**3GPP TSG-CT WG1 Meeting #141eC1-232393**

**Online 17– 21 April 2023**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** | **5283** | **rev** |  | **Current version:** |  |  |
|  | | | | | | | | |
| *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 | **x** | Radio Access Network |  | Core Network |  |

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| ***Title:*** | The partially allowed NSSAI – UE storage | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | vivo | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eNS\_Ph3 | | | | |  | ***Date:*** | | | 2023-04-05 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | In SA2 agreed CR(S2-2303809), the partial network slice feature is introduced for Rel-18 to address the scenario that a network slice may be supported in one or more TAs in a PLMN/SNPN. The stage 2 requirements on storage of the partially allowed NSSAI are shown as follows:  “- If received, a Partially Allowed NSSAI received in a Registration Accept message or a UE Configuration Update Command message applies to the current Registration Area. The UE stores the Partially Allowed NSSAI in the same way as described for the Allowed NSSAI (see also clause 5.15.X).”  This paper captures the UE storage part for the partially allowed NSSAI. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Introducing the UE storage of the partially allowed NSSAI. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The UE storage of the partially allowed NSSAI is not supported. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.6.2.2, C.1, C.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\* \* \* First Change \* \* \* \*

#### 4.6.2.2 NSSAI storage

If available, the configured NSSAI(s) shall be stored in a non-volatile memory in the ME as specified in annex C. For a configured NSSAI, if there is associated NSSRG information, the NSSRG information shall also be stored in a non-volatile memory in the ME as specified in annex C. For a configured NSSAI, if there is associated NSAG information, the NSAG information shall be stored in the ME. The support for NSSRG information and NSAG information by a UE or an AMF is optional.

The allowed NSSAI(s) should be stored in a non-volatile memory in the ME as specified in annex C. The partially allowed NSSAI(s) should be stored in a non-volatile memory in the ME as specified in annex C.

Each of the configured NSSAI stored in the UE, including the default configured NSSAI, is a set composed of at most 16 S-NSSAIs. Each of the allowed NSSAI stored in the UE is a set composed of at most 8 S-NSSAIs and is associated with a PLMN identity or SNPN identity, an access type and, if the UE supports access to an SNPN using credentials from a credentials holder, equivalent SNPNs or both, the selected entry of the "list of subscriber data" or the selected PLMN subscription. Each of the configured NSSAI, except the default configured NSSAI, and the rejected NSSAI is associated with a PLMN identity or SNPN identity and, if the UE supports access to an SNPN using credentials from a credentials holder, equivalent SNPNs or both, the selected entry of the "list of subscriber data" or the selected PLMN subscription. Each of the pending NSSAI stored in the UE is a set composed of at most 16 S-NSSAIs and is associated with a PLMN identity or SNPN identity and, if the UE supports access to an SNPN using credentials from a credentials holder, equivalent SNPNs or both, the selected entry of the "list of subscriber data" or the selected PLMN subscription. The S-NSSAI(s) in the rejected NSSAI for the current registration area are further associated with one or more tracking areas where the rejected S-NSSAI(s) is not available. The S-NSSAI(s) in the rejected NSSAI for the current PLMN or SNPN shall be considered rejected for the current PLMN or SNPN regardless of the access type. The S-NSSAI(s) in the rejected NSSAI for the failed or revoked NSSAA shall be considered rejected for the current PLMN or SNPN regardless of the access type. The S-NSSAI(s) in the rejected NSSAI for the maximum number of UEs reached are further associated with the access type over which the rejected NSSAI was received. There shall be no duplicated PLMN identities or SNPN identities associated with each of the list of configured NSSAI(s), pending NSSAI(s), rejected NSSAI(s) for the current PLMN or SNPN, rejected NSSAI(s) for the current registration area, rejected NSSAI(s) for the failed or revoked NSSAA, and rejected NSSAI for the maximum number of UEs reached. Each of the partially allowed NSSAI stored in the UE is a set composed of at most 8 S-NSSAIs and a list of TAs for which S-NSSAI is supported, and is associated with a PLMN identity or SNPN identity, 3GPP access type and, if the UE supports access to an SNPN using credentials from a credentials holder, equivalent SNPNs or both, the selected entry of the "list of subscriber data" or the selected PLMN subscription.

