**3GPP SA WG2 Meeting #164**

**Maastricht, NL, 19-23 August 2024 *(was S2-2407552)***

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** | **1** | **Current version:** |  |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **x** | Core Network |  |

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| ***Title:*** | Lack of indication of Emergency Service Support over NG | | | | | | | | | |
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| ***Source to WG:*** | Qualcomm Incorporated | | | | | | | | | |
| ***Source to TSG:*** | SA2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5GS\_Ph1, TEI18 | | | | |  | ***Date:*** | | | 2024-08-19 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
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| ***Reason for change:*** | | In LS R3-243933 RAN3 indicated that the text that exists in TS 23.501 cl. 5.16.4.1: “If a certain RAT is restricted for Emergency Services, AMF signals that the corresponding RAT is restricted for Emergency Services Support to the Master RAN Node. This helps assist the Master RAN node determine whether to set up Dual Connectivity for Emergency Services.” is not supported in TS 38.413 since R15 and that RAN3 has decided that a RAN configuration-based approach applies when some RAT is restricted for emergency service support | | | | | | | | |
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| ***Summary of change:*** | | Aligns with stage-3 regarding the restriction of specific RAT for Emergency Services based on a configuration approach | | | | | | | | |
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| ***Consequences if not approved:*** | | Misalignment with stage-3; inaccurate text in specification | | | | | | | | |
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| ***Clauses affected:*** | | 5.16.4.1 | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
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| ***Other comments:*** | | The CR applies also to previous versions of the present specification | | | | | | | | |
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| ***This CR's revision history:*** | |  | | | | | | | | |

>>>>BEGINNING OF CHANGES<<<<

#### 5.16.4.1 Introduction

Emergency Services are provided to support IMS emergency sessions. "Emergency Services" refers to functionalities provided by the serving network when the network is configured to support Emergency Services. Emergency Services are provided to normally registered UEs and to Emergency Registered UEs, that can be either normally registered or in limited service state. Depending on local regulation, receiving Emergency Services in limited service state does not require a valid subscription. Depending on local regulation and on operator's policy, the network may allow or reject a registration request for Emergency Services (i.e. Emergency Registration) from UEs that have been identified to be in limited service state. Four different behaviours of Emergency Services as defined in clause 4.3.12.1 of TS 23.401 [26] are supported.

Emergency Services shall not be provided to a UE over 3GPP access and non-3GPP access concurrently. Transfer from one Access Type to the other takes place as follows:

- a UE may be Emergency or normally Registered and have an emergency PDU session over non-3GPP access or may be attached with an emergency session to ePDG over untrusted WLAN (as defined in TS 23.402 [43]) when 3GPP access becomes available. In which case the UE may have to register over 3GPP access and check first the support for Emergency Services over the 3GPP RAT it has selected (e.g. based on Emergency Services Support indication, Emergency Services Fallback, AS broadcast indicator). If there is native support for Emergency Services in the selected 3GPP RAT the UE will attempt to transfer the emergency PDU session from non-3GPP access to 3GPP access (see clause 4.9.2 or clause 4.9.3 of TS 23.502 [3]). If there is no native support for Emergency Services in the selected RAT, but Emergency Services Fallback to another RAT in 5GS or to another System where Emergency Services is supported (based on the conditions defined in clause 5.16.4.11), the UE may trigger first Emergency Services Fallback (see clause 4.13.4.2 of TS 23.502 [3]) and then attempt to transfer the emergency PDU session from non-3GPP access to 3GPP access (see clause 4.9.2 of TS 23.502 [3]). During the session transfer the UE may be registered to receive emergency services over both 3GPP access and non-3GPP access concurrently.

NOTE 1: The conditions upon which the UE determines that 3GPP access becomes available are implementation dependent.

A UE may only attempt to use Emergency Services over non-3GPP access if it is unable to use Emergency Services over 3GPP access as specified in TS 23.167 [18].

The UE is only allowed to have one PDU session for Emergency services at a time. A PDU Session cannot be changed between a PDU Session for Non-Emergency services and a PDU Session for Emergency services. PDU session for emergency services can be transferred from one Access Type to another as specified in clause 5.16.4.9.

To provide Emergency Services, the AMF is configured with Emergency Configuration Data that are applied to Emergency Services that are established by an AMF based on request from the UE. The AMF Emergency Configuration Data contains the S-NSSAI and Emergency DNN which is used to derive an SMF. In addition, the AMF Emergency Configuration Data contains UE-AMBR and may also contain the statically configured SMF for the Emergency DNN. The SMF may also store Emergency Configuration Data that contains statically configured UPF information for the Emergency DNN.

