**3GPP TSG-CT WG1 Meeting #150C1-244594**

**Maastricht, Netherlands; 19th – 23rd August 2024**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** | **6332** | **rev** | **1** | **Current version:** | **18.7.0** |  |
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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 | **x** | Radio Access Network |  | Core Network | **x** |

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| ***Title:*** | Handling of regulatory prioritized services in non-allowed area C1-244015 | | | | | | | | | |
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| ***Source to WG:*** | Peraton Labs, CISA ECD, T-Mobile USA, AT&T, Verizon | | | | | | | | | |
| ***Source to TSG:*** | C1 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 5GProtoc19, MPS\_WLAN | | | | |  | ***Date:*** | | | 2024-08-08 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-19 |
|  | *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:*** | | According to SA2 S2-2403708/CR4660 against TS 23.501 rel-18, approved at SA#103:  "For MPS and MCX, based on operator policy or regional/national regulations, service area restrictions do not apply, as specified in TS 24.501 [47]."  TS 24.501 must accommodate scenarios where operator policy or regional/national regulations do not allow exemptions for high priority access as well as scenarios that do.  This CR is a continuation of the postponed rel-18 CR C1-243709. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Conveys the operator policy regarding exemption for high priorty access UEs in service restricted areas to the UE. Adds procedures for the UE to exempt itself or not, in restricted areas according to the operator policy.  First change:  Adds to the general section that the operator can convey exemption policy to the high priorty access UE in the REGISTRATION ACCEPT message or in the CONFIGURATION UPDATE COMMAND message.  Second change:  High priority access exemptions are replaced by a check of the high priority access service area restriction exempt bit in the REGISTRATION ACCEPT and the CONFIGURATION UPDATE COMMAND message.  Third change:  Adds a procedure for the network to send the UE the operator policy on UE exemption for service area restrictions in the CONFIGURATION UPDATE COMMAND message.  Fourth change:  Make the high priority access exemption based upon operator policy for the *UE-initiated NAS transport* procedure when the UE is in a restricted service area.  Fifth change:  The UE reports in the registration if it supports operator policy for high priorty access exemptions in service area restrictions.  Sixth change:  The UE reports in the registration update if it supports operator policy for high priorty access exemptions in service area restrictions.  Seventh change:  Adds a procedure for the network to send the UE the operator policy on UE exemption for service area restrictions in the REGISTRATION ACCEPT message following an initial registration.  Eighth change:  Make the high priority access exemption based upon operator policy for the *registration* procedure when the UE is in a restricted service area.  Adds a procedure for the network to send the UE the operator policy on UE exemption for service area restrictions in the REGISTRATION ACCEPT message following a mobility or periodic registration.  Ninth change:  Make the high priority access exemption based upon operator policy for the *service request* procedure when the UE is in a restricted service area.  Tenth change:  Adds a new UE feature for support of operator policy for high priorty access exemption.  Eleventh change:  Adds the high priority access service area restriction exempt bit to the 5GS network feature support for the REGISTRATION ACCEPT message.  Twelfth change:  Adds the high priority access service area restriction exempt bit to the priority indicator IE for the CONFIGURATION UPDATE COMMAND message.  NOTE: A UE that does not support the exemption policy bit in either the REGISTRATION ACCEPT message or the CONFIGURATION UPDATE COMMAND message ignores the bit. A mechanism for the UE to report support for the bit is not needed.  Backward compatibility analysis:  The CR is backward compatible through the use of the network feature support bit. | | | | | | | | |
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| ***Consequences if not approved:*** | | The operator policy or regional/national regulations for service area restrictions will have no effect. | | | | | | | | |
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| ***Clauses affected:*** | | 5.3.5.1, 5.3.5.2, 5.4.4.2, 5.4.5.2.5,5.5.1.2.2, 5.5.1.3.2, 5.5.1.2.4, 5.5.1.3.4, 5.6.1.5, 9.11.3.1, 9.11.3.5, 9.11.3.91 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 \*\*\*\*\*

#### 5.3.5.1 General

Service area restrictions are applicable only to 3GPP access and to wireline access.

Subclause 5.3.5.2 applies when the UE accesses 5GCN over 3GPP access.

Subclause 5.3.5.3 applies when the 5G-RG or the W-AGF acting on behalf of an FN-CRG (or on behalf of the N5GC device) access 5GCN over wireline access.

NOTE: Service area restrictions are not applicable for the W-AGF acting on behalf of the FN-BRG.

The network can optionally convey operator policy for service area restriction exemptions for UEs configured for high priority access in selected PLMN or SNPN using the high priority access service area restriction exempt bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message or the high priority access service area restriction exempt bit in the Priority indicator IE in the CONFIGURATION UPDATE COMMAND message, if the UE supports HPAOP.

\*\*\*\*\* Second change \*\*\*\*\*

#### 5.3.5.2 3GPP access service area restrictions

The service area restrictions consist of tracking areas forming either an allowed area, or a non-allowed area. The tracking areas belong to the registered PLMN, its equivalent PLMNs in the registration area, or the registered SNPN. The allowed area can contain up to 16 tracking areas or include all tracking areas in the registered PLMN and its equivalent PLMN(s) in the registration area, or in the registered SNPN. The non-allowed area can contain up to 16 tracking areas. The network conveys the service area restrictions to the UE by including either an allowed area, or a non-allowed area, but not both, in the Service area list IE of a REGISTRATION ACCEPT message or a CONFIGURATION UPDATE COMMAND message.

If the network does not convey the service area restrictions to the UE in the Service area list IE of a REGISTRATION ACCEPT message, the UE shall treat all tracking areas in the registered PLMN, its equivalent PLMN(s) in the registration area, or in the registered SNPN, as allowed area and delete the stored list of "allowed tracking areas" or the stored list of "non-allowed tracking areas".

When the UE receives a Service area list IE with an allowed area indication during a registration procedure or a generic UE configuration update procedure:

a) if the "Type of list" included in the Service area list IE does not indicate "all TAIs belonging to the PLMNs in the registration area are allowed area", the UE shall delete the old list of "allowed tracking areas" and store the tracking areas in the allowed area as the list of "allowed tracking areas". If the UE has a stored list of "non-allowed tracking areas", the UE shall delete that list; or

b) if the "Type of list" included in the Service area list IE indicates "all TAIs belonging to the PLMNs in the registration area are allowed area", the UE shall treat all tracking areas in the registered PLMN and its equivalent PLMN(s), or in the registered SNPN, as allowed area and delete the stored list of "allowed tracking areas" or the stored list of "non-allowed tracking areas".

When the UE receives a Service area list IE with a non-allowed area indication during a registration procedure or a generic UE configuration update procedure, the UE shall delete the old list of "non-allowed tracking areas" and store the tracking areas in the non-allowed area as the list of "non-allowed tracking areas". If the UE has a stored list of "allowed tracking areas", the UE shall delete that list.

If the UE is successfully registered to a PLMN or SNPN and has a stored list of "allowed tracking areas":

a) while the current TAI is in the list of "allowed tracking areas", the UE shall stay in, or enter, the state 5GMM-REGISTERED.NORMAL-SERVICE and is allowed to initiate any 5GMM and 5GSM procedures; and

b) while the UE is camped on a cell which is in the registration area, and the current TAI is not in the list of "allowed tracking areas", the UE shall enter the state 5GMM-REGISTERED.NON-ALLOWED-SERVICE, and:

1) if the UE is in 5GMM-IDLE mode or 5GMM-IDLE mode with suspend indication over 3GPP access, the UE:

i) shall not include the Uplink data status IE in the registration procedure for mobility and periodic registration update except for emergency services or for high priority access unless the HPASE bit indicates "High priority access UEs are not exempt from service area restrictions";

ii) shall not perform the registration procedure for mobility and periodic registration update with Follow-on request indicator set to "Follow-on request pending", except for:

- emergency services;

- high priority access unless the HPASE bit indicates "High priority access UEs are not exempt from service area restrictions";

- indicating a change of 3GPP PS data off UE status;

- sending an SOR transparent container;

- sending a UE policy container; or

- sending a UE parameters update transparent container;

iii) shall not initiate a service request procedure or request the lower layers to resume a suspended connection, except for:

- emergency services;

- emergency services fallback;

- high priority access unless the HPASE bit indicates "High priority access UEs are not exempt from service area restrictions";

- responding to paging;

- responding to notification received over non-3GPP access;

- indicating a change of 3GPP PS data off UE status;

- sending an SOR transparent container;

- sending a UE policy container; or

- sending a UE parameters update transparent container.

The UE shall not include the Uplink data status IE in the SERVICE REQUEST message or CONTROL PLANE SERVICE REQUEST message except for emergency services or for high priority access unless the HPASE bit indicates "High priority access UEs are not exempt from service area restrictions". In case of emergency services, the UE shall indicate that uplink data is pending only for the PDU session for emergency services;

iv) if the UE responds to a paging which includes an indication for non-3GPP access type, the UE shall include the Allowed PDU session status IE in the SERVICE REQUEST, CONTROL PLANE SERVICE REQUEST or REGISTRATION REQUEST message. For a UE with an emergency PDU session established or a UE configured for high priority access unless the HPASE bit indicates "High priority access UEs are not exempt from service area restrictions", the UE shall indicate the PDU session(s) for which the UE allows the user-plane resources to be re-established over 3GPP access in the Allowed PDU session status IE that re-establishment of the user-plane resources via 3GPP access is allowed; for all other cases, the UE shall indicate for each PDU session in the Allowed PDU session status IE that re-establishment of the user-plane resources via 3GPP access is not allowed; and

2) if the UE is in 5GMM-CONNECTED mode or 5GMM-CONNECTED mode with RRC inactive indication over 3GPP access, the UE:

i) shall not perform the registration procedure for mobility and periodic registration update with Uplink data status IE except for emergency services or for high priority access unless the HPASE bit indicates "High priority access UEs are not exempt from service area restrictions";

ii) shall not initiate a service request procedure except for:

- emergency services;

- emergency services fallback;

- high priority access unless the HPASE bit indicates "High priority access UEs are not exempt from service area restrictions";

- responding to paging or responding to a notification.

The UE shall not include the Uplink data status IE in the SERVICE REQUEST message or CONTROL PLANE SERVICE REQUEST message except for emergency services or for high priority access unless the HPASE bit indicates "High priority access UEs are not exempt from service area restrictions". In case of emergency services, the UE shall indicate that uplink data is pending only for the PDU session for emergency services;

iii) shall not initiate a 5GSM procedure except for:

- emergency services;

- high priority access unless the HPASE bit indicates "High priority access UEs are not exempt from service area restrictions"; or

- indicating a change of 3GPP PS data off UE status;

iv) shall not perform the NAS transport procedure except for the sending:

- 5GSM messages for UE-requested 5GSM procedures allowed in iii) above;

- 5GSM messages for network-requested 5GSM procedures;

- SMS;

- an LPP message;

- a UPP-CMI container;

- an SLPP message;

- a location services message;

- an SOR transparent container;

- a UE policy container;

- a UE parameters update transparent container; or

- a CIoT user data container; and

NOTE 1: The contents of CIoT user data container can be data that is not for exception reports, or data that is for exception reports if allowed for the UE (see subclause 6.2.13).

v) if the UE responds to a notification which includes an indication for non-3GPP access type, the UE shall include the Allowed PDU session status IE in the SERVICE REQUEST, CONTROL PLANE SERVICE REQUEST or REGISTRATION REQUEST message. For a UE with an emergency PDU session established or a UE configured for high priority access unless the HPASE bit indicates "High priority access UEs are not exempt from service area restrictions", the UE shall indicate the PDU session(s) for which the UE allows the user-plane resources to be re-established over 3GPP access in the Allowed PDU session status IE that re-establishment of the user-plane resources via 3GPP access is allowed; for all other cases, the UE shall indicate for each PDU session in the Allowed PDU session status IE that re-establishment of the user-plane resources via 3GPP access is not allowed.

If the UE is successfully registered to a PLMN or an SNPN and has a stored list of "non-allowed tracking areas":

a) while the UE is camped on a cell which is in the registration area and the current TAI is not in the list of "non-allowed tracking areas", the UE shall stay in, or enter, the state 5GMM-REGISTERED.NORMAL-SERVICE and is allowed to initiate any 5GMM and 5GSM procedures; and

b) while the current TAI is in the list of "non-allowed tracking areas", the UE shall enter the state 5GMM-REGISTERED.NON-ALLOWED-SERVICE, and:

1) if the UE is in 5GMM-IDLE mode or 5GMM-IDLE mode with suspend indication over 3GPP access, the UE:

i) shall not include the Uplink data status IE in the registration procedure for mobility and periodic registration update except for emergency services or for high priority access unless the HPASE bit indicates "High priority access UEs are not exempt from service area restrictions";

ii) shall not perform the registration procedure for mobility and periodic registration update with Follow-on request indicator set to "Follow-on request pending", except for:

- emergency services;

- high priority access unless the HPASE bit indicates "High priority access UEs are not exempt from service area restrictions";

- indicating a change of 3GPP PS data off UE status;

- sending an SOR transparent container;

- sending a UE policy container; or

- sending a UE parameters update transparent container; and

iii) shall not initiate a service request procedure or request the lower layers to resume a suspended connection, except for:

- emergency services;

- emergency services fallback;

- high priority access unless the HPASE bit indicates "High priority access UEs are not exempt from service area restrictions";

- responding to paging;

- responding to notification received over non-3GPP access;

- indicating a change of 3GPP PS data off UE status;

- sending an SOR transparent container;

- sending a UE policy container; or

- sending a UE parameters update transparent container.

The UE shall not include the Uplink data status IE in the SERVICE REQUEST message or CONTROL PLANE SERVICE REQUEST message except for emergency services or for high priority access unless the HPASE bit indicates "High priority access UEs are not exempt from service area restrictions". In case of emergency services, the UE shall indicate that uplink data is pending only for the PDU session for emergency services;

iv) if the UE responds to a paging which includes an indication for non-3GPP access type, the UE shall include the Allowed PDU session status IE in the SERVICE REQUEST, CONTROL PLANE SERVICE REQUEST or REGISTRATION REQUEST message. For a UE with an emergency PDU session established or a UE configured for high priority access unless the HPASE bit indicates "High priority access UEs are not exempt from service area restrictions", the UE shall indicate the PDU session(s) for which the UE allows the user-plane resources to be re-established over 3GPP access in the Allowed PDU session status IE that re-establishment of the user-plane resources via 3GPP access is allowed; for all other cases, the UE shall indicate for each PDU session in the Allowed PDU session status IE that re-establishment of the user-plane resources via 3GPP access is not allowed; and

2) if the UE is in 5GMM-CONNECTED mode or 5GMM-CONNECTED mode with RRC inactive indication over 3GPP access, the UE:

i) shall not perform the registration procedure for mobility and periodic registration update with the Uplink data status IE except for emergency services or for high priority access unless the HPASE bit indicates "High priority access UEs are not exempt from service area restrictions";

ii) shall not initiate a service request procedure or request the lower layers to resume a suspended connection, except for:

- emergency services;

- emergency services fallback;

- high priority access unless the HPASE bit indicates "High priority access UEs are not exempt from service area restrictions"; or

- responding to paging or responding to a notification.

The UE shall not include the Uplink data status IE in the SERVICE REQUEST message or CONTROL PLANE SERVICE REQUEST message except for emergency services or for high priority access. In case of emergency services, the UE shall indicate that uplink data is pending only for the PDU session for emergency services;

iii) shall not initiate a 5GSM procedure except for:

- emergency services;

- high priority access unless the HPASE bit indicates "High priority access UEs are not exempt from service area restrictions"; or

- indicating a change of 3GPP PS data off UE status;

iv) shall not perform the NAS transport procedure except for the sending:

- 5GSM messages for UE-requested 5GSM procedures allowed in iii) above;

- 5GSM messages for network-requested 5GSM procedures;

- SMS;

- an LPP message;

- a UPP-CMI container;

- an SLPP message;

- a location services message;

- an SOR transparent container;

- a UE policy container;

- a UE parameters update transparent container; or

- a CIoT user data container; and

NOTE 2: The contents of CIoT user data container can be data that is not for exception reports, or data that is for exception reports if allowed for the UE (see subclause 6.2.13).

v) if the UE responds to a notification which includes an indication for non-3GPP access type, the UE shall include the Allowed PDU session status IE in the SERVICE REQUEST, CONTROL PLANE SERVICE REQUEST or REGISTRATION REQUEST message. For a UE with an emergency PDU session established or a UE configured for high priority access unless the HPASE bit indicates "High priority access UEs are not exempt from service area restrictions", the UE shall indicate the PDU session(s) for which the UE allows the user-plane resources to be re-established over 3GPP access in the Allowed PDU session status IE that re-establishment of the user-plane resources via 3GPP access is allowed; for all other cases, the UE shall indicate for each PDU session in the Allowed PDU session status IE that re-establishment of the user-plane resources via 3GPP access is not allowed.

The list of "allowed tracking areas", as well as the list of "non-allowed tracking areas" shall be erased when:

a) the UE is switched off; and

b) the UICC containing the USIM is removed or an entry of the "list of subscriber data" with the SNPN identity of the SNPN is updated.

When a tracking area is added to the list of "5GS forbidden tracking areas for roaming" or to the list of "5GS forbidden tracking areas for regional provision of service" as specified in the subclauses 5.5.1.2.5 or 5.5.1.3.5, the tracking area shall be removed from the list of "allowed tracking areas" if the tracking area is already present in the list of "allowed tracking areas" and from the list of "non-allowed tracking areas" if the tracking area is already present in the list of "non-allowed tracking areas".

\*\*\*\*\* Third change \*\*\*\*\*

#### 5.4.4.2 Generic UE configuration update procedure initiated by the network

The AMF shall initiate the generic UE configuration update procedure by sending the CONFIGURATION UPDATE COMMAND message to the UE.

The AMF shall in the CONFIGURATION UPDATE COMMAND message either:

a) include one or more of the following parameters: 5G-GUTI, TAI list, allowed NSSAI that may include the mapped S-NSSAI(s), LADN information, extended LADN information, service area list, MICO indication, NITZ information, configured NSSAI that may include the mapped S-NSSAI(s), NSSRG information, S-NSSAI location validity information, S-NSSAI time validity information, rejected S-NSSAI(s) in the Rejected NSSAI IE or in the Extended rejected NSSAI IE, network slicing subscription change indication, operator-defined access category definitions, SMS indication, "CAG information list", UE radio capability ID, 5GS registration result, UE radio capability ID deletion indication, truncated 5G-S-TMSI configuration, T3447 value, "list of PLMN(s) to be used in disaster condition", disaster roaming wait range, disaster return wait range, PEIPS assistance information, the priority indicator, the NSAG information, alternative NSSAI, partially allowed NSSAI, partially rejected NSSAI, on-demand NSSAI, feature authorization indication, or discontinuous coverage maximum time offset;

b) include the Configuration update indication IE with the Registration requested bit set to "registration requested"; or

c) include a combination of both a) and b).

If the UE is registering or registered for onboarding services in SNPN, the serving SNPN shall not provide the configured NSSAI, the allowed NSSAI or the rejected NSSAI to the UE.

If the UE supports extended rejected NSSAI, the rejected S-NSSAI(s) shall be included in the Extended rejected NSSAI IE. Otherwise, the rejected S-NSSAI(s) shall be included in the Rejected NSSAI IE.

In roaming scenarios, if the Extended rejected NSSAI IE is included in the CONFIGURATION UPDATE COMMAND message, the AMF shall provide mapped S-NSSAI(s) for the rejected NSSAI.

If an acknowledgement from the UE is requested, the AMF shall indicate "acknowledgement requested" in the Acknowledgement bit of the Configuration update indication IE in the CONFIGURATION UPDATE COMMAND message and shall start timer T3555. Acknowledgement shall be requested for all parameters except when only NITZ information is included.

To initiate parameter re-negotiation between the UE and network, the AMF shall indicate "registration requested" in the Registration requested bit of the Configuration update indication IE in the CONFIGURATION UPDATE COMMAND message.

NOTE 1: Generic UE configuration update procedure can be initiated by the AMF for updating the emergency number list, the extended emergency number list or both by indicating "registration requested" in the Registration requested bit of the Configuration update indication IE in the CONFIGURATION UPDATE COMMAND message to the UE.

If a new allowed NSSAI information or AMF re-configuration of supported S-NSSAIs requires an AMF relocation, the AMF shall indicate "registration requested" in the Registration requested bit of the Configuration update indication IE and include the Allowed NSSAI IE in the CONFIGURATION UPDATE COMMAND message.

If the AMF includes a new allowed NSSAI in the CONFIGURATION UPDATE COMMAND message and the subscription information includes the NSSRG information, then the S-NSSAIs of the allowed NSSAI shall be associated with at least one common NSSRG value. If the network has pending NSSAI, the S-NSSAIs in the pending NSSAI and allowed NSSAI shall be associated with at least one common NSSRG value.

If the AMF includes a new partially allowed NSSAI and the new partially allowed NSSAI requires an AMF relocation, the AMF shall indicate "registration requested" in the Registration requested bit of the Configuration update indication IE and include the Partially allowed NSSAI IE in the CONFIGURATION UPDATE COMMAND message.

If the AMF includes a new configured NSSAI in the CONFIGURATION UPDATE COMMAND message and the new configured NSSAI requires an AMF relocation as specified in 3GPP TS 23.501 [8], the AMF shall indicate "registration requested" in the Registration requested bit of the Configuration update indication IE in the message.

If the AMF includes a new configured NSSAI in the CONFIGURATION UPDATE COMMAND message, the subscription information includes the NSSRG information, and the UE has set the NSSRG bit in the 5GMM capability IE of the REGISTRATION REQUEST message to:

a) "NSSRG supported", then the AMF shall include the NSSRG information in the CONFIGURATION UPDATE COMMAND message; or

b) "NSSRG not supported", then the configured NSSAI shall include one or more S-NSSAIs each of which is associated with all the NSSRG value(s) of the default S-NSSAI(s), or the configured NSSAI shall include, based on the indication received from the UDM as specified in 3GPP TS 23.501 [8], all subscribed S-NSSAIs even if these S-NSSAIs do not share any common NSSRG value.

If the AMF needs to update the NSSRG information and the UE has set the NSSRG bit to "NSSRG supported" in the 5GMM capability IE of the REGISTRATION REQUEST message, then the AMF shall include the new NSSRG information in the CONFIGURATION UPDATE COMMAND message.

If the AMF includes a new NSSRG information in the CONFIGURATION UPDATE COMMAND message and the AMF determines that the UE needs to provide a new requested NSSAI due to no NSSRG value common to all the S-NSSAI(s) of the allowed NSSAI based on the new NSSRG information, then the CONFIGURATION UPDATE COMMAND message shall indicate "registration requested" in the Registration requested bit of the Configuration update indication IE.

If the UE supports S-NSSAI time validity information and the AMF needs to update the S-NSSAI time validity information, then the AMF shall include the new S-NSSAI time validity information in the CONFIGURATION UPDATE COMMAND message.

If the AMF needs to update the S-NSSAI location validity information toward a UE which has set the SLVI bit to "S-NSSAI location validity information supported" in the 5GMM capability IE of the REGISTRATION REQUEST message, then the AMF shall include the new S-NSSAI location validity information in the CONFIGURATION UPDATE COMMAND message.

If the CONFIGURATION UPDATE COMMAND message is initiated only due to changes to the allowed NSSAI and these changes require the UE to initiate a registration procedure, but the AMF is unable to determine an allowed NSSAI for the UE as specified in 3GPP TS 23.501 [8], then the CONFIGURATION UPDATE COMMAND message shall indicate "registration requested" in the Registration requested bit of the Configuration update indication IE, and shall not contain any other parameters.

If the slice deregistration inactivity timer has expired, the UE does not support network slice usage control and the AMF removes the on-demand S-NSSAI from the allowed NSSAI over the corresponding access type, the AMF shall include the new allowed NSSAI in the CONFIGURATION UPDATE COMMAND message.

If:

- the AMF needs to enforce a change in the restriction on the use of enhanced coverage or use of CE mode B as described in subclause 5.3.18; or

- the AMF decides to inform a UE in 5GMM-CONNECTED mode and registered for disaster roaming services, that a disaster condition is no longer applicable;

NOTE 1A: The case of the AMF triggering a generic UE configuration update procedure to inform a UE registered for disaster roaming services that a disaster condition is no longer applicable, is only applicable for a UE already in 5GMM-CONNECTED mode.

the AMF shall indicate "registration requested" in the Registration requested bit of the Configuration update indication IE and "release of N1 NAS signalling connection not required" in the Signalling connection maintain request bit of the Additional configuration indication IE in the CONFIGURATION UPDATE COMMAND message.

If a network slice-specific authentication and authorization procedure for an S-NSSAI is completed as a:

a) success, the AMF shall include this S-NSSAI in the allowed NSSAI over the same access of the requested S-NSSAI or in the partially allowed NSSAI over 3GPP access; or

b) failure, the AMF shall include this S-NSSAI in the rejected NSSAI for the failed or revoked NSSAA with the rejection cause "S-NSSAI not available due to the failed or revoked network slice-specific authentication and authorization" over either 3GPP access or non-3GPP access.

If authorization is revoked for an S-NSSAI that is in the current allowed NSSAI for an access type, the AMF shall:

a) provide a new allowed NSSAI to the UE, excluding the S-NSSAI for which authorization is revoked; and

b) provide a new rejected NSSAI for the failed or revoked NSSAA, including the S-NSSAI in the rejected NSSAI for which the authorization is revoked, with the rejection cause "S-NSSAI not available due to the failed or revoked network slice-specific authentication and authorization".

The allowed NSSAI, the partially allowed NSSAI and the rejected NSSAI shall be included in the CONFIGURATION UPDATE COMMAND message to reflect the result of the procedures subject to network slice-specific authentication and authorization.

NOTE 2: If there are multiple S-NSSAIs subject to network slice-specific authentication and authorization, it is implementation specific if the AMF informs the UE about the outcome of the procedures in one or more CONFIGURATION UPDATE COMMAND messages.

If the AMF includes the Network slicing indication IE in the CONFIGURATION UPDATE COMMAND message with the Network slicing subscription change indication set to "Network slicing subscription changed", and changes to the allowed NSSAI require the UE to initiate a registration procedure, but the AMF is unable to determine an allowed NSSAI for the UE as specified in 3GPP TS 23.501 [8], then the CONFIGURATION UPDATE COMMAND message shall additionally indicate "registration requested" in the Registration requested bit of the Configuration update indication IE and shall not include an allowed NSSAI.

If EAC mode is activated for an S-NSSAI, the AMF shall perform NSAC for the S-NSSAI subject to NSAC before such S-NSSAI is included in the allowed NSSAI in the CONFIGURATION UPDATE COMMAND message. If EAC mode is deactivated for an S-NSSAI, the AMF shall perform NSAC for the S-NSSAI subject to NSAC after such S-NSSAI is included in the allowed NSSAI in the CONFIGURATION UPDATE COMMAND message.

If the UE supports extended rejected NSSAI and the AMF determines that maximum number of UEs reached for one or more S-NSSAI(s) in the allowed NSSAI as specified in subclause 4.6.2.5, the AMF shall include the rejected NSSAI containing one or more S-NSSAIs with the rejection cause "S-NSSAI not available due to maximum number of UEs reached" in the Extended rejected NSSAI IE in the CONFIGURATION UPDATE COMMAND message. In addition, the AMF may include a back-off timer value for each S-NSSAI with the rejection cause "S-NSSAI not available due to maximum number of UEs reached" included in the Extended rejected NSSAI IE of the CONFIGURATION UPDATE COMMAND message. To avoid that large numbers of UEs simultaneously initiate deferred requests, the network should select the value for the backoff timer for each S-NSSAI for the informed UEs so that timeouts are not synchronised.

If the UE does not indicate support for extended rejected NSSAI and the maximum number of UEs has been reached, the AMF should include the rejected NSSAI containing one or more S-NSSAIs with the rejection cause "S-NSSAI not available in the current registration area" in the Rejected NSSAI IE and should not include these S-NSSAIs in the allowed NSSAI in the CONFIGURATION UPDATE COMMAND message. In addition, the AMF may based on the network policies start a local implementation specific timer for the UE per rejected S-NSSAI and upon expiration of the local implementation specific timer, the AMF may remove the rejected S-NSSAI from the rejected NSSAI and update to the UE by initiating the generic UE configuration update procedure.

NOTE 3: Based on network policies, the AMF can include the S-NSSAI(s) for which the maximum number of UEs has been reached in the rejected NSSAI with rejection causes other than "S-NSSAI not available in the current registration area".

If the UE has set the NSAG bit to "NSAG supported" in the 5GMM capability IE of the REGISTRATION REQUEST message, the AMF may include the NSAG information IE in the CONFIGURATION UPDATE COMMAND message. Up to 4 NSAG entries are allowed to be associated with a TAI list in the NSAG information IE.

NOTE 3A: How the AMF selects NSAG entries to be included in the NSAG information IE is implementation specific, e.g. take the NSAG priority and the current registration area into account.

NOTE 3B: If the NSAG for the PLMN and its equivalent PLMN(s) have different associations with S-NSSAIs, then the AMF includes a TAI list for the NSAG entry in the NSAG information IE.

If the UE supports network slice replacement and the AMF determines to provide the mapping information between the S-NSSAI to be replaced and the alternative S-NSSAI to the UE, then the AMF shall include the Alternative NSSAI IE, the Allowed NSSAI IE including the alternative S-NSSAI, if not included in the current allowed NSSAI, and the Configured NSSAI IE including the alternative S-NSSAI, if not included in the current configured NSSAI, in the CONFIGURATION UPDATE COMMAND message. If the AMF determines that the replaced S-NSSAI is available, then the AMF shall provide the updated alternative NSSAI excluding the replaced S-NSSAI and the corresponding alternative S-NSSAI in the Alternative NSSAI IE in the CONFIGURATION UPDATE COMMAND message. If the AMF determines that all the replaced S-NSSAI(s) are available, then the AMF shall provide the Alternative NSSAI IE with Length of Alternative NSSAI contents set to 0 in the CONFIGURATION UPDATE COMMAND message. If the AMF determines that the replaced S-NSSAI is not supported due to the UE moving outside of NS-AoS of the S-NSSAI while the alternative S-NSSAI is available, then the AMF shall provide the updated allowed NSSAI and partially allowed NSSAI, if available, excluding the replaced S-NSSAI, if included, in the allowed NSSAI or partially allowed NSSAI in the CONFIGURATION UPDATE COMMAND message.

If the UE supports partial network slice and the AMF needs to update the partially allowed NSSAI, partially rejected NSSAI or both, then the AMF shall include the Partially allowed NSSAI IE, the Partially rejected NSSAI IE or both, in the CONFIGURATION UPDATE COMMAND message.

If the UE supports network slice usage control and the AMF needs to update the on-demand NSSAI, the AMF shall include the On-demand NSSAI IE in the CONFIGURATION UPDATE COMMAND message.

If the AMF needs to update the LADN information, the AMF shall include the LADN information in the LADN information IE of the CONFIGURATION UPDATE COMMAND message.

If the UE supports LADN per DNN and S-NSSAI and the AMF needs to update the extended LADN information, the AMF shall include the extended LADN information in the Extended LADN information IE of the CONFIGURATION UPDATE COMMAND message.