The UE stores NSSAIs as follows:

a) The configured NSSAI shall be stored until a new configured NSSAI is received for a given PLMN or SNPN. The network may provide to the UE the mapped S-NSSAI(s) for the new configured NSSAI which shall also be stored in the UE. When the UE is provisioned with a new configured NSSAI for a PLMN or SNPN, the UE shall:

1) replace any stored configured NSSAI for this PLMN or SNPN with the new configured NSSAI for this PLMN or SNPN;

2) delete any stored mapped S-NSSAI(s) for the configured NSSAI and, if available, store the mapped S-NSSAI(s) for the new configured NSSAI;

3) delete any stored allowed NSSAI for this PLMN or SNPN and, if available, the stored mapped S-NSSAI(s) for the allowed NSSAI, if the UE received the new configured NSSAI for this PLMN or SNPN and the Configuration update indication IE with the Registration requested bit set to "registration requested", in the same CONFIGURATION UPDATE COMMAND message but without any new allowed NSSAI for this PLMN or SNPN included;

4) delete any stored rejected NSSAI, and stop any timer T3526 associated with a deleted S-NSSAI in the rejected NSSAI for the maximum number of UEs reached if running;

4A) remove from the stored mapped S-NSSAI(s) for the rejected NSSAI for the current PLMN or SNPN and the stored mapped S-NSSAI(s) for the rejected NSSAI for the current registration area and the stored mapped S-NSSAI(s) for the rejected NSSAI for the maximum number of UEs reached, the S-NSSAI(s), if any, included in the mapped S-NSSAI(s) for the new configured NSSAI for the current PLMN (if the UE is roaming) or the current SNPN (if the SNPN is a non-subscribed SNPN), and stop any timer T3526 associated with the deleted S-NSSAI in the rejected NSSAI for the maximum number of UEs reached if running; and

5) delete any S-NSSAI(s) stored in the pending NSSAI that are not included in the new configured NSSAI for the current PLMN or SNPN or any mapped S-NSSAI(s), if any, stored in the pending NSSAI that are not included in the mapped S-NSSAI(s) for the configured NSSAI (if the UE is roaming or is in a non-subscribed SNPN);

If the UE having a stored configured NSSAI for a PLMN ID, receives an S-NSSAI associated with a PLMN ID from the network during the PDN connection establishment procedure in EPS as specified in 3GPP TS 24.301 [15] or via ePDG as specified in 3GPP TS 24.302 [16], the UE may store the received S-NSSAI in the configured NSSAI for the PLMN identified by the PLMN ID associated with the S-NSSAI, if not already included in the configured NSSAI and if the number of S-NSSAIs in the configured NSSAI is less than 16;

The UE may continue storing a received configured NSSAI for a PLMN and associated mapped S-NSSAI(s), if available, when the UE registers in another PLMN.

NOTE 1: The maximum number of configured NSSAIs and associated mapped S-NSSAIs for PLMNs other than the HPLMN that need to be stored in the UE, and how to handle the stored entries, are up to UE implementation.

ab) The NSAG information shall be stored until:

1) a new NSAG information for the registered PLMN or the registered SNPN is received over 3GPP access; or

2) a new configured NSSAI without any associated NSAG information for the registered PLMN or the registered SNPN is received over 3GPP access.

The UE shall remove any S-NSSAI from the NSAG information which is not part of the configured NSSAI, if any.

When a new NSAG information for the registered PLMN or the registered SNPN is received over 3GPP access, the UE shall replace any stored NSAG information for the registered PLMN and its equivalent PLMN(s) or the registered SNPN and its equivalent SNPN(s) with the new NSAG information for the registered PLMN or the registered SNPN.

When a new configured NSSAI without any associated NSAG information for the registered PLMN or the registered SNPN is received over 3GPP access, the UE shall delete any stored NSAG information for the registered PLMN and its equivalent PLMN(s) or the registered SNPN and its equivalent SNPN(s).

The UE shall be able to store 32 NSAG entries in the NSAG information stored for the registered PLMN or the registered SNPN.

The UE shall be able to store TAI lists for up to 4 NSAG entries in the NSAG information stored for the registered PLMN or the registered SNPN.

The UE needs not to store the NSAG information when the UE is switched off or when the UE is deregistered from the registered PLMN or the registered SNPN.

b) The allowed NSSAI shall be stored and the mapped S-NSSAI(s) for the allowed NSSAI (if available) shall be stored for a given PLMN and its equivalent PLMN(s) in the registration area or SNPN until:

1) a new allowed NSSAI for the same access type (i.e. 3GPP access or non-3GPP access) is received for a given PLMN or SNPN;

2) the CONFIGURATION UPDATE COMMAND message with the Registration requested bit of the Configuration update indication IE set to "registration requested" is received and contains no other parameters (see subclauses 5.4.4.2 and 5.4.4.3);

3) the REGISTRATION ACCEPT message is received with the "NSSAA to be performed" indicator of the 5GS registration result IE set to "Network slice-specific authentication and authorization is to be performed", and the REGISTRATION ACCEPT message contains a pending NSSAI and no new allowed NSSAI as described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4; or

4) a new partially allowed NSSAI via 3GPP access is received for a given PLMN or SNPN.

