposition header field set to
	3	"Info-Package", a multipart/mixed body including an
	-	"application/EmergencyCallData.eCall.MSD" MIME body part containing the
		MSD not exceeding 140 bytes and encoded in binary ASN.1 and a Content-
		Disposition header field set to "By-Reference" associated with the
		"application/EmergencyCallData.eCall.MSD" MIME body part).
	4	Verify that the UE A answer to request for the transfer of an updated MSD
		which is successfully routed to the PSAP.
Conformance	2.2	Cm TR CM RCSCE NCC INFO 01 (Event 9)
criteria of test	2, 3	Gm TP_GM_PCSCF_NGC_INFO_01 (Event 8) Mw TP_MW_PCSCF_NGC_INFO_01 (Event 7)
sequence step:	1	



NOTE: For reasons of readability, only the SIP messages are shown in the figure above.

Figure 23: MSD update during NG eCall

- 1) (Option 1) PSAP initiates an MSD update request. PSAP sends the INFO to E-CSCF.
- 2) (Option 2) PSAP initiates an MSD update request. PSAP sends the INFO towards IBCF.
- 3) (Option 2) IBCF forwards the INFO to E-CSCF.
- 4) (Option 3) PSAP initiates an MSD update request. PSAP sends the INFO towards BGCF.
- 5) (Option 2) BGCF forwards the INFO to E-CSCF.
- 6) E-CSCF forwards the INFO to P-CSCF.
- 7) P-CSCF forwards the INFO to UE A.
- 8) UE A responds with an INFO with SDP answer to P-CSCF.
- 9) P-CSCF forwards the INFO to E-CSCF.
- 10) (Option 1) E-CSCF forwards the INFO to PSAP.
- 11) (Option 2) E-CSCF forwards the INFO to IBCF.

- 12) (Option 2) IBCF forwards the INFO towards PSAP.
- 13) (Option 3) E-CSCF forwards the INFO to BGCF.
- 14) (Option 3) BGCF forwards the INFO towards PSAP over PSTN (may not be a SIP message).

5.4 Emergency Deregistration

UE shall not perform user-initiated deregistration due to ETSI TS 124 229 [2], clause 5.1.6.6.

An emergency registration will not be deregistered by the network due to ETSI TS 124 229 [2], clause 5.1.6.7.

5.5 Emergency Network Detachment

5.5.0 General

These tests cover interaction between the EPC, PCRF and IMS when emergency network detachment takes place. Emergency detachment may be triggered by the UE or network.

At the point of detachment, a UE may or may not be registered to IMS and may or may not have active IMS sessions. All possibilities are covered. All affected bearers for a given established session will be removed, and administrative termination of the SIP registration/sessions will be triggered as appropriate.

5.5.1 UE Emergency Network Detachment (with/without Emergency Registration)

		Interoperability Test Description	
Identifier:	TD_VoLT	E_ECO_INT_DTC_01	
Objective:	terminatio has been	strate UE initiated network emergency detachment (IP-CAN session n) for a UE that has not yet emergency registered to the IMS or for UE that emergency registered to the IMS. (emergency deregistration shall not be I by the UE due to ETSI TS 124 229 [2], clause 5.1.6.6)	
Summary:	On compl	ete network detachment, the EPC removes emergency bearers.	
Configuration:	CF_VoLTE_INT_ES		
SUT:	IMS A and	I EPC A	
Interfaces:	Gx		
References:	Gx	ETSI TS 129 212 [7], clause 4.5.15.2.4	
Pre-test conditions:	• UE	A previously attached to EPC with an emergency attachment	
	-		
Test Sequence:	Step		
	1	UE A starts complete network emergency detachment, whilst being or not being registered at IMS.	
	2	Verify that EPC removes the affected emergency bearer.	
	3	Verify that EPC PGW informs the PCRF of the loss of the emergency	
		bearer.	
Conformance criteria of test	2	Gx TP_GX_PCRF_ECO_CCA_02 (CCR, CCA - Events 2, 3)	
sequence step:			

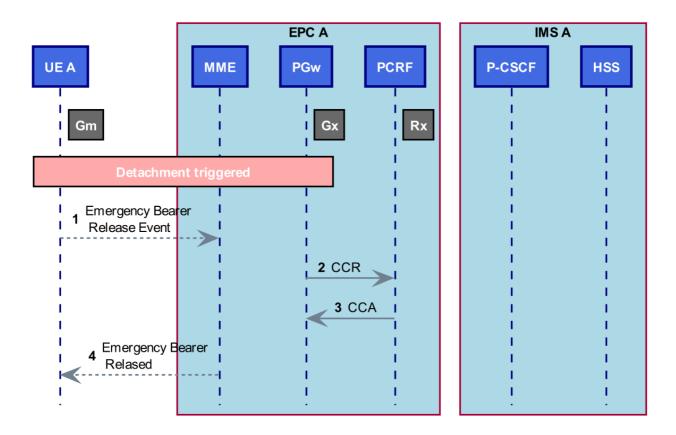


Figure 24: UE Emergency Initiated Network Detachment (with/without Emergency Registration)

- 1) User initiates emergency detachment on UE-A. The UE-A requests emergency IP-CAN session disestablishment to the EPC (MME).
- 2) The PGW sends a CCR message to the PCRF to inform the PCRF that the emergency bearer is being released.
- 3) The PCRF responds with a CCA.
- 4) The MME responds to the UE, confirming that the emergency IP-CAN has been successfully released. User is informed that the emergency bearer has been successfully released.

5.5.2 UE Emergency Network Detachment with Previously Established Emergency Registration & Emergency Session

		Interoperability Test Description		
Identifier:	TD_VoLTE_ECO_INT_DTC_02			
Objective:		strate UE initiated emergency network detachment (emergency IP-CAN		
	emergency	rmination) for a UE that is emergency registered to IMS and also has active v session.		
Summary:	UE terminates emergency session towards IMS. IMS will take action and terminate ongoing emergency SIP session. IMS release the session with PCRF and EPC removes relevant emergency bearer.			
Configuration:	CF_VoLTE_INT_ES (Option 1, Option 2 and Option 3)			
SUT:	IMS A and EPC A			
Interfaces:	Gm, Mw, Rx, Gx, Mm, Mx, Mi			
References:	Gm, ETSI TS 124 229 [2], clauses 5.1.5 (1 st paragraph), 5.1.6.9, 5.2.8.1.2, 5.4.5.2 Mw and 6.2			
	Rx ETSI TS 129 214 [6], clause 4.4.4			
	Gx I	ETSI TS 129 212 [7], clause 4.5.15.2.4		
Pre-test	UE A previously emergency attached to EPC with a single attachment.			
conditions:	UE A previously emergency registered to IMS.			
	UE A previously established emergency SIP session with PSAP.			