If:

- the UE does not support LADN per DNN and S-NSSAI;

- the UE is subscribed to the LADN DNN for a single S-NSSAI only; and

- the AMF only has the extended LADN information;

the AMF may decide to provide the LADN service area for that LADN DNN of the extended LADN information as the LADN information and include the LADN information in the LADN information IE of the CONFIGURATION UPDATE COMMAND message.

NOTE 3C: If the LADN service area is configured per DNN and S-NSSAI, in order to serve the UEs that do not support LADN per DNN and S-NSSAI, it is recommended that the LADN DNN is only served by a single S-NSSAI.

NOTE 3D: In case of the UE is subscribed to the LADN DNN for multiple S-NSSAIs, the AMF can treat this as no extended LADN information is available.

NOTE 3E: The AMF allocates the LADN service area and the TAI list associated with the S-NSSAI in the partially allowed NSSAI independently, if applicable.

If the UE does not support LADN per DNN and S-NSSAI and the AMF has neither the LADN information nor the extended LADN information, the AMF shall not provide any LADN information to the UE.

If the AMF needs to update the "CAG information list", the AMF shall include the CAG information list IE or the Extended CAG information list IE in the CONFIGURATION UPDATE COMMAND message.

NOTE 4: If the UE supports extended CAG information list, the CAG information list can be included either in the CAG information list IE or Extended CAG information list IE.

If the UE does not support extended CAG information list, the CAG information list shall not be included in the Extended CAG information list IE.

If the AMF needs to update the "CAG information list", the UE has an emergency PDU session, and the AMF can determine that the UE is in

a) a CAG cell and none of the CAG-ID(s) supported by the CAG cell is authorized based on the "allowed CAG list" for the current PLMN in the updated "CAG information list"; or

b) a non-CAG cell and the entry for the current PLMN in the updated "CAG information list" includes an "indication that the UE is only allowed to access 5GS via CAG cells";

the AMF may indicate to the SMF to perform a local release of:

a) all non-emergency single access PDU sessions associated with 3GPP access;

b) all MA PDU sessions without a PDN connection established as a user-plane resource and without user plane resources established on non-3GPP access; and

c) the 3GPP access user plane resources of all those MA PDU sessions with user plane resources established on both accesses.

The AMF shall not indicate to the SMF to release the emergency PDU session. If the AMF indicated to the SMF to perform a local release of:

a) all single access non-emergency PDU sessions associated with 3GPP access;

b) all MA PDU sessions without a PDN connection established as a user-plane resource and without user plane resources established on non-3GPP access; and

c) the 3GPP access user plane resources of all those MA PDU sessions with user plane resources established on both accesses;

the network shall behave as if the UE is registered for emergency services over 3GPP access and shall set the emergency registered bit of the 5GS registration result IE to "Registered for emergency services" in the CONFIGURATION UPDATE COMMAND message.

If the AMF is initiating the generic UE configuration update procedure to indicate to a UE which is registered for disaster roaming services, and which has an ongoing emergency PDU session, that the UE is registered for emergency services as described in subclause 4.24, the AMF shall set the emergency registered bit of the 5GS registration result IE to "Registered for emergency services" in the CONFIGURATION UPDATE COMMAND message.

If the AMF:

- updated the "CAG information list" to remove one or more CAG-ID(s) authorized based on the Allowed CAG list for the serving PLMN or an equivalent PLMN; or

- updated the "CAG information list" to set the "indication that the UE is only allowed to access 5GS via CAG cells" for the serving PLMN or an equivalent PLMN which was not set before,

then upon completion of the configuration update procedure and if the UE does not have an emergency PDU session, the AMF shall initiate the release of the N1 NAS signalling connection according to subclause 5.3.1.3.

If the AMF needs to update the truncated 5G-S-TMSI configuration for a UE in NB-N1 mode using control plane CIoT 5GS optimization, the AMF shall include the Truncated 5G-S-TMSI configuration IE in the CONFIGURATION UPDATE COMMAND message.

If the AMF includes a UE radio capability ID deletion indication IE in the CONFIGURATION UPDATE COMMAND message, the AMF shall indicate "registration requested" in the Registration requested bit of the Configuration update indication IE.

If the AMF needs to redirect the UE to EPC as described in subclause 4.8.4A.2, the AMF shall indicate "registration requested" in the Registration requested bit of the Configuration update indication IE and "release of N1 NAS signalling connection not required" in the Signalling connection maintain request bit of the Additional configuration indication IE in the CONFIGURATION UPDATE COMMAND message.

If the UE is not in NB-N1 mode and the UE supports RACS, the AMF may include either a UE radio capability ID IE or a UE radio capability ID deletion indication IE in the CONFIGURATION UPDATE COMMAND message.

During an established 5GMM context, the network may send none, one, or more CONFIGURATION UPDATE COMMAND messages to the UE. If more than one CONFIGURATION UPDATE COMMAND message is sent, the messages need not have the same content.

Upon receipt of the result of the UUAA-MM procedure from the UAS-NF, the AMF shall include:

a) the service-level-AA response with the SLAR field set to:

1) "Service level authentication and authorization was successful" if the AMF detects the UUAA-MM procedure has succeeded; or

2) "Service level authentication and authorization was not successful or service level authorization is revoked" if the AMF detects the UUAA-MM procedure has failed;

b) if the CAA-Level UAV ID is provided by the UAS-NF, the service-level device ID with the value set to the CAA-Level UAV ID; and;

c) if a payload is received from the UAS-NF:

1) the service-level-AA payload with the value set to the payload; and

2) if a payload type associated with the payload is received, the service-level-AA payload type with the values set to the payload type; and

3) if the payload type associated with the payload is for C2 authorization payload, the service-level-AA response with C2AR field set to either "C2 authorization was successful" or "C2 authorization was not successful or C2 authorization is revoked" according to the authorization result received from the UAS-NF;

in the Service-level-AA container IE of the CONFIGURATION UPDATE COMMAND message.

NOTE 5: UAS security information can be included in the UUAA payload by the USS as specified in 3GPP TS 33.256 [24B].

NOTE 5A: The service-level-AA payload associated with the payload type "C2 authorization payload" can include pairing information for the direct C2 communication, or the security information as specified in TS 33.256 [24B], or both.

NOTE 6: If the AMF receives the HTTP code set to "4xx" or "5xx" as specified in 3GPP TS 29.500 [20AA] or the AMF detects that the UUAA-MM failure as specified in 3GPP TS 29.256 [21B], then the AMF considers the UUAA-MM procedure has failed.

If the AMF needs to deliver to the UE the UUAA revocation notification received from the UAS-NF, the AMF shall include the service-level-AA response with SLAR set to "Service level authentication and authorization was not successful or service level authorization is revoked" in the Service-level-AA container IE of the CONFIGURATION UPDATE COMMAND message.

If the UE supports UAS services and UAS services become enabled for the UE (e.g. because of the aerial subscription becomes a part of the UE subscription data retrieved from the UDM), the AMF may include the service-level-AA service status indication with UAS field set to "UAS services enabled" in the Service-level-AA container IE of the CONFIGURATION UPDATE COMMAND message.

If the UE supports MINT, the AMF may include the List of PLMNs to be used in disaster condition IE in the CONFIGURATION UPDATE COMMAND message.

If the UE supports MINT, the AMF may include the Disaster roaming wait range IE in the CONFIGURATION UPDATE COMMAND message.

If the UE supports MINT, the AMF may include the Disaster return wait range IE in the CONFIGURATION UPDATE COMMAND message.

NOTE 7: The AMF can determine the content of the "list of PLMN(s) to be used in disaster condition", the value of the disaster roaming wait range and the value of the disaster return wait range based on the network local configuration.

If the UE supports discontinuous coverage, the AMF may include the Discontinuous coverage maximum time offset IE in the CONFIGURATION UPDATE COMMAND message.

If the UE supports and the network supports and accepts the use of the PEIPS assistance information, and the AMF needs to update the PEIPS assistance information, the AMF may include the PEIPS assistance information in the Updated PEIPS assistance information IE of the CONFIGURATION UPDATE COMMAND message.

If the AMF needs to inform the UE that the use of access identity 1 is valid or is no longer valid, then,

1) if the UE supports MPS indicator update via the UE configuration update procedure, the AMF:

a) informs the UE by setting the MPS indicator bit of the Priority indicator IE to "Access identity 1 valid" or "Access identity 1 not valid" respectively, in the CONFIGURATION UPDATE COMMAND message. Based on operator policy, the AMF sets the MPS indicator bit in the CONFIGURATION UPDATE COMMAND message based on the MPS priority information in the user's subscription context obtained from the UDM; or

b) indicates "registration requested" in the Registration requested bit of the Configuration update indication IE in the CONFIGURATION UPDATE COMMAND message; or

2) if the UE supports MCS indicator update via the UE configuration update procedure, the AMF:

a) informs the UE by setting the MCS indicator bit of the Priority indicator IE to "Access identity 2 valid" or "Access identity 2 not valid" respectively, in the CONFIGURATION UPDATE COMMAND message. Based on operator policy, the AMF sets the MCS indicator bit in the CONFIGURATION UPDATE COMMAND message based on the MCS priority information in the user's subscription context obtained from the UDM; or

b) indicates "registration requested" in the Registration requested bit of the Configuration update indication IE in the CONFIGURATION UPDATE COMMAND message; or

3) otherwise, the AMF shall indicate "registration requested" in the Registration requested bit of the Configuration update indication IE in the CONFIGURATION UPDATE COMMAND message.

If the UE has set the Reconnection to the network due to RAN timing synchronization status change (RANtiming) bit to "Reconnection to the network due to RAN timing synchronization status change supported" in the 5GMM capability IE of the REGISTRATION REQUEST message, the AMF may include the RAN timing synchronization IE with the RecReq bit set to "Reconnection requested" in the CONFIGURATION UPDATE COMMAND message.

When the UE is operating as an MBSR and its status of the MBSR authorization changes to not authorized for MBSR operation based on the UE subscription and local policy and the UE is allowed to operate as a UE, then the AMF shall include the Feature authorization indication IE in the CONFIGURATION UPDATE COMMAND message and shall set the MBSRAI field to "not authorized to operate as MBSR but allowed to operate as a UE", and the AMF can request the SMF to release the PDU session for OAM access (see 3GPP TS 23.501 [8]) provided in the serving PLMN. When the UE that was not allowed for MBSR operation becomes to be allowed for MBSR operation based on the UE subscription and local policy, then the AMF shall include the Feature authorization indication IE in the CONFIGURATION UPDATE COMMAND message and shall set the MBSRAI field to "authorized to operate as MBSR"

If the AMF needs to inform the UE of the operator policy on UE exemption for service area restrictions, and if the UE supports HPAOP, the AMF may do so by setting the High priority access service area restriction exempt bit of the Priority indicator IE in the CONFIGURATION UPDATE COMMAND message.

\*\*\*\*\* Fourth change \*\*\*\*\*

##### 5.4.5.2.5 Abnormal cases on the network side

The following abnormal cases in AMF are identified:

a) If the Payload container type IE is set to "N1 SM information" and:

1) if the Old PDU session ID IE is not included in the UL NAS TRANSPORT message, the AMF does not have a PDU session routing context for the PDU session ID and the UE, the Request type IE is set to "initial request" or "MA PDU request", and the SMF selection fails, then the AMF shall send back to the UE the 5GSM message which was not forwarded as specified in subclause 5.4.5.3.1 case e) or case f);

2) if the Old PDU session ID IE is included in the UL NAS TRANSPORT message, the AMF has a PDU session routing context for the old PDU session ID and the UE and does not have a PDU session routing context for the PDU session ID and the UE, the Request type IE is set to "initial request", the AMF received a reallocation requested indication from the SMF indicating that the SMF is to be reallocated, and the SMF selection fails, then the AMF shall send back to the UE the 5GSM message which was not forwarded as specified in subclause 5.4.5.3.1 case e) or case f);

3) if the AMF does not have a PDU session routing context for the PDU session ID and the UE, the Request type IE is set to "existing PDU session" or "MA PDU request", and the user's subscription context obtained from the UDM does not contain an SMF ID for the PDU session ID matching the PDU session ID received from the UE or for the DNN matching the DNN received from the UE such that the SMF ID includes a PLMN identity corresponding to the UE's HPLMN or the current PLMN or the PLMN ID part of the current SNPN, then the AMF may send back to the UE the 5GSM message which was not forwarded as specified in subclause 5.4.5.3.1 case e) or case f).

4) if the Old PDU session ID IE is included in the UL NAS TRANSPORT message, and the AMF has a PDU session routing context for the old PDU session ID and the UE and does not have a PDU session routing context for the PDU session ID and the UE, the Request type IE is set to "initial request" and the AMF has not received a reallocation requested indication, the AMF should select an SMF with following handlings:

i) if the S-NSSAI IE is not included and the allowed NSSAI contains:

A) one S-NSSAI, the AMF shall use the S-NSSAI in the allowed NSSAI as the S-NSSAI;

B) two or more S-NSSAIs and the user's subscription context obtained from UDM contains only one default S-NSSAI that is included in the allowed NSSAI, the AMF shall use the S-NSSAI in the allowed NSSAI as the S-NSSAI; or

C) two or more S-NSSAIs and the user's subscription context obtained from UDM contains two or more default S-NSSAI(s) included in the allowed NSSAI, the AMF shall use an S-NSSAI in the allowed NSSAI selected based on operator policy as the S-NSSAI;

ii) if the DNN IE is not included, and the user's subscription context obtained from UDM:

A) contains the default DNN for the S-NSSAI, the AMF shall use the default DNN as the DNN; and

B) does not contain the default DNN for the S-NSSAI, the AMF shall use a locally configured DNN as the DNN;

iii) if the DNN selected by the network is a LADN DNN, the AMF shall determine the UE presence in LADN service area (see subclause 6.2.6);

iv) if the SMF selection is successful, the AMF should store a PDU session routing context for the PDU session ID and the UE, set the SMF ID in the stored PDU session routing context to the selected SMF ID, and forward the 5GSM message, the PDU session ID, the old PDU session ID, the S-NSSAI, the mapped S-NSSAI (in roaming scenarios), the DNN determined by the AMF, DNN selected by the network (if different from DNN determined by the AMF), the request type and UE presence in LADN service area (if DNN selected by the network corresponds to an LADN DNN) towards the SMF ID of the PDU session routing context; and

v) if the SMF selection fails, then the AMF shall send back to the UE the 5GSM message which was not forwarded as specified in subclause 5.4.5.3.1 case e) or case f);

5) if the AMF has a PDU session routing context for the PDU session ID and the UE, the PDU session routing context indicates that the PDU session is an emergency PDU session, the Request type IE is set to "initial emergency request", the AMF should forward the 5GSM message, the PDU session ID, the S-NSSAI (if configured in the AMF emergency configuration data), the DNN (if configured in the AMF emergency configuration data) and the request type towards the SMF ID of the PDU session routing context;

6) if the Request type IE is set to "initial emergency request" and the S-NSSAI or the DNN is received, the AMF ignores the received S-NSSAI or the DNN and uses the emergency DNN from the AMF emergency configuration data, if any;

7) if the AMF does not have a PDU session routing context for the PDU session ID and the UE, and the Request type IE of the UL NAS TRANSPORT message is either not provided or is provided but set to other value than "initial request", "existing PDU session", "initial emergency request", "existing emergency PDU session" and "MA PDU request", then the AMF may send back to the UE the 5GSM message which was not forwarded as specified in subclause 5.4.5.3.1 case e) or case f);

8) if the AMF unsuccessfully attempted to forward the 5GSM message, the PDU session ID, the S-NSSAI, the mapped S-NSSAI (in roaming scenarios), the DNN and the request type (if received) towards a SMF ID, then the AMF may send back to the UE the 5GSM message which was not forwarded as specified in subclause 5.4.5.3.1 case e) or case f).

9) if the Old PDU session ID IE is included in the UL NAS TRANSPORT message, the AMF does not have a PDU session routing context for the old PDU session ID and the UE, the AMF does not have a PDU session routing context for the PDU session ID and the UE, the Request type IE is set to "initial request", the AMF should select an SMF with following handlings:

i) if the S-NSSAI IE is not included and the allowed NSSAI contains:

A) one S-NSSAI, the AMF shall use the S-NSSAI in the allowed NSSAI as the S-NSSAI;

B) two or more S-NSSAIs and the user's subscription context obtained from UDM contains only one default S-NSSAI that is included in the allowed NSSAI, the AMF shall use the default S-NSSAI in the allowed NSSAI as the S-NSSAI; or

C) two or more S-NSSAIs and the user's subscription context obtained from UDM contains two or more default S-NSSAI(s) included in the allowed NSSAI, the AMF shall use an S-NSSAI in the allowed NSSAI selected based on operator policy as the S-NSSAI.

ii) if the DNN IE is not included, and the user's subscription context obtained from UDM:

A) contains the default DNN for the S-NSSAI, the AMF shall use the default DNN as the DNN; and

B) does not contain the default DNN for the S-NSSAI, the AMF shall use a locally configured DNN as the DNN;

iii) if the DNN selected by the network is a LADN DNN, the AMF shall determine the UE presence in LADN service area (see subclause 6.2.6);

iv) if the SMF selection is successful, the AMF should store a PDU session routing context for the PDU session ID and the UE, set the SMF ID in the stored PDU session routing context to the selected SMF ID, and forward the 5GSM message, the PDU session ID, the old PDU session ID, the S-NSSAI, the mapped S-NSSAI (in roaming scenarios), the DNN determined by the AMF, DNN selected by the network (if different from DNN determined by the AMF), the request type and UE presence in LADN service area (if DNN selected by the network corresponds to an LADN DNN) towards the SMF ID of the PDU session routing context; and

v) if the SMF selection fails, then the AMF shall send back to the UE the 5GSM message which was not forwarded as specified in subclause 5.4.5.3.1 case e) or case f);

10) if the AMF has a PDU session routing context for the PDU session ID and the UE, the PDU session routing context indicates that the PDU session is not an emergency PDU session, and the Request type IE is included and is set to "existing emergency PDU session", the AMF may send back to the UE the 5GSM message which was not forwarded as specified in subclause 5.4.5.3.1 case e) or case f);

11) if the AMF has a PDU session routing context for the PDU session ID and the UE, the PDU session routing context indicates that the PDU session is an emergency PDU session, and the Request type IE is included and is set to "existing PDU session", the AMF may forward the 5GSM message, the PDU session ID, the S-NSSAI (if configured in the AMF emergency configuration data), the DNN (if configured in the AMF emergency configuration data), and the request type towards the SMF identified by the SMF ID of the PDU session routing context;

12) if the AMF has a PDU session routing context for the PDU session ID and the UE, the Request type IE is set to "initial request", then the AMF shall perform a local release of the PDU session identified by the PDU session ID and shall request the SMF to perform a local release of the PDU session, and proceed as specified in subclause 5.4.5.2.3;

13) if the Request type IE is set to "initial request" or "modification request", and the S-NSSAI IE contains an S-NSSAI that is not allowed by the network, then the AMF shall send back to the UE the 5GSM message which was not forwarded as specified in subclause 5.4.5.3.1 case e), case f) or h4);

14) if the Request type IE is set to "existing PDU session", the AMF has a PDU session routing context for the PDU session ID and the UE, the PDU session routing context indicates that the PDU session is not an emergency PDU session, and the S-NSSAI associated with the PDU session identified by the PDU session ID is not allowed for the target access type, the AMF shall send back to the UE the 5GSM message which was not forwarded as specified in subclause 5.4.5.3.1 case e), case f) or h4);

15) if the Request type IE is set to "initial request", "existing PDU session", "modification request" or "MA PDU request":

i) the UE is not configured for high priority access in selected PLMN or SNPN; or

ii) the UE is configured for high priority access in selected PLMN or SNPN and service area restrictions are applicable for high priority access based on operator policy;

and the UE is in a non-allowed area or is not in an allowed area, the AMF shall send back to the UE the 5GSM message which was not forwarded, and 5GMM cause #28 "Restricted service area" as specified in subclause 5.4.5.3.1 case i);

15a) if the Request type IE is set to "initial request" or "initial emergency request" and the AMF determines that the UE has registered to a PLMN via a satellite NG-RAN cell that is not allowed to operate at the present UE location, then the AMF may send back to the UE the 5GSM message which was not forwarded as specified in subclause 5.4.5.3.1 case i1); and

16) if the Request type IE is set to "initial request" or "MA PDU request", the AMF is pending the receipt of a REGISTRATION REQUEST message indicating "mobility registration updating" in the 5GS registration type IE, and an emergency PDU session exists for the UE (see subclause 5.4.4.3), the AMF shall send back to the UE the 5GSM message which was not forwarded as specified in subclause 5.4.5.3.1 case e) or case f);

17) if the timer T3447 is running and the UE supports service gap control and:

i) the Request type IE:

A) is set to "initial request";

B) is set to "existing PDU session"; or

C is set to "modification request" and the PDU session being modified is a non-emergency PDU session;

ii) the UE is not configured for high priority access in selected PLMN;

iii) the current NAS signalling connection was not triggered by paging; and

iv) mobile terminated signalling has not been sent or no user-plane resources have been established for any PDU session after the establishment of the current NAS signalling connection,

then the AMF shall send back to the UE the 5GSM message which was not forwarded as specified in subclause 5.4.5.3.1 case e) or case f);

18) if the AMF has a PDU session routing context for the PDU session ID and the UE, the Request type IE is not included, the UE is not configured for high priority access in selected PLMN or SNPN, and the PDU session is not an emergency PDU session, then the AMF shall forward the 5GSM message, and the PDU session ID IE towards the SMF identified by the SMF ID of the PDU session routing context with:

i) an exemptionInd attribute indicating "message was exempted from the DNN based congestion activated in the AMF" as specified in 3GPP TS 29.502 [20A], if DNN based congestion control is activated for the selected DNN;

ii) an exemptionInd attribute indicating "message was exempted from the S-NSSAI and DNN based congestion activated in the AMF" as specified in 3GPP TS 29.502 [20A], if S-NSSAI and DNN based congestion control is activated for the selected S-NSSAI and the selected DNN; or

iii) an exemptionInd attribute indicating "message was exempted from the S-NSSAI only based congestion activated in the AMF" as specified in 3GPP TS 29.502 [20A], if S-NSSAI only based congestion control is activated for the selected S-NSSAI;

19) if the Request type IE is set to "MA PDU request" and the S-NSSAI IE contains an S-NSSAI that is not allowed by the network on neither access, then the AMF shall send to the UE the 5GSM message which was not forwarded as specified in subclause 5.4.5.3.1 case e) or case f);

20) if the Request type IE is set to "initial request" and the UE is registered for emergency services over the current access, then the AMF may send back to the UE the 5GSM message which was not forwarded as specified in subclause 5.4.5.3.1 case e) or case f); and

21) if the Request type IE is set to "existing PDU session", the UE is attempting to transfer a PDU session from 3GPP access to non-3GPP access, and the PDU session is associated with control plane only indication then the AMF shall send back to the UE the 5GSM message which was not forwarded as specified in subclause 5.4.5.3.1 case e).

22) if the Request type IE is set to "MA PDU request" and the UE requested DNN corresponds to an LADN DNN, the AMF shall send back to the UE the 5GSM message which was not forwarded and 5GMM cause #90 "payload was not forwarded" as specified in subclause 5.4.5.3.1 case hx).

23) if the Request type IE is set to "initial request", the UE requested DNN corresponds to an LADN DNN, and the MA PDU session information IE is included, the AMF shall not forward the MA PDU session information towards the SMF.

24) if the Request type IE is set to "modification request", the DNN associated with the PDU session corresponds to an LADN DNN, and MA PDU session information IE is included, the AMF shall not forward the MA PDU session information towards the SMF.

b) If the Payload container type IE is set to "SMS" and:

1) the AMF does not have an SMSF address associated with the UE;

2) the AMF cannot forward the content of the Payload container IE to the SMSF associated with the SMSF address available in the AMF; or

3) the AMF determines that the UE has registered to a PLMN via a satellite NG-RAN cell that is not allowed to operate at the present UE location;

then the AMF shall abort the procedure.

c) If the Payload container type IE is set to "LTE Positioning Protocol (LPP) message container" or "SLPP message container" and:

1) if the Additional information IE is not included in the UL NAS TRANSPORT message;

2) the AMF cannot forward the content of the Payload container IE to the LMF associated with the routing information included in the Additional information IE; or

3) the AMF determines that the UE has registered to a PLMN via a satellite NG-RAN cell that is not allowed to operate at the present UE location;

then the AMF shall abort the procedure.

d) If the Payload container type IE is set to "UE policy container" and:

1) the AMF does not have a PCF address associated with the UE;

2) the AMF cannot forward the content of the Payload container IE to the PCF associated with the PCF address available in the AMF; or

3) the AMF determines that the UE has registered to a PLMN via a satellite NG-RAN cell that is not allowed to operate at the present UE location;

then the AMF shall abort the procedure.

e) If the Payload container type IE is set to "Location services message container" and:

1) if the Additional information IE is included in the UL NAS TRANSPORT message and the AMF cannot forward the content of the Payload container IE to an LMF associated with the routing information included in the Additional information IE;

2) the AMF determines that the UE has registered to a PLMN via a satellite NG-RAN cell that is not allowed to operate at the present UE location;

3) the AMF determines that the payload container content is related to PRU and the UE has not a valid PRU subscription information; or

4) any combination of bullets 1 to 3,

then the AMF shall abort the procedure.

f) If the Payload container type IE is set to "SMS" or "LTE Positioning Protocol (LPP) message container" or "SLPP message container":

1) the timer T3447 is running and the UE supports service gap control;

2) the UE is not configured for high priority access in selected PLMN;

3) the current NAS signalling connection was not triggered by paging; and

4) mobile terminated signalling has not been sent or no user-plane resources have been established for any PDU session after the establishment of the current NAS signalling connection,

the AMF shall abort the procedure.

NOTE: In this state the N1 NAS signalling connection can be released by the network.

g) If the Payload container type IE is set to "CIoT user data container" and:

1) if the AMF does not have a PDU session routing context for the PDU session ID and the UE; or

2) if the AMF unsuccessfully attempted to forward the user data container and the PDU session ID,

then the AMF may send back to the UE the CIoT user data container which was not forwarded as specified in subclause 5.4.5.3.1 case l1).

h) If the Payload container type IE is set to "CIoT user data container":

1) if the timer T3447 is running and the UE supports service gap control;

2) the UE is not configured for high priority access in selected PLMN;

3) the current N1 NAS signalling connection was not triggered by paging; and

4) mobile terminated signalling has not been sent or no user-plane resources have been established for any PDU session after the establishment of the current NAS signalling connection,

then the AMF shall send back to the UE the CIoT user data container which was not forwarded as specified in subclause 5.4.5.3.1 case l1).

i) If the Payload container type IE is set to "SOR transparent container", "UE parameters update transparent container", or "Service-level-AA container", and the AMF determines that the UE has registered to a PLMN via a satellite NG-RAN cell that is not allowed to operate at the present UE location, then the AMF shall abort the procedure.

j) If the Payload container type IE is set to "UPP-CMI container" and:

1) if the Additional information IE is not included in the UL NAS TRANSPORT message;

2) the AMF cannot forward the content of the Payload container IE to the LMF associated with the routing information included in the Additional information IE; or

3) the AMF determines that the UE has registered to a PLMN via a satellite NG-RAN cell that is not allowed to operate at the present UE location;

then the AMF shall abort the procedure.

\*\*\*\*\* Fifth change \*\*\*\*\*

##### 5.5.1.2.2 Initial registration initiation

The UE in state 5GMM-DEREGISTERED shall initiate the registration procedure for initial registration by sending a REGISTRATION REQUEST message to the AMF,

a) when the UE performs initial registration for 5GS services;

b) when the UE performs initial registration for emergency services;

c) when the UE performs initial registration for SMS over NAS;

d) when the UE moves from GERAN to NG-RAN coverage or the UE moves from a UTRAN to NG-RAN coverage and the following applies:

1) the UE initiated a GPRS attach or routing area updating procedure while in A/Gb mode or Iu mode; or

2) the UE has performed 5G-SRVCC from NG-RAN to UTRAN as specified in 3GPP TS 23.216 [6A],

and since then the UE did not perform a successful EPS attach or tracking area updating procedure in S1 mode or registration procedure in N1 mode;

e) when the UE performs initial registration for onboarding services in SNPN;

f) when the UE performs initial registration for disaster roaming services; and

g) when the UE performs initial registration to come out of unavailability period and resume normal services;

with the following clarifications to initial registration for emergency services:

a) the UE shall not initiate an initial registration for emergency services over the current access, if the UE is already registered for emergency services over the non-current access, unless the initial registration has to be initiated to perform handover of an existing emergency PDU session from the non-current access to the current access; and

NOTE 1: Transfer of an existing emergency PDU session between 3GPP access and non-3GPP access is needed e.g. if the UE determines that the current access is no longer available.

b) the UE can only initiate an initial registration for emergency services over non-3GPP access if it cannot register for emergency services over 3GPP access.

The UE initiates the registration procedure for initial registration by sending a REGISTRATION REQUEST message to the AMF, starting timer T3510. If timer T3502 is currently running, the UE shall stop timer T3502. If timer T3511 is currently running, the UE shall stop timer T3511.

During initial registration the UE handles the 5GS mobile identity IE in the following order:

a) if:

1) the UE:

i) was previously registered in S1 mode before entering state EMM-DEREGISTERED; and

ii) has received an "interworking without N26 interface not supported" indication from the network; and

2) EPS security context and a valid native 4G-GUTI are available;

then the UE shall create a 5G-GUTI mapped from the valid native 4G-GUTI as specified in 3GPP TS 23.003 [4] and indicate the mapped 5G-GUTI in the 5GS mobile identity IE. The UE shall include the UE status IE with the EMM registration status set to "UE is not in EMM-REGISTERED state" and shall include an ATTACH REQUEST message as specified in 3GPP TS 24.301 [15] in the EPS NAS message container IE.