The network may provide to the UE the mapped S-NSSAI(s) for the new allowed NSSAI (see subclauses 5.5.1.2 and 5.5.1.3) which shall also be stored in the UE. When a new allowed NSSAI for a PLMN or SNPN is received, the UE shall:

1) replace any stored allowed NSSAI for this PLMN and its equivalent PLMN(s) in the registration area or this SNPN for the same access type with the new allowed NSSAI for this PLMN or SNPN;

2) delete any stored mapped S-NSSAI(s) for the allowed NSSAI for this PLMN and its equivalent PLMN(s) in the registration area or this SNPN for the same access type and, if available, store the mapped S-NSSAI(s) for the new allowed NSSAI;

3) remove from the stored rejected NSSAI for the current PLMN or SNPN, the rejected NSSAI for the current registration area and rejected NSSAI for the maximum number of UEs reached, the S-NSSAI(s), if any, included in the new allowed NSSAI for the current PLMN or SNPN, unless the S-NSSAI in the rejected NSSAI is associated with one or more S-NSSAI(s) in the stored mapped rejected NSSAI and these mapped S-NSSAI(s) are not included in the mapped S-NSSAI(s) for the new allowed NSSAI, and stop any timer T3526 associated with a deleted S-NSSAI in the rejected NSSAI for the maximum number of UEs reached if running;

4) remove from the stored rejected NSSAI for the failed or revoked NSSAA, the S-NSSAI(s), if any, included in the new allowed NSSAI for the current PLMN (if the UE is not roaming) or the current SNPN (if the SNPN is the subscribed SNPN) or the mapped S-NSSAI(s) for the new allowed NSSAI for the current PLMN (if the UE is roaming) or the current SNPN (if the SNPN is a non-subscribed SNPN);

5) remove from the stored mapped S-NSSAI(s) for the rejected NSSAI for the current PLMN or SNPN, the stored mapped S-NSSAI(s) for the rejected NSSAI for the current registration area and mapped S-NSSAI(s) for the rejected NSSAI for the maximum number of UEs reached, the S-NSSAI(s), if any, included in the mapped S-NSSAI(s) for the new allowed NSSAI for the current PLMN (if the UE is roaming) or the current SNPN (if the SNPN is a non-subscribed SNPN), and stop any timer T3526 associated with a deleted S-NSSAI in the rejected NSSAI for the maximum number of UEs reached if running; and

6) remove from the stored pending NSSAI for this PLMN and its equivalent PLMN(s) in the registration area or this SNPN, one or more S-NSSAIs, if any, included in the new allowed NSSAI for the current PLMN and these equivalent PLMN(s) (if the UE is not roaming) or the current SNPN (if the SNPN is the subscribed SNPN) or the mapped S-NSSAI(s) for the new allowed NSSAI for the current PLMN and these equivalent PLMN(s) (if the UE is roaming) or the current SNPN (if the SNPN is a non-subscribed SNPN).

NOTE 2: Whether the UE stores the allowed NSSAI and the mapped S-NSSAI(s) for the allowed NSSAI also when the UE is switched off is implementation specific.

The network may provide to the UE the partially allowed NSSAI. When a new partially allowed NSSAI for a PLMN or SNPN is received, the UE shall replace any stored partially allowed S-NSSAI for this PLMN and its equivalent PLMN(s) in the registration area or this SNPN via the 3GPP access with the new partially allowed S-NSSAI for this PLMN or SNPN.

c) When the UE receives the S-NSSAI(s) included in the rejected NSSAI in the REGISTRATION ACCEPT message, the REGISTRATION REJECT message, the DEREGISTRATION REQUEST message or in the CONFIGURATION UPDATE COMMAND message, the UE shall:

1) store the S-NSSAI(s) into the rejected NSSAI and the mapped S-NSSAI(s) for the rejected NSSAI based on the associated rejection cause(s);

2) if the UE receives the S-NSSAI(s) included in the Rejected NSSAI IE, or if the UE receives the S-NSSAI(s) included in the Extended rejected NSSAI IE in non-roaming case when not in SNPN access operation mode or in the subscribed SNPN, remove from the stored allowed NSSAI for the current PLMN and its equivalent PLMN(s) in the registration area or the current SNPN, the S-NSSAI(s), if any, included in the:

i) rejected NSSAI for the current PLMN or SNPN, for each and every access type;

ii) rejected NSSAI for the current registration area, associated with the same access type; or

iii) rejected NSSAI for the maximum number of UEs reached, associated with the same access type;