NOTE 2: The Network slices associated with emergency services are assumed to be configured consistently in the AMF (i.e. emergency configuration data) and NG-RAN nodes within the corresponding Registration Area where emergency services are to be supported.

When the UE is camped normally in the cell, i.e. not in limited service state, during Registration procedure described in clause 4.2.2.2 of TS 23.502 [3], the serving AMF includes an indication for Emergency Services Support within the Registration Accept to the UE. For 3GPP access, the Emergency Services Support indication is valid within the current Registration Area per RAT (i.e. this is to cover cases when the same registration area supports multiple RATs and they have different capability).

The Emergency Services Support is configured in the AMF according to local regulations and network capabilities. AMF includes Emergency Services Support indicator in the Registration Accept message to indicate that the UE can setup emergency PDU Session to obtain emergency services. The AMF may include additional local emergency numbers associated with the serving network for the UE, further defined in TS 24.501 [47].

During Registration procedures over 3GPP access in a PLMN, the 5GC includes the Emergency Services Support indicator, valid for the current Registration Area and indicating per RAT that Emergency Services are supported if any of the following conditions is true within the current Registration Area:

- the Network is able to support Emergency Services natively over 5GS;

- E-UTRA connected to 5GC supports IMS Emergency Services (e.g. voice), and the NG-RAN is able to trigger handover or redirection from NR to E-UTRA connected to 5GC at QoS Flow establishment for IMS Emergency Services (e.g. voice);

- NG-RAN is able to trigger handover to EPS at QoS Flow establishment for IMS Emergency Services (e.g. voice);

- NG-RAN is able to trigger redirection to EPS at QoS Flow establishment for IMS Emergency Services (e.g. voice); or

- NG-RAN is able to trigger 5G SRVCC handover to UTRAN for IMS Emergency Services (i.e. voice).

During Registration procedures over non-3GPP access, the 5GC indicates that Emergency Services are supported if the Network is able to support Emergency Services natively over 5GS.

In the case of SNPN, during Registration procedures over 3GPP access, the 5GC includes the Emergency Services Support indicator, valid for the current Registration Area indicating that Emergency Services are supported if the following condition is true within the current Registration Area:

- the Network is able to support Emergency Services natively over 5GS.

The 5GC includes an indication per RAT whether it supports Emergency Services Fallback (as defined in clause 5.16.4.11) to another RAT in 5GS or to another System where Emergency Services are supported natively. The Emergency Services Fallback support indicator is valid within the current Registration Area per RAT.

NOTE 3: If a certain RAT is restricted for Emergency Services, the restriction of the corresponding RAT for Emergency Services Support is configured in the RAN Node. This helps the RAN node to determine whether to set up Dual Connectivity for Emergency Services.

UEs that are in limited service state, as specified in TS 23.122 [17], or that camp normally on a cell but failed to register successfully to the network under conditions specified in TS 24.501 [47], initiate the Registration procedure by indicating that the registration is to receive Emergency Services, referred to as Emergency Registration, and a Follow-on request is included in the Registration Request to initiate PDU Session Establishment procedure with a Request Type indicating "Emergency Request". UEs that had registered for normal services and do not have emergency PDU Session established and that are subject to Mobility Restriction in the present area or RAT (e.g. because of restricted tracking area) shall initiate the UE Requested PDU Session Establishment procedure to receive Emergency Services, i.e. with a Request Type indicating "Emergency Request". Based on local regulation, the network supporting Emergency Services for UEs in limited service state provides Emergency Services to these UE, regardless whether the UE can be authenticated, has roaming or Mobility Restrictions or a valid subscription.

For Emergency Services over 3GPP access via PLMN, other than eCall over IMS, the UEs in limited service state that do not operate in SNPN access mode determine that the cell supports Emergency Services over NG-RAN from a broadcast indicator in AS. The cell connected to EPC and 5GC broadcasts separate broadcast indicator for EPC and 5GC to indicate support of emergency services by the EPC and 5GC. If the UE supports SNPN access mode, is in limited service state, is not operating in SNPN access mode, needs to make an emergency call and cannot find an acceptable cell in any PLMN, the UE may activate SNPN access mode and attempt to camp on an acceptable cell of any available SNPN supporting emergency calls (irrespective of SNPN ID or GIN) as defined in TS 23.122 [17]. For Emergency Services over untrusted non-3GPP access, other than eCall over IMS, the UE in limited service state selects any N3IWF as specified in clause 6.3.6. Emergency calls for eCall Over IMS may only be performed if the UE has a USIM.