Additionally, if the UE holds a valid 5G‑GUTI, the UE shall include the 5G-GUTI in the Additional GUTI IE in the REGISTRATION REQUEST message in the following order:

1) a valid 5G-GUTI that was previously assigned by the same PLMN with which the UE is performing the registration, if available;

2) a valid 5G-GUTI that was previously assigned by an equivalent PLMN, if available; and

3) a valid 5G-GUTI that was previously assigned by any other PLMN, if available;

b) if:

1) the UE is registering with a PLMN and the UE holds a valid 5G-GUTI that was previously assigned, over 3GPP access or non-3GPP access, by the same PLMN with which the UE is performing the registration, the UE shall indicate the 5G-GUTI in the 5GS mobile identity IE; or

2) the UE is registering with a SNPN, the UE holds a valid 5G-GUTI that was previously assigned, over 3GPP access or non-3GPP access, by the same SNPN with which the UE is performing the registration, and the UE is not initiating the initial registration for onboarding services in SNPN, the UE shall indicate the 5G-GUTI in the 5GS mobile identity IE;

c) if:

1) the UE is registering with a PLMN and the UE holds a valid 5G-GUTI that was previously assigned, over 3GPP access or non-3GPP access, by an equivalent PLMN, the UE shall indicate the 5G-GUTI in the 5GS mobile identity IE; or

2) the UE is registering with an SNPN, the UE holds a valid 5G-GUTI that was previously assigned, over 3GPP access or non-3GPP access, by an equivalent SNPN identified by a globally unique SNPN identity, and the UE is not initiating the initial registration for onboarding services in SNPN, the UE shall indicate the 5G-GUTI in the 5GS mobile identity IE and shall additionally include the NID of the equivalent SNPN in the NID IE;

d) if:

1) the UE is registering with a PLMN and the UE holds a valid 5G-GUTI that was previously assigned, over 3GPP access or non-3GPP access, by any other PLMN, the UE shall indicate the 5G-GUTI in the 5GS mobile identity IE; or

2) the UE is registering with an SNPN, the UE holds a valid 5G-GUTI that was previously assigned, over 3GPP access or non-3GPP access, by any other SNPN identified by a globally unique SNPN identity, and the UE is not initiating the initial registration for onboarding services in SNPN, the UE shall indicate the 5G-GUTI in the 5GS mobile identity IE and shall additionally include the NID of the other SNPN in the NID IE;

e) if a SUCI other than an onboarding SUCI is available, and the UE is not initiating the initial registration for onboarding services in SNPN, the UE shall include the SUCI other than an onboarding SUCI in the 5GS mobile identity IE;

f) if the UE does not hold a valid 5G-GUTI or SUCI other than an onboarding SUCI, and is initiating the initial registration for emergency services, the PEI shall be included in the 5GS mobile identity IE; and

g) if the UE is initiating the initial registration for onboarding services in SNPN, an onboarding SUCI shall be included in the 5GS mobile identity IE.

NOTE 2: The AMF in ON-SNPN uses the onboarding SUCI as specified in 3GPP TS 23.501 [8].

If the SUCI is included in the 5GS mobile identity IE and the timer T3519 is not running, the UE shall start timer T3519 and store the value of the SUCI sent in the REGISTRATION REQUEST message. The UE shall include the stored SUCI in the REGISTRATION REQUEST message while timer T3519 is running.

If the UE is operating in the dual-registration mode and it is in EMM state EMM-REGISTERED, the UE shall include the UE status IE with the EMM registration status set to "UE is in EMM-REGISTERED state".

NOTE 3: Inclusion of the UE status IE with this setting corresponds to the indication that the UE is "moving from EPC" as specified in 3GPP TS 23.502 [9].

NOTE 4: The value of the 5GMM registration status included by the UE in the UE status IE is not used by the AMF.

If the last visited registered TAI is available, the UE shall include the last visited registered TAI in the REGISTRATION REQUEST message.

NOTE 5: The AMF can use the last visited registered TAI included in the REGISTRATION REQUEST message, if available, in the procedure of slice-based N3IWF selection as specified in 3GPP TS 23.502 [9] when the registration procedure is performed over non-3gpp access.

If the UE requests the use of SMS over NAS, the UE shall include the 5GS update type IE in the REGISTRATION REQUEST message with the SMS requested bit set to "SMS over NAS supported". When the 5GS update type IE is included in the REGISTRATION REQUEST for reasons other than requesting the use of SMS over NAS, and the UE does not need to register for SMS over NAS, the UE shall set the SMS requested bit of the 5GS update type IE to "SMS over NAS not supported" in the REGISTRATION REQUEST message.

If the UE supports MICO mode and requests the use of MICO mode, then the UE shall include the MICO indication IE in the REGISTRATION REQUEST message. If the UE requests to use an active time value, it shall include the active time value in the T3324 IE in the REGISTRATION REQUEST message. If the UE includes the T3324 IE, it may also request a particular T3512 value by including the Requested T3512 IE in the REGISTRATION REQUEST message. Additionally, if the UE supports strictly periodic registration timer, the UE shall set the Strictly Periodic Registration Timer Indication bit of the MICO indication IE in the REGISTRATION REQUEST message to "strictly periodic registration timer supported".

If the UE needs to use the UE specific DRX parameters, the UE shall include the Requested DRX parameters IE in the REGISTRATION REQUEST message.

If the UE is in NB-N1 mode and if the UE needs to use the UE specific DRX parameters for NB-N1 mode, the UE shall include the Requested NB-N1 mode DRX parameters IE in the REGISTRATION REQUEST message.

If the UE supports eDRX and requests the use of eDRX, the UE shall include the Requested extended DRX parameters IE in the REGISTRATION REQUEST message.

If the UE needs to request LADN information for specific LADN DNN(s) or indicates a request for LADN information as specified in 3GPP TS 23.501 [8], the UE shall include the LADN indication IE in the REGISTRATION REQUEST message and:

- request specific LADN DNNs by including a LADN DNN value in the LADN indication IE for each LADN DNN for which the UE requests LADN information; or

- to indicate a request for LADN information by not including any LADN DNN value in the LADN indication IE.

The UE shall include the requested NSSAI containing the S-NSSAI(s) corresponding to the slice(s) to which the UE intends to register with and shall include the mapped S-NSSAI(s) for the requested NSSAI, if available, in the REGISTRATION REQUEST message. If the UE has allowed NSSAI or configured NSSAI or both for the current PLMN or SNPN, the requested NSSAI shall be either:

a) the configured NSSAI for the current PLMN or SNPN, or a subset thereof as described below;

b) the allowed NSSAI for the current PLMN or SNPN, or a subset thereof as described below; or

c) the allowed NSSAI for the current PLMN or SNPN, or a subset thereof as described below, plus the configured NSSAI for the current PLMN or SNPN, or a subset thereof as described below.

If both the S-NSSAI to be replaced and the alternative S-NSSAI are included in the configured NSSAI, and the UE needs to request the S-NSSAI to be replaced, the UE shall include the S-NSSAI to be replaced in the requested NSSAI.

If the UE supports the S-NSSAI time validity information, S-NSSAI time validity information is available for an S-NSSAI, and the S-NSSAI time validity information indicates that the S-NSSAI is not available, the UE shall not include the S-NSSAI in the Requested NSSAI IE of the REGISTRATION REQUEST message. If the UE has S-NSSAI time validity information over the other access in the same PLMN and the S-NSSAI time validity information indicates that the S-NSSAI is not available, the UE shall not include the S-NSSAI in the Requested NSSAI IE of the REGISTRATION REQUEST message for the current access type.

If the UE has neither allowed NSSAI for the current PLMN or SNPN nor configured NSSAI for the current PLMN or SNPN and has a default configured NSSAI, the UE shall:

a) include the S-NSSAI(s) in the Requested NSSAI IE of the REGISTRATION REQUEST message using the default configured NSSAI; and

b) include the Network slicing indication IE with the Default configured NSSAI indication bit set to "Requested NSSAI created from default configured NSSAI" in the REGISTRATION REQUEST message.

If the UE has no allowed NSSAI for the current PLMN or SNPN, no configured NSSAI for the current PLMN or SNPN, and no default configured NSSAI, the UE shall not include a requested NSSAI in the REGISTRATION REQUEST message.

If all the S-NSSAI(s) corresponding to the slice(s) to which the UE intends to register are included in the pending NSSAI, the UE shall not include a requested NSSAI in the REGISTRATION REQUEST message.

The subset of configured NSSAI provided in the requested NSSAI consists of one or more S-NSSAIs in the configured NSSAI applicable to the current PLMN or SNPN, where any included S-NSSAI is:

a) neither in the rejected NSSAI nor associated to an S-NSSAI in the rejected NSSAI. If the UE is inside the NS-AoS of an S-NSSAI in the rejected NSSAI with a rejection cause value set to "S-NSSAI not available in the current registration area", the S-NSSAI may be included in the requested NSSAI; or

b) in the partially rejected NSSAI and the current TAI is not in the list of TAs for which the S-NSSAI is rejected. If the UE is inside the NS-AoS of an S-NSSAI in the partially rejected NSSAI and the current TAI is in the list of TAs for which the S-NSSAI is rejected, the S-NSSAI may be included in the requested NSSAI.

In addition, if the NSSRG information is available, the subset of configured NSSAI provided in the requested NSSAI shall be associated with at least one common NSSRG value. The UE may also include in the requested NSSAI, the S-NSSAI(s) which were added to configured NSSAI in S1 mode and for which the associated NSSRG information is not available. If the UE is in 5GMM-REGISTERED state over the other access and has already an allowed NSSAI for the other access in the same PLMN or in different PLMNs, all the S-NSSAI(s) in the requested NSSAI for the current access shall share at least an NSSRG value common to all the S-NSSAI(s) of the allowed NSSAI for the other access. If the UE is simultaneously performing the registration procedure on the other access in different PLMNs, the UE shall include S-NSSAIs that share at least a common NSSRG value across all access types. If the UE has pending NSSAI which the UE is still interested in using, then S-NSSAIs in the pending NSSAI and requested NSSAI shall be associated with at least one common NSSRG value.

NOTE 6: If the UE has stored mapped S-NSSAI(s) for the rejected NSSAI, and one or more S-NSSAIs in the stored mapped S-NSSAI(s) for the configured NSSAI are not included in the stored mapped S-NSSAI(s) for the rejected NSSAI, then a S-NSSAI in the configured NSSAI associated to one or more of these mapped S-NSSAI(s) for the configured NSSAI are available to be included in the requested NSSAI together with their mapped S-NSSAI.

NOTE 7: If one or more mapped S-NSSAIs in the stored mapped S-NSSAI(s) for the configured NSSAI are not included in the stored rejected NSSAI for the failed or revoked NSSAA, a S-NSSAI in the configured NSSAI associated to one or more of these mapped S-NSSAI(s) for the configured NSSAI are available to be included in the registration request together with their mapped S-NSSAI.

NOTE 8: There is no need to consider the case that the UE is simultaneously performing the registration procedure on the other access in the same PLMN, due to that the UE is not allowed to initiate the registration procedure over one access when the registration over the other access to the same PLMN is going on.

The subset of allowed NSSAI provided in the requested NSSAI consists of one or more S-NSSAIs in the allowed NSSAI for the current PLMN.

NOTE 9: How the UE selects the subset of configured NSSAI or allowed NSSAI to be provided in the requested NSSAI is implementation specific. The UE can take preferences indicated by the upper layers (e.g. policies like URSP, applications) and UE local configuration into account.

NOTE 10: The number of S-NSSAI(s) included in the requested NSSAI cannot exceed eight.

If the UE initiates an initial registration for onboarding services in SNPN, the UE shall not include the Requested NSSAI IE in the REGISTRATION REQUEST message.

If the UE supports NSAG, the UE shall set the NSAG bit to "NSAG supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports sending of REGISTRATION COMPLETE message for acknowledging the reception of NSAG information IE in the REGISTRATION ACCEPT message, the UE shall set the RCMAN bit to "Sending of REGISTRATION COMPLETE message for NSAG information supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE initiates an initial registration for emergency services or needs to prolong the established NAS signalling connection after the completion of the initial registration procedure (e.g. due to uplink signalling pending), the UE shall set the Follow-on request indicator to "Follow-on request pending".

NOTE 11: The UE does not have to set the Follow-on request indicator to 1, even if the UE has to request resources for V2X communication over PC5 reference point, 5G ProSe direct discovery over PC5, 5G ProSe direct communication over PC5 or A2X communication over PC5 reference point.

If the UE supports S1 mode and the UE has not disabled its E-UTRA capability and the 5GS registration type IE in the REGISTRATION REQUEST message is not set to "disaster roaming initial registration", the UE shall:

- set the S1 mode bit to "S1 mode supported" in the 5GMM capability IE of the REGISTRATION REQUEST message;

- include the S1 UE network capability IE in the REGISTRATION REQUEST message; additionally, if the UE supports EPS-UPIP, the UE shall set the EPS-UPIP bit to "EPS-UPIP supported" in the S1 UE network capability IE in the REGISTRATION REQUEST message; and

- if the UE supports sending an ATTACH REQUEST message containing a PDN CONNECTIVITY REQUEST message with request type set to "handover" to transfer a PDU session from N1 mode to S1 mode, set the HO attach bit to "attach request message containing PDN connectivity request with request type set to handover to transfer PDU session from N1 mode to S1 mode supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the LTE positioning protocol (LPP) in N1 mode as specified in 3GPP TS 37.355 [26], the UE shall set the LPP bit to "LPP in N1 mode supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the Location Services (LCS) notification mechanisms in N1 mode as specified in 3GPP TS 23.273 [6B], the UE shall set the 5G-LCS bit to "LCS notification mechanisms supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the user plane positioning using LCS-UPP as specified in 3GPP TS 23.273 [6B], the UE shall set the LCS-UPP bit to "LCS-UPP user plane positioning supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the user plane positioning using SUPL as described in 3GPP TS 38.305 [67] and 3GPP TS 23.271 [68], the UE shall set the SUPL bit to "SUPL user plane positioning supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports network verified UE location over satellite NG-RAN as specified in 3GPP TS 23.501 [8], the UE shall set the NVL-SATNR bit to "Network verified UE location over satellite NG-RAN supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE is in NB-N1 mode, then the UE shall set the Control plane CIoT 5GS optimization bit to "Control plane CIoT 5GS optimization supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE is capable of NB-S1 mode, then the UE shall set the Control plane CIoT EPS optimization bit to "Control plane CIoT EPS optimization supported" in the S1 UE network capability IE of the REGISTRATION REQUEST message.

If the UE supports N3 data transfer and multiple user-plane resources in NB-N1 mode (see 3GPP TS 36.306 [25D], 3GPP TS 36.331 [25A]), then the UE shall set the Multiple user-plane resources support bit to "Multiple user-plane resources supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports 5G-SRVCC from NG-RAN to UTRAN as specified in 3GPP TS 23.216 [6A], the UE shall:

- set the 5G-SRVCC from NG-RAN to UTRAN capability bit to "5G-SRVCC from NG-RAN to UTRAN supported" in the 5GMM capability IE of the REGISTRATION REQUEST message; and

- include the Mobile station classmark 2 IE and the Supported codecs IE in the REGISTRATION REQUEST message.

If the UE supports service gap control, then the UE shall set the SGC bit to "service gap control supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the restriction on use of enhanced coverage, the UE shall set the RestrictEC bit to "Restriction on use of enhanced coverage supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports network slice-specific authentication and authorization, the UE shall set the NSSAA bit to "network slice-specific authentication and authorization supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports CAG feature, the UE shall set the CAG bit to "CAG Supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports extended CAG information list, the UE shall set the Ex-CAG bit to "Extended CAG information list supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports enhanced CAG information, the UE shall set the ECI bit to "enhanced CAG information supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports network slice replacement, the UE shall set the NSR bit to "network slice replacement supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports sending of REGISTRATION COMPLETE message for acknowledging the reception of Negotiated PEIPS assistance information IE in the REGISTRATION ACCEPT message, the UE shall set the RCMP bit to "Sending of REGISTRATION COMPLETE message for negotiated PEIPS assistance information supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

When the UE is not in NB-N1 mode, if the UE supports RACS, the UE shall:

a) set the RACS bit to "RACS supported" in the 5GMM capability IE of the REGISTRATION REQUEST message;

b) if the UE has an applicable network-assigned UE radio capability ID for the current UE radio configuration in the selected PLMN or SNPN, include the applicable network-assigned UE radio capability ID in the UE radio capability ID IE of the REGISTRATION REQUEST message; and

c) if the UE:

1) does not have an applicable network-assigned UE radio capability ID for the current UE radio configuration in the selected PLMN or SNPN; and

2) has an applicable manufacturer-assigned UE radio capability ID for the current UE radio configuration,

include the applicable manufacturer-assigned UE radio capability ID in the UE radio capability ID IE of the REGISTRATION REQUEST message.

If the UE has one or more stored UE policy sections:

- identified by a UPSI with the PLMN ID part indicating the HPLMN or the selected PLMN; or

- identified by a UPSI with the PLMN ID part indicating the PLMN ID part of the SNPN identity of the selected SNPN and associated with the NID of the selected SNPN;

then the UE shall set the Payload container type IE to "UE policy container" and include the UE STATE INDICATION message (see annex D) in the Payload container IE of the REGISTRATION REQUEST message.

If the UE does not have any stored UE policy section:

- identified by a UPSI with the PLMN ID part indicating the HPLMN or the selected PLMN; or

- identified by a UPSI with the PLMN ID part indicating the PLMN ID part of the SNPN identity of the selected SNPN and associated with the NID of the selected SNPN;

and the UE needs to send a UE policy container to the network, then the UE shall set the Payload container type IE to "UE policy container" and include the UE STATE INDICATION message (see annex D) in the Payload container IE of the REGISTRATION REQUEST message.

NOTE 12: In this version of the protocol, the UE can only include the Payload container IE in the REGISTRATION REQUEST message to carry a payload of type "UE policy container".

If the UE does not have a valid 5G NAS security context, the UE shall send the REGISTRATION REQUEST message without including the NAS message container IE. The UE shall include the entire REGISTRATION REQUEST message (i.e. containing cleartext IEs and non-cleartext IEs, if any) in the NAS message container IE that is sent as part of the SECURITY MODE COMPLETE message as described in subclauses 4.4.6 and 5.4.2.3.

If the UE has a valid 5G NAS security context and the UE needs to send non-cleartext IEs, the UE shall send a REGISTRATION REQUEST message including the NAS message container IE as described in subclause 4.4.6. If the UE does not need to send non-cleartext IEs, the UE shall send a REGISTRATION REQUEST message without including the NAS message container IE.

If the UE supports ciphered broadcast assistance data and needs to obtain new ciphering keys, the UE shall include the Additional information requested IE with the CipherKey bit set to "ciphering keys for ciphered broadcast assistance data requested" in the REGISTRATION REQUEST message.

The UE shall set the WUSA bit to "WUS assistance information reception supported" in the 5GMM capability IE if the UE supports WUS assistance information. The UE may include its UE paging probability information in the Requested WUS assistance information IE if the UE has set the WUSA bit to "WUS assistance information reception supported" in the 5GMM capability IE and the UE is not performing the initial registration for emergency services.

The UE shall set the NR-PSSI bit to "NR paging subgrouping supported" in the 5GMM capability IE if the UE supports PEIPS assistance information and the 5GS registration type IE in the REGISTRATION REQUEST message is not set to "emergency registration". The UE may include its UE paging probability information in the Requested PEIPS assistance information IE if the UE has set the NR-PSSI bit to "NR paging subgrouping supported" in the 5GMM capability IE.

If the REGISTRATION REQUEST message includes a NAS message container IE, the AMF shall process the REGISTRATION REQUEST message that is obtained from the NAS message container IE as described in subclause 4.4.6.

If the UE supports V2X as specified in 3GPP TS 24.587 [19B], the UE shall set the V2X bit to "V2X supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports V2X communication over E-UTRA-PC5 as specified in 3GPP TS 24.587 [19B], the UE shall set the V2XCEPC5 bit to "V2X communication over E-UTRA-PC5 supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports V2X communication over NR-PC5 as specified in 3GPP TS 24.587 [19B], the UE shall set the V2XCNPC5 bit to "V2X communication over NR-PC5 supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

The UE shall set the ER-NSSAI bit to "Extended rejected NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the NSSRG, then the UE shall set the NSSRG bit to "NSSRG supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the W-AGF acting on behalf of an N5GC device initiates an initial registration as specified in 3GPP TS 23.316 [6D], the W-AGF acting on behalf of the N5GC device shall include the N5GC indication IE with the N5GC device indication bit set to "N5GC device registration is requested" in the REGISTRATION REQUEST message.

If the 5G-RG acting on behalf of an AUN3 device initiates an initial registration as specified in 3GPP TS 23.316 [6D], the 5G-RG acting on behalf of an AUN3 device shall include the AUN3 indication IE with the AUN3 device indication bit set to "AUN3 device registration is requested" in the REGISTRATION REQUEST message.

If the UE supports UAS services, the UE shall set the UAS bit to "UAS services supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports A2X over E-UTRA-PC5 as specified in 3GPP TS 24.577 [60], the UE shall set the A2XEPC5 bit to "A2X over E-UTRA-PC5 supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports A2X over NR-PC5 as specified in 3GPP TS 24.577 [60], the UE shall set the A2XNPC5 bit to "A2X over NR-PC5 supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports A2X over Uu as specified in 3GPP TS 24.577 [60], the UE shall set the A2X-Uu bit to "A2X over Uu supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

When the UE supporting UAS services initiates an initial registration for UAS services, the UE shall include the service-level device ID in the Service-level-AA container IE of the REGISTRATION REQUEST message and set the value to the CAA-level UAV ID. The UE shall include the service-level-AA server address in the Service-level-AA container IE of the REGISTRATION REQUEST message and set the value to the USS address, if it is provided by the upper layers. The UE shall include the service-level-AA payload in the Service-level-AA container IE of the REGISTRATION REQUEST message and shall set the service-level-AA payload type, if the service-level-AA payload is provided by upper layers.

NOTE 13: The service-level-AA payload can be of type "C2 authorization payload". The C2 authorization payload can include one or both of an indication of the request for direct C2 communication and pairing information for direct C2 communication.

If the UE supports 5G ProSe direct discovery as specified in 3GPP TS 24.554 [19E], the UE shall set the 5G ProSe-dd bit to "5G ProSe direct discovery supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports 5G ProSe direct communication as specified in 3GPP TS 24.554 [19E], the UE shall set the 5G ProSe-dc bit to "5G ProSe direct communication supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports acting as 5G ProSe layer-2 UE-to-network relay UE as specified in 3GPP TS 24.554 [19E], the UE shall set the 5G ProSe-l2relay bit to "Acting as a 5G ProSe layer-2 UE-to-network relay UE supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports acting as 5G ProSe layer-3 UE-to-network relay UE as specified in 3GPP TS 24.554 [19E], the UE shall set the 5G ProSe-l3relay bit to "Acting as a 5G ProSe layer-3 UE-to-network relay UE supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports acting as 5G ProSe layer-2 UE-to-network remote UE as specified in 3GPP TS 24.554 [19E], the UE shall set the 5G ProSe-l2rmt bit to "Acting as a 5G ProSe layer-2 UE-to-network remote UE supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports acting as 5G ProSe layer-3 UE-to-network remote UE as specified in 3GPP TS 24.554 [19E], the UE shall set the 5G ProSe-l3rmt bit to "Acting as a 5G ProSe layer-3 UE-to-network remote UE supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports acting as 5G ProSe layer-2 UE-to-UE relay UE as specified in 3GPP TS 24.554 [19E], the UE shall set the 5G ProSe-l2U2U relay bit to "Acting as a 5G ProSe layer-2 UE-to-UE relay UE supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports acting as 5G ProSe layer-3 UE-to-UE relay UE as specified in 3GPP TS 24.554 [19E], the UE shall set the 5G ProSe-l3U2U relay bit to "Acting as a 5G ProSe layer-3 UE-to-UE relay UE supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports acting as 5G ProSe layer-2 end UE as specified in 3GPP TS 24.554 [19E], the UE shall set the 5G ProSe-l2end bit to "Acting as a 5G ProSe layer-2 end UE supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports acting as 5G ProSe layer-3 end UE as specified in 3GPP TS 24.554 [19E], the UE shall set the 5G ProSe-l3end bit to "Acting as a 5G ProSe layer-3 end UE supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the MUSIM UE supports the N1 NAS signalling connection release, then the UE shall set the N1 NAS signalling connection release bit to "N1 NAS signalling connection release supported" in the 5GMM capability IE of the REGISTRATION REQUEST message otherwise the UE shall not set the N1 NAS signalling connection release bit to "N1 NAS signalling connection release supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the MUSIM UE supports the paging indication for voice services, then the UE shall set the paging indication for voice services bit to "paging indication for voice services supported" in the 5GMM capability IE of the REGISTRATION REQUEST message otherwise the UE shall not set the paging indication for voice services bit to "paging indication for voice services supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the MUSIM UE supports the reject paging request, then the UE shall set the reject paging request bit to "reject paging request supported" in the 5GMM capability IE of the REGISTRATION REQUEST message otherwise the UE shall not set the reject paging request bit to "reject paging request supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the MUSIM UE sets:

- the reject paging request bit to "reject paging request supported";

- the N1 NAS signalling connection release bit to "N1 NAS signalling connection release supported"; or

- both of them;

and supports the paging restriction, then the UE shall set the paging restriction bit to "paging restriction supported" in the 5GMM capability IE of the REGISTRATION REQUEST message otherwise the UE shall not set the paging restriction bit to "paging restriction supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports MINT, the UE shall set the MINT bit to "MINT supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports slice-based N3IWF selection, the UE shall set the SBNS bit to "Slice-based N3IWF selection supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports slice-based TNGF selection, the UE shall set the SBTS bit to "Slice-based TNGF selection supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE initiates the registration procedure for disaster roaming services, the UE has determined the UE determined PLMN with disaster condition as specified in 3GPP TS 23.122 [5] and:

a) the UE determined PLMN with disaster condition is the HPLMN and:

1) the Additional GUTI IE is included in the REGISTRATION REQUEST message and does not contain a valid 5G-GUTI that was previously assigned by the HPLMN; or

2) the Additional GUTI IE is not included in the REGISTRATION REQUEST message and the 5GS mobile identity IE contains neither the SUCI nor a valid 5G-GUTI that was previously assigned by the HPLMN; or

b) the UE determined PLMN with disaster condition is not the HPLMN and:

1) the Additional GUTI IE is included in the REGISTRATION REQUEST message and does not contain a valid 5G-GUTI that was previously assigned by the UE determined PLMN with disaster condition; or

2) the Additional GUTI IE is not included in the REGISTRATION REQUEST message and the 5GS mobile identity IE does not contain a valid 5G-GUTI that was previously assigned by the UE determined PLMN with disaster condition;

the UE shall include in the REGISTRATION REQUEST message the UE determined PLMN with disaster condition IE indicating the UE determined PLMN with disaster condition.

NOTE 14: If the UE initiates the registration procedure for disaster roaming services, and the UE determined PLMN with disaster condition cannot be determined when an NG-RAN cell of the PLMN broadcasts the disaster related indication as specified in 3GPP TS 23.122 [5], the UE does not include in the REGISTRATION REQUEST message the UE determined PLMN with disaster condition IE but includes the Additional GUTI IE or the 5GS mobile identity IE or both as specified in subclauses 5.5.1.2.2.

If the UE supports event notification, the UE shall set the EventNotification bit to "Event notification supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports access to an SNPN using credentials from a credentials holder and:

a) the UE is in its HPLMN or EHPLMN or the subscribed SNPN; or

b) the UE is in a non-subscribed SNPN and supports equivalent SNPNs;

the UE shall set the SSNPNSI bit to "SOR-SNPN-SI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports equivalent SNPNs, the UE shall set the ESI bit to "equivalent SNPNs supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the unavailability period, the UE shall set the UN-PER bit to "unavailability period supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the reconnection to the network due to RAN timing synchronization status change, the UE shall set the Reconnection to the network due to RAN timing synchronization status change (RANtiming) bit to "Reconnection to the network due to RAN timing synchronization status change supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports LADN per DNN and S-NSSAI, the UE shall set the LADN-DS bit to "LADN per DNN and S-NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports MPS indicator update via the UE configuration update procedure, the UE shall set the MPSIU bit to "MPS indicator update supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports MCS indicator update via the UE configuration update procedure, the UE shall set the MCSIU bit to "MCS indicator update supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports ranging and sidelink positioning as specified in 3GPP TS 24.514 [62] and supports:

a) V2X communication over PC5 as specified in 3GPP TS 24.587 [19B];

b) 5G ProSe direct discovery and 5G ProSe direct communication as specified in 3GPP TS 24.554 [19E]; or

c) both a) and b),

the UE shall set

1. the RSPPC5 bit to "Ranging and sidelink positioning over PC5 supported";
2. the RSLPL bit to "Ranging and sidelink positioning for located UE supported";
3. the RSLPS bit to "Ranging and sidelink positioning for SL positioning server UE supported"; or
4. any combination of a), b) and c), in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the partial network slice, the UE shall set the PNS bit to "Partial network slice supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports network slice usage control, the UE shall set the NSUC bit to "Network slice usage control supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the S-NSSAI time validity information, the UE shall set the TempNS bit to "S-NSSAI time validity information supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the S-NSSAI location validity information, the UE shall set the SLVI bit to "S-NSSAI location validity information supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the operator policy for high priorty access exemption for service area restrictions, the UE shall set the HPAOP bit to "Operator policy for high priority access exemption for service area restrictions is supported by the UE" in the 5GMM capability IE of the REGISTRATION REQUEST message.