74

	Interoperability Test Description		
Test Sequence:	Step		
	1	UE A starts emergency detachment and perform release of emergency call	
		first.	
	2	Verify that IMS performs P-CSCF-initiated emergency call release on affected	
		emergency SIP sessions.	
	3	Verify that EPC aborts affected Rx sessions with IMS.	
	4	Verify that IMS does not performs emergency De-registration.	
	5	EPC triggers removal of all affected bearers. Verify that media is no longer	
		exchanged after these procedures.	
	6	Verify that media between UE and other endpoint can no longer be	
		exchanged and is filtered out by EPC.	
Conformance	2	Gm TP_GM_PCSCF_ECO_BYE_01 (Event 2)	
criteria of test		Mw TP_MW_PCSCF_ECO_BYE_01 (Event 7)	
sequence step:		Mm TP_MM_ECSCF_ECO_BYE_01 (Event 8)	
		Mx TP_MX_ECSCF_ECO_BYE_01 (Events 9, 10)	
		Mi TP_MI_ECSCF_ECO_BYE_01 (Event 11, 12)	
		Gm TP_GM_PCSCF_200OK_BYE_01 (Event 19)	
		Mw TP_MW_PCSCF_200OK_BYE_01 (Event 18)	
	3	Gx TP_GX_PCRF_RAR_02 (RAR - Event 4)	
		Gx TP_GX_PGW_RAA_03 (RAA - Event 5)	
		Rx TP_RX_PCRF_STA_02 (STR, STA - Events 3, 6)	
	5	Gx TP_GX_PCRF_ECO_CCA_02 (CCR, CCA - Events 20, 21)	

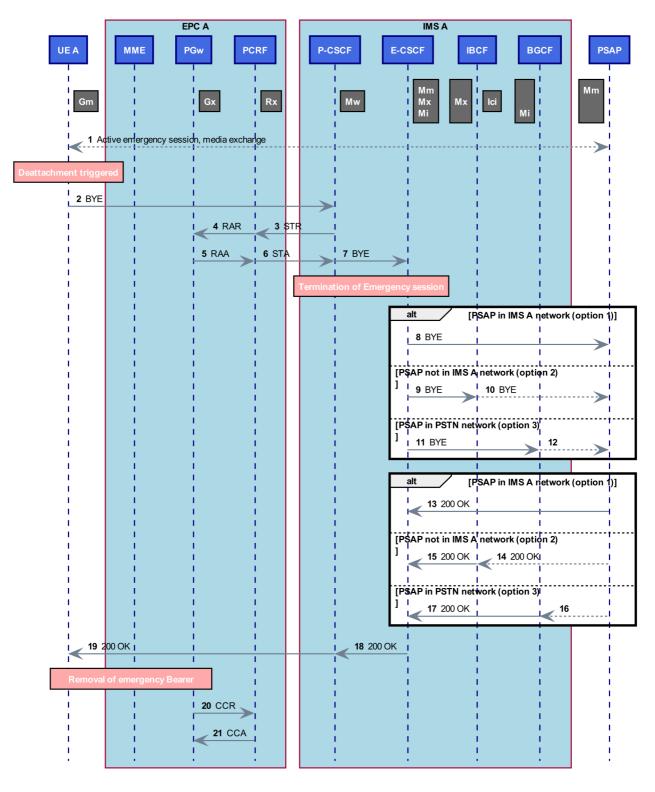


Figure 25: UE Emergency Network Detachment (Emergency Registered & Emergency session)

- 1) UE-A, PSAP active session, media exchange.
- 2) User initiates detachment on UE-A. UE-A sends BYE towards P-CSCF.
- 3) IMS P-CSCF sends STR to abort the Rx session (emergency bearer).
- 4) The PCRF removes the emergency SIP bearer RAR.
- 5) The PGW in the EPC responds with RAA to the PCRF.

- 6) EPC PCRF responds with STA.
- 7) P-CSCF forwards the BYE to E-CSCF.
- 8) Option 1: E-CSCF forwards the BYE to PSAP over Mm interface.
- 9) Option 2: E-CSCF forwards the BYE to IBCF over Mx interface.
- 10) Option 2: IBCF forwards the BYE towards PSAP in another network.
- 11) Option 3: E-CSCF forwards the BYE to BGCF over Mi interface.
- 12) Option 3: BGCF forwards the request towards PSAP in PSTN network.
- 13) Option 3: PSAP send an answer towards BGCF.
- 14) Option 3: BGCF responds with 200 OK (BYE) towards E-CSCF.
- 15) Option 2: PSAP responds with 200 OK (BYE) towards IBCF.
- 16) Option 2: IBCF forwards the 200 OK (BYE) towards E-CSCF.
- 17) Option 1: PSAP responds with 200 OK (BYE) towards E-CSCF.
- 18) E-CSCF forwards 200 OK (BYE) to P-CSCF.
- 19) P-CSCF forwards 200 OK (BYE) to UE A.
- 20) The PGW sends a CCR message to the PCRF to inform the PCRF that the emergency bearer is being released.
- 21) The PCRF responds with a CCA.