3) if the UE receives the S-NSSAI(s) included in the Extended rejected NSSAI IE in roaming case or in a non-subscribed SNPN, remove from the stored allowed NSSAI for the current PLMN and its equivalent PLMN(s) in the registration area or the current SNPN, the S-NSSAI(s), if any, included in the:

i) rejected NSSAI for the current PLMN or SNPN, for each and every access type;

ii) rejected NSSAI for the current registration area, associated with the same access type; or

iii) rejected NSSAI for the maximum number of UEs reached, associated with the same access type;

if the mapped S-NSSAI(s) for the S-NSSAI in the stored allowed NSSAI for the current PLMN or SNPN are stored in the UE, and the all of the mapped S-NSSAI are included in the Extended rejected NSSAI IE;

4) remove from the stored allowed NSSAI for the current PLMN and its equivalent PLMN(s) in the registration area (if the UE is not roaming) or the current SNPN (if the SNPN is the subscribed SNPN) or the stored mapped S-NSSAI(s) for the allowed NSSAI (if available and if the UE is roaming or is a non-subscribed SNPN), the S-NSSAI(s), if any, included in the:

i) rejected NSSAI for the failed or revoked NSSAA, for each and every access type;

ii) mapped S-NSSAI(s) for the rejected NSSAI for the current PLMN or SNPN, for each and every access type;

iii) mapped S-NSSAI(s) for the rejected NSSAI for the current registration area, associated with the same access type; or

iv) mapped S-NSSAI(s) for the rejected NSSAI for the maximum number of UEs reached, associated with the same access type;

5) if the UE receives the S-NSSAI(s) included in the Rejected NSSAI IE, or if the UE receives the S-NSSAI(s) included in the Extended rejected NSSAI IE in non-roaming case when not in SNPN access operation mode or in the subscribed SNPN, remove from the stored pending NSSAI for the current PLMN and its equivalent PLMN(s) in the registration area or the current SNPN, the S-NSSAI(s), if any, included in the:

i) rejected NSSAI for the current PLMN or SNPN, for each and every access type;

ii) rejected NSSAI for the current registration area, associated with the same access type; or

iii) rejected NSSAI for the maximum number of UEs reached, associated with the same access type;

6) if the UE receives the S-NSSAI(s) included in the Extended rejected NSSAI IE in roaming case or in a non-subscribed SNPN, remove from the stored pending NSSAI for the current PLMN and its equivalent PLMN(s) in the registration area or the current SNPN, the S-NSSAI(s), if any, included in the:

i) rejected NSSAI for the current PLMN or SNPN, for each and every access type;

ii) rejected NSSAI for the current registration area, associated with the same access type; or

iii) rejected NSSAI for the maximum number of UEs reached, associated with the same access type,

if the mapped S-NSSAI(s) for the S-NSSAI in the stored pending NSSAI are stored in the UE, and all of the mapped S-NSSAI(s) are included in the Extended rejected NSSAI IE; and

7) remove from the stored pending NSSAI for the current PLMN and its equivalent PLMN(s) in the registration area (if the UE is not roaming) or the current SNPN (if the SNPN is the subscribed SNPN) or the stored mapped S-NSSAI(s) for the pending NSSAI (if available and if the UE is roaming or is in a non-subscribed SNPN), the S-NSSAI(s) included in the:

i) rejected NSSAI for the failed or revoked NSSAA, for each and every access type;

ii) mapped S-NSSAI(s) for the rejected NSSAI for the current PLMN or SNPN, for each and every access type;

iii) mapped S-NSSAI(s) for the rejected NSSAI for the current registration area, associated with the same access type; or

iv) mapped S-NSSAI(s) for the rejected NSSAI for the maximum number of UEs reached, associated with the same access type;

If the UE receives the CONFIGURATION UPDATE COMMAND message with the Registration requested bit of the Configuration update indication IE set to “registration requested” and contains no other parameters (see subclauses 5.4.4.2 and 5.4.4.3), the UE shall delete any stored rejected NSSAI.

When the UE:

1) enters state 5GMM-DEREGISTERED following an unsuccessful registration for 5GMM causes other than #62 “No network slices available” for the current PLMN or SNPN;

2) successfully registers with a new PLMN or SNPN;

3) enters state 5GMM-DEREGISTERED following an unsuccessful registration with a new PLMN; or

4) performs inter-system change from N1 mode to S1 mode and the UE successfully completes tracking area update procedure;

and the UE is not registered with the current PLMN or SNPN over another access, the rejected NSSAI for the current PLMN or SNPN and the rejected NSSAI for the failed or revoked NSSAA shall be deleted.

When the UE receives ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message provided with S-NSSAI and the PLMN ID in the Protocol configuration options IE or Extended protocol configuration options IE (see subclause 6.5.1.3 of 3GPP TS 24.301 [15]), the UE shall remove the S-NSSAI associated with the PLMN ID from the rejected NSSAI for the current PLMN. When the UE receives ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message provided with S-NSSAI and the PLMN ID in the Protocol configuration options IE or Extended protocol configuration options IE (see subclause 6.5.1.3 of 3GPP TS 24.301 [15]), the UE may remove the S-NSSAI from the rejected NSSAI for the maximum number of UEs reached for each and every access type, if any, and stop the timer T3526 associated with the S-NSSAI if running.