Figure 5.5.1.2.2.1: Registration procedure for initial registration

\*\*\*\*\* Sixth change \*\*\*\*\*

##### 5.5.1.3.2 Mobility and periodic registration update initiation

The UE in state 5GMM-REGISTERED shall initiate the registration procedure for mobility and periodic registration update by sending a REGISTRATION REQUEST message to the AMF,

a) when the UE detects that the current TAI is not in the list of tracking areas that the UE previously registered in the AMF;

b) when the periodic registration updating timer T3512 expires in 5GMM-IDLE mode and the UE is not registered for emergency services (see subclause 5.3.7);

c) when the UE receives a CONFIGURATION UPDATE COMMAND message indicating "registration requested" in the Registration requested bit of the Configuration update indication IE as specified in subclauses 5.4.4.3;

d) when the UE in state 5GMM-REGISTERED.ATTEMPTING-REGISTRATION-UPDATE either receives a paging or the UE receives a NOTIFICATION message with access type indicating 3GPP access over the non-3GPP access for PDU sessions associated with 3GPP access;

NOTE 1: As an implementation option, MUSIM UE is allowed to not respond to paging based on the information available in the paging message, e.g. voice service indication.

e) upon inter-system change from S1 mode to N1 mode and if the UE previously had initiated an attach procedure or a tracking area updating procedure when in S1 mode;

f) when the UE receives an indication of "RRC Connection failure" from the lower layers and does not have signalling pending (i.e. when the lower layer requests NAS signalling connection recovery) except for the case specified in subclause 5.3.1.4;

g) when the UE changes the 5GMM capability or the S1 UE network capability or both;

h) when the UE's usage setting changes;

i) when the UE needs to change the slice(s) it is currently registered to;

NOTE 1A: The UE can after the completion of the ongoing registration procedure, initiate another registration procedure for mobility registration update to request more slices.

j) when the UE changes the UE specific DRX parameters;

k) when the UE in state 5GMM-REGISTERED.ATTEMPTING-REGISTRATION-UPDATE receives a request from the upper layers to establish an emergency PDU session or perform emergency services fallback;

l) when the UE needs to register for SMS over NAS, indicate a change in the requirements to use SMS over NAS, or de-register from SMS over NAS;

m) when the UE needs to indicate PDU session status to the network after performing a local release of PDU session(s) as specified in subclauses 6.4.1.5 and 6.4.3.5;

n) when the UE in 5GMM-IDLE mode changes the radio capability for NG-RAN or E-UTRAN;

o) when the UE receives a fallback indication from the lower layers and does not have signalling pending, see subclauses 5.3.1.4 and 5.3.1.2);

p) void;

q) when the UE needs to request new LADN information;

r) when the UE needs to request the use of MICO mode or needs to stop the use of MICO mode or to request the use of new T3324 value or new T3512 value;

s) when the UE in 5GMM-CONNECTED mode with RRC inactive indication enters a cell in the current registration area belonging to an equivalent PLMN of the registered PLMN and not belonging to the registered PLMN;

t) when the UE receives over 3GPP access a SERVICE REJECT message or a DL NAS TRANSPORT message, with the 5GMM cause value set to #28 "Restricted service area";

u) when the UE needs to request the use of eDRX, when a change in the eDRX usage conditions at the UE requires different extended DRX parameters, or needs to stop the use of eDRX;

NOTE 2: A change in the eDRX usage conditions at the UE can include e.g. a change in the UE configuration, a change in requirements from upper layers or the battery running low at the UE.

v) when the UE supporting 5G-SRVCC from NG-RAN to UTRAN changes the mobile station classmark 2 or the supported codecs;

w) when the UE in state 5GMM-REGISTERED.ATTEMPTING-REGISTRATION-UPDATE decides to request new network slices after being rejected due to no allowed network slices requested, or request S-NSSAI(s) which have been removed from the rejected NSSAI for the maximum number of UEs reached;

x) when the UE is not in NB-N1 mode and the UE has received a UE radio capability ID deletion indication IE set to "Network-assigned UE radio capability IDs deletion requested";

y) when the UE receives a REGISTRATION REJECT message with 5GMM cause values #3, #6 or #7 without integrity protection over another access;

z) when the UE needs to request new ciphering keys for ciphered broadcast assistance data;

za) when due to manual CAG selection the UE has selected a CAG-ID which is not a CAG-ID authorized based on the "allowed CAG list" for the selected PLMN or a CAG-ID in a PLMN for which the entry in the "CAG information list" does not exist or when the UE has selected, without selecting a CAG-ID, a PLMN for which the entry in the "CAG information list" includes an "indication that the UE is only allowed to access 5GS via CAG cells";

zb) when the UE needs to start, stop or change the conditions for using the WUS assistance information or PEIPS assistance information;

zc) when the UE changes the UE specific DRX parameters in NB-N1 mode;

zd) when the UE in 5GMM-CONNECTED mode with RRC inactive indication enters a new cell with different RAT in current TAI list or not in current TAI list;

ze) when the UE enters state 5GMM-REGISTERED.NORMAL-SERVICE or 5GMM-REGISTERED.NON-ALLOWED-SERVICE (as described in subclause 5.3.5.2) over 3GPP access after the UE has sent a NOTIFICATION RESPONSE message over non-3GPP access in response to reception of a NOTIFICATION message over non-3GPP access as specified in subclause 5.6.3.1;

zf) when the UE supporting UAS services is not registered for UAS services and needs to register to the 5GS for UAS services;

zg) when the UE supporting MINT needs to perform the registration procedure for mobility and periodic registration update to register to the PLMN offering disaster roaming;

zh) when the MUSIM UE supporting the paging timing collision control needs to request a new 5G-GUTI assignment and the UE is not registered for emergency services;

NOTE 3: Based on implementation, the MUSIM UE can request a new 5G-GUTI assignment (e.g. when the lower layers request to modify the timing of the paging occasions).

zi) when the network supports the paging restriction and the MUSIM UE in state 5GMM-REGISTERED.NON-ALLOWED-SERVICE needs to requests the network to remove the paging restriction;

zj) when the UE changes the 5GS Preferred CIoT network behaviour or the EPS Preferred CIoT network behaviour;

zk) when the UE that has entered 5GMM-REGISTERED.NO-CELL-AVAILABLE and it has one or more S-NSSAI(s) in pending NSSAI, finds a suitable cell according to 3GPP TS 38.304 [28];

zl) when the UE is registered for disaster roaming services and receives a request from the upper layers to establish an emergency PDU session or perform emergency services fallback;

zm1) when the UE needs to provide the unavailability information or to update the unavailability information;

zm2) void;

NOTE 3A: How UE determines that it is about to lose satellite coverage is an implementation option.

zn) when the UE needs to come out of unavailability period and resume normal services;

zo) when the UE in state 5GMM-REGISTERED.ATTEMPTING-REGISTRATION-UPDATE, the UE supports the reconnection to the network due to RAN timing synchronization status change has been requested to reconnect to the network upon receiving an indication of a change in the RAN timing synchronization status (see subclauses 5.4.4.2, 5.5.1.2.4, and 5.5.1.3.4), and the UE receives an indication of a change in the RAN timing synchronization status; or

zp) when the UE that supports non-3GPP access path switching needs to trigger non-3GPP access path switching from the old non-3GPP access to the new non-3GPP access that is in the same PLMN.

NOTE 4: Non-3GPP access path switching from a non-3GPP access to a wireline access, or from a wireline access to a non-3GPP access, is not specified in this release of the specification.

zq) if the UE moves from a tracking area for which the TAI is configured for partially rejected NSSAI to another tracking area within the registration area with aTAI for which the S-NSSAI(s) is supported and the UE still needs to request that S-NSSAI(s).

NOTE 4A: The UEs that do not initiate the registration procedure for mobility and periodic registration update in the case above will not receive service for the S-NSSAI(s) that are configured to support the S-NSSAI(s) in the tracking areas supporting the S-NSSAI(s). Operators are recomended to consider the impact of such a configuration, of having partially rejected NSSAI applicable in some tracking areas within a registration area, as it requires the UE to perform mobility and periodic registration update procedure upon mobility within the same registration area.

If case b is the only reason for initiating the registration procedure for mobility and periodic registration update, the UE shall indicate "periodic registration updating" in the 5GS registration type IE; otherwise, if the UE initiates the registration procedure for mobility and periodic registration update due to case zg, the UE shall indicate "disaster roaming mobility registration updating" in the 5GS registration type IE; otherwise the UE shall indicate "mobility registration updating".

If case zl is the reason for initiating the registration procedure for mobility and periodic registration update and if the UE supports S1 mode and the UE has not disabled its E-UTRA capability, the UE shall:

- set the S1 mode bit to "S1 mode supported" in the 5GMM capability IE of the REGISTRATION REQUEST message; and

- include the S1 UE network capability IE in the REGISTRATION REQUEST message;

If the UE which is not registered for disaster roaming services indicates "mobility registration updating" in the 5GS registration type IE and the UE supports S1 mode and the UE has not disabled its E-UTRA capability, the UE shall:

- set the S1 mode bit to "S1 mode supported" in the 5GMM capability IE of the REGISTRATION REQUEST message;

- include the S1 UE network capability IE in the REGISTRATION REQUEST message additionally, if the UE supports EPS-UPIP, the UE shall set the EPS-UPIP bit to "EPS-UPIP supported" in the S1 UE network capability IE in the REGISTRATION REQUEST message; and

- if the UE supports sending an ATTACH REQUEST message containing a PDN CONNECTIVITY REQUEST message with request type set to "handover" to transfer a PDU session from N1 mode to S1 mode, set the HO attach bit to "attach request message containing PDN connectivity request with request type set to handover to transfer PDU session from N1 mode to S1 mode supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the LTE positioning protocol (LPP) in N1 mode as specified in 3GPP TS 37.355 [26], the UE shall set the LPP bit to "LPP in N1 mode supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the Location Services (LCS) notification mechanisms in N1 mode as specified in 3GPP TS 23.273 [6B], the UE shall set the 5G-LCS bit to "LCS notification mechanisms supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the user plane positioning using LCS-UPP as specified in 3GPP TS 23.273 [6B], the UE shall set the LCS-UPP bit to "LCS-UPP user plane positioning supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the user plane positioning using SUPL as specified in 3GPP TS 38.305 [67] and 3GPP TS 23.271 [68], the UE shall set the SUPL bit to "SUPL user plane positioning supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports network verified UE location over satellite NG-RAN as specified in 3GPP TS 23.501 [8], the UE shall set the NVL-SATNR bit to "Network verified UE location over satellite NG-RAN supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

For all cases except case b, when the UE is not in NB-N1 mode and the UE supports RACS, the UE shall set the RACS bit to "RACS supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports 5G-SRVCC from NG-RAN to UTRAN as specified in 3GPP TS 23.216 [6A], the UE shall set:

- the 5G-SRVCC from NG-RAN to UTRAN capability bit to "5G-SRVCC from NG-RAN to UTRAN supported" in the 5GMM capability IE of the REGISTRATION REQUEST message for all cases except case b; and

- include the Mobile station classmark 2 IE and the Supported codecs IE in the REGISTRATION REQUEST message for all cases except case b.

If the UE supports the restriction on use of enhanced coverage, the UE shall set the RestrictEC bit to "Restriction on use of enhanced coverage supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports network slice-specific authentication and authorization, the UE shall set the NSSAA bit to "network slice-specific authentication and authorization supported" in the 5GMM capability IE of the REGISTRATION REQUEST message for all cases except case b.

If the UE supports CAG feature, the UE shall set the CAG bit to "CAG Supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports extended CAG information list, the UE shall set the Ex-CAG bit to "Extended CAG information list supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports enhanced CAG information, the UE shall set the ECI bit to "enhanced CAG information supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports sending of REGISTRATION COMPLETE message for acknowledging the reception of Negotiated PEIPS assistance inforation IE, the UE shall set the RCMAP bit to "Sending of REGISTRATION COMPLETE message for negotiated PEIPS assistance information supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE operating in the single-registration mode performs inter-system change from S1 mode to N1 mode and:

a) has one or more stored UE policy sections identified by a UPSI with the PLMN ID part indicating the HPLMN or the selected PLMN, the UE shall set the Payload container type IE to "UE policy container" and include the UE STATE INDICATION message (see annex D) in the Payload container IE of the REGISTRATION REQUEST message; or

b) does not have any stored UE policy section identified by a UPSI with the PLMN ID part indicating the HPLMN or the selected PLMN, and the UE needs to send a UE policy container to the network, the UE shall set the Payload container type IE to "UE policy container" and include the UE STATE INDICATION message (see annex D) in the Payload container IE of the REGISTRATION REQUEST message.

NOTE 5: In this version of the protocol, the UE can only include the Payload container IE in the REGISTRATION REQUEST message to carry a payload of type "UE policy container".

The UE in state 5GMM-REGISTERED shall initiate the registration procedure for mobility and periodic registration update by sending a REGISTRATION REQUEST message to the AMF when the UE needs to request the use of SMS over NAS transport or the current requirements to use SMS over NAS transport change in the UE. The UE shall set the SMS requested bit of the 5GS update type IE in the REGISTRATION REQUEST message as specified in subclause 5.5.1.2.2.

When initiating a registration procedure for mobility and periodic registration update and the UE needs to send the 5GS update type IE for a reason different than indicating a change in requirement to use SMS over NAS, the UE shall set the SMS requested bit of the 5GS update type IE in the REGISTRATION REQUEST message to the same value as indicated by the UE in the last REGISTRATION REQUEST message.

If the UE no longer requires the use of SMS over NAS, then the UE shall include the 5GS update type IE in the REGISTRATION REQUEST message with the SMS requested bit set to "SMS over NAS not supported".

After sending the REGISTRATION REQUEST message to the AMF the UE shall start timer T3510. If timer T3502 is currently running, the UE shall stop timer T3502. If timer T3511 is currently running, the UE shall stop timer T3511.

If the last visited registered TAI is available, the UE shall include the last visited registered TAI in the REGISTRATION REQUEST message.

The UE shall handle the 5GS mobile identity IE in the REGISTRATION REQUEST message as follows:

a) if the UE is operating in the single-registration mode, performs inter-system change from S1 mode to N1 mode, and the UE holds a valid native 4G-GUTI, the UE shall create a 5G-GUTI mapped from the valid native 4G-GUTI as specified in 3GPP TS 23.003 [4] and indicate the mapped 5G-GUTI in the 5GS mobile identity IE. Additionally, if the UE holds a valid 5G‑GUTI, the UE shall include the 5G-GUTI in the Additional GUTI IE in the REGISTRATION REQUEST message in the following order:

1) a valid 5G-GUTI that was previously assigned by the same PLMN with which the UE is performing the registration, if available;

2) a valid 5G-GUTI that was previously assigned by an equivalent PLMN, if available; and

3) a valid 5G-GUTI that was previously assigned by any other PLMN, if available; and

NOTE 6: The 5G-GUTI included in the Additional GUTI IE is a native 5G-GUTI.

b) for all other cases, if the UE holds a valid 5G-GUTI, the UE shall indicate the 5G-GUTI in the 5GS mobile identity IE. If the UE is registering with an SNPN and the valid 5G-GUTI was previously assigned by another SNPN, the UE shall additionally include the NID of the other SNPN in the NID IE.

If the UE does not operate in SNPN access operation mode, holds two valid native 5G-GUTIs assigned by PLMNs and:

1) one of the valid native 5G-GUTI was assigned by the PLMN with which the UE is performing the registration, then the UE shall indicate the valid native 5G-GUTI assigned by the PLMN with which the UE is performing the registration. In addition, the UE shall include the other valid native 5G-GUTI in the Additional GUTI IE; or

2) none of the valid native 5G-GUTI was assigned by the PLMN with which the UE is performing the registration, then the UE shall indicate the valid native 5G-GUTI assigned over the same access via which the UE is performing the registration.

If the UE supports MICO mode and requests the use of MICO mode, then the UE shall include the MICO indication IE in the REGISTRATION REQUEST message. If the UE requests to use an active time value, it shall include the active time value in the T3324 IE in the REGISTRATION REQUEST message. If the UE includes the T3324 IE, it may also request a particular T3512 value by including the Requested T3512 IE in the REGISTRATION REQUEST message. Additionally, if the UE supports strictly periodic registration timer, the UE shall set the Strictly Periodic Registration Timer Indication bit of the MICO indication IE in the REGISTRATION REQUEST message to "strictly periodic registration timer supported". If the UE needs to stop the use of MICO mode, then the UE shall not include the MICO indication IE in the REGISTRATION REQUEST message.

If the UE needs to use or change the UE specific DRX parameters, the UE shall include the Requested DRX parameters IE in the REGISTRATION REQUEST message for all cases except case b).

If the UE is in NB-N1 mode and if the UE needs to use or change the UE specific DRX parameters for NB-N1 mode, the UE shall include the Requested NB-N1 mode DRX parameters IE in the REGISTRATION REQUEST message for all cases except case b).

If the UE supports eDRX and requests the use of eDRX, the UE shall include the Requested extended DRX parameters IE in the REGISTRATION REQUEST message.

If the UE needs to request LADN information for specific LADN DNN(s) or indicates a request for LADN information as specified in 3GPP TS 23.501 [8], the UE shall include the LADN indication IE in the REGISTRATION REQUEST message and:

- request specific LADN DNNs by including a LADN DNN value in the LADN indication IE for each LADN DNN for which the UE requests LADN information; or

- to indicate a request for LADN information by not including any LADN DNN value in the LADN indication IE.

If the UE is initiating the registration procedure for mobility and periodic registration update, the UE may include the Uplink data status IE to indicate which PDU session(s) is:

- not associated with control plane only indication;

- associated with the access type the REGISTRATION REQUEST message is sent over; and

- have pending user data to be sent over user plane or are associated with active multicast MBS session(s).

If the UE has one or more active always-on PDU sessions associated with the access type over which the REGISTRATION REQUEST message is sent and the user-plane resources for these PDU sessions are not established, and for cases triggering the REGISTRATION REQUEST message except b), the UE shall include the Uplink data status IE and indicate that the UE has pending user data to be sent for those PDU sessions. If the UE is located outside the LADN service area and inside the registration area assigned by the network, the UE shall not include the PDU session for LADN in the Uplink data status IE. If the UE is in a non-allowed area or is not in an allowed area as specified in subclause 5.3.5, and the UE is in the registration area assigned by the network, the UE shall not include the Uplink data status IE except for emergency services or for high priority access. If the MUSIM UE requests the network to release the NAS signalling connection, the UE shall not include the Uplink data status IE in the REGISTRATION REQUEST message.

If the UE has one or more active PDU sessions which are not accepted by the network as always-on PDU sessions and no uplink user data pending to be sent for those PDU sessions, the UE shall not include those PDU sessions in the Uplink data status IE in the REGISTRATION REQUEST message.

When the registration procedure for mobility and periodic registration update is initiated in 5GMM-IDLE mode, the UE may include a PDU session status IE in the REGISTRATION REQUEST message, indicating:

a) which single access PDU sessions associated with the access type the REGISTRATION REQUEST message is sent over are not inactive in the UE; and

b) which MA PDU sessions are not inactive and having the corresponding user plane resources being established or established in the UE on the access the REGISTRATION REQUEST message is sent over.

If the UE received a paging message with the access type indicating non-3GPP access, the UE shall include the Allowed PDU session status IE in the REGISTRATION REQUEST message. If the UE has PDU session(s) over non-3GPP access, where

a) the associated S-NSSAI(s) are included in the allowed NSSAI for 3GPP access or the partially allowed NSSAI for 3GPP access and the TAI where the UE is currently camped is in the list of TAs for which the S-NSSAI is allowed; and

b) the UE is currently camped inside the NS-AoS of the S-NSSAI, if the S-NSSAI location validity information is available,

the UE shall indicate the PDU session(s) for which the UE allows to re-establish the user-plane resources over 3GPP access in the Allowed PDU session status IE; otherwise, the UE shall not indicate any PDU session(s) in the Allowed PDU session status IE. If the UE is in a non-allowed area or the UE is not in an allowed area, the UE shall set the Allowed PDU session status IE as specified in subclause 5.3.5.2.

When the Allowed PDU session status IE is included in the REGISTRATION REQUEST message, the UE shall indicate that a PDU session is not allowed to be transferred to the 3GPP access if the 3GPP PS data off UE status is "activated" for the corresponding PDU session and the UE is not using the PDU session to send uplink IP packets for any of the 3GPP PS data off exempt services (see subclause 6.2.10).

If the UE operating in the single-registration mode performs inter-system change from S1 mode to N1 mode, the UE:

a) shall include the UE status IE with the EMM registration status set to "UE is in EMM-REGISTERED state" in the REGISTRATION REQUEST message;

NOTE 7: Inclusion of the UE status IE with this setting corresponds to the indication that the UE is "moving from EPC" as specified in 3GPP TS 23.502 [9], subclause 4.11.1.3.3 and 4.11.2.3.

NOTE 8: The value of the 5GMM registration status included by the UE in the UE status IE is not used by the AMF.

b) may include the PDU session status IE in the REGISTRATION REQUEST message indicating the status of the PDU session(s) mapped during the inter-system change from S1 mode to N1 mode from the PDN connection(s) for which the EPS indicated that interworking to 5GS is supported, if any (see subclause 6.1.4.1);

c) shall include a TRACKING AREA UPDATE REQUEST message as specified in 3GPP TS 24.301 [15] in the EPS NAS message container IE in the REGISTRATION REQUEST message if the registration procedure is initiated in 5GMM-IDLE mode and the UE has received an "interworking without N26 interface not supported" indication from the network;

c1) may include a TRACKING AREA UPDATE REQUEST message as specified in 3GPP TS 24.301 [15] in the EPS NAS message container IE in the REGISTRATION REQUEST message if the registration procedure is initiated in 5GMM-IDLE mode and the UE has received an "interworking without N26 interface supported" indication from the network; and

d) shall include an EPS bearer context status IE in the REGISTRATION REQUEST message indicating which EPS bearer contexts are active in the UE, if the UE has locally deactivated EPS bearer context(s) for which interworking to 5GS is supported while the UE was in S1 mode without notifying the network.

For a REGISTRATION REQUEST message with a 5GS registration type IE indicating "mobility registration updating", if the UE:

a) is in NB-N1 mode and:

1) the UE needs to change the slice(s) it is currently registered to within the same registration area; or

2) the UE has entered a new registration area; or

b) is not in NB-N1 mode and is not registered for onboarding services in SNPN;

the UE shall include the Requested NSSAI IE containing the S-NSSAI(s) corresponding to the network slices to which the UE intends to register and associated mapped S-NSSAI(s), if available, in the REGISTRATION REQUEST message as described in this subclause. When the UE is entering a visited PLMN and intends to register to the slices for which the UE has only HPLMN S-NSSAI(s) available, the UE shall include these HPLMN S-NSSAI(s) in the Requested mapped NSSAI IE. When the UE is entering an EHPLMN whose PLMN code is not derived from the IMSI and intends to register to the slices for which the UE has only HPLMN S-NSSAI(s) available, the UE shall include HPLMN S-NSSAI(s) in the Requested mapped NSSAI IE. The sum of number of S-NSSAI values in the Requested NSSAI IE and number of S-NSSAI values in the Requested mapped NSSAI IE shall not exceed eight.

NOTE 9: The REGISTRATION REQUEST message can include both the Requested NSSAI IE and the Requested mapped NSSAI IE as described below.

If the UE is registered for onboarding services in SNPN, the UE shall not include the Requested NSSAI IE in the REGISTRATION REQUEST message.

If the UE has allowed NSSAI or configured NSSAI or both for the current PLMN, the Requested NSSAI IE shall include either:

a) the configured NSSAI for the current PLMN or SNPN, or a subset thereof as described below;

b) the allowed NSSAI for the current PLMN or SNPN, or a subset thereof as described below; or

c) the allowed NSSAI for the current PLMN or SNPN, or a subset thereof as described below, plus the configured NSSAI for the current PLMN or SNPN, or a subset thereof as described below;

In addition, the Requested NSSAI IE shall include S-NSSAI(s) applicable in the current PLMN or SNPN, and if available the associated mapped S-NSSAI(s) for:

a) each PDN connection that is established in S1 mode when the UE is operating in the single-registration mode and the UE is performing an inter-system change from S1 mode to N1 mode; or

b) each active PDU session.

If the UE does not have S-NSSAI(s) applicable in the current PLMN or SNPN, then the Requested mapped NSSAI IE shall include HPLMN S-NSSAI(s) (e.g. mapped S-NSSAI(s), if available) for:

a) each PDN connection established in S1 mode when the UE is operating in the single-registration mode and the UE is performing an inter-system change from S1 mode to N1 mode to a visited PLMN; or

b) each active PDU session when the UE is performing mobility from N1 mode to N1 mode to a visited PLMN.

NOTE 10: The Requested NSSAI IE is used instead of Requested mapped NSSAI IE in REGISTRATION REQUEST message when the UE enters HPLMN and the EHPLMN list is not present or is empty; or when the UE enters a PLMN whose PLMN code is derived from the IMSI and the EHPLMN list is not empty. The Requested mapped NSSAI IE is used when the UE enters an EHPLMN whose PLMN code is not derived from the IMSI.

If both the S-NSSAI to be replaced and the alternative S-NSSAI are included in the configured NSSAI, and the UE needs to request the S-NSSAI to be replaced, the UE shall include the S-NSSAI to be replaced in the Requested NSSAI IE or the Requested mapped NSSAI IE.

For a REGISTRATION REQUEST message with a 5GS registration type IE indicating "mobility registration updating", if the UE is in NB-N1 mode and the procedure is initiated for all cases except case a), c), e), i), s), t), w), and x), the REGISTRATION REQUEST message shall not include the Requested NSSAI IE.

If the UE has:

- no allowed NSSAI for the current PLMN or SNPN;

- no configured NSSAI for the current PLMN or SNPN;

- neither active PDU session(s) nor PDN connection(s) to transfer associated with an S-NSSAI applicable in the current PLMN or SNPN; and

- neither active PDU session(s) nor PDN connection(s) to transfer associated with mapped S-NSSAI(s);

and has a default configured NSSAI, then the UE shall:

a) include the S-NSSAI(s) in the Requested NSSAI IE of the REGISTRATION REQUEST message using the default configured NSSAI; and

b) include the Network slicing indication IE with the Default configured NSSAI indication bit set to "Requested NSSAI created from default configured NSSAI" in the REGISTRATION REQUEST message.

If the UE has:

- no allowed NSSAI for the current PLMN or SNPN;

- no configured NSSAI for the current PLMN or SNPN;

- neither active PDU session(s) nor PDN connection(s) to transfer associated with an S-NSSAI applicable in the current PLMN or SNPN

- neither active PDU session(s) nor PDN connection(s) to transfer associated with mapped S-NSSAI(s); and

- no default configured NSSAI,

the UE shall include neither Requested NSSAI IE nor Requested mapped NSSAI IE in the REGISTRATION REQUEST message.

If all the S-NSSAI(s) corresponding to the slice(s) to which the UE intends to register are included in the pending NSSAI, the UE shall not include a requested NSSAI in the REGISTRATION REQUEST message.

When the UE storing a pending NSSAI intends to register to additional S-NSSAI(s) over the same access type, the UE shall send the requested NSSAI containing the additional S-NSSAI(s) that the UE intends to register to in the REGISTRATION REQUEST message. The requested NSSAI shall not include any S-NSSAI from the pending NSSAI.

The subset of configured NSSAI provided in the requested NSSAI consists of one or more S-NSSAIs in the configured NSSAI applicable to the current PLMN or SNPN, where any included S-NSSAI is neither in the rejected NSSAI nor associated to an S-NSSAI in the rejected NSSAI. If the UE is inside the NS-AoS of an S-NSSAI in the rejected NSSAI with a rejection cause value set to "S-NSSAI not available in the current registration area", the S-NSSAI may be included in the requested NSSAI.

For case zq, the subset of configured NSSAI provided in the requested NSSAI consists of one or more S-NSSAIs in the configured NSSAI applicable to the current PLMN or SNPN, where any included S-NSSAI is in the partially rejected NSSAI and the current TAI is in the list of TAs for which the S-NSSAI is not rejected. If the UE is inside the NS-AoS of an S-NSSAI in the partially rejected NSSAI and the current TAI is in the list of TAs for which the S-NSSAI is rejected, the S-NSSAI may be included in the requested NSSAI.

In addition, if the NSSRG information is available, the subset of configured NSSAI provided in the requested NSSAI shall be associated with at least one common NSSRG value. The UE may also include in the requested NSSAI included in the Requested NSSAI IE or the Requested mapped NSSAI IE or both, the S-NSSAI(s) which were added to configured NSSAI in S1 mode and for which the associated NSSRG information is not available. If the UE is in 5GMM-REGISTERED state over the other access and has already an allowed NSSAI for the other access in the same PLMN or in different PLMNs, all the S-NSSAI(s) in the requested NSSAI included in the Requested NSSAI IE or the Requested mapped NSSAI IE or both for the current access shall share at least an NSSRG value common to all the S-NSSAI(s) of the allowed NSSAI for the other access. If the UE is simultaneously performing the registration procedure on the other access in different PLMNs, the UE shall include S-NSSAIs that share at least a common NSSRG value across all access types. If the UE has pending NSSAI which the UE is still interested in using, then S-NSSAIs in the pending NSSAI and requested NSSAI shall be associated with at least one common NSSRG value.

NOTE 11: If the UE has stored mapped S-NSSAI(s) for the rejected NSSAI, and one or more S-NSSAIs in the stored mapped S-NSSAI(s) for the configured NSSAI are not included in the stored mapped S-NSSAI(s) for the rejected NSSAI, then a S-NSSAI in the configured NSSAI associated to one or more of these mapped S-NSSAI(s) for the configured NSSAI are available to be included in the requested NSSAI together with their mapped S-NSSAI.

NOTE 12: If one or more mapped S-NSSAIs in the stored mapped S-NSSAI(s) for the configured NSSAI are not included in the stored rejected NSSAI for the failed or revoked NSSAA, a S-NSSAI in the configured NSSAI associated to one or more of these mapped S-NSSAI(s) for the configured NSSAI are available to be included in the registration request together with their mapped S-NSSAI.

NOTE 13: There is no need to consider the case that the UE is simultaneously performing the registration procedure on the other access in the same PLMN, due to that the UE is not allowed to initiate the registration procedure over one access when the registration over the other access to the same PLMN is going on.

If:

a) the UE is registered to current PLMN over the other access and has NSSRG information available;

b) the UE is attempting mobility registration to the same current PLMN from other PLMN in the current access; and

c) the UE has PDU session(s) or PDN connection(s) associated with NSSAI not sharing part of NSSRG available of the current PLMN;

then the UE locally releases these PDU session(s) or PDN connection(s), as the NSSAI for these PDU session(s) or PDN connection(s) will not be included in the requested or the requested mapped NSSAI in the current PLMN due to its lack of association to the common NSSRG of the current PLMN.

The subset of allowed NSSAI provided in the requested NSSAI consists of one or more S-NSSAIs in the allowed NSSAI for this PLMN.

If the UE supports the S-NSSAI time validity information, S-NSSAI time validity information is available for an S-NSSAI, and the S-NSSAI time validity information indicates that the S-NSSAI is not available, the UE shall not include the S-NSSAI in the Requested NSSAI IE of the REGISTRATION REQUEST message. If the UE has S-NSSAI time validity information over the other access in the same PLMN and the S-NSSAI time validity information indicates that the S-NSSAI is not available, the UE shall not include the S-NSSAI in the Requested NSSAI IE of the REGISTRATION REQUEST message for the current access type.

NOTE 14: How the UE selects the subset of configured NSSAI or allowed NSSAI to be provided in the requested NSSAI is implementation specific. The UE can take preferences indicated by the upper layers (e.g. policies like URSP, applications) and UE local configuration into account.

NOTE 14A: If the UE determines the on-demand S-NSSAI for a PDU session establishment as specified in subclause 4.2.2 of 3GPP TS 24.526 [19], the UE includes the on-demand S-NSSAI in the requested NSSAI during the registration procedure.

NOTE 15: The number of S-NSSAI(s) included in the requested NSSAI cannot exceed eight.

If the UE supports NSAG, the UE shall set the NSAG bit to "NSAG supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports sending of REGISTRATION COMPLETE message for acknowledging the reception of NSAG information IE in the REGISTRATION ACCEPT message, the UE shall set the RCMAN bit to "Sending of REGISTRATION COMPLETE message for NSAG information supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the unavailability period, the UE shall set the UN-PER bit to "unavailability period supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports network slice replacement, the UE shall set the NSR bit to "network slice replacement supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

For case zm1, if the network indicated support for the unavailability period in the last registration procedure, the UE shall include the Unavailability information IE in the REGISTRATION REQUEST message. If the UE did not include a start of the unavailability period in the Unavailability information IE, the UE shall set the Follow-on request indicator to "No follow-on request pending" in the REGISTRATION REQUEST message and shall not include the Uplink data status IE or the Allowed PDU session status IE in the REGISTRATION REQUEST message even if the UE has one or more active always-on PDU sessions associated with the 3GPP access. If the UE includes the Unavailability information IE to indicate the type of the unavailability and the UE will be unavailable due to NR satellite access discontinuous coverage, the UE shall set the Unavailability type bit to "unavailability due to discontinuous coverage" in the Unavailability information IE.

For case zm1, the UE should initiate the registration procedure for mobility and periodic registration update only if the UE can determine, based on its implementation, that there is enough time to complete the procedure before the start of the unavailability period.

NOTE 15A: If the UE is unable to store its 5GMM and 5GSM contexts, the UE triggers the de-registration procedure. Ability to store the 5GMM information for UEs not operating in SNPN access operation mode as described in Annex C.1 does not imply the ability to store the 5GMM and 5GSM contexts.