6 Test Descriptions (Roaming)

6.1 Network Attachment

6.1.1 UE Emergency Network Attachment and Establishment of the Emergency Bearer with USIM

	Interoperability Test Description		
Identifier:	TD_VoLTE_ECO_RMI_ATT_01		
Objective:	To perform UE emergency attachment to the visited network with USIM and establish an emergency bearer.		
Summary:	On successful emergency attachment, the UE/IVS should discover the P-CSCF IP address. The EPC will create the Emergency Bearers which will allow communication only between the UE and the P-CSCF and allowed forwarding towards E-CSCF.		
Configuration:	CF_VoLTE_RMI_ES		
SUT:	IMS A and EPC A		
Interfaces:	Gx, S6a		
References:	ETSI TS 124 229 [2], clauses 9.2.1 and L.2.2.6		
	Gx ETSI TS 129 212 [7], clauses 4.5.15 and 4a.5.12		
	S6a ETSI TS 129 272 [8], clause 5.2.1.1 (MME shall proceed even if Update Location fails)		

		Interoperability Test Description
Pre-test conditions:	PC	etwork emergency attachment credential provisioned in UE B, HSS/SPR and CRF.
	fo	SS/SPR and UE B provisioned with selectable emergency APN configurations r Ipv4, Ipv6 or Ipv4&Ipv6 PDN types.
	en	CSCF address provisioned in the PCRF for the purpose of delivery to UE on nergency attachment.
		nergency Bearer PCRF policies set to allow UE B - P-CSCF communication. efault EPC Gating Policy set to "Deny".
	• UE	E B contains USIM and is not attached to network and EPC.
Test Sequence:	Step	
	1	UE B starts emergency network attachment to visited EPC
	2	Verify that the message sequence is correct
	3	Verify that EPC establishes Emergency Bearer for allowing UE B - P-CSCF communication, by starting at UE B an Emergency registration
	4	Verify that UE B attached successfully and received the following information:
		 suitable Ipv4 and/or Ipv6 address(es)
		DNS configuration information
		P-CSCF IP address or FQDN
	5	Verify that arbitrary IP packets from UE B to arbitrary node, other than the P-CSCF, are filtered-out by EPC and not visible on PO_Sgi
	6	Verify that arbitrary IP packets from another node (e.g. PSAP sent over PO_Sgi) to UE B, are filtered-out by EPC and not visible on PO_UE B

			· · · · · · · · · · · · · · · · · · ·
Conformance	2	S6a	TP_S6A_MME_ULR_01 (ULR - Event 2)
criteria of test		S6a	TP_S6A_HSS_ECO_ULA_01 (ULA - Event 3)
sequence step:		Gx	TP_GX_PCRF_ECO_CCA_01 (CCR, CCA - Events 4, 5)

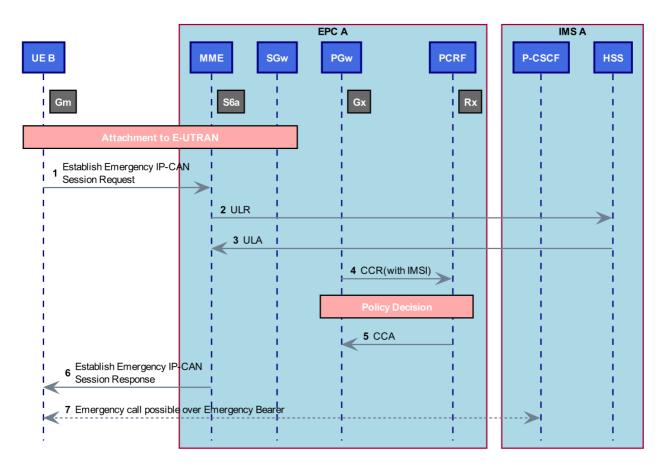


Figure 26: Visited emergency network attachment with USIM

1) The UE-B requests IP-CAN emergency session establishment to the visited EPC (MME).

- 2) The MME sends a ULR message to the HSS/SPR.
- 3) The HSS responds with ULA.
- 4) The PGW sends a CCR message with IMSI to the PCRF to request the emergency bearer.
- 5) The PCRF responds with a CCA.
- 6) The MME responds to the UE B, confirming that the emergency IP-CAN has been successfully set up.
- 7) User is informed that the emergency bearer has been successfully set up.

6.1.2 UE Emergency Network Attachment and Establishment of the Emergency Bearer without USIM

	Interoperability Test Description			
Identifier:	TD_VoLTE_EMC_RMI_ATT_02			
Objective:	To perform UE emergency attachment to the visited network without USIM (related only to emergency call) and establish an emergency bearer.			
Summary:	On successful emergency attachment, the UE/IVS should discover the P-CSCF IP address. The EPC will create the Emergency Bearers which will allow communication only between the UE and the P-CSCF and allowed forwarding towards E-CSCF.			
Configuration:	CF_VoLTE_RMI_ES			
SUT:	IMS A and EPC A			
Interfaces:	Gx, S6a			
References:	ETSI TS 124 229 [2], clauses 9.2.1 and L.2.2.6 Gx ETSI TS 129 212 [7], clause 4.5.15 S6a ETSI TS 129 272 [8], clause 5.2.1.1 (MME shall proceed even if Update Location fails)			
Pre-test conditions:	Network emergency attachment credential provisioned in UE B, HSS/SPR and PCRF.			
	 HSS/SPR and UE B provisioned with selectable emergency APN configurations for Ipv4, Ipv6 or Ipv4&Ipv6 PDN types. 			
	 P-CSCF address provisioned in the PCRF for the purpose of delivery to UE on emergency attachment. 			
	 Emergency Bearer PCRF policies set to allow UE B - P-CSCF communication. Default EPC Gating Policy set to "Deny". 			
	• UE B does not contain USIM and is not attached to network and EPC.			
Test Sequence:	Step			
	1 UE B starts emergency network attachment to EPC 2 Verify that the message sequence is correct			
	3 Verify that EPC establishes Emergency Bearer for allowing UE B - P-CSCF communication, by starting at UE B an Emergency registration			
	 4 Verify that UE B attached successfully and received the following information: • suitable Ipv4 and/or Ipv6 address(es) • DNS configuration information P-CSCF IP address or FQDN 			
	5 Verify that arbitrary IP packets from UE B to arbitrary node, other than the P-CSCF, are filtered-out by EPC and not visible on PO_Sgi			
	6 Verify that arbitrary IP packets from another node (e.g. PSAP sent over PO_Sgi) to UE B, are filtered-out by EPC and not visible on PO_UE B			
Conformance	2 S6a TP_S6A_MME_ULR_01 (ULR - Event 2)			
criteria of test	S6a TP_S6A_HSS_ECO_ULA_01 (ULA - Event 3)			
sequence step:	Gx TP_GX_PCRF_EMC_CCA_01 (CCR, CCA - Events 4, 5)			