When the UE:

1) deregisters over an access type;

2) successfully registers in a new registration area over an access type;

3) enters state 5GMM-DEREGISTERED or 5GMM-REGISTERED following an unsuccessful registration in a new registration area over an access type; or

4) performs inter-system change from N1 mode to S1 mode and the UE successfully completes tracking area update procedure;

the rejected NSSAI for the current registration area corresponding to the access type shall be deleted;

d) When the UE receives the pending NSSAI in the REGISTRATION ACCEPT message, the UE shall replace any stored pending NSSAI for this PLMN or SNPN with the new pending NSSAI received in the REGISTRATION ACCEPT message for this PLMN or SNPN. If the UE does not receive the pending NSSAI in the REGISTRATION ACCEPT message and the “NSSAA to be performed” indicator is not set to “Network slice-specific authentication and authorization is to be performed” in the 5GS registration result IE of the REGISTRATION ACCEPT message, the UE shall delete the stored pending NSSAI, if any, for this PLMN and its equivalent PLMN(s) in the registration area or this SNPN.

If the registration area contains TAIs belonging to different PLMNs, which are equivalent PLMNs, then for each of the equivalent PLMNs, the UE shall replace any stored pending NSSAI with the pending NSSAI received in the registered PLMN.

When the UE:

1) deregisters with the current PLMN or SNPN using explicit signalling or enters state 5GMM-DEREGISTERED for the current PLMN or SNPN;

2) successfully registers with a new PLMN not in the list of equivalent PLMNs or the new SNPN;

3) enters state 5GMM-DEREGISTERED following an unsuccessful registration with a new PLMN or SNPN; or

4) successfully initiates an attach or tracking area update procedure in S1 mode and the UE is operating in single-registration mode;

and the UE is not registered with the current PLMN or SNPN over another access, the pending NSSAI for the current PLMN and its equivalent PLMN(s) in the registration area or the current SNPN shall be deleted;

e) When the UE receives the Network slicing indication IE with the Network slicing subscription change indication set to "Network slicing subscription changed" in the REGISTRATION ACCEPT message or in the CONFIGURATION UPDATE COMMAND message, the UE shall delete the network slicing information for each of the PLMNs or SNPNs that the UE has slicing information stored for (excluding the current PLMN or SNPN). The UE shall delete any stored rejected NSSAI and stop any timer T3526 associated with a deleted S-NSSAI in the rejected NSSAI for the maximum number of UEs reached if running. The UE shall not delete the default configured NSSAI. Additionally, the UE shall update the network slicing information for the current PLMN or SNPN (if received) as specified above in bullets a), b), c) and d); and

f) When the UE receives the new default configured NSSAI included in the default configured NSSAI update data in the Payload container IE of DL NAS TRANSPORT message, the UE shall replace any stored default configured NSSAI with the new default configured NSSAI. In case of SNPN, the UE shall replace the stored default configured NSSAI associated with the selected entry of the "list of subscriber data" or the PLMN subscription with the new default configured NSSAI.

\* \* \* Next Change \* \* \* \*

# C.1 Storage of 5GMM information for UEs not operating in SNPN access operation mode

The following 5GMM parameters shall be stored on the USIM if the corresponding file is present:

a) 5G-GUTI;

b) last visited registered TAI;

c) 5GS update status;

d) 5G NAS security context parameters from a full native 5G NAS security context (see 3GPP TS 33.501 [24]);

e) KAUSF and KSEAF (see 3GPP TS 33.501 [24]);

f) SOR counter (see subclause 9.11.3.51); and

g) UE parameter update counter (see subclause 9.11.3.53A);

The UE may support multiple records of NAS security context storage for multiple registration (see 3GPP TS 31.102 [22]). If the UE supports multiple records of NAS security context storage for multiple registration, the first 5G security context of one access shall be stored in record 1 of the 5G NAS Security Context USIM file for that access and the second 5G security context of that access shall be stored in record 2 of the same file. The presence and format of corresponding files on the USIM is specified in 3GPP TS 31.102 [22].

If the corresponding file is not present on the USIM, these 5GMM parameters are stored in a non-volatile memory in the ME together with the SUPI from the USIM. These 5GMM parameters can only be used if the SUPI from the USIM matches the SUPI stored in the non-volatile memory; else the UE shall delete the 5GMM parameters.