NOTE 15B: If the UE is able to store its 5GMM and 5GSM contexts, the UE can store the 5GMM and 5GSM contexts even if the registration procedure for mobility and periodic registration update is not completed successfully.

The UE shall set the Follow-on request indicator to "Follow-on request pending", if the UE:

a) initiates the registration procedure for mobility and periodic registration update upon request of the upper layers to establish an emergency PDU session;

b) initiates the registration procedure for mobility and periodic registration update upon receiving a request from the upper layers to perform emergency services fallback; or

c) needs to prolong the established NAS signalling connection after the completion of the registration procedure for mobility and periodic registration update (e.g. due to uplink signalling pending but no user data pending).

NOTE 16: The UE does not have to set the Follow-on request indicator to 1 even if the UE has to request resources for V2X communication over PC5 reference point, 5G ProSe direct discovery over PC5, 5G ProSe direct communication over PC5 or ranging and sidelink positioning or A2X communication over PC5 reference point.

For case n, the UE shall include the 5GS update type IE in the REGISTRATION REQUEST message with the NG-RAN-RCU bit set to "UE radio capability update needed". Additionally, if the UE is not in NB-N1 mode, the UE supports RACS and the UE has an applicable UE radio capability ID for the new UE radio configuration in the serving PLMN or SNPN, the UE shall include the applicable UE radio capability ID in the UE radio capability ID of the REGISTRATION REQUEST message.

NOTE 16A: For cases n, if the UE supports RACS irrespective whether the UE has an applicable UE radio capability ID for the new UE radio configuration in the selected PLMN the 5GS update type IE in the REGISTRATION REQUEST message with the NG-RAN-RCU bit is set to "UE radio capability update needed".

If the UE is in the 5GMM-CONNECTED mode and the UE changes the radio capability for NG-RAN or E‑UTRAN, the UE may locally release the established N1 NAS signalling connection and enter the 5GMM-IDLE mode. Then, the UE shall initiate the registration procedure for mobility and periodic registration update including the 5GS update type IE in the REGISTRATION REQUEST message with the NG-RAN-RCU bit set to " UE radio capability update needed".

For case o, the UE shall include the Uplink data status IE in the REGISTRATION REQUEST message indicating the PDU session(s) without active user-plane resources for which the UE has pending user data to be sent, if any, and the PDU session(s) for which user-plane resources were active prior to receiving the fallback indication, if any. If the UE has joined one or more multicast MBS session and was in 5GMM-CONNECTED mode with RRC inactive indication before receiving the fallback indication from the lower layers, the UE shall include the Uplink data status IE in the REGISTRATION REQUEST message indicating the PDU session(s) that are associated to the one or more multicast MBS session. If the UE is in a non-allowed area or if the UE is not in allowed area, the UE shall not include the Uplink data status IE in REGISTRATION REQUEST message, except if the PDU session for which user-plane resources were active prior to receiving the fallback indication is an emergency PDU session, or if the UE is configured for high priority access in the selected PLMN or SNPN as specified in subclause 5.3.5.

For case f-, the UE shall include the Uplink data status IE in the REGISTRATION REQUEST message indicating the PDU session(s) for which the UE has uplink user data pending and the PDU session(s) for which user-plane resources were active prior to receiving "RRC Connection failure" indication from the lower layers, if any. If the UE has joined one or more multicast MBS session and was in 5GMM-CONNECTED mode with RRC inactive indication before receiving the indication of "RRC Connection failure" from the lower layers or before receiving the indication that the resumption of the RRC connection has failed from the lower layers, the UE shall include the Uplink data status IE in the REGISTRATION REQUEST message indicating the PDU session(s) that are associated to the one or more multicast MBS session. If the UE is in non-allowed area or not in allowed area, the UE shall not include the Uplink data status IE in REGISTRATION REQUEST message, except that the PDU session for which user-plane resources were active prior to receiving the "RRC Connection failure"indication is emergency PDU session, or that the UE is configured for high priority access in selected PLMN or SNPN, as specified in subclause 5.3.5.

If the UE supports service gap control, then the UE shall set the SGC bit to "service gap control supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

For cases a, x or if the UE operating in the single-registration mode performs inter-system change from S1 mode to N1 mode, the UE shall:

a) if the UE has an applicable network-assigned UE radio capability ID for the current UE radio configuration in the selected PLMN or SNPN, include the applicable network-assigned UE radio capability ID in the UE radio capability ID IE of the REGISTRATION REQUEST message; and

b) if the UE:

1) does not have an applicable network-assigned UE radio capability ID for the current UE radio configuration in the selected PLMN or SNPN; and

2) has an applicable manufacturer-assigned UE radio capability ID for the current UE radio configuration,

include the applicable manufacturer-assigned UE radio capability ID in the UE radio capability ID IE of the REGISTRATION REQUEST message.

For all cases except cases b and z, if the UE supports ciphered broadcast assistance data and the UE needs to obtain new ciphering keys, the UE shall include the Additional information requested IE with the CipherKey bit set to "ciphering keys for ciphered broadcast assistance data requested" in the REGISTRATION REQUEST message.

For case z, the UE shall include the Additional information requested IE with the CipherKey bit set to "ciphering keys for ciphered broadcast assistance data requested" in the REGISTRATION REQUEST message.

For case a, if the UE supports ciphered broadcast assistance data and the UE detects that one or more ciphering keys stored at the UE is not applicable in the current TAI, the UE should include the Additional information requested IE with the CipherKey bit set to "ciphering keys for ciphered broadcast assistance data requested" in the REGISTRATION REQUEST message.

For case b, if the UE supports ciphered broadcast assistance data and the remaining validity time for one or more ciphering keys stored at the UE is less than timer T3512, the UE should include the Additional information requested IE with the CipherKey bit set to "ciphering keys for ciphered broadcast assistance data requested" in the REGISTRATION REQUEST message.

The UE shall set the WUSA bit to "WUS assistance information reception supported" in the 5GMM capability IE if the UE supports WUS assistance information. The UE may include its UE paging probability information in the Requested WUS assistance information IE if the UE has set the WUSA bit to "WUS assistance information reception supported" in the 5GMM capability IE and does not have an active emergency PDU session.

The UE shall set the NR-PSSI bit to "NR paging subgrouping supported" in the 5GMM capability IE if the UE supports PEIPS assistance information, is not registered for emergency services and does not have an active emergency PDU session. The UE may include its UE paging probability information in the Requested PEIPS assistance information IE if the UE has set the NR-PSSI bit to "NR paging subgrouping supported" in the 5GMM capability IE.

If the network supports the N1 NAS signalling connection release, and the MUSIM UE requests the network to release the NAS signalling connection, the UE shall set Request type to "NAS signalling connection release" in the UE request type IE, set the Follow-on request indicator to "No follow-on request pending" and, if the network supports the paging restriction, may set the paging restriction preference in the Paging restriction IE in the REGISTRATION REQUEST message. In addition, the UE shall not include the Uplink data status IE or the Allowed PDU session status IE in the REGISTRATION REQUEST message even if the UE has one or more active always-on PDU sessions associated with the 3GPP access.

NOTE 17: If the network has already indicated support for N1 NAS signalling connection release in the current stored registration area and the UE doesn't have an emergency PDU session established, the MUSIM UE is allowed to request the network to release the NAS signalling connection during registration procedure for mobility and periodic registration update that is due to mobility outside the registration area even before detecting whether the network supports the N1 NAS signalling connection release in the current TAI.

NOTE 18: If the network has already indicated support for paging restriction in the current stored registration area and the UE doesn't have an emergency PDU session established, the MUSIM UE is allowed to include paging restriction together with the request to the network to release the NAS signalling connection during registration procedure for mobility and periodic registration update that is due to mobility outside the registration area even before detecting whether the network supports the paging restriction in the current TAI.

For case zi, the UE shall not include the Paging restriction IE in the REGISTRATION REQUEST message. If the UE is in 5GMM-IDLE mode and the network supports the N1 NAS signalling connection release, the UE may include the UE request type IE and set Request type to "NAS signalling connection release" to remove the paging restriction and request the release of the NAS signalling connection at the same time. In addition, the UE shall not include the Uplink data status IE in the REGISTRATION REQUEST message.

If the UE does not have a valid 5G NAS security context and the UE is sending the REGISTRATION REQUEST message after an inter-system change from S1 mode to N1 mode in 5GMM-IDLE mode, the UE shall send the REGISTRATION REQUEST message without including the NAS message container IE. The UE shall include the entire REGISTRATION REQUEST message (i.e. containing cleartext IEs and non-cleartext IEs, if any) in the NAS message container IE that is sent as part of the SECURITY MODE COMPLETE message as described in subclauses 4.4.6 and 5.4.2.3.

If the UE indicates "mobility registration updating" in the 5GS registration type IE and supports V2X as specified in 3GPP TS 24.587 [19B], the UE shall set the V2X bit to "V2X supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE indicates "mobility registration updating" in the 5GS registration type IE and supports V2X communication over E-UTRA-PC5 as specified in 3GPP TS 24.587 [19B], the UE shall set the V2XCEPC5 bit to "V2X communication over E-UTRA-PC5 supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE indicates "mobility registration updating" in the 5GS registration type IE and supports V2X communication over NR-PC5 as specified in 3GPP TS 24.587 [19B], the UE shall set the V2XCNPC5 bit to "V2X communication over NR-PC5 supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

The UE shall send the REGISTRATION REQUEST message including the NAS message container IE as described in subclause 4.4.6:

a) when the UE is sending the message from 5GMM-IDLE mode, the UE has a valid 5G NAS security context, and needs to send non-cleartext IEs; or

b) when the UE is sending the message after an inter-system change from S1 mode to N1 mode in 5GMM-IDLE mode and the UE has a valid 5G NAS security context and needs to send non-cleartext IEs.

The UE with a valid 5G NAS security context shall send the REGISTRATION REQUEST message without including the NAS message container IE when the UE does not need to send non-cleartext IEs and the UE is sending the message:

a) from 5GMM-IDLE mode; or

b) after an inter-system change from S1 mode to N1 mode in 5GMM-IDLE mode.

If the UE is sending the REGISTRATION REQUEST message after an inter-system change from S1 mode to N1 mode in 5GMM-CONNECTED mode and the UE needs to send non-cleartext IEs, the UE shall cipher the NAS message container IE using the mapped 5G NAS security context and send the REGISTRATION REQUEST message including the NAS message container IE as described in subclause 4.4.6. If the UE does not need to send non-cleartext IEs, the UE shall send the REGISTRATION REQUEST message without including the NAS message container IE.

If the REGISTRATION REQUEST message includes a NAS message container IE, the AMF shall process the REGISTRATION REQUEST message that is obtained from the NAS message container IE as described in subclause 4.4.6.

If the UE is in NB-N1 mode, then the UE shall set the Control plane CIoT 5GS optimization bit to "Control plane CIoT 5GS optimization supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. For all cases except case b, if the UE is capable of NB-S1 mode, then the UE shall set the Control plane CIoT EPS optimization bit to "Control plane CIoT EPS optimization supported" in the S1 UE network capability IE of the REGISTRATION REQUEST message.

If the registration procedure for mobility and periodic registration update is initiated and there is request from the upper layers to perform "emergency services fallback" pending, the UE shall send a REGISTRATION REQUEST message without an Uplink data status IE.

If the UE supports N3 data transfer and multiple user-plane resources in NB-N1 mode (see 3GPP TS 36.306 [25D], 3GPP TS 36.331 [25A]), then the UE shall set the Multiple user-plane resources support bit to "Multiple user-plane resources supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

The UE shall set the ER-NSSAI bit to "Extended rejected NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the NSSRG, then the UE shall set the NSSRG bit to "NSSRG supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

For case zf, the UE shall include the service-level device ID in the Service-level-AA container IE of the REGISTRATION REQUEST message and set the value to the CAA-level UAV ID. The UE shall include the service-level-AA server address in the Service-level-AA container IE of the REGISTRATION REQUEST message and set the value to the USS address, if it is provided by the upper layers. The UE shall include the service-level-AA payload in the Service-level-AA container IE of the REGISTRATION REQUEST message and shall set the service-level-AA payload type, if the service-level-AA payload is provided by upper layers.

NOTE 18: The service-level-AA payload can be of type "C2 authorization payload". The C2 authorization payload can include one or both of an indication of the request for direct C2 communication and pairing information for direct C2 communication.

If the UE supports 5G ProSe direct discovery as specified in 3GPP TS 24.554 [19E], the UE shall set the 5G ProSe-dd bit to "5G ProSe direct discovery supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports 5G ProSe direct communication as specified in 3GPP TS 24.554 [19E], the UE shall set the 5G ProSe-dc bit to "5G ProSe discovery communication supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports acting as 5G ProSe layer-2 UE-to-network relay UE as specified in 3GPP TS 24.554 [19E], the UE shall set the 5G ProSe-l2relay bit to "Acting as a 5G ProSe layer-2 UE-to-network relay UE supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports acting as 5G ProSe layer-3 UE-to-network relay UE as specified in 3GPP TS 24.554 [19E], the UE shall set the 5G ProSe-l3relay bit to "Acting as a 5G ProSe layer-3 UE-to-network relay UE supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports acting as 5G ProSe layer-2 UE-to-network remote UE as specified in 3GPP TS 24.554 [19E], the UE shall set the 5G ProSe-l2rmt bit to "Acting as a 5G ProSe layer-2 UE-to-network remote UE supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports acting as 5G ProSe layer-3 UE-to-network remote UE as specified in 3GPP TS 24.554 [19E], the UE shall set the 5G ProSe-l3rmt bit to "Acting as a 5G ProSe layer-3 UE-to-network remote UE supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports acting as 5G ProSe layer-2 UE-to-UE relay UE as specified in 3GPP TS 24.554 [19E], the UE shall set the 5G ProSe-l2U2U relay bit to "Acting as a 5G ProSe layer-2 UE-to-UE relay UE supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports acting as 5G ProSe layer-3 UE-to-UE relay UE as specified in 3GPP TS 24.554 [19E], the UE shall set the 5G ProSe-l3U2U relay bit to "Acting as a 5G ProSe layer-3 UE-to-UE relay UE supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports acting as 5G ProSe layer-2 end UE as specified in 3GPP TS 24.554 [19E], the UE shall set the 5G ProSe-l2end bit to "Acting as a 5G ProSe layer-2 end UE supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports acting as 5G ProSe layer-3 end UE as specified in 3GPP TS 24.554 [19E], the UE shall set the 5G ProSe-l3end bit to "Acting as a 5G ProSe layer-3 end UE supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

For all cases except case b, if the MUSIM UE supports the N1 NAS signalling connection release, then the UE shall set the N1 NAS signalling connection release bit to "N1 NAS signalling connection release supported" in the 5GMM capability IE of the REGISTRATION REQUEST message otherwise the UE shall not set the N1 NAS signalling connection release bit to "N1 NAS signalling connection release supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

For all cases except case b, if the MUSIM UE supports the paging indication for voice services, then the UE shall set the paging indication for voice services bit to "paging indication for voice services supported" in the 5GMM capability IE of the REGISTRATION REQUEST message otherwise the UE shall not set the paging indication for voice services bit to "paging indication for voice services supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

For all cases except case b, if the MUSIM UE supports the reject paging request, then the UE shall set the reject paging request bit to "reject paging request supported" in the 5GMM capability IE of the REGISTRATION REQUEST message otherwise the UE shall not set the reject paging request bit to "reject paging request supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

For all cases except case b, if the MUSIM UE sets:

- the reject paging request bit to "reject paging request supported";

- the N1 NAS signalling connection release bit to "N1 NAS signalling connection release supported"; or

- both of them;

and supports the paging restriction, then the UE shall set the paging restriction bit to "paging restriction supported" in the 5GMM capability IE of the REGISTRATION REQUEST message otherwise the UE shall not set the paging restriction bit to "paging restriction supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports MINT, the UE shall set the MINT bit to "MINT supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports slice-based N3IWF selection, the UE shall set the SBNS bit to "Slice-based N3IWF selection supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports slice-based TNGF selection, the UE shall set the SBTS bit to "Slice-based TNGF selection supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports UAS services, the UE shall set the UAS bit to "UAS services supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports A2X over E-UTRA-PC5 as specified in 3GPP TS 24.577 [60], the UE shall set the A2XEPC5 bit to "A2X over E-UTRA-PC5 supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports A2X over NR-PC5 as specified in 3GPP TS 24.577 [60], the UE shall set the A2XNPC5 bit to "A2X over NR-PC5 supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports A2X over Uu as specified in 3GPP TS 24.577 [60], the UE shall set the A2X-Uu bit to "A2X over Uu supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

For case zg, if the UE has determined the UE determined PLMN with disaster condition as specified in 3GPP TS 23.122 [5], and:

a) the UE determined PLMN with disaster condition is the HPLMN and:

1) the Additional GUTI IE is included in the REGISTRATION REQUEST message and does not contain a valid 5G-GUTI that was previously assigned by the HPLMN; or

2) the Additional GUTI IE is not included in the REGISTRATION REQUEST message and the 5GS mobile identity IE contains neither the SUCI nor a valid 5G-GUTI that was previously assigned by the HPLMN; or

b) the UE determined PLMN with disaster condition is not the HPLMN and:

1) the Additional GUTI IE is included in the REGISTRATION REQUEST message and does not contain a valid 5G-GUTI that was previously assigned by the UE determined PLMN with disaster condition; or

2) the Additional GUTI IE is not included in the REGISTRATION REQUEST message and the 5GS mobile identity IE does not contain a valid 5G-GUTI that was previously assigned by the UE determined PLMN with disaster condition;

the UE shall include in the REGISTRATION REQUEST message the UE determined PLMN with disaster condition IE indicating the UE determined PLMN with disaster condition.

NOTE 19: If the UE initiates the registration procedure for disaster roaming services, and the UE determined PLMN with disaster condition cannot be determined when an NG-RAN cell of the PLMN broadcasts the disaster related indication as specified in 3GPP TS 23.122 [5], the UE does not include in the REGISTRATION REQUEST message the UE determined PLMN with disaster condition IE but includes the Additional GUTI IE or the 5GS mobile identity IE or both as specified in subclauses 5.5.1.2.2.

For case zh the UE shall indicate "mobility registration updating" in the 5GS registration type IE of the REGISTRATION REQUEST message.

For case zp, the UE shall send the REGISTRATION REQUEST message over the new non-3GPP access. The UE shall include the Uplink data status IE in the REGISTRATION REQUEST message indicating the MA PDU session ID(s) or the single access PDU session ID(s) whose user plan resources are to be switched from the old non-3GPP access to the new non-3GPP access or to be established over the new non-3GPP access, if any. If the UE requests the network to keep using the user plane resources of the old non-3GPP access during path switching to the new non-3GPP access, the UE shall include the Non-3GPP path switching information IE in the REGISTRATION REQUEST message and set the NSONR bit to "non-3GPP path switching while using old non-3GPP resources requested".

If the UE supports event notification, the UE shall set the EventNotification bit to "Event notification supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports access to an SNPN using credentials from a credentials holder and:

a) the UE is in its HPLMN or EHPLMN or the subscribed SNPN; or

b) the UE is in a non-subscribed SNPN and supports equivalent SNPNs;

the UE shall set the SSNPNSI bit to "SOR-SNPN-SI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports equivalent SNPNs, the UE shall set the ESI bit to "equivalent SNPNs supported" in the 5GMM capability IE of the REGISTRATION REQUEST message. If the UE supports LADN per DNN and S-NSSAI, the UE shall set the LADN-DS bit to "LADN per DNN and S-NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the reconnection to the network due to RAN timing synchronization status change, the UE shall set the Reconnection to the network due to RAN timing synchronization status change (RANtiming) bit to "Reconnection to the network due to RAN timing synchronization status change supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports MPS indicator update via the UE configuration update procedure, the UE shall set the MPSIU bit to "MPS indicator update supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports MCS indicator update via the UE configuration update procedure, the UE shall set the MCSIU bit to "MCS indicator update supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports ranging and sidelink positioning as specified in 3GPP TS 24.514 [62] and supports:

a) V2X communication over PC5 as specified in 3GPP TS 24.587 [19B];

b) 5G ProSe direct discovery and 5G ProSe direct communication as specified in 3GPP TS 24.554 [19E]; or

c) both a) and b),

the UE shall set

1. the RSPPC5 bit to "Ranging and sidelink positioning over PC5 supported";
2. the RSLPL bit to "Ranging and sidelink positioning for located UE supported";

c) the RSLPS bit to "Ranging and sidelink positioning for SL positioning server UE supported"; or

d) any combination of a), b) and c), in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the partial network slice, the UE shall set the PNS bit to "Partial network slice supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports network slice usage control, the UE shall set the NSUC bit to "Network slice usage control supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the S-NSSAI time validity information, the UE shall set the TempNS bit to "S-NSSAI time validity information supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the S-NSSAI location validity information, the UE shall set the SLVI bit to "S-NSSAI location validity information supported" in the 5GMM capability IE of the REGISTRATION REQUEST message.

If the UE supports the operator policy for high priorty access exemption for service area restrictions, the UE shall set the HPAOP bit to "Operator policy for high priority access exemption for service area restrictions is supported by the UE" in the 5GMM capability IE of the REGISTRATION REQUEST message.



Figure 5.5.1.3.2.1: Registration procedure for mobility and periodic registration update

\*\*\*\*\* Seventh change \*\*\*\*\*

##### 5.5.1.2.4 Initial registration accepted by the network

During a registration procedure with 5GS registration type IE set to "emergency registration", the AMF shall not check for mobility and access restrictions, regional restrictions or subscription restrictions, or CAG restrictions when processing the REGISTRATION REQUEST message.

If the initial registration request is accepted by the network, the AMF shall send a REGISTRATION ACCEPT message to the UE.

NOTE 0: If the AMF receives the initial registration request over non-3GPP access and detects that the N3IWF used by the UE is compatible with only part of the allowed NSSAI and the UE has not indicated its support for slice-based N3IWF selection in the REGISTRATION REQUEST message, the AMF accepts the initial registration request.

NOTE 0A: If the AMF receives the initial registration request over non-3GPP access and detects that the TNGF used by the UE is compatible with only part of the allowed NSSAI and the UE has not indicated its support for slice-based TNGF selection in the REGISTRATION REQUEST message, the AMF accepts the initial registration request.

For each of the information elements: 5GMM capability, S1 UE network capability, and UE security capability, the AMF shall store all octets received from the UE in the REGISTRATION REQUEST message, up to the maximum length defined for the respective information element.

NOTE 1: This information is forwarded to the new AMF during inter-AMF handover or to the new MME during inter-system handover to S1 mode.

The AMF shall assign and include a TAI list as a registration area the UE is registered to in the REGISTRATION ACCEPT message. The AMF shall not assign a TAI list containing both tracking areas in NB-N1 mode and tracking areas not in NB-N1 mode. The UE, upon receiving a REGISTRATION ACCEPT message, shall delete its old TAI list and store the received TAI list. If the REGISTRATION REQUEST message was received over non-3GPP access, the AMF shall include a single TAI in the TAI list.

NOTE 2: For non-3GPP access, the operator can allocate a TAI per N3IWF, TNGF, TWIF or W-AGF. Each N3IWF, TNGF, TWIF or W-AGF is locally configured with a TAI. Each N3IWF, TNGF, TWIF or W-AGF can be configured with its own TAI value, or with the same TAI value as other N3IWFs, TNGFs, TWIFs or W-AGFs.

NOTE 3: When assigning the TAI list, the AMF can take into account the eNodeB's capability of support of CIoT 5GS optimization.

The AMF may include service area restrictions in the Service area list IE in the REGISTRATION ACCEPT message. The UE, upon receiving a REGISTRATION ACCEPT message with the service area restrictions shall act as described in subclause 5.3.5.

The AMF may also include a list of equivalent PLMNs in the REGISTRATION ACCEPT message. Each entry in the list contains a PLMN code (MCC+MNC). The UE shall store the list as provided by the network, and if the initial registration procedure is not for emergency services, the UE shall remove from the list any PLMN code that is already in the forbidden PLMN list as specified in subclause 5.3.13A. In addition, the UE shall add to the stored list the PLMN code of the registered PLMN that sent the list. The UE shall replace the stored list on each receipt of the REGISTRATION ACCEPT message. If the REGISTRATION ACCEPT message does not contain a list, then the UE shall delete the stored list. The AMF of a PLMN shall not include a list of equivalent SNPNs.

If the ESI bit of the 5GMM capability IE of the REGISTRATION REQUEST message is set to "equivalent SNPNs supported", the AMF of a SNPN may include a list of equivalent SNPNs in the REGISTRATION ACCEPT message. If the initial registration request is for onboarding services in SNPN, the AMF shall not include a list of equivalent SNPNs in the REGISTRATION ACCEPT message. Each entry in the list contains an SNPN identity. The UE shall store the list as provided by the network. If the initial registration procedure is not for emergency services and is not the initial registration for onboarding services in SNPN, the UE shall remove from the list any SNPN identity that is already in:

- the "permanently forbidden SNPNs" list or the "temporarily forbidden SNPNs" list, if the SNPN is not an SNPN selected for localized services in SNPN (see 3GPP TS 23.122 [5]); or

- the "permanently forbidden SNPNs for access for localized services in SNPN" list or the "temporarily forbidden SNPNs for access for localized services in SNPN" list, if the SNPN is an SNPN selected for localized services in SNPN (see 3GPP TS 23.122 [5]).

The UE shall add to the stored list the SNPN identity of the registered SNPN that sent the list. The UE shall replace the stored list on each receipt of the REGISTRATION ACCEPT message. If the REGISTRATION ACCEPT message does not contain a list, then the UE shall delete the stored list. The AMF of an SNPN shall not include a list of equivalent PLMNs.

NOTE 3A: If N1 mode was disabled for an SNPN due to reception of 5GMM cause #27 or #62, the UE implementation ensures that it does not register to this SNPN due to being part of the list of "equivalent SNPNs" received while registered in another SNPN.

If the initial registration procedure is not for emergency services, the UE is not registered for disaster roaming services, and if the PLMN identity of the registered PLMN is a member of the forbidden PLMN list as specified in subclause 5.3.13A, any such PLMN identity shall be deleted from the corresponding list(s).

If the Service area list IE is not included in the REGISTRATION ACCEPT message, any tracking area in the registered PLMN and its equivalent PLMN(s) in the registration area, or in the registered SNPN, is considered as an allowed tracking area as described in subclause 5.3.5.

If the REGISTRATION REQUEST message contains the LADN indication IE, based on the LADN indication IE, UE subscription information, UE location and local configuration about LADN and:

- if the LADN indication IE includes requested LADN DNNs, the UE subscribed DNN list includes the requested LADN DNNs or the wildcard DNN, and the LADN service area of the requested LADN DNN has an intersection with the current registration area, the AMF shall determine the requested LADN DNNs included in the LADN indication IE as LADN DNNs for the UE;

- if no requested LADN DNNs included in the LADN indication IE and the wildcard DNN is included in the UE subscribed DNN list, the AMF shall determine the LADN DNN(s) configured in the AMF whose LADN service area has an intersection with the current registration area as LADN DNNs for the UE; or

- if no requested LADN DNNs included in the LADN indication IE and the wildcard DNN is not included in the UE subscribed DNN list, or if the UE subscribed DNN list does not include any of the DNN's in the LADN indication IE, the AMF shall determine the LADN DNN(s) included in the UE subscribed DNN list whose LADN service area has an intersection with the current registration area as LADN DNNs for the UE.

If the LADN indication IE is not included in the REGISTRATION REQUEST message, the AMF shall determine the LADN DNN(s) included in the UE subscribed DNN list whose service area has an intersection with the current registration area as LADN DNNs for the UE, except for the wildcard DNN included in the UE subscribed DNN list.

If the UE supports WUS assistance information and the AMF supports and accepts the use of WUS assistance information for the UE, then the AMF shall determine the negotiated UE paging probability information for the UE, store it in the 5GMM context of the UE, and if the UE is not performing the initial registration for emergency services, the AMF shall include it in the Negotiated WUS assistance information IE in the REGISTRATION ACCEPT message. The AMF may consider the UE paging probability information received in the Requested WUS assistance information IE when determining the negotiated UE paging probability information for the UE.

NOTE 4: Besides the UE paging probability information requested by the UE, the AMF can take local configuration or previous statistical information for the UE into account when determining the negotiated UE paging probability information for the UE.

If the UE sets the NR-PSSI bit to "NR paging subgrouping supported" in the 5GMM capability IE in the REGISTRATION REQUEST message and the AMF supports and accepts the use of PEIPS assistance information for the UE, then the AMF shall determine the Paging subgroup ID for the UE, store it in the 5GMM context of the UE, and shall include it in the Negotiated PEIPS assistance information IE in the REGISTRATION ACCEPT message or in the Updated PEIPS assistance information IE in the CONFIGURATION UPDATE COMMAND message as part of the registration procedure. The AMF may consider the UE paging probability information received in the Requested PEIPS assistance information IE when determining the Paging subgroup ID for the UE.

NOTE 5: Besides the UE paging probability information when provided by the UE, the AMF can also take local configuration, whether the UE is likely to receive IMS voice over PS session calls, UE mobility pattern or previous statistical information for the UE or information provided by the NG-RAN into account when determining the Paging subgroup ID for the UE.

If the UE set the UN-PER bit to "unavailability period supported" in the 5GMM capability IE in the REGISTRATION REQUEST message and the AMF supports and accepts the use of unavailability period for the UE, then the AMF shall set the UN-PER bit to "unavailability period supported" in the 5GS network feature support IE in the REGISTRATION ACCEPT message. Furthermore, if the AMF is able to determine an unavailability period duration for the UE based on satellite coverage availability information (see 3GPP TS 23.401 [7]), the AMF shall store the determined unavailability period duration and provide the determined unavailability period duration to the UE by including the unavailability period duration in the Unavailability configuration IE in the REGISTRATION ACCEPT message. If the AMF is able to determine the start of unavailability period based on satellite coverage availability information (see 3GPP TS 23.401 [7]), the AMF shall store the determined start of unavailability period and provide the determined start of unavailability period to the UE by including the start of unavailability period in the Unavailability configuration IE in the REGISTRATION ACCEPT message. The AMF may determine the periodic registration update timer value based on the network determined unavailability period duration, a network determined start of the unavailability period or a discontinuous coverage maximum time offset value or any combination of them.

The AMF shall include the LADN information which consists of the determined LADN DNNs for the UE and LADN service area(s) available in the current registration area in the LADN information IE of the REGISTRATION ACCEPT message.

If the UE has set the LADN-DS bit to "LADN per DNN and S-NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message and the extended LADN information is available for the UE, the AMF shall include the extended LADN information which consists of the determined LADN DNNs for the UE, the S-NSSAIs associated with the determined LADN DNNs for the UE and in the allowed NSSAI or partially allowed NSSAI, and LADN service area(s) available in the current registration area in the Extended LADN information IE in the Registration accept type 6 IE container IE of the REGISTRATION ACCEPT message.

NOTE 5A0: The AMF allocates the LADN service area and the TAI list associated with the S-NSSAI in the partially allowed NSSAI independently, if applicable.