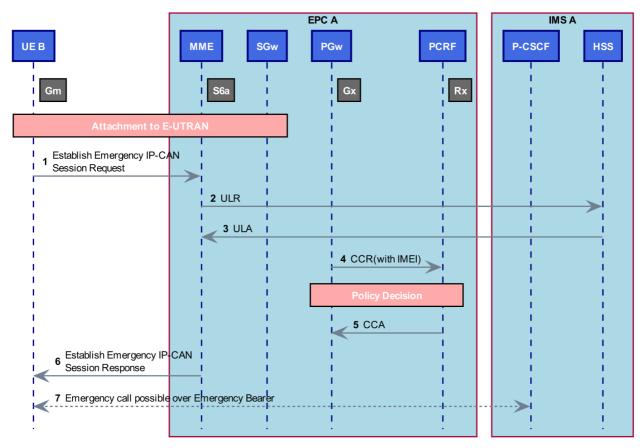


Figure 27: Visited emergency network attachment without USIM

- 1) The UE B requests IP-CAN emergency session establishment to the visited EPC (MME).
- 2) The MME sends a ULR message to the HSS/SPR.
- 3) The HSS responds with ULA.
- 4) The PGW sends a CCR message with IMEI to the PCRF to request the emergency bearer.
- 5) The PCRF responds with a CCA.
- 6) The MME responds to the UE B, confirming that the emergency IP-CAN has been successfully set up.
- 7) User is informed that the emergency bearer has been successfully set up.

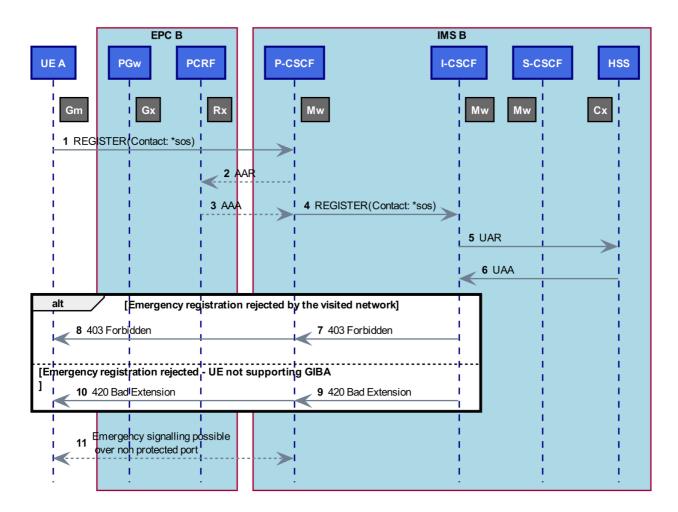
6.2 IMS Emergency Registration in a visited network

6.2.1 IMS Emergency Registration - Rejection

		Interoperability Test Description		
Identifier:	TD_VoLT	TD_VoLTE_ECO_RMI_REG_01		
Objective:	To attempt initial emergency registration via the established emergency bearer for a roaming UE. In this case, the emergency registration is rejected due to visited network or due to not supported GIBA at UE side. Emergency call can be established without emergency registration in visited network(see TD_VoLTE_ECO_RMI_INI_02.			
Summary:	On failed UE emergency Registration to IMS, IMS will be able to transport emergency signalling.			
Configuration:	CF_VoLTE_RMI_ES			
SUT:	IMS B and EPC B			
Interfaces:	Gm, Mw, Cx, Rx			
References:	Gm, Mw Px	ETSI TS 124 229 [2], clauses 5.1.6.2, 5.2.10.5 ETSI TS 134 229-1 [13], clause 19.4.6 or 19.4.7 ETSI TS 129 214 [6] clause A 5		
	Rx ETSI TS 129 214 [6], clause A.5			

80

		Interoperability Test Description		
	Сх	Cx ETSI TS 129 228 [4], clause 6.1.1.1		
Pre-test	• U	E A previously attached to EPC, but not registered to IMS.		
conditions:	• El	PC established a Default Bearer allowing UE A - P-CSCF IP communication.		
	• H	SS of IMS not provisioned with UE A's subscription.		
	• U	E A discovered the P-CSCF address.		
Test Sequence:	Step			
	1	UE A triggers Emergency registration with not acceptable credentials.		
	2	Verify that the Emergency registration has been rejected.		
	3	Verify that the PCRF is not invoked.		
Conformance	2	Gm TP_GM_PCSCF_ECO_REGISTER_04 (Events 1, 8) or		
criteria of test		Gm TP_GM_PCSCF_ECO_REGISTER_05 (Events 1, 10)		
sequence step:		Mw TP_MW_ICSCF_ECO_REGISTER_04 (Events 4, 7) or		
		Mw TP_MW_ICSCF_ECO_REGISTER_05 (Events 4, 9)		
		Cx TP_CX_HSS_UAA_03 (UAR, UAA - Events 5, 6)		
	3	Rx TP_RX_PCSCF_ECO_AAR_01 (AAR - Event 2)		
		Rx TP_RX_PCRF_ECO_AAA_01 (AAA - Event 3)		



NOTE: In the above figure, the Gx interaction may take place after completion of the Rx interaction.

Figure 28: IMS Initial Registration - unsuccessful (Roaming)

- 1) The UE A requests IMS B Registration.
- 2) P-CSCF optionally sent AAR to PCRF to provide EPC-level identities (MSISDN, IMSI, IMEI).
- 3) PCRF responds with AAA.

- 4) P-CSCF forwards the REGISTER to I-CSCF.
- 5) I-CSCF sends UAR to HSS.
- 6) HSS responds with UAA USER_UNKNOWN.
- 7) Option 1: I-CSCF sends 403 response to P-CSCF due to emergency registration rejected by the visited network.
- 8) Option 1: P-CSCF forwards 403 response to UE A.
- 9) Option 2: I-CSCF sends 420 response to P-CSCF due to emergency registration rejected because UE does not support GIBA.
- 10) Option 2: P-CSCF forwards 420 response to UE A.
- 11) Emergency signalling possible over non protected port in visited network.