The following 5GMM parameters shall be stored in a non-volatile memory in the ME together with the SUPI from the USIM:

- configured NSSAI(s);

- NSSRG information;

- NSSAI inclusion mode(s);

- MPS indicator;

- MCS indicator;

- operator-defined access category definitions;

- network-assigned UE radio capability IDs;

- "CAG information list", if the UE supports CAG;

- signalled URSP (see 3GPP TS 24.526 [19]);

- SOR-CMCI;

- one or more lists of type "list of PLMN(s) to be used in disaster condition", if the UE supports MINT;

- disaster roaming wait range, if the UE supports MINT;

- disaster return wait range, if the UE supports MINT;

- indication of whether disaster roaming is enabled in the UE; and

- indication of 'applicability of "lists of PLMN(s) to be used in disaster condition" provided by a VPLMN'.

The following 5GMM parameters should be stored in a non-volatile memory in the ME together with the SUPI from the USIM:

- allowed NSSAI(s); and

- partially allowed NSSAI(s).

Each configured NSSAI consists of S-NSSAI(s) stored together with a PLMN identity, if it is associated with a PLMN. The UE shall store the S-NSSAI(s) of the HPLMN. If the UE is in the VPLMN, the UE shall also store the configured NSSAI for the current PLMN and any necessary mapped S-NSSAI(s). The configured NSSAI(s) can only be used if the SUPI from the USIM matches the SUPI stored in the non-volatile memory of the ME; else the UE shall delete the configured NSSAI(s). A configured NSSAI may be associated with NSSRG information.

Each NSSAI inclusion mode is associated with a PLMN identity and access type. The NSSAI inclusion mode(s) can only be used if the SUPI from the USIM matches the SUPI stored in the non-volatile memory of the ME; else the UE shall delete the NSSAI inclusion mode(s).

The MPS indicator is stored together with a PLMN identity of the PLMN that provided it, and is valid in that RPLMN or equivalent PLMN. The MPS indicator can only be used if the SUPI from the USIM matches the SUPI stored in the non-volatile memory of the ME, else the UE shall delete the MPS indicator.

The MCS indicator is stored together with a PLMN identity of the PLMN that provided it, and is valid in that RPLMN or equivalent PLMN. The MCS indicator can only be used if the SUPI from the USIM matches the SUPI stored in the non-volatile memory of the ME, else the UE shall delete the MCS indicator.

Operator-defined access category definitions are stored together with a PLMN identity of the PLMN that provided them, and is valid in that PLMN or equivalent PLMN. The operator-defined access category definitions can only be used if the SUPI from the USIM matches the SUPI stored in the non-volatile memory of the ME, else the UE shall delete the operator-defined access category definitions. The maximum number of stored operator-defined access category definitions is UE implementation dependent.

Each network-assigned UE radio capability ID is stored together with a PLMN identity of the PLMN that provided it as well as a mapping to the corresponding UE radio configuration, and is valid in that PLMN. A network-assigned UE radio capability ID can only be used if the SUPI from the USIM matches the SUPI stored in the non-volatile memory of the ME, else the UE shall delete the network-assigned UE radio capability ID. The UE shall be able to store at least the last 16 received network-assigned UE radio capability IDs. There shall be only one network-assigned UE radio capability ID stored for a given combination of PLMN identity and UE radio configuration and any existing UE radio capability ID shall be deleted when a new UE radio capability ID is added for the same combination of PLMN identity and UE radio configuration. If the UE receives a network-assigned UE radio capability ID with a Version ID value different from the value included in the network-assigned UE radio capability ID(s) stored at the UE for the serving PLMN, the UE may delete these stored network-assigned UE radio capability ID(s).

The allowed NSSAI(s) can be stored in a non-volatile memory in the ME together with the SUPI from the USIM. Allowed NSSAI consists of S-NSSAI(s) stored together with a PLMN identity, if it is associated with a PLMN. If the allowed NSSAI is stored, then the UE shall store the S-NSSAI(s) of the HPLMN. If the UE is in the VPLMN, the UE shall also store the allowed NSSAI for the serving PLMN and any necessary mapping of the allowed NSSAI for the serving PLMN to the S-NSSAI(s) of the HPLMN. The allowed NSSAI(s) can only be used if the SUPI from the USIM matches the SUPI stored in the non-volatile memory of the ME; else the UE shall delete the allowed NSSAI(s).

The partially allowed NSSAI(s) can be stored as allowed NSSAI(s) in a non-volatile memory in the ME together with the SUPI from the USIM. Partially allowed NSSAI consists of allowed S-NSSAI(s) and for each S-NSSAI a list of TAs for which the S-NSSAI is supported, together with a PLMN identity.

If the UE is registered for emergency services, the UE shall not store the 5GMM parameters described in this annex on the USIM or in non-volatile memory. Instead the UE shall temporarily store these parameters locally in the ME and the UE shall delete these parameters when the UE is deregistered.