For Emergency Services over NR via SNPN, other than eCall over IMS, the UEs in limited service state that operate in SNPN access mode determine that the cell supports Emergency Services over NR from a broadcast indicator in AS and indication that the SNPN supports Emergency Services. If the UE operates in SNPN access mode and is in limited service state, the UE shall attempt to camp on an acceptable cell of any available SNPN supporting emergency calls (irrespective of SNPN ID or GIN). If the UE cannot find acceptable cell on any available SNPN, the UE shall deactivate SNPN access mode and camp on any available PLMN cell supporting emergency calls (irrespective of PLMN ID) as defined in TS 23.122 [17].

For NR satellite access, if a UE in limited service state is aware of its location, the UE selects a PLMN that is allowed to operate in the UE location as specified in TS 23.122 [17]. The network may be configured to verify the location of a UE that is registering for emergency services as specified in clause 5.4.11.4.

There is no support for eCall over IMS for SNPNs in this Release.

A serving network shall provide an Access Stratum broadcast indication from NG-RAN (NR or E-UTRA connected to 5GC) to UEs indicating whether eCall Over IMS is supported:

- When an E-UTRA cell is connected to EPC and 5GC, the cell broadcasts separate Access stratum broadcast indication for 5GC and EPC to indicate support of eCall over IMS by 5GC and EPC.

- A UE that is not in limited service state determines that the NG-RAN cell supports eCall Over IMS via 5GC using the broadcast indicator for eCall over IMS. Emergency calls for eCall over IMS are not supported over non-3GPP access.

NOTE 4: The Access Stratum broadcast indicator is determined according to operator policies and minimally indicates that the PLMN, or all of the PLMNs in the case of network sharing, and at least one emergency centre or PSAP to which an eCall Over IMS can be routed, support eCall Over IMS.

- A UE in limited service state determines that the cell supports eCall Over IMS using both the broadcast indicator for support of Emergency Services over NG-RAN and the broadcast indicator of NG-RAN for eCall over IMS. Emergency calls for eCall Over IMS are not supported over Non-3GPP access and NR via SNPN.

NOTE 5: The broadcast indicator for eCall Over IMS does not indicate whether UEs in limited service state are supported. So, the broadcast indicator for support of Emergency Services over NG-RAN that indicates limited service state support needs to be applied in addition.

For a UE that is Emergency Registered, if it is unauthenticated the security context is not set up on UE.

In order to receive Emergency Services, UEs that camp on a suitable cell in RM-DEREGISTERED state (i.e. without any conditions that result in limited service state), or that decide to access 5GC via non-3GPP access (and not in limited service state over non-3GPP access), initiate the Initial Registration procedure for normal service instead of Emergency Registration. Upon successful registration, such UEs shall initiate the UE Requested PDU Session Establishment procedure with a Request Type indicating "Emergency Request" to receive Emergency Services if the AMF indicated support for Emergency Services in 5GC (for the RAT the UE is currently camped on when UE is camping on 3GPP access). The UEs that camp normally on a cell or that are connected via Non-3GPP access are informed that the PLMN supports Emergency Services over 5G-AN from the Emergency Services Support indicator in the Registration procedure. This applies to both 3GPP and non-3GPP Access Types. There is no support for Emergency Services for SNPN that is accessed via NWu from a PLMN.

NOTE 6: The Emergency Services Support indicator in the Registration procedures does not indicate support for eCall Over IMS.

For a UE that is Emergency Registered, normal PLMN or SNPN selection principles apply after the end of the IMS emergency session.

NOTE 7: For Emergency Services, there is no support for inter PLMN mobility thus there is a risk of service disruption due to failed inter PLMN mobility attempts when there is no session continuity (e.g. change of anchor SMF/UPF due to mobility) for the PDU Session and/or based on operator policies.

NOTE 8: Based on operator policies, Inter PLMN mobility with session continuity can be supported for Emergency Services if the anchor SMF/UPF for PDU Session supporting Emergency Services does not change.

The UE shall set the RRC establishment cause to emergency as defined in TS 38.331 [28] when it requests an RRC Connection in relation to an emergency session.

In the case of Limited Service state, UE shall not include any Network Slice related parameters when communicating with the network.

When a PLMN or SNPN supports IMS and Emergency Services:

- all AMFs in that PLMN or SNPN shall have the capability to support Emergency Services.

- at least one SMF shall have this capability.

For other emergency scenarios (e.g. UE autonomous selection for initiating Emergency Services), refer to TS 23.167 [18] for domain selection principles.

For emergency service support in Public network integrated NPNs, refer to clause 5.30.3.5.

For emergency support via 5G ProSe UE-to-Network Relaying, refer to TS 23.304 [128].

>>>>END OF CHANGES<<<<