If:

a) the UE does not support LADN per DNN and S-NSSAI;

b) the UE is subscribed to the LADN DNN for a single S-NSSAI only; and

c) the AMF has the extended LADN information but no LADN information;

the AMF may decide to provide the LADN service area for that LADN DNN of the extended LADN information as the LADN information and include the LADN information in the LADN information IE of the REGISTRATION ACCEPT message.

NOTE 5A: If the LADN service area is configured per DNN and S-NSSAI, in order to serve the UEs that do not support LADN per DNN and S-NSSAI, it is recommended that the LADN DNN is only served by a single S-NSSAI.

NOTE 5B: For the case when the UE is subscribed to the LADN DNN for multiple S-NSSAIs, the AMF can treat this as no extended LADN information is available.

If the UE does not support LADN per DNN and S-NSSAI and the AMF has neither the LADN information nor the extended LADN information, the AMF shall not provide any LADN information to the UE.

The UE, upon receiving the REGISTRATION ACCEPT message with the LADN information, shall store the received LADN information. The UE, upon receiving the REGISTRATION ACCEPT message with the Extended LADN information in the Registration accept type 6 IE container IE, shall store the received extended LADN information. If there exists one or more LADN DNNs which are included in the LADN indication IE of the REGISTRATION REQUEST message and are not included in the LADN information IE and Extended LADN information IE in the Registration accept type 6 IE container IE of the REGISTRATION ACCEPT message, the UE considers such LADN DNNs as not available in the current registration area.

The 5G-GUTI reallocation shall be part of the initial registration procedure. During the initial registration procedure, if the AMF has not allocated a new 5G-GUTI by the generic UE configuration update procedure, the AMF shall include in the REGISTRATION ACCEPT message the new assigned 5G-GUTI together with the assigned TAI list.

If the UE has set the CAG bit to "CAG supported" in the 5GMM capability IE of the REGISTRATION REQUEST message and the AMF needs to update the "CAG information list" stored in the UE, the AMF shall include the CAG information list IE or the Extended CAG information list IE in the REGISTRATION ACCEPT message.

NOTE 6: The "CAG information list" can be provided by the AMF and include no entry if no "CAG information list" exists in the subscription.

NOTE 7: If the UE supports extended CAG information list, the CAG information list can be included either in the CAG information list IE or Extended CAG information list IE.

If the UE does not support extended CAG information list, the CAG information list shall not be included in the Extended CAG information list IE.

If a 5G-GUTI or the SOR transparent container IE is included in the REGISTRATION ACCEPT message, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If the Operator-defined access category definitions IE, the Extended emergency number list IE, the CAG information list IE or the Extended CAG information list IE are included in the REGISTRATION ACCEPT message, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If the UE has set the RCMAP bit to "Sending of REGISTRATION COMPLETE message for negotiated PEIPS assistance information supported" in the 5GMM capability IE of the REGISTRATION REQUEST message and if the Negotiated PEIPS assistance information IE is included in the REGISTRATION ACCEPT message, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If the UE is not in NB-N1 mode and the UE has set the RACS bit to "RACS supported" in the 5GMM Capability IE of the REGISTRATION REQUEST message, the AMF may include either a UE radio capability ID IE or a UE radio capability ID deletion indication IE in the REGISTRATION ACCEPT message. If the UE radio capability ID IE or the UE radio capability ID deletion indication IE is included in the REGISTRATION ACCEPT message, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

The AMF shall include the MICO indication IE in the REGISTRATION ACCEPT message only if the MICO indication IE was included in the REGISTRATION REQUEST message, the AMF supports and accepts the use of MICO mode. If the AMF supports and accepts the use of MICO mode, the AMF may indicate "all PLMN registration area allocated" in the MICO indication IE in the REGISTRATION ACCEPT message. If "all PLMN registration area allocated" is indicated in the MICO indication IE, the AMF shall not assign and include the TAI list in the REGISTRATION ACCEPT message. If the REGISTRATION ACCEPT message included an MICO indication IE indicating "all PLMN registration area allocated", the UE shall treat all TAIs in the current PLMN as a registration area and delete its old TAI list. If "strictly periodic registration timer supported" is indicated in the MICO indication IE in the REGISTRATION REQUEST message, the AMF may indicate "strictly periodic registration timer supported" in the MICO indication IE in the REGISTRATION ACCEPT message.

The AMF shall include an active time value in the T3324 IE in the REGISTRATION ACCEPT message if the UE requested an active time value in the REGISTRATION REQUEST message and the AMF accepts the use of MICO mode and the use of active time.

If the AMF supports and accepts the use of MICO, and the UE included the Requested T3512 value IE in the REGISTRATION REQUEST message, then the AMF shall take into account the T3512 value requested when providing the T3512 value IE in the REGISTRATION ACCEPT message.

NOTE 7A: The T3512 value assigned to the UE by AMF can be different from the T3512 value requested by the UE. AMF can take several factors into account when assigning the T3512 value, e.g. local configuration, expected UE behaviour, UE requested T3512 value, UE subscription data, network policies.

The AMF shall include the T3512 value IE in the REGISTRATION ACCEPT message only if the REGISTRATION REQUEST message was sent over the 3GPP access.

The AMF shall include the non-3GPP de-registration timer value IE in the REGISTRATION ACCEPT message only if the REGISTRATION REQUEST message was sent over the non-3GPP access.

If the UE requests "control plane CIoT 5GS optimization" in the 5GS update type IE, indicates support of control plane CIoT 5GS optimization in the 5GMM capability IE and the AMF decides to accept the requested CIoT 5GS optimization and the registration request, the AMF shall indicate "control plane CIoT 5GS optimization supported" in the 5GS network feature support IE of the REGISTRATION ACCEPT message.

The AMF may include the T3447 value IE set to the service gap time value in the REGISTRATION ACCEPT message if:

- the UE has indicated support for service gap control in the REGISTRATION REQUEST message; and

- a service gap time value is available in the 5GMM context.

If there is a running T3447 timer in the AMF and the Follow-on request indicator is set to "Follow-on request pending" in the REGISTRATION REQUEST message, the AMF shall ignore the flag and proceed as if the flag was not received except for the following cases:

a) the UE is configured for high priority access in the selected PLMN; or

b) the 5GS registration type IE in the REGISTRATION REQUEST message is set to "emergency registration".

If the UE has indicated support for the control plane CIoT 5GS optimizations, and the AMF decides to activate the congestion control for transport of user data via the control plane, then the AMF shall include the T3448 value IE in the REGISTRATION ACCEPT message.

If:

- the UE in NB-N1 mode is using control plane CIoT 5GS optimization; and

- the network is configured to provide the truncated 5G-S-TMSI configuration for control plane CIoT 5GS optimizations;

the AMF shall include the Truncated 5G-S-TMSI configuration IE in the REGISTRATION ACCEPT message and set the "Truncated AMF Set ID value" and the "Truncated AMF Pointer value" in the Truncated 5G-S-TMSI configuration IE based on network policies. The AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If the UE has included the service-level device ID set to the CAA-level UAV ID in the Service-level-AA container IE of the REGISTRATION REQUEST message, and if:

- the UE has a valid aerial UE subscription information;

- the UUAA procedure is to be performed during the registration procedure according to operator policy;

- there is no valid successful UUAA result for the UE in the UE 5GMM context; and

- the REGISTRATION REQUEST message was not received over non-3GPP access,

then the AMF shall initiate the UUAA-MM procedure with the UAS-NF as specified in 3GPP TS 23.256 [6AB] and shall include a service-level-AA pending indication in the Service-level-AA container IE of the REGISTRATION ACCEPT message. The AMF shall store in the UE 5GMM context that a UUAA procedure is pending. The AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3. If the REGISTRATION REQUEST message was received over non-3GPP access, the AMF shall not initiate UUAA-MM procedure.

If the UE has included the service-level device ID set to the CAA-level UAV ID in the Service-level-AA container IE of the REGISTRATION REQUEST message, and if:

- the UE has a valid aerial UE subscription information;

- the UUAA procedure is to be performed during the registration procedure according to operator policy; and

- there is a valid successful UUAA result for the UE in the UE 5GMM context,

then the AMF shall include a service-level-AA response in the Service-level-AA container IE of the REGISTRATION ACCEPT message and set the SLAR field in the service-level-AA response to "Service level authentication and authorization was successful".

If the AMF determines that the UUAA-MM procedure needs to be performed for a UE, the AMF has not received the service-level device ID set to the CAA-level UAV ID in the Service-level-AA container IE of the REGISTRATION REQUEST message from the UE and the AMF decides to accept the UE to be registered for other services than UAS services based on the user's subscription data and the operator policy, the AMF shall accept the initial registration request and shall mark in the UE's 5GMM context that the UE is not allowed to request UAS services.

If the UE supports MINT, the AMF may include the List of PLMNs to be used in disaster condition IE in the REGISTRATION ACCEPT message.

If the UE supports MINT, the AMF may include the Disaster roaming wait range IE in the REGISTRATION ACCEPT message.

If the UE supports MINT, the AMF may include the Disaster return wait range IE in the REGISTRATION ACCEPT message.

NOTE 8: The AMF can determine the contents of the "list of PLMN(s) to be used in disaster condition", the value of the disaster roaming wait range and the value of the disaster return wait range based on the network local configuration.

If the AMF received the list of TAIs from the satellite NG-RAN as described in 3GPP TS 23.501 [8], and determines that, by UE subscription and operator's preferences, any but not all TAIs in the received list of TAIs is forbidden for roaming or for regional provision of service, the AMF shall include the TAI(s) in:

a) the Forbidden TAI(s) for the list of "5GS forbidden tracking areas for roaming" IE; or

b) the Forbidden TAI(s) for the list of "5GS forbidden tracking areas for regional provision of service" IE; or

c) both;

in the REGISTRATION ACCEPT message.

NOTE 9: Void.

If the UE has set the Reconnection to the network due to RAN timing synchronization status change (RANtiming) bit to "Reconnection to the network due to RAN timing synchronization status change supported" in the 5GMM capability IE of the REGISTRATION REQUEST message, the AMF may include the RAN timing synchronization IE with the RecReq bit set to "Reconnection requested" in the REGISTRATION ACCEPT message.

If the AMF receives the initial registration request along with the mobile IAB-indication over N2 reference point (see TS 38.413 [31]) from UE and the UE is authorized to operate as an MBSR based on the subscription information and local policy (see 3GPP TS 23.501 [8]), the AMF shall include the Feature authorization indication IE in the REGISTRATION ACCEPT message and shall set the MBSRAI field to "authorized to operate as MBSR". If the AMF receives the initial registration request along with the mobile IAB-indication over N2 reference point (see TS 38.413 [31]) from UE and the UE is not authorized to operate as an MBSR based on the subscription information and local policy but can operate as a UE, the AMF shall include the Feature authorization indication IE in the REGISTRATION ACCEPT message and shall set the MBSRAI field to "not authorized to operate as MBSR but allowed to operate as a UE".

If the UE supports user plane positioning using LCS-UPP, SUPL, or both, the AMF shall set the LCS-UPP bit, the SUPL bit, or both in the 5GS network feature support IE of the REGISTRATION ACCEPT message as specified in 3GPP TS 24.572 [64].

Upon receipt of the REGISTRATION ACCEPT message, the UE shall reset the registration attempt counter, enter state 5GMM-REGISTERED and set the 5GS update status to 5U1 UPDATED.

If the UE receives the REGISTRATION ACCEPT message from a PLMN, then the UE shall reset the PLMN-specific attempt counter for that PLMN for the specific access type for which the message was received. The UE shall also reset the PLMN-specific N1 mode attempt counter for that PLMN for the specific access type for which the message was received. If the message was received via 3GPP access, the UE shall reset the counter for "SIM/USIM considered invalid for GPRS services" events and the counter for "SIM/USIM considered invalid for non-GPRS services" events, if any. If the message was received via non-3GPP access, the UE shall reset the counter for "USIM considered invalid for 5GS services over non-3GPP" events.

If the UE receives the REGISTRATION ACCEPT message from an SNPN, then the UE shall reset the SNPN-specific attempt counter for the current SNPN for the specific access type for which the message was received. If the message was received via 3GPP access, the UE shall reset the counter for "the entry for the current SNPN considered invalid for 3GPP access" events. If the message was received via non-3GPP access, the UE shall reset the counter for "the entry for the current SNPN considered invalid for non-3GPP access" events.

If the REGISTRATION ACCEPT message included a T3512 value IE, the UE shall use the value in the T3512 value IE as periodic registration update timer (T3512).

If the REGISTRATION ACCEPT message include a T3324 value IE, the UE shall use the value in the T3324 value IE as active timer (T3324).

If the REGISTRATION ACCEPT message included a non-3GPP de-registration timer value IE, the UE shall use the value in non-3GPP de-registration timer value IE as non-3GPP de-registration timer.

If the REGISTRATION ACCEPT message contains

a) the Network slicing indication IE with the Network slicing subscription change indication set to "Network slicing subscription changed";

b) a Configured NSSAI IE with a new configured NSSAI for the current PLMN or SNPN and optionally the mapped S-NSSAI(s) for the configured NSSAI for the current PLMN or SNPN;

c) an NSSRG information IE with a new NSSRG information;

d) an Alternative NSSAI IE with a new alternative NSSAI;

e) an S-NSSAI location validity information in the Registration accept type 6 IE container IE with a new S-NSSAI location validity information;

f) an S-NSSAI time validity information IE with a new S-NSSAI time validity information; or

g) an On-demand NSSAI IE with a new on-demand NSSAI or an updated slice deregistration inactivity timer value,

the UE shall return a REGISTRATION COMPLETE message to the AMF to acknowledge the successful update of the network slicing information. If the UE has set the RCMAN bit to "Sending of REGISTRATION COMPLETE message for NSAG information supported" in the 5GMM capability IE of the REGISTRATION REQUEST message and if REGISTRATION ACCEPT message contains the NSAG information IE, the UE shall return REGISTRATION COMPLETE message to the AMF to acknowledge the reception of the NSAG information IE.

NOTE 9A: When the UE receives the NSSRG information IE, the UE may provide the NSSRG information to lower layers for the purpose of NSAG-aware cell reselection.

If the REGISTRATION ACCEPT message contains the CAG information list IE or the Extended CAG information list IE and the UE had set the CAG bit to "CAG supported" in the 5GMM capability IE of the REGISTRATION REQUEST message, the UE shall:

a) replace the "CAG information list" stored in the UE with the received CAG information list IE or the Extended CAG information list IE when received in the HPLMN or EHPLMN;

NOTE 10: When the UE receives the CAG information list IE or the Extended CAG information list IE in the HPLMN whose PLMN code is derived from the IMSI, the EHPLMN list is present and is not empty and the HPLMN is not present in the EHPLMN list, the UE behaves as if it receives the CAG information list IE or the Extended CAG information list IE in a VPLMN.

b) replace the serving VPLMN's entry of the "CAG information list" stored in the UE with the serving VPLMN's entry of the received CAG information list IE or the Extended CAG information list IE when the UE receives the CAG information list IE or the Extended CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN; or

NOTE 11: When the UE receives the CAG information list IE or the Extended CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN, entries of a PLMN other than the serving VPLMN, if any, in the received CAG information list IE or the Extended CAG information list IE are ignored.

c) remove the serving VPLMN's entry of the "CAG information list" stored in the UE when the UE receives the CAG information list IE or the Extended CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN and the CAG information list IE or the Extended CAG information list IE does not contain the serving VPLMN's entry.

The UE shall store the "CAG information list" received in the CAG information list IE or the Extended CAG information list IE as specified in annex C.

If the received "CAG information list" includes an entry containing the identity of the registered PLMN, the UE shall operate as follows:

a) if the UE receives the REGISTRATION ACCEPT message via a CAG cell, none of the CAG-ID(s) supported by the current CAG cell is authorized based on the "Allowed CAG list" of the entry for the registered PLMN in the received "CAG information list", and:

1) the entry for the registered PLMN in the received "CAG information list" does not include an "indication that the UE is only allowed to access 5GS via CAG cells", then the UE shall enter the state 5GMM-REGISTERED.LIMITED-SERVICE and shall search for a suitable cell according to 3GPP TS 38.304 [28] or 3GPP TS 36.304 [25C] with the updated "CAG information list"; or

2) the entry for the registered PLMN in the received "CAG information list" includes an "indication that the UE is only allowed to access 5GS via CAG cells" and:

i) if one or more CAG-ID(s) are authorized based on the "Allowed CAG list" of the entry for the registered PLMN in the received "CAG information list", the UE shall enter the state 5GMM-REGISTERED.LIMITED-SERVICE and shall search for a suitable cell according to 3GPP TS 38.304 [28] with the updated "CAG information list"; or

ii) if no CAG-ID is authorized based on the "Allowed CAG list" of the entry for the registered PLMN in the received "CAG information list", the UE has not set the 5GS registration type IE in the REGISTRATION REQUEST message to "emergency registration", and the initial registration was not initiated to perform handover of an existing emergency PDU session from the non-current access to the current access, then the UE shall enter the state 5GMM-REGISTERED.PLMN-SEARCH and shall apply the PLMN selection process defined in 3GPP TS 23.122 [5] with the updated "CAG information list"; or

b) if the UE receives the REGISTRATION ACCEPT message via a non-CAG cell and the entry for the registered PLMN in the received "CAG information list" includes an "indication that the UE is only allowed to access 5GS via CAG cells" and:

1) if one or more CAG-ID(s) are authorized based on the "allowed CAG list" for the registered PLMN in the received "CAG information list", the UE shall enter the state 5GMM-REGISTERED.LIMITED-SERVICE and shall search for a suitable cell according to 3GPP TS 38.304 [28] with the updated "CAG information list"; or

2) if no CAG-ID is authorized based on the "Allowed CAG list" of the entry for the registered PLMN in the received "CAG information list", the UE has not set the 5GS registration type IE in the REGISTRATION REQUEST message to "emergency registration", and the initial registration was not initiated to perform handover of an existing emergency PDU session from the non-current access to the current access, then the UE shall enter the state 5GMM-REGISTERED.PLMN-SEARCH and shall apply the PLMN selection process defined in 3GPP TS 23.122 [5] with the updated "CAG information list".

If the received "CAG information list" does not include an entry containing the identity of the registered PLMN and the UE receives the REGISTRATION ACCEPT message via a CAG cell, the UE shall enter the state 5GMM-REGISTERED.LIMITED-SERVICE and shall search for a suitable cell according to 3GPP TS 38.304 [28] or 3GPP TS 36.304 [25C] with the updated "CAG information list".

If the REGISTRATION ACCEPT message contains the Operator-defined access category definitions IE, the Extended emergency number list IE ,the CAG information list IE or the Extended CAG information list IE, the UE shall return a REGISTRATION COMPLETE message to the AMF to acknowledge reception of the operator-defined access category definitions, the extended local emergency numbers list or the "CAG information list".

If the UE has set the RCMAP bit to "Sending of REGISTRATION COMPLETE message for negotiated PEIPS parameters supported" in the 5GMM capability IE of the REGISTRATION REQUEST message and if REGISTRATION ACCEPT message contains the Negotiated PEIPS assistance information IE, the UE shall return REGISTRATION COMPLETE message to the AMF to acknowledge the reception of the Negotiated PEIPS assistance information IE.

If the REGISTRATION ACCEPT message contains the UE radio capability ID IE or the UE radio capability ID deletion indication IE, the UE shall return a REGISTRATION COMPLETE message to the AMF to acknowledge reception of the UE radio capability ID IE or the UE radio capability ID deletion indication IE.

Upon receiving a REGISTRATION COMPLETE message, the AMF shall stop timer T3550 and change to state 5GMM-REGISTERED. The 5G-GUTI, if sent in the REGISTRATION ACCEPT message, shall be considered as valid, the PEIPS assistance information, if sent in the REGISTRATION ACCEPT message, shall be considered as valid, and the UE radio capability ID, if sent in the REGISTRATION ACCEPT, shall be considered as valid.

If the 5GS update type IE was included in the REGISTRATION REQUEST message with the SMS requested bit set to "SMS over NAS supported", and SMSF selection is successful, then the AMF shall send the REGISTRATION ACCEPT message after the SMSF has confirmed that the activation of the SMS service was successful. When sending the REGISTRATION ACCEPT message, the AMF shall:

a) set the SMS allowed bit of the 5GS registration result IE to "SMS over NAS allowed" in the REGISTRATION ACCEPT message, if the UE has set the SMS requested bit of the 5GS update type IE to "SMS over NAS supported" in the REGISTRATION REQUEST message and the network allows the use of SMS over NAS for the UE; and

b) store the SMSF address and the value of the SMS allowed bit of the 5GS registration result IE in the UE 5GMM context and consider the UE available for SMS over NAS.

If:

a) the SMSF selection in the AMF is not successful;

b) the SMS activation via the SMSF is not successful;

c) the AMF does not allow the use of SMS over NAS;

d) the SMS requested bit of the 5GS update type IE was set to "SMS over NAS not supported" in the REGISTRATION REQUEST message; or

e) the 5GS update type IE was not included in the REGISTRATION REQUEST message;

then the AMF shall set the SMS allowed bit of the 5GS registration result IE to "SMS over NAS not allowed" in the REGISTRATION ACCEPT message.

When the UE receives the REGISTRATION ACCEPT message, if the UE is also registered over another access to the same PLMN, the UE considers the value indicated by the SMS allowed bit of the 5GS registration result IE as applicable for both accesses over which the UE is registered.

The AMF shall include the 5GS registration result IE in the REGISTRATION ACCEPT message. If the 5GS registration result value in the 5GS registration result IE indicates:

a) "3GPP access", the UE:

- shall consider itself as being registered to 3GPP access; and

- if in 5GMM-REGISTERED state over non-3GPP access and on the same PLMN or SNPN as 3GPP access, shall enter state 5GMM-DEREGISTERED.ATTEMPTING-REGISTRATION over non-3GPP access and set the 5GS update status to 5U2 NOT UPDATED over non-3GPP access; or

b) "Non-3GPP access", the UE:

- shall consider itself as being registered to non-3GPP access; and

- if in the 5GMM-REGISTERED state over 3GPP access and is on the same PLMN or SNPN as non-3GPP access, shall enter the state 5GMM-DEREGISTERED.ATTEMPTING-REGISTRATION over 3GPP access and set the 5GS update status to 5U2 NOT UPDATED over 3GPP access; or

c) "3GPP access and non-3GPP access", the UE shall consider itself as being registered to both 3GPP access and non-3GPP access.

In roaming scenarios, the AMF shall provide mapped S-NSSAI(s) for the configured NSSAI, the allowed NSSAI, the partially allowed NSSAI, the rejected NSSAI (if Extended rejected NSSAI IE is used) , the partially rejected NSSAI, the pending NSSAI or NSSRG information when included in the REGISTRATION ACCEPT message.

The AMF shall include the allowed NSSAI for the current PLMN or SNPN and shall include the mapped S-NSSAI(s) for the allowed NSSAI contained in the requested NSSAI from the UE if available, in the REGISTRATION ACCEPT message if the UE included the requested NSSAI in the REGISTRATION REQUEST message and the AMF allows one or more S-NSSAIs in the requested NSSAI. Additionally, if the AMF allows one or more subscribed S-NSSAIs for the UE, the AMF may include the allowed subscribed S-NSSAI(s) in the allowed NSSAI in the REGISTRATION ACCEPT message.

The AMF may also include rejected NSSAI in the REGISTRATION ACCEPT message if the initial registration request is not for onboarding services in SNPN. If the UE has set the ER-NSSAI bit to "Extended rejected NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message, the rejected NSSAI shall be included in the Extended rejected NSSAI IE in the REGISTRATION ACCEPT message; otherwise the rejected NSSAI shall be included in the Rejected NSSAI IE in the REGISTRATION ACCEPT message. If the initial registration request is for onboarding services in SNPN, the AMF shall not include rejected NSSAI in the REGISTRATION ACCEPT message.

If the UE has indicated the support for partial network slice and the AMF determines one or more S-NSSAI(s) in the requested NSSAI are to be included in the partially rejected NSSAI as specified in subclause 4.6.2.11, the AMF shall include the Partially rejected NSSAI IE in the Registration accept type 6 IE container IE of the REGISTRATION ACCEPT message.

If the UE receives the Partially rejected NSSAI IE in the Registration accept type 6 IE container IE of the REGISTRATION ACCEPT message, the UE shall store the partially rejected NSSAI as specified in subclause 4.6.2.2.

If the UE has set the ER-NSSAI bit to "Extended rejected NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message, the rejected NSSAI contains S-NSSAI(s) which was included in the requested NSSAI but rejected by the network associated with rejection cause(s); otherwise the rejected NSSAI contains S-NSSAI(s) which was included in the requested NSSAI but rejected by the network associated with rejection cause(s) with the following restrictions:

a) rejected NSSAI for the current PLMN or SNPN shall not include an S-NSSAI for the current PLMN or SNPN which is associated to multiple mapped S-NSSAIs and some of these but not all mapped S-NSSAIs are not allowed; and

b) rejected NSSAI for the current registration area shall not include an S-NSSAI for the current PLMN or SNPN which is associated to multiple mapped S-NSSAIs and some of these but not all mapped S-NSSAIs are not allowed.

NOTE 12: The UE that does not support extended rejected NSSAI can avoid requesting an S-NSSAI associated with a mapped S-NSSAI, which was included in the previous requested NSSAI but neither in the allowed NSSAI nor in the rejected NSSAI in the consequent registration procedures.

If the UE indicated the support for network slice-specific authentication and authorization, and if the Requested NSSAI IE includes one or more S-NSSAIs subject to network slice-specific authentication and authorization, the AMF shall in the REGISTRATION ACCEPT message include:

a) the allowed NSSAI containing the S-NSSAI(s) or the mapped S-NSSAI(s), if any:

1) which are not subject to network slice-specific authentication and authorization and are allowed by the AMF; or

2) for which the network slice-specific authentication and authorization has been successfully performed;

aa) the partially allowed NSSAI containing the S-NSSAI(s) or the mapped S-NSSAI(s), if any:

1) which are not subject to network slice-specific authentication and authorization and are allowed by the AMF; or

2) for which the network slice-specific authentication and authorization has been successfully performed;

b) optionally, the rejected NSSAI;

ba) optionally, the partially rejected NSSAI;

c) pending NSSAI containing one or more S-NSSAIs for which network slice-specific authentication and authorization (except for re-NSSAA) will be performed or is ongoing, and one or more S-NSSAIs from the pending NSSAI which the AMF provided to the UE during the previous registration procedure for which network slice-specific authentication and authorization will be performed or is ongoing, if any; and

d) the "NSSAA to be performed" indicator in the 5GS registration result IE set to indicate that the network slice-specific authentication and authorization procedure will be performed by the network, if the allowed NSSAI is not included in the REGISTRATION ACCEPT message.

If the initial registration request is not for onboarding services in SNPN, the UE indicated the support for network slice-specific authentication and authorization, and:

a) the UE did not include the requested NSSAI in the REGISTRATION REQUEST message or none of the S-NSSAIs in the requested NSSAI in the REGISTRATION REQUEST message are allowed;

b) all default S-NSSAIs are subject to network slice-specific authentication and authorization; and

c) the network slice-specific authentication and authorization procedure has not been successfully performed for any of the default S-NSSAIs,

the AMF shall in the REGISTRATION ACCEPT message include:

a) the "NSSAA to be performed" indicator in the 5GS registration result IE to indicate that the network slice-specific authentication and authorization procedure will be performed by the network;

b) pending NSSAI containing one or more default S-NSSAIs for which network slice-specific authentication and authorization will be performed or is ongoing and one or more S-NSSAIs from the pending NSSAI which the AMF provided to the UE during the previous registration procedure for which network slice-specific authentication and authorization will be performed or is ongoing (if any);

c) optionally, the rejected NSSAI; and

e) optionally, the partially rejected NSSAI.

If the initial registration request is not for onboarding services in SNPN, the UE indicated the support for network slice-specific authentication and authorization, and:

a) the UE did not include the requested NSSAI in the REGISTRATION REQUEST message or none of the S-NSSAIs in the requested NSSAI in the REGISTRATION REQUEST message are allowed; and

b) one or more default S-NSSAIs are not subject to network slice-specific authentication and authorization or the network slice-specific authentication and authorization procedure has been successfully performed for one or more default S-NSSAIs;

the AMF shall in the REGISTRATION ACCEPT message include:

a) pending NSSAI containing one or more default S-NSSAIs for which network slice-specific authentication and authorization will be performed or is ongoing (if any) and one or more S-NSSAIs from the pending NSSAI which the AMF provided to the UE during the previous registration procedure for which network slice-specific authentication and authorization will be performed or is ongoing (if any);

b) allowed NSSAI containing S-NSSAI(s) for the current PLMN each of which corresponds to a default S-NSSAI which are not subject to network slice-specific authentication and authorization or for which the network slice-specific authentication and authorization has been successfully performed;

c) allowed NSSAI containing one or more default S-NSSAIs, as the mapped S-NSSAI(s) for the allowed NSSAI in roaming scenarios, which are not subject to network slice-specific authentication and authorization or for which the network slice-specific authentication and authorization has been successfully performed; and

d) optionally, the rejected NSSAI.

If the UE did not include the requested NSSAI in the REGISTRATION REQUEST message or none of the S-NSSAIs in the requested NSSAI in the REGISTRATION REQUEST message are allowed, the allowed NSSAI shall not contain default S-NSSAI(s) that are subject to NSAC. If the subscription information includes the NSSRG information, the S-NSSAIs of the allowed NSSAI shall be associated with at least one common NSSRG value.

When the REGISTRATION ACCEPT message includes a pending NSSAI, the pending NSSAI shall contain all S-NSSAIs for which network slice-specific authentication and authorization (except for re-NSSAA) will be performed or is ongoing from the requested NSSAI of the REGISTRATION REQUEST message that was received over the 3GPP access, non-3GPP access, or both the 3GPP access and non-3GPP access.

If the UE supports extended rejected NSSAI and the AMF determines that maximum number of UEs reached for one or more S-NSSAI(s) in the requested NSSAI as specified in subclause 4.6.2.5, the AMF shall include the rejected NSSAI containing one or more S-NSSAIs with the rejection cause "S-NSSAI not available due to maximum number of UEs reached" in the Extended rejected NSSAI IE in the REGISTRATION ACCEPT message. In addition, the AMF may include a back-off timer value for each S-NSSAI with the rejection cause "S-NSSAI not available due to maximum number of UEs reached" included in the Extended rejected NSSAI IE of the REGISTRATION ACCEPT message. To avoid that large numbers of UEs simultaneously initiate deferred requests, the network should select the value for the backoff timer for each S-NSSAI for the informed UEs so that timeouts are not synchronised.

If the UE does not indicate support for extended rejected NSSAI and the maximum number of UEs has been reached, the AMF should include the rejected NSSAI containing one or more S-NSSAIs with the rejection cause "S-NSSAI not available in the current registration area" in the Rejected NSSAI IE and should not include these S-NSSAIs in the allowed NSSAI in the REGISTRATION ACCEPT message.

NOTE 13: Based on network policies, the AMF can include the S-NSSAI(s) for which the maximum number of UEs has been reached in the rejected NSSAI with rejection causes other than "S-NSSAI not available in the current registration area".