6.3 Emergency Session Establishment (Roaming)

6.3.1 Roaming UE calling PSAP with emergency registration

The emergency session establishment for emergency registered roaming UE to which the exceptions in ETSI TS 124 229 [2], clauses 5.2.10.3 case 1B) a) do not apply is the same as for not roaming UE described in clause 5.3.1.2.

Identifier:	TD_VoLTE_ECO_RMI_INI_01		
Objective:	To demonstrate the establishment of dedicated bearers at the originating EPC due to		
,	SIP roaming emergency session establishment with an emergency registration.		
	PSAP is located in the IM CN subsystem of IMS A.		
Summary:	An emergency call is setup between the roaming UE B and the PSAP located in the IM CN subsystem of IMS A. UE-B is attached to EPC A and registered to IMS A, has performed the emergency registration to IMS A, and requests emergency session establishment using an emergency URN. The P-CSCF derives descriptions of the Service Data Flow from the SDP data, requests creation of adequate bearers from PCRF and EPC, and forwards the request to the E- CSCF. The E-CSCF retrieves the PSAP URI from local configuration and forwards the request to this PSAP. Media transport is possible only after the successful establishment of the session.		
	Media negotiation happens during INVITE/200 OK (UE A sends SDP-offer, PSAP responds with SDP-answer).		
Configuration:	CF_VoLTE_RMI_ES option 1		
SUT:	IMS A, EPC A and PSAP		
Interfaces:	Gm, Mw, Rx, Gx, Mm		
References:	Mm ETSI TS 124 229 [2], clause 5.11.2		
	ETSI TS 123 167 [14]		
	Gm, ETSI TS 124 229 [2], clauses 5.1.6.8.3, 5.1.6.11, 5.2.6.3.3, 5.2.10.3 case 1B)		
	Mw and 5.11.2		
	Rx ETSI TS 129 214 [6], clauses 4.4.1, A.1, A.2 and annex B		
	Gx ETSI TS 129 212 [7], clause 4.5.2		
Pre-test	UE B previously attached to EPC A.		
conditions:	UE B previously registered to IMS A.		
	EPC established an emergency Bearer allowing UE B - P-CSCF IP		
	communication.		
	EPC established an IMS signalling bearer.		
	PSAP is registered or connected to the IMS A and ready to accept the session		
	establishment.		
	UE B previously performed emergency registration.		

Test Sequence:	Step	
	1	Verify that media between UE B and PSAP is not delivered in any direction before call establishment.
	2	UE B initiates an emergency call to establish a communication session using an emergency service URN.
	3	Verify that the UE B inserts in the INVITE request, a From header field that includes the public user identity registered via emergency registration or the tel URI associated with the public user identity registered via emergency registration and a To header indicating one of the emergency URNs defined in Table 1.
	4	Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network.
	5	Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF.
	6	Verify that the PCRF invokes the EPC PGW with a RA-Request to create a new bearer for the requested media.
	7	Verify that PCRF requested media description was found acceptable by EPC and dedicated bearers are established and that a RA-Answer is sent to the PCRF.
	8	Verify that media between UE B and PSAP is successfully routed over the dedicated bearer.
	9	Verify that media between UE B and PSAP is transported with appropriate PCC characteristics.
Conformance	2	Gm TP_GM_PCSCF_ECO_INVITE_02 (Event1)
criteria of test		Gm TP_GM_PCSCF_ECO_INVITE_04 for eCall (Event 1)
sequence step:	3	Gm TP_GM_PCSCF_ECO_REGISTER_02 (Pre-test)
	4	Mw TP_MW_PCSCF_ECO_INVITE_02 (Event 10)
		Mm TP_MM_ECSCF_ECO_INVITE_01 (Event 11)
	6/7	Rx TP_RX_PCSCF_AAR_03 (AAR - Event 2)
		Rx TP_RX_PCSCF_AAR_04 (AAR - Event 14)
		Rx TP_RX_PCRF_AAA_02 (AAA - Events 5, 17)
		Gx TP_GX_PCRF_RAR_01 (RAR - Events 3, 15)
		RxTP_RX_PCSCF_RAA_01 (RAR, RAA - Events 7, 8)GxTP_GX_PGW_RAA_02 (RAA - Events 4, 16)
		GxTP_GX_PGW_RAA_02 (RAA - Events 4, 16)GxTP_GX_PCRF_CCA_06 (CCR, CCA - Events 6, 9)
	8	Rtp TP_RTP_ECO_03 (Event 29)
	0	

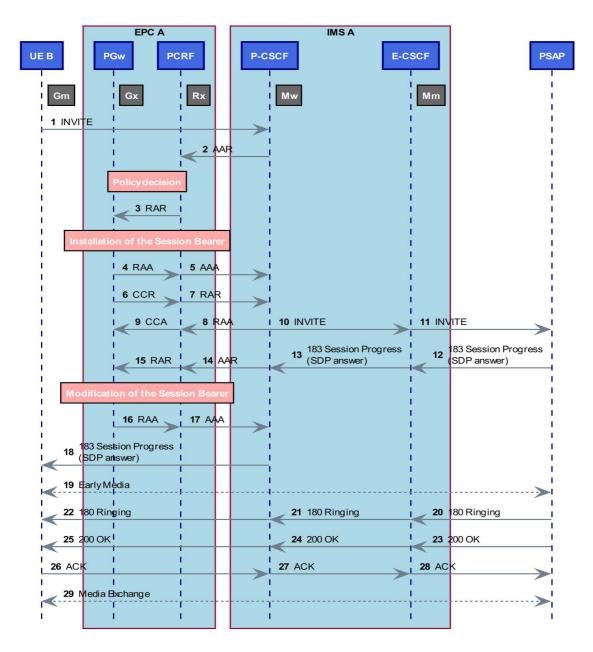


Figure 29: Emergency Session Establishment with emergency registration, PSAP in same IM CN subsystem, UE in another subsystem

- 1) UE B initiates the emergency session with an INVITE request. The From header field includes the public user identity (registered via emergency registration) or the tel URI associated with the public user identity (registered via emergency registration).
- 2) The IMS A P-CSCF invokes the PCRF.
- 3) PCRF sends RAR to EPC A PGW.
- 4) EPC A PGW responds with RAA.
- 5) PCRF responds to IMS A P-CSCF with AAA.
- 6) EPC A P- GW sends CCR.
- 7) PCRF sends RAR to P-CSCF.
- 8) P-CSCF responds with RAA.
- 9) PCRF responds with CCA to PGW.