If the UE is configured for eCall only mode as specified in 3GPP TS 31.102 [22], the UE shall not store the 5GMM parameters described in this annex on the USIM or in non-volatile memory. Instead the UE shall temporarily store these parameters locally in the ME and the UE shall delete these parameters when the UE enters 5GMM-DEREGISTERED.eCALL-INACTIVE state, the UE is switched-off or the USIM is removed.

The "CAG information list" can only be used if the SUPI from the USIM matches the SUPI stored in the non-volatile memory of the ME; else the UE shall delete the "CAG information list".

The handling of the SOR-CMCI stored in the non-volatile memory in the ME is specified in 3GPP TS 23.122 [5].

Each "list of PLMN(s) to be used in disaster condition" is stored together with the PLMN identity of the PLMN that provided it. The stored lists of type "list of PLMN(s) to be used in disaster condition" can only be used if the SUPI from the USIM matches the SUPI stored in the non-volatile memory of the ME; else the UE shall delete the lists of type "list of PLMN(s) to be used in disaster condition". The UE shall store at least the "list of PLMN(s) to be used in disaster condition" provided by the HPLMN or EHPLMN. If the 'applicability of "lists of PLMN(s) to be used in disaster condition" provided by a VPLMN' is set to "true", the UE should also store the "list of PLMN(s) to be used in disaster condition" provided by the VPLMN. The maximum number of stored lists of type "list of PLMN(s) to be used in disaster condition" provided by a PLMN other than the HPLMN or EHPLMN is UE implementation dependent.

The disaster roaming wait range can only be used if the SUPI from the USIM matches the SUPI stored in the non-volatile memory of the ME; else the UE shall delete the disaster roaming wait range.

The disaster return wait range can only be used if the SUPI from the USIM matches the SUPI stored in the non-volatile memory of the ME; else the UE shall delete the disaster return wait range.

The indication of whether disaster roaming is enabled in the UE can only be used if the SUPI from the USIM matches the SUPI stored in the non-volatile memory of the ME; else the UE shall delete the indication of whether disaster roaming is enabled in the UE.

The indication of 'applicability of "lists of PLMN(s) to be used in disaster condition" provided by a VPLMN' can only be used if the SUPI from the USIM matches the SUPI stored in the non-volatile memory of the ME; else the UE shall delete the indication of 'applicability of "lists of PLMN(s) to be used in disaster condition" provided by a VPLMN'.

\* \* \* Next Change \* \* \* \*

# C.2 Storage of 5GMM information for UEs operating in SNPN access operation mode

The 5GMM information for UEs operating in SNPN access operation mode and not registering or registered for the onboarding service in SNPN are stored according to the following conditions:

- if the UE does not support access to an SNPN using credentials from a credentials holder and equivalent SNPNs, the following 5GMM parameters shall be stored per subscribed SNPN in a non-volatile memory in the ME together with the subscriber identifier associated with the SNPN identity of the SNPN in the "list of subscriber data" configured in the ME (see 3GPP TS 23.122 [5]) or with the SUPI from the USIM if no subscriber identifier is configured in the entry of the "list of subscriber data" associated with the SNPN identity and the UE has a valid USIM;and

- if the UE supports access to an SNPN using credentials from a credentials holder, equivalent SNPNs or both, the following 5GMM parameters shall be stored in a non-volatile memory in the ME per:

i) the subscribed SNPN together with the subscriber identifier associated with the selected entry in the "list of subscriber data" configured in the ME (see 3GPP TS 23.122 [5]) or with the SUPI from the USIM if no subscriber identifier is configured in the selected entry of the "list of subscriber data" configured in the ME and the UE has a valid USIM; or

ii) if the UE supports access to an SNPN using credentials from a credentials holder, the PLMN subscription together with the SUPI from the USIM which is associated with the PLMN subscription:

a) 5G-GUTI;a1) NID of the registered SNPN;

b) last visited registered TAI;

c) 5GS update status;

d) 5G NAS security context parameters from a full native 5G NAS security context (see 3GPP TS 33.501 [24]);

e) KAUSF and KSEAF (see 3GPP TS 33.501 [24]);

f) UE parameter update counter (see subclause 9.11.3.53A);

g) configured NSSAI(s);

g1) NSSRG information;

h) NSSAI inclusion mode(s);

i) MPS indicator;

j) MCS indicator;

k) operator-defined access category definitions;

l) network-assigned UE radio capability IDs;

m) zero or more instances of signalled URSP (see 3GPP TS 24.526 [19]), each associated with a non-subscribed SNPN, the subscribed SNPN or the HPLMN, which provided the URSP;

n) optionally a non-subscribed SNPN signalled URSP handling indication indicating whether the UE is allowed to accept URSP signalled by non-subscribed SNPNs;

o) permanently forbidden SNPNs list;

p) temporarily forbidden SNPNs;

q) SOR counter (see subclause 9.11.3.51); and

r) SOR-CMCI.