If the UE indicates support for network slice usage control and the AMF determines to provide on-demand NSSAI, the AMF shall include the On-demand NSSAI IE in the REGISTRATION ACCEPT message. In addition, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If the UE receives the On-demand NSSAI IE in the REGISTRATION ACCEPT message, the UE shall store the on-demand NSSAI as specified in subclause 4.6.2.2.

If the AMF has a new configured NSSAI for the current PLMN or SNPN, the AMF shall include the configured NSSAI for the current PLMN or SNPN in the REGISTRATION ACCEPT message.

NOTE 13A: A new configured NSSAI can be available at the AMF following an indication that the subscription data for network slicing has changed.

The AMF may include a new configured NSSAI for the current PLMN or SNPN in the REGISTRATION ACCEPT message if:

a) the REGISTRATION REQUEST message did not include the requested NSSAI and the initial registration request is not for onboarding services in SNPN;

b) the REGISTRATION REQUEST message included the requested NSSAI containing an S-NSSAI that is not valid in the serving PLMN or SNPN;

c) the REGISTRATION REQUEST message included the requested NSSAI containing S-NSSAI(s) with incorrect mapped S-NSSAI(s);

d) the REGISTRATION REQUEST message included the Network slicing indication IE with the Default configured NSSAI indication bit set to "Requested NSSAI created from default configured NSSAI";

e) the S-NSSAIs of the requested NSSAI in the REGISTRATION REQUEST message are not associated with any common NSSRG value, except for the case that the AMF, based on the indication received from the UDM as specified in 3GPP TS 23.501 [8], has provided all subscribed S-NSSAIs in the configured NSSAI to a UE who does not support NSSRG; or

NOTE 14: If the S-NSSAIs of the requested NSSAI in the REGISTRATION REQUEST message are not associated with any common NSSRG value, it is possible that at least one of the S-NSSAIs is not included in any of new allowed NSSAI, new (extended) rejected NSSAI (if applicable), and new pending NSSAI (if applicable).

f) the UE is in 5GMM-REGISTERED state over the other access and the S-NSSAIs of the requested NSSAI in the REGISTRATION REQUEST message over the current access and the allowed NSSAI over the other access are not associated with any common NSSRG value.

The AMF may include a new configured NSSAI for the current PLMN or SNPN in the REGISTRATION ACCEPT message if the REGISTRATION REQUEST message includes a requested NSSAI containing an S-NSSAI and the S-NSSAI time validity information, if available, indicates that the S-NSSAI is not available (see 3GPP TS 23.501 [8]). In this case, if the TempNS bit of the 5GMM capability IE in the REGISTRATION REQUEST message is set to:

a) "S-NSSAI time validity information supported" and the S-NSSAI time validity information indicates that the S-NSSAI will:

1) become available again, then the AMF shall also send S-NSSAI time validity information; or

2) not become available again, then the AMF shall not include the S-NSSAI in the new configured NSSAI; or

b) "S-NSSAI time validity information not supported" and the AMF sends a new configured NSSAI, then the AMF shall not include the S-NSSAI in the new configured NSSAI.

If a new configured NSSAI for the current PLMN is included in the REGISTRATION ACCEPT message, the subscription information includes the NSSRG information, and the NSSRG bit in the 5GMM capability IE of the REGISTRATION REQUEST message is set to:

a) "NSSRG supported", then the AMF shall include the NSSRG information in the REGISTRATION ACCEPT message; or

b) "NSSRG not supported", then the configured NSSAI shall include one or more S-NSSAIs each of which is associated with all the NSSRG value(s) of the default S-NSSAI(s), or the configured NSSAI shall include, based on the indication received from the UDM as specified in 3GPP TS 23.501 [8], all subscribed S-NSSAIs even if these S-NSSAIs do not share any common NSSRG value.

If the AMF needs to update the NSSRG information and the UE has set the NSSRG bit to "NSSRG supported" in the 5GMM capability IE of the REGISTRATION REQUEST message, then the AMF shall include the new NSSRG information in the REGISTRATION ACCEPT message. In addition, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If the UE supports S-NSSAI time validity information and the AMF needs to update the S-NSSAI time validity information, then the AMF shall include the S-NSSAI time validity information IE in the REGISTRATION ACCEPT message. In addition, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If the UE supports S-NSSAI location validity information and the AMF needs to update the S-NSSAI location validity information, then the AMF shall include the new S-NSSAI location validity information in the Registration accept type 6 IE container IE of the REGISTRATION ACCEPT message. In addition, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If the UE has set the NSAG bit to "NSAG supported" in the 5GMM capability IE of the REGISTRATION REQUEST message over 3GPP access, the AMF may include the NSAG information IE in the REGISTRATION ACCEPT message. Up to 4 NSAG entries are allowed to be associated with a TAI list in the NSAG information IE. If the UE has set the RCMAN bit to "Sending of REGISTRATION COMPLETE message for NSAG information supported" in the 5GMM capability IE of the REGISTRATION REQUEST message and if the NSAG information IE is included in the REGISTRATION ACCEPT message, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

NOTE 14A: How the AMF selects NSAG entries to be included in the NSAG information IE is implementation specific, e.g. take the NSAG priority and the current registration area into account.

NOTE 14B: If the NSAG for the PLMN and its equivalent PLMN(s) have different associations with S-NSSAIs, then the AMF includes a TAI list for the NSAG entry in the NSAG information IE.

If the UE receives the NSAG information IE in the REGISTRATION ACCEPT message, the UE shall store the NSAG information as specified in subclause 4.6.2.2.

If the UE supports network slice replacement and the AMF determines to provide the mapping information between the S-NSSAI to be replaced and the alternative S-NSSAI to the UE, then the AMF shall include the Alternative NSSAI IE, the Allowed NSSAI IE including the alternative S-NSSAI, if not included in the current allowed NSSAI, and the Configured NSSAI IE including the alternative S-NSSAI, if not included in the current configured NSSAI, in the REGISTRATION ACCEPT message. If the AMF determines that the replaced S-NSSAI is available, then the AMF shall provide the updated alternative NSSAI excluding the replaced S-NSSAI and the corresponding alternative S-NSSAI in the Alternative NSSAI IE in the REGISTRATION ACCEPT message. If the AMF determines that all the replaced S-NSSAI(s) are available, then the AMF shall provide the Alternative NSSAI IE with Length of Alternative NSSAI contents set to 0 in the REGISTRATION ACCEPT message. In addition, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3. If the AMF determines that the replaced S-NSSAI is not supported due to the UE moving outside of NS-AoS of the S-NSSAI while the alternative S-NSSAI is available, then the AMF shall provide the updated allowed NSSAI and partially allowed NSSAI, if available, excluding the replaced S-NSSAI, if included, in the allowed NSSAI or partially allowed NSSAI in the REGISTRATION ACCEPT message.

If the UE receives the Alternative NSSAI IE in the REGISTRATION ACCEPT message, the UE shall store the alternative NSSAI as specified in subclause 4.6.2.2.

If the UE has indicated the support for partial network slice and the AMF determines one or more S-NSSAI(s) in the requested NSSAI are to be included in the partially allowed NSSAI as specified in subclause 4.6.2.11, the AMF shall include the Partially allowed NSSAI IE in the Registration accept type 6 IE container IE of the REGISTRATION ACCEPT message.

If the UE receives the Partially allowed NSSAI IE in the Registration accept type 6 IE container IE of the REGISTRATION ACCEPT message, the UE shall store the partially allowed NSSAI as specified in subclause 4.6.2.2.

If the UE requests ciphering keys for ciphered broadcast assistance data in the REGISTRATION REQUEST message and the AMF has valid ciphering key data applicable to the UE's subscription and current tracking area, then the AMF shall include the ciphering key data in the Ciphering key data IE of the REGISTRATION ACCEPT message.

The AMF shall include the Network slicing indication IE with the Network slicing subscription change indication set to "Network slicing subscription changed" in the REGISTRATION ACCEPT message if the UDM has indicated that the subscription data for network slicing has changed. In this case the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

The UE that has indicated the support for network slice-specific authentication and authorization receiving the pending NSSAI in the REGISTRATION ACCEPT message shall store the S-NSSAI(s) in the pending NSSAI as specified in subclause 4.6.2.2. If the registration area contains TAIs belonging to different PLMNs, which are equivalent PLMNs, the UE shall store the received pending NSSAI for each of the equivalent PLMNs as specified in subclause 4.6.2.2. If the pending NSSAI is not included 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, then the UE shall delete the pending NSSAI for the current PLMN and its equivalent PLMN(s) or SNPN, if existing, as specified in subclause 4.6.2.2.

The UE receiving the rejected NSSAI in the REGISTRATION ACCEPT message takes the following actions based on the rejection cause in the rejected S-NSSAI(s):

"S-NSSAI not available in the current PLMN or SNPN"

The UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the current PLMN or SNPN as specified in subclause 4.6.2.2 and shall not attempt to use this S-NSSAI(s) in the current PLMN or SNPN over any access until switching off the UE, the UICC containing the USIM is removed, the entry of the "list of subscriber data" with the SNPN identity of the current SNPN is updated, or the rejected S-NSSAI(s) are removed as described in subclause 4.6.2.2.

"S-NSSAI not available in the current registration area"

The UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the current registration area as specified in subclause 4.6.2.2 and shall not attempt to use this S-NSSAI(s) in the current registration area over the current until switching off the UE, the UE moving out of the current registration area, the UICC containing the USIM is removed, the entry of the "list of subscriber data" with the SNPN identity of the current SNPN is updated, or the rejected S-NSSAI(s) are removed as described in subclause 4.6.2.2.

"S-NSSAI not available due to the failed or revoked network slice-specific authentication and authorization"

The UE shall store the rejected S-NSSAI(s) in the rejected NSSAI for the failed or revoked NSSAA as specified in subclause 4.6.2.2 and shall not attempt to use this S-NSSAI in the current PLMN or SNPN over any access until switching off the UE, the UICC containing the USIM is removed, the entry of the "list of subscriber data" with the SNPN identity of the current SNPN is updated, or the rejected S-NSSAI(s) are removed as described in subclause 4.6.1 and 4.6.2.2.

"S-NSSAI not available due to maximum number of UEs reached"

Unless the back-off timer value received along with the S-NSSAI is zero, the UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the maximum number of UEs reached as specified in subclause 4.6.2.2 and shall not attempt to use this S-NSSAI in the current PLMN or SNPN over the current access until switching off the UE, the UICC containing the USIM is removed, the entry of the "list of subscriber data" with the SNPN identity of the current SNPN is updated, or the rejected S-NSSAI(s) are removed as described in subclauses 4.6.1 and 4.6.2.2.

NOTE 15: If the back-off timer value received along with the S-NSSAI in the rejected NSSAI for the maximum number of UEs reached is zero as specified in subclause 10.5.7.4a of 3GPP TS 24.008 [12], the UE does not consider the S-NSSAI as the rejected S-NSSAI.

If there is one or more S-NSSAIs in the rejected NSSAI with the rejection cause "S-NSSAI not available due to maximum number of UEs reached", then for each S-NSSAI, the UE shall behave as follows:

a) stop the timer T3526 associated with the S-NSSAI, if running;

b) start the timer T3526 with:

1) the back-off timer value received along with the S-NSSAI, if a back-off timer value is received along with the S-NSSAI that is neither zero nor deactivated; or

2) an implementation specific back-off timer value, if no back-off timer value is received along with the S-NSSAI; and

c) remove the S-NSSAI from the rejected NSSAI for the maximum number of UEs reached when the timer T3526 associated with the S-NSSAI expires.

If the UE sets the NSSAA bit in the 5GMM capability IE to "Network slice-specific authentication and authorization not supported", and:

a) if the Requested NSSAI IE only includes the S-NSSAI(s) subject to network slice-specific authentication and authorization and one or more default S-NSSAIs (containing one or more S-NSSAIs each of which may be associated with a new S-NSSAI) which are not subject to network slice-specific authentication and authorization are available, the AMF shall in the REGISTRATION ACCEPT message include:

1) the allowed NSSAI or the partially allowed NSSAI containing S-NSSAI(s) for the current PLMN or SNPN each of which corresponds to a default S-NSSAI which are not subject to network slice-specific authentication and authorization;

2) the allowed NSSAI or the partially allowed NSSAI containing the default S-NSSAIs, as the mapped S-NSSAI(s) for the allowed NSSAI in roaming scenarios, which are not subject to network slice-specific authentication and authorization; and

3) the rejected NSSAI containing the S-NSSAI(s) subject to network slice specific authentication and authorization with the rejection cause indicating "S-NSSAI not available in the current PLMN or SNPN", except if the UE has not set the ER-NSSAI bit to "Extended rejected NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message and the S-NSSAI(s) is associated to multiple mapped S-NSSAIs and some of these but not all mapped S-NSSAIs are subject to NSSAA; or

b) if the Requested NSSAI IE includes one or more S-NSSAIs subject to network slice-specific authentication and authorization, the AMF shall in the REGISTRATION ACCEPT message include:

1) the allowed NSSAI or the partially allowed NSSAI containing the S-NSSAI(s) or the mapped S-NSSAI(s) which are not subject to network slice-specific authentication and authorization; and

2) the rejected NSSAI containing:

i) the S-NSSAI(s) subject to network slice specific authentication and authorization with the rejection cause indicating "S-NSSAI not available in the current PLMN or SNPN", except if the UE has not set the ER-NSSAI bit to "Extended rejected NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message and the S-NSSAI is associated to multiple mapped S-NSSAIs and some of these but not all mapped S-NSSAIs are subject to NSSAA; and

ii) the S-NSSAI(s) which was included in the requested NSSAI but rejected by the network associated with the rejection cause indicating "S-NSSAI not available in the current PLMN or SNPN" or the rejection cause indicating "S-NSSAI not available in the current registration area", if any.

If the UE does not indicate support for network slice-specific authentication and authorization, the initial registration request is not for onboarding services in SNPN, and if:

a) the UE did not include the requested NSSAI in the REGISTRATION REQUEST message; or

b) none of the S-NSSAIs in the requested NSSAI in the REGISTRATION REQUEST message are allowed;

and one or more default S-NSSAIs (containing one or more S-NSSAIs each of which may be associated with a new S-NSSAI) which are not subject to network slice-specific authentication and authorization are available, the AMF shall:

a) put the allowed S-NSSAI(s) for the current PLMN or SNPN each of which corresponds to a default S-NSSAI and not subject to network slice-specific authentication and authorization in the allowed NSSAI of the REGISTRATION ACCEPT message;

b) put the default S-NSSAIs and not subject to network slice-specific authentication and authorization, as the mapped S-NSSAI(s) for the allowed NSSAI in roaming scenarios, in the allowed NSSAI of the REGISTRATION ACCEPT message; and

c) determine a registration area such that all S-NSSAIs of the allowed NSSAI are available in the registration area.

If the REGISTRATION ACCEPT message contains the Network slicing indication IE with the Network slicing subscription change indication set to "Network slicing subscription changed", the UE shall delete the network slicing information for each and every PLMN or SNPN except for the current PLMN or SNPN as specified in subclause 4.6.2.2 and remove all tracking areas from the list of "5GS forbidden tracking areas for roaming" which were added due to rejection of S-NSSAI due to "S-NSSAI not available in the current registration area".

If the REGISTRATION ACCEPT message contains the allowed NSSAI, then the UE shall store the included allowed NSSAI together with the PLMN identity of the registered PLMN or the SNPN identity of the registered SNPN and the registration area as specified in subclause 4.6.2.2. If the registration area contains TAIs belonging to different PLMNs, which are equivalent PLMNs, the UE shall store the received allowed NSSAI in each of allowed NSSAIs which are associated with each of the PLMNs.

If the REGISTRATION ACCEPT message contains a configured NSSAI IE with a new configured NSSAI for the current PLMN or SNPN and optionally the mapped S-NSSAI(s) for the configured NSSAI for the current PLMN or SNPN, the UE shall store the contents of the configured NSSAI IE as specified in subclause 4.6.2.2. In addition, if the REGISTRATION ACCEPT message contains:

a) an NSSRG information IE, the UE shall store the contents of the NSSRG information IE as specified in subclause 4.6.2.2. If the UE receives a new configured NSSAI in the REGISTRATION ACCEPT message and no NSSRG information IE, the UE shall delete any stored NSSRG information, if any, as specified in subclause 4.6.2.2;

b) an S-NSSAI location validity information in the Registration accept type 6 IE container IE, the UE shall store the contents of the S-NSSAI location validity information as specified in subclause 4.6.2.2. If the UE receives a Configured NSSAI IE in the REGISTRATION ACCEPT message and no S-NSSAI location validity information, the UE shall delete any stored S-NSSAI location validity information as specified in subclause 4.6.2.2;

c) an S-NSSAI time validity information IE, the UE shall store the contents of the S-NSSAI time validity information IE as specified in subclause 4.6.2.2. If the UE receives a Configured NSSAI IE in the REGISTRATION ACCEPT message and no S-NSSAI time validity information IE, the UE shall delete any stored S-NSSAI time validity information as specified in subclause 4.6.2.2; or

d) an On-demand NSSAI IE, the UE shall store the contents of the On-demand NSSAI IE as specified in subclause 4.6.2.2. If the UE receives a Configured NSSAI IE in the REGISTRATION ACCEPT message and no On-demand NSSAI IE, the UE shall delete any stored on-demand NSSAI as specified in subclause 4.6.2.2. The UE shall stop slice deregistration inactivity timer, if running for the S-NSSAI which is deleted from the on-demand NSSAI.

If the REGISTRATION ACCEPT message:

a) includes the 5GS registration result IE with the "NSSAA to be performed" indicator set to "Network slice-specific authentication and authorization is to be performed";

b) includes a pending NSSAI;

c) does not include an allowed NSSAI; and

d) does not include an partially allowed NSSAI,

the UE shall delete the stored allowed NSSAI, if any, as specified in subclause 4.6.2.2, and the UE:

a) shall not initiate a 5GSM procedure except for emergency services ; and

b) shall not initiate a service request procedure except for cases f), i), m) and o) in subclause 5.6.1.1;

c) shall not initiate an NAS transport procedure except for sending SMS, an LPP message, a UPP-CMI container, an SLPP message, a location service message, an SOR transparent container, a UE policy container, a UE parameters update transparent container or a CIoT user data container;

until the UE receives an allowed NSSAI, a partially allowed NSSAI, or both.

If the UE included S1 mode supported indication in the REGISTRATION REQUEST message, the AMF supporting interworking with EPS shall set the IWK N26 bit to either:

a) "interworking without N26 interface not supported" if the AMF supports N26 interface; or

b) "interworking without N26 interface supported" if the AMF does not support N26 interface

in the 5GS network feature support IE in the REGISTRATION ACCEPT message.

The UE supporting S1 mode shall operate in the mode for interworking with EPS as follows:

a) if the IWK N26 bit in the 5GS network feature support IE is set to "interworking without N26 interface not supported", the UE shall operate in single-registration mode;

b) if the IWK N26 bit in the 5GS network feature support IE is set to "interworking without N26 interface supported" and the UE supports dual-registration mode, the UE may operate in dual-registration mode; or

NOTE 16: The registration mode used by the UE is implementation dependent.

c) if the IWK N26 bit in the 5GS network feature support IE is set to "interworking without N26 interface supported" and the UE only supports single-registration mode, the UE shall operate in single-registration mode.

The UE shall store the received interworking without N26 interface indicator for interworking with EPS as specified in annex C.1 and treat it as valid in the entire PLMN and its equivalent PLMN(s).

The network informs the UE about the support of specific features, such as IMS voice over PS session, location services (5G-LCS), emergency services, emergency services fallback, ATSSS and non-3GPP access path switching, in the 5GS network feature support information element. In a UE with IMS voice over PS session capability, the IMS voice over PS session indicator, the Emergency services support indicator, and the Emergency services fallback indicator shall be provided to the upper layers. The upper layers take the IMS voice over PS session indicator into account when selecting the access domain for voice sessions or calls. In a UE with LCS capability, location services indicator (5G-LCS) shall be provided to the upper layers. When initiating an emergency call, the upper layers also take the IMS voice over PS session indicator, the Emergency services support indicator, and the Emergency services fallback indicator into account for the access domain selection. In a UE with the capability for ATSSS, the network support for ATSSS shall be provided to the upper layers. If the UE receives the 5GS network feature support IE with the ATSSS support indicator set to "ATSSS not supported", the UE shall perform a local release of the MA PDU session, if any. In a UE that supports non-3GPP access path switching, the network support for non-3GPP access path switching shall be provided to the upper layers. If the UE receives the 5GS network feature support IE with the non-3GPP access path switching bit set to "non-3GPP access path switching not supported", the UE shall not perform the registration procedure for mobility registration update for non-3GPP access path switching.

NOTE 17: If the UE is registered to different PLMNs over 3GPP and non-3GPP accesses, the UE uses the capability received over non-3GPP access to determine whether to initiate the registration procedure for mobility registration update for non-3GPP path switching.

The AMF shall set the EMF bit in the 5GS network feature support IE to:

a) "Emergency services fallback supported in NR connected to 5GCN and E-UTRA connected to 5GCN" if the network supports the emergency services fallback procedure when the UE is in an NR cell connected to 5GCN or an E-UTRA cell connected to 5GCN;

b) "Emergency services fallback supported in NR connected to 5GCN only" if the network supports the emergency services fallback procedure when the UE is in an NR cell connected to 5GCN and does not support the emergency services fallback procedure when the UE is in an E-UTRA cell connected to 5GCN;

c) "Emergency services fallback supported in E-UTRA connected to 5GCN only" if the network supports the emergency services fallback procedure when the UE is in an E-UTRA cell connected to 5GCN and does not support the emergency services fallback procedure when the UE is in an NR cell connected to 5GCN; or

d) "Emergency services fallback not supported" if network does not support the emergency services fallback procedure when the UE is in any cell connected to 5GCN.

NOTE 18: If the emergency services are supported in neither the EPS nor the 5GS homogeneously, based on operator policy, the AMF will set the EMF bit in the 5GS network feature support IE to "Emergency services fallback not supported".

NOTE 19: Even though the AMF's support of emergency services fallback is indicated per RAT, the UE's support of emergency services fallback is not per RAT, i.e. the UE's support of emergency services fallback is the same for both NR connected to 5GCN and E-UTRA connected to 5GCN.

Access identity 1 is only applicable while the UE is in N1 mode. Access identity 2 is only applicable while the UE is in N1 mode.

When the UE is registered to the same PLMN or SNPN over 3GPP and non-3GPP access, the UE and the AMF maintain one MPS indicator and one MCS indicator that are common to both 3GPP and non-3GPP access. When the UE is registered to different PLMNs or SNPNs over 3GPP access and non-3GPP access, the UE maintains two MPS indicators and two MCS indicators separately for different accesses i.e., an MPS indicator and an MCS indicator for the 3GPP access and another MPS indicator and an MCS indicator for the non-3GPP access. For both 3GPP and non-3GPP access, the access identity is determined according to subclause 4.5.2:

- if the UE is not operating in SNPN access operation mode:

a) the network informs the UE that the use of access identity 1 is valid in the RPLMN or equivalent PLMN by setting the MPS indicator bit of the 5GS network feature support IE to "Access identity 1 valid", in the REGISTRATION ACCEPT message. Based on operator policy, the AMF sets the MPS indicator bit in the REGISTRATION ACCEPT message based on the MPS priority information in the user's subscription context obtained from the UDM;

b) upon receiving a REGISTRATION ACCEPT message with the MPS indicator bit set to "Access identity 1 valid":

- via 3GPP access; or

- via non-3GPP access if the UE is registered to the same PLMN over 3GPP access and non-3GPP access;

the UE shall act as a UE with access identity 1 configured for MPS, as described in subclause 4.5.2, in all NG-RAN of the registered PLMN and its equivalent PLMNs. The MPS indicator bit in the 5GS network feature support IE provided in the REGISTRATION ACCEPT message is valid in all NG-RAN of the registered PLMN and its equivalent PLMNs until the UE receives a REGISTRATION ACCEPT message or a CONFIGURATION UPDATE COMMAND message with the MPS indicator bit set to "Access identity 1 not valid":

- via 3GPP access; or

- via non-3GPP access if the UE is registered to the same PLMN over 3GPP access and non-3GPP access; or

until the UE selects a non-equivalent PLMN over 3GPP access;

b1) upon receiving a REGISTRATION ACCEPT message with the MPS indicator bit set to "Access identity 1 valid":

- via non-3GPP access; or

- via 3GPP access if the UE is registered to the same PLMN over 3GPP access and non-3GPP access;

the UE shall act as a UE with access identity 1 configured for MPS, as described in subclause 4.5.2, in non-3GPP access of the registered PLMN and its equivalent PLMNs. The MPS indicator bit in the 5GS network feature support IE provided in the REGISTRATION ACCEPT message is valid in non-3GPP access of the registered PLMN and its equivalent PLMNs until the UE receives a REGISTRATION ACCEPT message or a CONFIGURATION UPDATE COMMAND message with the MPS indicator bit set to "Access identity 1 not valid":

- via non-3GPP access; or

- via 3GPP access if the UE is registered to the same PLMN over 3GPP access and non-3GPP access; or

until the UE selects a non-equivalent PLMN over non-3GPP access;

c) the network informs the UE that the use of access identity 2 is valid in the RPLMN or equivalent PLMN by setting the MCS indicator bit of the 5GS network feature support IE to "Access identity 2 valid", in the REGISTRATION ACCEPT message. Based on operator policy, the AMF sets the MCS indicator bit in the REGISTRATION ACCEPT message based on the MCS priority information in the user's subscription context obtained from the UDM;

d) upon receiving a REGISTRATION ACCEPT message with the MCS indicator bit set to "Access identity 2 valid":

- via 3GPP access; or

- via non-3GPP access if the UE is registered to the same PLMN over 3GPP access and non-3GPP access;

the UE shall act as a UE with access identity 2 configured for MCS, as described in subclause 4.5.2, in all NG-RAN of the registered PLMN and its equivalent PLMNs. The MCS indicator bit in the 5GS network feature support IE provided in the REGISTRATION ACCEPT message is valid in all NG-RAN of the registered PLMN and its equivalent PLMNs until the UE receives a REGISTRATION ACCEPT message or a CONFIGURATION UPDATE COMMAND message with the MCS indicator bit set to "Access identity 2 not valid":

- via 3GPP access; or

- via non-3GPP access if the UE is registered to the same PLMN over 3GPP access and non-3GPP access; or

until the UE selects a non-equivalent PLMN over 3GPP access; and

d1) upon receiving a REGISTRATION ACCEPT message with the MCS indicator bit set to "Access identity 2 valid":

- via non-3GPP access; or

- via 3GPP access if the UE is registered to the same PLMN over 3GPP access and non-3GPP access;

the UE shall act as a UE with access identity 2 configured for MCS, as described in subclause 4.5.2, in non-3GPP access of the registered PLMN and its equivalent PLMNs. The MCS indicator bit in the 5GS network feature support IE provided in the REGISTRATION ACCEPT message is valid in non-3GPP access of the registered PLMN and its equivalent PLMNs until the UE receives a REGISTRATION ACCEPT message or a CONFIGURATION UPDATE COMMAND message with the MCS indicator bit set to "Access identity 2 not valid":

- via non-3GPP access; or

- via 3GPP access if the UE is registered to the same PLMN over 3GPP access and non-3GPP access; or

until the UE selects a non-equivalent PLMN over non-3GPP access; or

- if the UE is operating in SNPN access operation mode:

a) the network informs the UE that the use of access identity 1 is valid in the RSNPN or equivalent SNPN by setting the MPS indicator bit of the 5GS network feature support IE to "Access identity 1 valid", in the REGISTRATION ACCEPT message. Based on operator policy, the AMF sets the MPS indicator bit in the REGISTRATION ACCEPT message based on the MPS priority information in the user's subscription context obtained from the UDM;

b) upon receiving a REGISTRATION ACCEPT message with the MPS indicator bit set to "Access identity 1 valid":

- via 3GPP access; or

- via non-3GPP access if the UE is registered to the same SNPN over 3GPP access and non-3GPP access;

the UE shall act as a UE with access identity 1 configured for MPS, as described in subclause 4.5.2A, in all NG-RAN of the registered SNPN and its equivalent SNPNs. The MPS indicator bit in the 5GS network feature support IE provided in the REGISTRATION ACCEPT message is valid in all NG-RAN of the registered SNPN and its equivalent SNPNs until the UE receives a REGISTRATION ACCEPT message or a CONFIGURATION UPDATE COMMAND message with the MPS indicator bit set to "Access identity 1 not valid":

- via 3GPP access; or

- via non-3GPP access if the UE is registered to the same SNPN over 3GPP access and non-3GPP access; or

until the UE selects a non-equivalent SNPN over 3GPP access;

b1) upon receiving a REGISTRATION ACCEPT message with the MPS indicator bit set to "Access identity 1 valid":

- via non-3GPP access; or

- via 3GPP access if the UE is registered to the same SNPN over 3GPP access and non-3GPP access;

the UE shall act as a UE with access identity 1 configured for MPS, as described in subclause 4.5.2A, in non-3GPP access of the registered SNPN and its equivalent SNPNs. The MPS indicator bit in the 5GS network feature support IE provided in the REGISTRATION ACCEPT message is valid in non-3GPP access of the registered SNPN and its equivalent SNPNs until the UE receives a REGISTRATION ACCEPT message or a CONFIGURATION UPDATE COMMAND message with the MPS indicator bit set to "Access identity 1 not valid";

- via non-3GPP access; or

- via 3GPP access if the UE is registered to the same SNPN over 3GPP access and non-3GPP access; or

until the UE selects a non-equivalent SNPN over non-3GPP access;

c) the network informs the UE that the use of access identity 2 is valid in the RSNPN or equivalent SNPN by setting the MCS indicator bit of the 5GS network feature support IE to "Access identity 2 valid", in the REGISTRATION ACCEPT message. Based on operator policy, the AMF sets the MCS indicator bit in the REGISTRATION ACCEPT message based on the MCS priority information in the user's subscription context obtained from the UDM;

d) upon receiving a REGISTRATION ACCEPT message with the MCS indicator bit set to "Access identity 2 valid":

- via 3GPP access; or

- via non-3GPP access if the UE is registered to the same SNPN over 3GPP access and non-3GPP access;

the UE shall act as a UE with access identity 2 configured for MCS, as described in subclause 4.5.2A, in all NG-RAN of the registered SNPN and its equivalent SNPNs. The MCS indicator bit in the 5GS network feature support IE provided in the REGISTRATION ACCEPT message is valid in all NG-RAN of the registered SNPN and its equivalent SNPNs until the UE receives a REGISTRATION ACCEPT message or a CONFIGURATION UPDATE COMMAND message with the MCS indicator bit set to "Access identity 2 not valid":

- via 3GPP access; or

- via non-3GPP access if the UE is registered to the same SNPN over 3GPP access and non-3GPP access; or

until the UE selects a non-equivalent SNPN over 3GPP access; and

d1) upon receiving a REGISTRATION ACCEPT message with the MCS indicator bit set to "Access identity 2 valid":

- via non-3GPP access; or

- via 3GPP access if the UE is registered to the same SNPN over 3GPP access and non-3GPP access;

the UE shall act as a UE with access identity 2 configured for MCS, as described in subclause 4.5.2A, in non-3GPP access of the registered SNPN and its equivalent SNPNs. The MCS indicator bit in the 5GS network feature support IE provided in the REGISTRATION ACCEPT message is valid in non-3GPP access of the registered SNPN and its equivalent SNPNs until the UE receives a REGISTRATION ACCEPT message or a CONFIGURATION UPDATE COMMAND message with the MCS indicator bit set to "Access identity 2 not valid":

- via non-3GPP access; or

- via 3GPP access if the UE is registered to the same SNPN over 3GPP access and non-3GPP access; or

until the UE selects a non-equivalent SNPN over non-3GPP access.