- 10) P-CSCF sends the INVITE to E-CSCF.
- 11) E-CSCF sends the INVITE to PSAP.
- 12) PSAP responds with the 183 response with SDP answer to E-CSCF.
- 13) E-CSCF sends the 183 response to P-CSCF.
- 14) The IMS A P-CSCF invokes the PCRF to modify the bearer with AAR.
- 15) PCRF sends RAR to EPC A PGW.
- 16) EPC A PGW responds with RAA.
- 17) PCRF responds to IMS A P-CSCF with AAA.
- 18) P-CSCF forwards the SIP 183 (SDP) to UE A.
- 19) Early media may flow between the UE B and PSAP.
- 20) The PSAP responds with the 180 Ringing to E-CSCF.
- 21) E-CSCF forwards the 180 to P-CSCF.
- 22) P-CSCF forwards the SIP 180 to UE A.
- 23) PSAP sends 200 OK to E-CSCF.
- 24) E-CSCF forwards the 200 OK to P-CSCF.
- 25) P-CSCF forwards the 200 OK towards UE A.
- 26) UE B sends ACK to P-CSCF.
- 27) P-CSCF sends ACK to E-CSCF.
- 28) E-CSCF sends ACK to PSAP.
- 29) Media Exchange.

6.3.2 Roaming UE calling PSAP with non-emergency registration

6.3.2.1 Roaming UE calling PSAP in same network

If the UE is roaming and the P-CSCF is in the same network as the UE is roaming, the emergency session establishment is treated as if the UE is not roaming. ETSI TS 124 229 [2], clauses 5.2.10.4, case 0A) b).

	Interoperability Test Description
Identifier:	TD_VoLTE_ECO_RMI_INI_02
Objective:	To demonstrate the establishment of dedicated bearers at the originating EPC due to roaming SIP emergency session establishment within non-emergency registration. PSAP is located in the IM CN subsystem of IMS A.
Summary:	An emergency call is setup between UE B and the PSAP located in the IM CN subsystem of IMS A. UE-A is attached to EPC A and registered to IMS A, has NOT performed the emergency registration to IMS A, and requests emergency session establishment using an emergency URN. The P-CSCF derives descriptions of the Service Data Flow from the SDP data, requests creation of adequate bearers from PCRF and EPC, and forwards the request to the E- CSCF. The E-CSCF retrieves the PSAP URI from local configuration and forwards the request to this PSAP. Media transport is possible only after the successful establishment of the session. Media negotiation happens during INVITE/200 OK (UE B sends SDP-offer, PSAP responds with SDP-answer).
Configuration:	CF_VoLTE_RMI_ES option 1
SUT:	IMS A and EPC A