The 5GMM information for UEs operating in SNPN access operation mode and registering or registered for the onboarding service in SNPN are stored as follows:

a) 5G-GUTI;

b) last visited registered TAI;

c) 5GS update status;

d) 5G NAS security context parameters from a full native 5G NAS security context (see 3GPP TS 33.501 [24]);

e) KAUSF and KSEAF (see 3GPP TS 33.501 [24]);

f) UE parameter update counter (see subclause 9.11.3.53A);

g) network-assigned UE radio capability IDs;

h) "permanently forbidden SNPNs" list for onboarding services; and

i) "temporarily forbidden SNPNs" list for onboarding services.

The 5GMM information for UEs operating in SNPN access operation mode are stored according to the following conditions:

- if the UE does not support access to an SNPN using credentials from a credentials holder, equivalent SNPNs or both, the following 5GMM parameters should be stored per subscribed SNPN in a non-volatile memory in the ME together with the subscriber identifier associated with the SNPN identity of the SNPN in the "list of subscriber data" configured in the ME (see 3GPP TS 23.122 [5]) or with the SUPI from the USIM if no subscriber identifier is configured in the entry of the "list of subscriber data" associated with the SNPN identity and the UE has a valid USIM; and

- if the UE supports access to an SNPN using credentials from a credentials holder, equivalent SNPNs or both, the following 5GMM parameters should be stored in a non-volatile memory in the ME per:

i) the subscribed SNPN together with the subscriber identifier associated with the selected entry in the "list of subscriber data" configured in the ME (see 3GPP TS 23.122 [5]) or with the SUPI from the USIM if no subscriber identifier is configured in the selected entry of the "list of subscriber data" configured in the ME and the UE has a valid USIM; or

ii) if the UE supports access to an SNPN using credentials from a credentials holder, the PLMN subscription together with the SUPI from the USIM which is associated with the PLMN subscription:

a) allowed NSSAI(s); and

b) partially allowed NSSAI(s).

If the 5GMM parameters are associated with the PLMN subscription, then the 5GMM parameters can only be used if the SUPI from the USIM which is associated with the selected PLMN subscription matches the SUPI stored in the non-volatile memory; else the UE shall delete the 5GMM parameters.

If the 5GMM parameters are associated with the subscribed SNPN of the entry in the "list of subscriber data", then the 5GMM parameters can only be used if the subscriber identifier of the selected entry of the "list of subscriber data" matches the subscriber identifier stored in the non-volatile memory or if the subscriber identifier from the USIM matches the subscriber identifier stored in the non volatile memory, no subscriber identifier is configured in the selected entry of the "list of subscriber data" configured in the ME and the UE has a valid USIM.

Each configured NSSAI consists of S-NSSAI(s) stored together with an SNPN identity, if it is associated with an SNPN. A configured NSSAI may be associated with NSSRG information.

Each NSSAI inclusion mode is associated with an SNPN identity and access type.

The MPS indicator is stored together with an SNPN identity of the SNPN that provided it, and is valid in that registered SNPN or equivalent SNPN.

The MCS indicator is stored together with an SNPN identity of the SNPN that provided it, and is valid in that registered SNPN or equivalent SNPN.

Operator-defined access category definitions are stored together with an SNPN identity of the SNPN that provided them, and are valid in that SNPN or equivalent SNPN. The maximum number of stored operator-defined access category definitions is UE implementation dependent.

Each network-assigned UE radio capability ID is stored together with an SNPN identity of the SNPN that provided it as well as a mapping to the corresponding UE radio configuration, and is valid in that SNPN. The UE shall be able to store at least the last 16 received network-assigned UE radio capability IDs. There shall be only one network-assigned UE radio capability ID stored for a given combination of SNPN identity and UE radio configuration and any existing UE radio capability ID shall be deleted when a new UE radio capability ID is added for the same combination of SNPN identity and UE radio configuration. If the UE receives a network-assigned UE radio capability ID with a Version ID value different from the value included in the network-assigned UE radio capability ID(s) stored at the UE for the serving SNPN, the UE may delete these stored network-assigned UE radio capability ID(s).

The handling of the SOR-CMCI stored in the non-volatile memory in the ME is specified in 3GPP TS 23.122 [5].

The allowed NSSAI(s) can be stored in a non-volatile memory in the ME. Allowed NSSAI consists of S-NSSAI(s) stored together with an SNPN identity, if it is associated with an SNPN.

The partially allowed NSSAI(s) can be stored as allowed NSSAI(s) in a non-volatile memory in the ME. Partially allowed NSSAI consists of S-NSSAI(s) and a list of TAs for which the S-NSSAI is supported, stored together with an SNPN identity, if it is associated with an SNPN.

\* \* \* End of Changes \* \* \* \*