Interfeeee		Dx Cx Mm				
Interfaces:		v, Rx, Gx, Mm				
References:	Mm	ETSI TS 124 229 [2], clause 5.11.2				
		ETSI TS 123 167 [14]				
	Gm,	ETSI TS 124 229 [2], clauses 5.1.6.8.4, 5.2.6.3.3, 5.2.10.4 case 0A) and				
	Mw	5.11.2				
	Rx	ETSI TS 129 214 [6], clauses 4.4.1, A.1, A.2 and annex B				
	Gx	ETSI TS 129 212 [7], clause 4.5.2				
Pre-test	UE B pre	JE B previously attached to EPC A.				
conditions:	UE B pre	eviously registered to IMS A.				
	UE B ha	JE B has not performed emergency registration.				
	EPC esta	ablished a non-emergency Bearer allowing UE B - P-CSCF IP communication.				
	EPC esta	ablished an IMS signalling bearer.				
		registered or connected to the IMS A and ready to accept the session				
	establishment.					
Test Sequence:	Step					
	1	Verify that media between UE B and PSAP is not delivered in any direction				
		before call establishment.				
	2	UE B initiates an emergency call to establish a communication session using				
	-	an emergency service URN (To header indicating one of the emergency				
		URNs defined in Table 1).				
	3	Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP				
	Ŭ	in the same IM CN subsystem of the own network.				
	4	Verify that the IMS produced a Media Description for the session according to				
	-	SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF.				
	5	Verify that the PCRF invokes the EPC PGW with RA-Request to create a new				
	5	bearer for the requested media.				
	6	Verify that PCRF requested media description was found acceptable by EPC				
	0					
	1					
		and emergency bearers are established and that a RA-Answer is sent to the				
	7	PCRF.				
	7	PCRF. Verify that media between UE B and PSAP is successfully routed over the				
		PCRF. Verify that media between UE B and PSAP is successfully routed over the dedicated bearer.				
	7	PCRF. Verify that media between UE B and PSAP is successfully routed over the dedicated bearer. Verify that media between UE B and PSAP is transported with appropriate				
		PCRF. Verify that media between UE B and PSAP is successfully routed over the dedicated bearer.				
Conformance	8	PCRF. Verify that media between UE B and PSAP is successfully routed over the dedicated bearer. Verify that media between UE B and PSAP is transported with appropriate PCC characteristics.				
Conformance	8	PCRF. Verify that media between UE B and PSAP is successfully routed over the dedicated bearer. Verify that media between UE B and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_03 (Event1)				
criteria of test	8	PCRF. Verify that media between UE B and PSAP is successfully routed over the dedicated bearer. Verify that media between UE B and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_03 (Event1) Mw TP_MW_PCSCF_ECO_INVITE_03 (Event 10)				
	8 2 4	PCRF. Verify that media between UE B and PSAP is successfully routed over the dedicated bearer. Verify that media between UE B and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_03 (Event1) Mw TP_MW_PCSCF_ECO_INVITE_03 (Event 10) Mm TP_MM_ECSCF_ECO_INVITE_01 (Event 11)				
criteria of test	8	PCRF. Verify that media between UE B and PSAP is successfully routed over the dedicated bearer. Verify that media between UE B and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_03 (Event1) Mw TP_MW_PCSCF_ECO_INVITE_03 (Event 10) Mm TP_MM_ECSCF_ECO_INVITE_01 (Event 11) Rx TP_RX_PCSCF_AAR_03 (AAR - Event 2)				
criteria of test	8 2 4	PCRF. Verify that media between UE B and PSAP is successfully routed over the dedicated bearer. Verify that media between UE B and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_03 (Event1) Mw TP_MW_PCSCF_ECO_INVITE_03 (Event 10) Mm TP_MM_ECSCF_ECO_INVITE_01 (Event 11) Rx TP_RX_PCSCF_AAR_03 (AAR - Event 2) Rx TP_RX_PCSCF_AAR_04 (AAR - Event 14)				
criteria of test	8 2 4	PCRF. Verify that media between UE B and PSAP is successfully routed over the dedicated bearer. Verify that media between UE B and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_03 (Event1) Mw TP_MW_PCSCF_ECO_INVITE_03 (Event 10) Mm TP_MM_ECSCF_ECO_INVITE_01 (Event 11) Rx TP_RX_PCSCF_AAR_03 (AAR - Event 2) Rx TP_RX_PCSCF_AAR_04 (AAR - Event 14) Rx TP_RX_PCRF_AAA_02 (AAA - Events 5, 17)				
criteria of test	8 2 4	PCRF. Verify that media between UE B and PSAP is successfully routed over the dedicated bearer. Verify that media between UE B and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_03 (Event1) Mw TP_MW_PCSCF_ECO_INVITE_03 (Event 10) Mm TP_MM_ECSCF_ECO_INVITE_01 (Event 11) Rx TP_RX_PCSCF_AAR_03 (AAR - Event 2) Rx TP_RX_PCSCF_AAR_04 (AAR - Event 14) Rx TP_RX_PCRF_AAA_02 (AAA - Events 5, 17) Gx TP_GX_PCRF_RAR_01 (RAR - Events 3, 15)				
criteria of test	8 2 4	PCRF. Verify that media between UE B and PSAP is successfully routed over the dedicated bearer. Verify that media between UE B and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_03 (Event1) Mw TP_MW_PCSCF_ECO_INVITE_03 (Event10) Mm TP_MM_ECSCF_ECO_INVITE_01 (Event 10) Rx TP_RX_PCSCF_AAR_03 (AAR - Event 2) Rx TP_RX_PCSCF_AAR_04 (AAR - Event 14) Rx TP_RX_PCRF_AAA_02 (AAA - Events 5, 17) Gx TP_GX_PCRF_RAR_01 (RAR - Events 3, 15) Rx TP_RX_PCSCF_RAA_01 (RAR, RAA - Events 7, 8)				
criteria of test	8 2 4	PCRF. Verify that media between UE B and PSAP is successfully routed over the dedicated bearer. Verify that media between UE B and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_03 (Event1) Mw TP_MW_PCSCF_ECO_INVITE_03 (Event 10) Mm TP_MM_ECSCF_ECO_INVITE_01 (Event 11) Rx TP_RX_PCSCF_AAR_03 (AAR - Event 2) Rx TP_RX_PCSCF_AAR_04 (AAR - Event 14) Rx TP_RX_PCRF_AAA_02 (AAA - Events 5, 17) Gx TP_GX_PCRF_RAR_01 (RAR - Events 3, 15) Rx TP_RX_PCSCF_RAA_02 (RAA - Events 7, 8) Gx TP_GX_PGW_RAA_02 (RAA - Events 4, 18)				
criteria of test	8 2 4	PCRF. Verify that media between UE B and PSAP is successfully routed over the dedicated bearer. Verify that media between UE B and PSAP is transported with appropriate PCC characteristics. Gm TP_GM_PCSCF_ECO_INVITE_03 (Event1) Mw TP_MW_PCSCF_ECO_INVITE_03 (Event 10) Mm TP_MM_ECSCF_ECO_INVITE_01 (Event 11) Rx TP_RX_PCSCF_AAR_03 (AAR - Event 2) Rx TP_RX_PCSCF_AAR_04 (AAR - Event 14) Rx TP_GX_PCRF_AAA_02 (AAA - Events 5, 17) Gx TP_GX_PCRF_RAR_01 (RAR - Events 3, 15) Rx TP_RX_PCSCF_RAA_01 (RAR, RAA - Events 7, 8)				

The message sequence as depicted in Figure 29 applies.

6.3.2.2 Roaming UE calling PSAP in home operator's network

	Interoperability Test Description			
Identifier:	TD_VoLTE_ECO_RMI_INI_03			
Objective:	To demonstrate the rejection of roaming UE emergency session establishment when the P-CSCF is in home operator's network within non-emergency registration. P-CSCF is located in the IM CN subsystem of IMS A.			
Summary:	An emergency call is setup between roaming UE A and the P-CSCF located in the IM CN subsystem of IMS A. UE-A is attached to EPC B and registered to IMS A, has NOT performed the emergency registration to IMS A, and requests emergency session establishment using an emergency URN. The P-CSCF is in the home operator's network and shall reject the request as specified in ETSI TS 124 229 [2], clause 5.2.10.5.			
Configuration:	CF_VoLTE_RMI_S8HR			

Interoperability Test Description				
SUT:	IMS A and EPC A			
Interfaces:	Gm, Rx, Gx, S8			
	Gm, Mw	ETSI TS 124 229 [2], clauses 5.1.6.8.4, 5.2.6.3.3, 5.2.10.4, 5.2.10.5 and 5.11.2 ETSI TS 123 167 [14], clause 7.1.2		
	Rx	ETSI TS 129 214 [6], clauses 4.4.1, A.1, A.2 and annex B		
Pre-test conditions:	•	Roaming UE A previously attached to EPC B. UE A has not performed emergency registration. EPC B established a Default Bearer allowing UE A - P-CSCF IP communication. UE A previously registered to IMS A. EPC B established an IMS A signalling bearer.		
Test Sequence:	Step			
	1	UE A initiates an emergency call to establish a communication session using an emergency service URN (To header indicating one of the emergency URNs defined in Table 1).		
	2	Verify that IMS A (P-CSCF, E-CSCF) receives the emergency call of the roaming UE A.		
	3	Verify that P-CSCF reject the request by returning a 380 (Alternative Service) response		
Conformance criteria of test sequence step:	1	Gm TP_GM_PCSCF_ECO_INVITE_03 (Event1)		

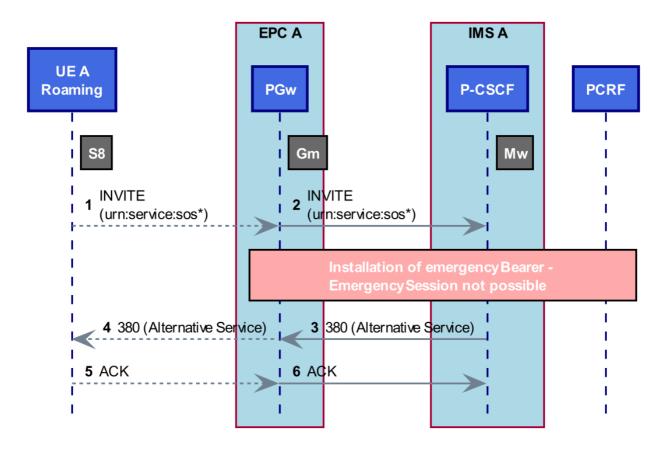


Figure 30: Roaming UE calling home operator

- 1) Roaming UE A initiates the emergency session with an INVITE containing the service URN "sos".
- 2) PGw forwards INVITE message to P-CSCF.

- 3) P-CSCF in IMS A sends 380 (Alternative Service) to PGw.
- 4) PGw forwards 380 (Alternative Service) to roaming UE A.
- 5) UE A sends ACK to PGw.
- 6) PGw forwards ACK to P-CSCF.

6.3.2.3 Roaming UE calling PSAP with non-registration

	Interoperability Test Description			
Identifier:	TD_VoLTE_ECO_ RMI_INI_04			
Objective:	To demonstrate the establishment of emergency bearers for a roaming UE without any registration. PSAP is located in the IM CN subsystem of IMS A.			
Summary:	An emergency call is setup between UE B and the PSAP located in the IM CN subsystem of IMS A.			
	UE-B connects to the visited network A attached to the EPC A but NOT registered to IMS A, has NOT performed the emergency registration to IMS A, and requests			
	emergency session establishment using an emergency URN. The P-CSCF derives descriptions of the Service Data Flow from the SDP data, requests creation of adequate bearers from PCRF and EPC, and forwards the request to the E- CSCF.			
	The E-CSCF retrieves the PSAP URI from local configuration and forwards the request to this PSAP.			
	Media transport is possible only after the successful establishment of the session. Media negotiation happens during INVITE/200 OK (UE B sends SDP-offer, PSAP responds with SDP-answer).			
Configuration:	CF_VoLTE_RMI_ES option 1			
SUT:	IMS A and EPC A			
Interfaces:	Gm, Mw, Rx, Gx, Mm			
References:	Mm ETSI TS 124 229 [2], clause 5.11.2 ETSI TS 123 167 [14]			
	Gm, ETSI TS 124 229 [2], clauses 5.1.6.8.2, 5.2.6.3.3, 5.2.10.2 and 5.11.2 Mw			
	Rx ETSI TS 129 214 [6], clauses 4.4.1, A.1, A.2 and annex B			
	Gx ETSI TS 129 212 [7], clause 4.5.2			
Pre-test	UE B connects to the visited network A attached to the EPC A.			
conditions:	 EPC established a default bearer allowing UE A - P-CSCF IP communication. PSAP is registered or connected to the IMS A and ready to accept the session 			
	establishment.			
	UE B previously not registered to IMS A.			
	UE B has not performed emergency registration.			
	UE B discovered the P-CSCF address.			
Test Sequence:	Step			
	 Verify that media between UE B and PSAP is not delivered in any direction before call establishment. 			
	2 UE B initiates an emergency call to establish a communication session using an emergency service URN.			
	3 Verify that the UE B sets the From header field of the INVITE request to "Anonymous" as specified in IETF RFC 3261 [12] and a To header indicating one of the emergency URNs defined in Table 1.			
	4 Verify that IMS A (P-CSCF, E-CSCF) routes the emergency call to the PSAP in the same IM CN subsystem of the own network.			
	5 Verify that the IMS produced a Media Description for the session according to SDP-offer in SIP INVITE Request and SDP-answer in SIP 183 to the PCRF.			
	 6 Verify that the PCRF invokes the EPC PGW with RA-Request to create a new bearer for the requested media. 			
	7 Verify that PCRF requested media description was found acceptable by EPC and emergency bearers are established and that a RA-Answer is sent to the PCRF.			
	8 Verify that media between UE B and PSAP is successfully routed over the			

Interoperability Test Description					
	9	Verify that media between UE B and PSAP is transported with appropriate PCC characteristics.			
	- 1-				
Conformance	2/3	Gm	TP_GM_PCSCF_ECO_INVITE_01 (Event 1)		
criteria of test	4	Mw	TP_MW_PCSCF_ECO_INVITE_01 (Event 10)		
sequence step:		Mm	TP_MM_ECSCF_ECO_INVITE_01 (Event 11)		
	6/7	Rx	TP_RX_PCSCF_AAR_03 (AAR - Event 2)		
		Rx	TP_RX_PCSCF_AAR_04 (AAR - Event 14)		
		Rx	TP_RX_PCRF_AAA_02 (AAA - Events 5, 17)		
		Gx	TP_GX_PCRF_RAR_01 (RAR - Events 3, 15)		
		Rx	TP_RX_PCSCF_RAA_01 (RAR, RAA - Events 7, 8)		
		Gx	TP_GX_PGW_RAA_02 (RAA - Events 4, 18)		
		Gx	TP_GX_PCRF_CCA_06 (CCR, CCA - Events 6, 9)		
	8	Rtp	TP_RTP_ECO_03 (Event 29)		

89

The message sequence as depicted in Figure 29 applies.

ETSI

Annex A (informative): Message Sequence Charts (MSCs)

A.1 The MSC files

The MSCs have been produced using the PlantUML tool with recommended ETSI styles.

The PlantUML text files and the derived Portable Network Graphics files (.png) of the MSCs related to the test descriptions are released in the ETSI forge repository:

90

• https://forge.etsi.org/rep/int/vxlte/emergency-iop/-/tree/main/msc_scripts.

History

Document history					
V1.1.1	March 2024	Publication			

91