If the UE indicates support for restriction on use of enhanced coverage in the REGISTRATION REQUEST message and:

a) in WB-N1 mode, the AMF decides to restrict the use of CE mode B for the UE, then the AMF shall set the RestrictEC bit to "CE mode B is restricted";

b) in WB-N1 mode, the AMF decides to restrict the use of both CE mode A and CE mode B for the UE, then the AMF shall set the RestrictEC bit to " Both CE mode A and CE mode B are restricted"; or

c) in NB-N1 mode, the AMF decides to restrict the use of enhanced coverage for the UE, then the AMF shall set the RestrictEC bit to "Use of enhanced coverage is restricted",

in the 5GS network feature support IE in the REGISTRATION ACCEPT message.

If the UE indicates support of the N1 NAS signalling connection release in the REGISTRATION REQUEST message and the network decides to accept the N1 NAS signalling connection release, then the AMF shall set the N1 NAS signalling connection release bit to "N1 NAS signalling connection release supported" in the 5GS network feature support IE of the REGISTRATION ACCEPT message.

If the UE indicates support of the paging indication for voice services in the REGISTRATION REQUEST message and the network decides to accept the paging indication for voice services, then the AMF shall set the paging indication for voice services bit to "paging indication for voice services supported" in the 5GS network feature support IE of the REGISTRATION ACCEPT message. Upon receipt of REGISTRATION ACCEPT message with the paging indication for voice services bit set to "paging indication for voice services supported", the UE NAS layer informs the lower layers that paging indication for voice services is supported. Otherwise, the UE NAS layer informs the lower layers that paging indication for voice services is not supported.

If the UE indicates support of the reject paging request in the REGISTRATION REQUEST message and the network decides to accept the reject paging request, then the AMF shall set the reject paging request bit to "reject paging request supported" in the 5GS network feature support IE of the REGISTRATION ACCEPT message.

If the UE indicates support of the paging restriction in the REGISTRATION REQUEST message, and the AMF sets:

- the reject paging request bit to "reject paging request supported";

- the N1 NAS signalling connection release bit to "N1 NAS signalling connection release supported"; or

- both of them;

in the 5GS network feature support IE of the REGISTRATION ACCEPT message, and the network decides to accept the paging restriction, then the AMF shall set the paging restriction bit to "paging restriction supported" in the 5GS network feature support IE of the REGISTRATION ACCEPT message.

If the UE indicates support of ranging and sidelink positioning in the REGISTRATION REQUEST message and the network supports and accepts the use of ranging and sidelink positioning, the AMF shall set the ranging and sidelink positioning support bit to "Ranging and sidelink positioning supported" in the 5GS network feature support IE of the REGISTRATION ACCEPT message.

If the UE supports HPAOP and the AMF supports HPAOP, the AMF shall set the High priority access service area restriction exempt bit in the 5GS network feature support IE of the REGISTRATION ACCEPT message to indicate the operator policy on UE exemption for service area restrictions.

If the UE has set the Follow-on request indicator to "Follow-on request pending" in the REGISTRATION REQUEST message, or the network has downlink signalling pending, the AMF shall not immediately release the NAS signalling connection after the completion of the registration procedure.

If the UE is authorized to use V2X communication over PC5 reference point based on:

a) at least one of the following bits in the 5GMM capability IE of the REGISTRATION REQUEST message set by the UE, or already stored in the 5GMM context in the AMF during the previous registration procedure as follows:

1) the V2XCEPC5 bit to "V2X communication over E-UTRA-PC5 supported"; or

2) the V2XCNPC5 bit to "V2X communication over NR-PC5 supported"; and

b) the user's subscription context obtained from the UDM as defined in 3GPP TS 23.287 [6C];

the AMF should not immediately release the NAS signalling connection after the completion of the registration procedure.

If the UE is authorized to use A2X communication over PC5 reference point based on:

a) at least one of the following bits in the 5GMM capability IE of the REGISTRATION REQUEST message set by the UE, or already stored in the 5GMM context in the AMF during the previous registration procedure as follows:

1) the A2XEPC5 bit to "A2X over E-UTRA-PC5 supported"; or

2) the A2XNPC5 bit to "A2X over NR-PC5 supported"; and

b) the user's subscription context obtained from the UDM as defined in 3GPP TS 23.256 [6C];

the AMF should not immediately release the NAS signalling connection after the completion of the registration procedure.

If the UE is authorized to use 5G ProSe services based on:

a) at least one of the following bits in the 5GMM capability IE of the REGISTRATION REQUEST message set by the UE, or already stored in the 5GMM context in the AMF during the previous registration procedure as follows:

1) the 5G ProSe direct discovery bit to "5G ProSe direct discovery supported"; or

2) the 5G ProSe direct communication bit to "5G ProSe direct communication supported"; and

b) the user's subscription context obtained from the UDM as defined in 3GPP TS 23.304 [6E];

the AMF should not immediately release the NAS signalling connection after the completion of the registration procedure.

If the Requested DRX parameters IE was included in the REGISTRATION REQUEST message, the AMF shall include the Negotiated DRX parameters IE in the REGISTRATION ACCEPT message and replace any stored Negotiated DRX parameter and use it for the downlink transfer of signalling and user data. The AMF may set the Negotiated DRX parameters IE based on the received Requested DRX parameters IE and operator policy if available.

If the Requested NB-N1 mode DRX parameters IE was included in the REGISTRATION REQUEST message, the AMF shall include the Negotiated NB-N1 mode DRX parameters IE in the REGISTRATION ACCEPT message and replace any stored Negotiated NB-N1 mode DRX parameters and use it for the downlink transfer of signalling and user data in NB-N1 mode. The AMF may set the Negotiated NB-N1 mode DRX parameters IE based on the received Requested NB-N1 mode DRX parameters IE and operator policy if available.

The AMF shall include the Negotiated extended DRX parameters IE in the REGISTRATION ACCEPT message only if the Requested extended DRX parameters IE was included in the REGISTRATION REQUEST message, and the AMF supports and accepts the use of eDRX. The AMF may set the Negotiated extended DRX parameters IE based on the received Requested extended DRX parameters IE, operator policy, information from NG-RAN and the user's subscription context obtained from the UDM if available.

If:

a) the UE's USIM is configured with indication that the UE is to receive the SOR transparent container IE, the SOR transparent container IE included in the REGISTRATION ACCEPT message does not successfully pass the integrity check (see 3GPP TS 33.501 [24]); and

b) if the UE attempts obtaining service on another PLMNs as specified in 3GPP TS 23.122 [5] annex C;

then the UE shall locally release the established N1 NAS signalling connection after sending a REGISTRATION COMPLETE message.

If:

a) the UE's USIM is configured with indication that the UE is to receive the SOR transparent container IE, the SOR transparent container IE is not included in the REGISTRATION ACCEPT message; and

b) the UE attempts obtaining service on another PLMNs as specified in 3GPP TS 23.122 [5] annex C;

then the UE shall locally release the established N1 NAS signalling connection.

If:

a) the UE operates in SNPN access operation mode;

b) the ME is configured to indicate that the UE shall expect to receive the steering of roaming information during initial registration procedure for the selected entry of the "list of subscriber data" or the selected PLMN subscription;

c) the SOR transparent container IE included in the REGISTRATION ACCEPT message does not successfully pass the integrity check (see 3GPP TS 33.501 [24]); and

d) the UE attempts obtaining service on another SNPN as specified in 3GPP TS 23.122 [5] annex C;

then the UE shall locally release the established N1 NAS signalling connection after sending a REGISTRATION COMPLETE message.

If:

a) the UE operates in SNPN access operation mode;

b) the ME is configured to indicate that the UE shall expect to receive the steering of roaming information during initial registration procedure for the selected entry of the "list of subscriber data" or the selected PLMN subscription;

c) the SOR transparent container IE is not included in the REGISTRATION ACCEPT message; and

d) the UE attempts obtaining service on another SNPN as specified in 3GPP TS 23.122 [5] annex C;

then the UE shall locally release the established N1 NAS signalling connection.

If the REGISTRATION ACCEPT message includes the SOR transparent container IE and the SOR transparent container IE successfully passes the integrity check (see 3GPP TS 33.501 [24]), the ME shall store the received SOR counter as specified in annex C and proceed as follows:

a) the UE shall proceed with the behaviour as specified in 3GPP TS 23.122 [5] annex C; and

b) if the registration procedure is performed over 3GPP access and the UE attempts obtaining service on another PLMNs or SNPNs as specified in 3GPP TS 23.122 [5] annex C, then the UE may locally release the established N1 NAS signalling connection after sending a REGISTRATION COMPLETE message. Otherwise the UE shall send a REGISTRATION COMPLETE message and not release the current N1 NAS signalling connection locally. If an acknowledgement is requested in the SOR transparent container IE of the REGISTRATION ACCEPT message, the UE acknowledgement is included in the SOR transparent container IE of the REGISTRATION COMPLETE message. In the SOR transparent container IE carrying the acknowledgement, the UE shall set the ME support of SOR-CMCI indicator to "SOR-CMCI supported by the ME". Additionally, if the UE supports access to an SNPN using credentials from a credentials holder and the UE is not operating in SNPN access operation mode, the UE may set the ME support of SOR-SNPN-SI indicator to "SOR-SNPN-SI supported by the ME". Additionally, if the UE supports access to an SNPN providing access for localized services in SNPN, the UE shall set the ME support of SOR-SNPN-SI-LS indicator to "SOR-SNPN-SI-LS supported by the ME"

If the SOR transparent container IE successfully passes the integrity check (see 3GPP TS 33.501 [24]) and:

a) the list type indicates:

1) "PLMN ID and access technology list", and the SOR transparent container IE indicates a list of preferred PLMN/access technology combinations is provided, then the ME shall replace the highest priority entries in the "Operator Controlled PLMN Selector with Access Technology" list stored in the ME and shall proceed with the behaviour as specified in 3GPP TS 23.122 [5] annex C; or

2) "secured packet", then the ME shall behave as if a SMS is received with protocol identifier set to SIM data download, data coding scheme set to class 2 message and SMS payload as secured packet contents of SOR transparent container IE. The SMS payload is forwarded to UICC as specified in 3GPP TS 23.040 [4A] and the ME shall proceed with the behaviour as specified in 3GPP TS 23.122 [5] annex C; or

b) the list type indicates "PLMN ID and access technology list" and the SOR transparent container IE indicates "HPLMN indication that 'no change of the "Operator Controlled PLMN Selector with Access Technology" list stored in the UE is needed and thus no list of preferred PLMN/access technology combinations is provided'", the UE operates in SNPN access operation mode and the SOR transparent container IE includes SOR-SNPN-SI, the ME shall replace SOR-SNPN-SI of the selected entry of the "list of subscriber data" or associated with the selected PLMN subscription, as specified in 3GPP TS 23.122 [5] with the received SOR-SNPN-SI. Additionally, if the SOR transparent container IE includes SOR-SNPN-SI-LS, the ME shall replace SOR-SNPN-SI-LS of the selected entry of the "list of subscriber data" or associated with the selected PLMN subscription, as specified in 3GPP TS 23.122 [5] with the received SOR-SNPN-SI-LS.

If the SOR-CMCI is present and the Store SOR-CMCI in ME indicator is set to "Store SOR-CMCI in ME" then the UE shall store or delete the SOR-CMCI in the non-volatile memory of the ME as described in annex C.1.

The UE shall proceed with the behaviour as specified in 3GPP TS 23.122 [5] annex C.

If the SOR transparent container IE does not pass the integrity check successfully, then the UE shall discard the content of the SOR transparent container IE.

If required by operator policy, the AMF shall include the NSSAI inclusion mode IE in the REGISTRATION ACCEPT message (see table 4.6.2.3.1 of subclause 4.6.2.3). Upon receipt of the REGISTRATION ACCEPT message:

a) if the message includes the NSSAI inclusion mode IE, the UE shall operate in the NSSAI inclusion mode indicated in the NSSAI inclusion mode IE over the current access within the current PLMN and its equivalent PLMN(s), if any, or the current SNPN ,in the current registration area; or

b) otherwise:

1) if the UE has NSSAI inclusion mode for the current PLMN or SNPN and access type stored in the UE, the UE shall operate in the stored NSSAI inclusion mode;

2) if the UE does not have NSSAI inclusion mode for the current PLMN or SNPN and the access type stored in the UE and if the UE is performing the registration procedure over:

i) 3GPP access, the UE shall operate in NSSAI inclusion mode D in the current PLMN or SNPN and the current access type;

ii) untrusted non-3GPP access, the UE shall operate in NSSAI inclusion mode B in the current PLMN and the current access type; or

iii) trusted non-3GPP access, the UE shall operate in NSSAI inclusion mode D in the current PLMN and the current access type; or

3) if the 5G-RG does not have NSSAI inclusion mode for the current PLMN and wireline access stored in the 5G-RG, and the 5G-RG is performing the registration procedure over wireline access, the 5G-RG shall operate in NSSAI inclusion mode B in the current PLMN and the current access type.

The AMF may include operator-defined access category definitions in the REGISTRATION ACCEPT message.

If the UE receives Operator-defined access category definitions IE in the REGISTRATION ACCEPT message and the Operator-defined access category definitions IE contains one or more operator-defined access category definitions, the UE shall delete any operator-defined access category definitions stored for the RPLMN and shall store the received operator-defined access category definitions for the RPLMN. If the UE receives the Operator-defined access category definitions IE in the REGISTRATION ACCEPT message and the Operator-defined access category definitions IE contains no operator-defined access category definitions, the UE shall delete any operator-defined access category definitions stored for the RPLMN. If the REGISTRATION ACCEPT message does not contain the Operator-defined access category definitions IE, the UE shall not delete the operator-defined access category definitions stored for the RPLMN.

If the UE has indicated support for service gap control in the REGISTRATION REQUEST message and:

- the REGISTRATION ACCEPT message contains the T3447 value IE, then the UE shall store the new T3447 value, erase any previous stored T3447 value if exists and use the new T3447 value with the timer T3447 next time it is started; or

- the REGISTRATION ACCEPT message does not contain the T3447 value IE, then the UE shall erase any previous stored T3447 value if exists and stop the timer T3447 if running.

If the T3448 value IE is present in the received REGISTRATION ACCEPT message and the value indicates that this timer is neither zero nor deactivated, the UE shall:

a) stop timer T3448 if it is running; and

b) start timer T3448 with the value provided in the T3448 value IE.

If the UE is using 5GS services with control plane CIoT 5GS optimization, the T3448 value IE is present in the REGISTRATION ACCEPT message and the value indicates that this timer is either zero or deactivated, the UE shall ignore the T3448 value IE and proceed as if the T3448 value IE was not present.

If the REGISTRATION ACCEPT message contains the Truncated 5G-S-TMSI configuration IE, then the UE shall store the included truncated 5G-S-TMSI configuration and return a REGISTRATION COMPLETE message to the AMF to acknowledge reception of the truncated 5G-S-TMSI configuration.

NOTE 20: The UE provides the truncated 5G-S-TMSI configuration to the lower layers.

If the UE is not in NB-N1 mode, the UE has set the RACS bit to "RACS supported" in the 5GMM Capability IE of the REGISTRATION REQUEST message and the REGISTRATION ACCEPT message includes:

a) a UE radio capability ID deletion indication IE set to "Network-assigned UE radio capability IDs deletion requested", the UE shall delete any network-assigned UE radio capability IDs associated with the RPLMN or RSNPN 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 stored at the UE, then the UE shall, after the completion of the ongoing registration procedure, initiate a registration procedure for mobility and periodic registration update as specified in subclause 5.5.1.3.2 over the existing N1 NAS signalling connection; or

b) a UE radio capability ID IE, the UE shall store the UE radio capability ID as specified in annex C.

If the UE has included the service-level device ID set to the CAA-level UAV ID in the Service-level-AA container IE of the REGISTRATION REQUEST message and the REGISTRATION ACCEPT message contains the service-level-AA pending indication in the Service-level-AA container IE, the UE shall return a REGISTRATION COMPLETE message to the AMF to acknowledge reception of the service-level-AA pending indication, and the UE shall not attempt to perform another registration procedure for UAS services until the UUAA-MM procedure is completed, or to establish a PDU session for USS communication or a PDU session for C2 communication until the UUAA-MM procedure is completed successfully.

If the UE has included the service-level device ID set to the CAA-level UAV ID in the Service-level-AA container IE of the REGISTRATION REQUEST message and the REGISTRATION ACCEPT message does not contain the service-level-AA pending indication in the Service-level-AA container IE, the UE shall consider the UUAA-MM procedure is not triggered.

If the REGISTRATION REQUEST message includes the 5GS registration type IE set to "SNPN onboarding registration" or the network determines that the UE's subscription only allows for configuration of SNPN subscription parameters in PLMN via the user plane, the AMF may start an implementation specific timer for onboarding services when the network considers that the UE is in 5GMM-REGISTERED (i.e. the network receives the REGISTRATION COMPLETE message from UE).

NOTE 21: If the AMF considers that the UE is in 5GMM-IDLE, when the implementation specific timer for onboarding services expires and the network considers that the UE is still in state 5GMM-REGISTERED, the AMF can locally de-register the UE; or if the UE is in 5GMM-CONNECTED, the AMF can initiate the network-initiated de-registration procedure (see subclause 5.5.2.3).

NOTE 22: The value of the implementation specific timer for onboarding services needs to be large enough to allow a UE to complete the configuration of one or more entries of the "list of subscriber data" taking into consideration that configuration of SNPN subscription parameters in PLMN via the user plane or onboarding services in SNPN involves third party entities outside of the operator's network.

If the UE receives the List of PLMNs to be used in disaster condition IE in the REGISTRATION ACCEPT message and the UE supports MINT, the UE shall delete the "list of PLMN(s) to be used in disaster condition" stored in the ME together with the PLMN ID of the RPLMN, if any, and may store the "list of PLMN(s) to be used in disaster condition" included in the List of PLMNs to be used in disaster condition IE in the ME together with the PLMN ID of the RPLMN.

If the UE receives the Disaster roaming wait range IE in the REGISTRATION ACCEPT message and the UE supports MINT, the UE shall delete the disaster roaming wait range stored in the ME, if any, and store the disaster roaming wait range included in the Disaster roaming wait range IE in the ME.

If the UE receives the Disaster return wait range IE in the REGISTRATION ACCEPT message and the UE supports MINT, the UE shall delete the disaster return wait range stored in the ME, if any, and store the disaster return wait range included in the Disaster return wait range IE in the ME.

If the 5GS registration type IE in the REGISTRATION REQUEST message is set to "disaster roaming initial registration" and:

a) the UE determined PLMN with disaster condition IE is included in the REGISTRATION REQUEST message, the AMF shall determine the PLMN with disaster condition in the UE determined PLMN with disaster condition IE;

b) the UE determined PLMN with disaster condition IE is not included in the REGISTRATION REQUEST message and the Additional GUTI IE is included in the REGISTRATION REQUEST message and contains 5G-GUTI of a PLMN of the country of the PLMN providing disaster roaming services, the AMF shall determine the PLMN with disaster condition in the PLMN identity of the 5G-GUTI;

c) the UE determined PLMN with disaster condition IE and the Additional GUTI IE are not included in the REGISTRATION REQUEST message and:

1) the 5GS mobile identity IE contains 5G-GUTI of a PLMN of the country of the PLMN providing disaster roaming services, the AMF shall determine the PLMN with disaster condition in the PLMN identity of the 5G-GUTI; or

2) the 5GS mobile identity IE contains SUCI of a PLMN of the country of the PLMN providing disaster roaming services, the AMF shall determine the PLMN with disaster condition in the PLMN identity of the SUCI; or

d) the UE determined PLMN with disaster condition IE is not included in the REGISTRATION REQUEST message, NG-RAN of the PLMN providing disaster roaming services broadcasts disaster roaming indication and:

1) the Additional GUTI IE is included in the REGISTRATION REQUEST message and contains 5G-GUTI of a PLMN of a country other than the country of the PLMN providing disaster roaming services; or

2) the Additional GUTI IE is not included and the 5GS mobile identity IE contains 5G-GUTI or SUCI of a PLMN of a country other than the country of the PLMN providing disaster roaming services;

the AMF shall determine the PLMN with disaster condition based on the disaster roaming agreement arrangement between mobile network operators.

NOTE 23: The disaster roaming agreement arrangement between mobile network operators is out scope of 3GPP.

If the AMF determines that a disaster condition applies to the PLMN with disaster condition, and the UE is allowed to be registered for disaster roaming services, the AMF shall set the Disaster roaming registration result value bit in the 5GS registration result IE to "no additional information" in the REGISTRATION ACCEPT message. If the AMF determines that the UE can be registered to the PLMN for normal service, the AMF shall set the Disaster roaming registration result value bit in the 5GS registration result IE to "request for registration for disaster roaming services accepted as registration not for disaster roaming services" in the REGISTRATION ACCEPT message.

If the UE indicates "disaster roaming initial registration" in the 5GS registration type IE in the REGISTRATION REQUEST message and the 5GS registration result IE value in the REGISTRATION ACCEPT message is set to:

a) "request for registration for disaster roaming service accepted as registration not for disaster roaming services", the UE shall consider itself registered for normal service. If the PLMN identity of the registered PLMN is a member of the forbidden PLMN list as specified in subclause 5.3.13A, any such PLMN identity shall be deleted from the corresponding list(s). If UE supports S1 mode, the UE shall initiate the registration procedure for mobility and periodic registration update and indicate that S1 mode is supported as described in subclause 5.5.1.3.2; or

b) "no additional information", the UE shall consider itself registered for disaster roaming services.

If the UE receives the forbidden TAI(s) for the list of "5GS forbidden tracking areas for roaming" IE in the REGISTRATION ACCEPT message, the UE shall store the TAI(s) belonging to the serving PLMN or equivalent PLMN(s) and ignore the TAI(s) which do not belong to the serving PLMN or equivalent PLMN(s) included in the IE, if not already stored, into the list of "5GS forbidden tracking areas for roaming".

If the UE receives the forbidden TAI(s) for the list of "5GS forbidden tracking areas for regional provision of service" IE in the REGISTRATION ACCEPT message, the UE shall store the TAI(s) belonging to the serving PLMN or equivalent PLMN(s) and ignore the TAI(s) which do not belong to the serving PLMN or equivalent PLMN(s) included in the IE, if not already stored, into the list of "5GS forbidden tracking areas for regional provision of service".

If the UE supporting the reconnection to the network due to RAN timing synchronization status change receives the RAN timing synchronization IE with the RecReq bit set to "Reconnection requested" in the REGISTRATION ACCEPT message, the UE shall operate as specified in subclauses 5.3.1.4, 5.5.1.3.2 and 5.6.1.1.

If the UE supports discontinuous coverage, the AMF may include the Discontinuous coverage maximum time offset IE in the REGISTRATION ACCEPT message.

If the UE receives, the Discontinuous coverage maximum time offset IE in the REGISTRATION ACCEPT message, the UE shall replace any previously received discontinuous coverage maximum time offset value on the same satellite NG-RAN RAT type and PLMN with the latest received timer value.

If the UE receives the Unavailability configuration IE in the REGISTRATION ACCEPT message, the UE shall consider that the corresponding unavailability type is "unavailability due to discontinuous coverage". A UE that does not implement this unavailability type may ignore the Unavailability configuration IE provided by the AMF. If the EUPR bit is set to "UE does not need to report end of unavailability period", the UE is not required to initiate the registration procedure for mobility registration update when the unavailability period duration has ended.

If the UE receives the Unavailability configuration IE with a value of the unavailability period duration in the REGISTRATION ACCEPT, then the UE may either:

a) delete a UE determined value and start using the received unavailability period duration value; or

b) use a UE determined value.If the UE receives the Unavailability configuration IE with a value of the start of the unavailability period in the REGISTRATION ACCEPT message, then the UE may either:

a) delete a UE determined value and start using the received start of the unavailability period value; or

b) use a UE determined value.

NOTE 24: The UE can consider the received value from the network when determining the value for unavailability period duration and the start of the unavailability period.

If the UE operating as MBSR receives the MBSRAI field of the Feature authorization indication IE in the REGISTRATION ACCEPT message, the UE NAS layer informs the lower layers of the status of MBSR authorization as specified in subclause 5.35A.4 of 3GPP TS 23.501 [8].

\*\*\*\*\* Eighth change \*\*\*\*\*

##### 5.5.1.3.4 Mobility and periodic registration update accepted by the network

If the registration update request has been accepted by the network, the AMF shall send a REGISTRATION ACCEPT message to the UE.

NOTE 0: If the AMF receives the registration update request over non-3GPP access and detects that the N3IWF used by the UE is compatible with only part of the allowed NSSAI and the UE has not indicated its support for slice-based N3IWF selection in the REGISTRATION REQUEST message, the AMF accepts the registration update request.

NOTE 0A: If the AMF receives the registration update request over non-3GPP access and detects that the TNGF used by the UE is compatible with only part of the allowed NSSAI and the UE has not indicated its support for slice-based TNGF selection in the REGISTRATION REQUEST message, the AMF accepts the registration update request.

If timer T3513 is running in the AMF, the AMF shall stop timer T3513 if a paging request was sent with the access type indicating non-3GPP and the REGISTRATION REQUEST message includes the Allowed PDU session status IE.

If timer T3565 is running in the AMF, the AMF shall stop timer T3565 when a REGISTRATION REQUEST message is received.

For each of the information elements: 5GMM capability, S1 UE network capability, and UE security capability, the AMF shall store all octets received from the UE in the REGISTRATION REQUEST message, up to the maximum length defined for the respective information element.

NOTE 1: This information is forwarded to the new AMF during inter-AMF handover or to the new MME during inter-system handover to S1 mode.

The 5G-GUTI reallocation shall be part of the registration procedure for mobility registration update. The 5G-GUTI reallocation should be part of the registration procedure for periodic registration update. During the registration procedure for mobility registration update, if the AMF has not allocated a new 5G-GUTI by the generic UE configuration update procedure, the AMF shall include in the REGISTRATION ACCEPT message the new assigned 5G-GUTI.

If the UE has set the CAG bit to "CAG supported" in the 5GMM capability IE of the REGISTRATION REQUEST message and the AMF needs to update the "CAG information list" stored in the UE, the AMF shall include the CAG information list IE or the Extended CAG information list IE in the REGISTRATION ACCEPT message.

NOTE 2: The "CAG information list" can be provided by the AMF and include no entry if no "CAG information list" exists in the subscription.

NOTE 2A: If the UE supports extended CAG information list, the CAG information list can be included either in the CAG information list IE or Extended CAG information list IE.

If the UE does not support extended CAG information list, the CAG information list shall not be included in the Extended CAG information list IE.

If a 5G-GUTI or the SOR transparent container IE is included in the REGISTRATION ACCEPT message, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If the Operator-defined access category definitions IE or the Extended emergency number list IE, the CAG information list IE or the Extended CAG information list IE are included in the REGISTRATION ACCEPT message, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If the UE has set the RCMP bit to "Sending of REGISTRATION COMPLETE message for negotiated PEIPS assistance information supported" in the 5GMM capability IE of the REGISTRATION REQUEST message and if the PEIPS assistance information IE is included in the REGISTRATION ACCEPT message, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If the UE is not in NB-N1 mode and the UE has set the RACS bit to "RACS supported" in the 5GMM Capability IE of the REGISTRATION REQUEST message, the AMF may include either a UE radio capability ID IE or a UE radio capability ID deletion indication IE in the REGISTRATION ACCEPT message. If the UE radio capability ID IE or the UE radio capability ID deletion indication IE is included in the REGISTRATION ACCEPT message, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

The AMF may include a new TAI list for the UE in the REGISTRATION ACCEPT message. The new TAI list shall not contain both tracking areas in NB-N1 mode and tracking areas not in NB-N1 mode. The UE, upon receiving a REGISTRATION ACCEPT message, shall delete its old TAI list and store the received TAI list. If there is no TAI list received, the UE shall consider the old TAI list as valid. If the registration area contains TAIs belonging to different PLMNs, which are equivalent PLMNs, and

a) the UE already has stored allowed NSSAI for the current registration area, the UE shall store the allowed NSSAI for the current registration area in each of the allowed NSSAIs which are associated with each of the PLMNs in the registration area;

b) the UE already has stored rejected NSSAI for the current registration area, the UE shall store the rejected NSSAI for the current registration area in each of the rejected NSSAIs which are associated with each of the PLMNs in the registration area;

c) the UE already has stored rejected NSSAI for the failed or revoked NSSAA, the UE shall store the rejected NSSAI for the failed or revoked NSSAA in each of the rejected NSSAIs which are associated with each of the PLMNs in the registration area;

d) the UE already has stored rejected NSSAI for the maximum number of UEs reached, the UE shall store the rejected NSSAI for the maximum number of UEs reached in each of the rejected NSSAIs which are associated with each of the PLMNs in the registration area;

e) the UE already has stored pending NSSAI, the UE shall store the pending NSSAI in each of the pending NSSAIs which are associated with each of the PLMNs in the registration area; and

f) the UE already has stored partially rejected NSSAI, the UE shall store the partially rejected NSSAI in each of the partially rejected NSSAIs which are associated with each of the PLMNs in the registration area.

NOTE 3: When assigning the TAI list, the AMF can take into account the eNodeB's capability of support of CIoT 5GS optimization.

The AMF may also include a list of equivalent PLMNs in the REGISTRATION ACCEPT message. Each entry in the list contains a PLMN code (MCC+MNC). The UE shall store the list as provided by the network, and if there is no emergency PDU session established, the UE shall remove from the list any PLMN code that is already in the forbidden PLMN list as specified in subclause 5.3.13A. If the UE is not registered for emergency services and there is an emergency PDU session established, the UE shall remove from the list of equivalent PLMNs any PLMN code present in the forbidden PLMN list as specified in subclause 5.3.13A, when the emergency PDU session is released. In addition, the UE shall add to the stored list the PLMN code of the registered PLMN that sent the list. The UE shall replace the stored list on each receipt of the REGISTRATION ACCEPT message. If the REGISTRATION ACCEPT message does not contain a list, then the UE shall delete the stored list. The AMF of a PLMN shall not include a list of equivalent SNPNs.

If the ESI bit of the 5GMM capability IE of the REGISTRATION REQUEST message is set to "equivalent SNPNs supported", the AMF of a SNPN may include a list of equivalent SNPNs in the REGISTRATION ACCEPT message. If the UE is registered for onboarding services in SNPN, the AMF shall not include a list of equivalent SNPNs in the REGISTRATION ACCEPT message. Each entry in the list contains an SNPN identity. The UE shall store the list as provided by the network. If there is no emergency PDU session established and the UE is not registered for onboarding services in SNPN, the UE shall remove from the list any SNPN identity that is already in:

- the "permanently forbidden SNPNs" list or the "temporarily forbidden SNPNs" list, if the SNPN is not an SNPN selected for localized services in SNPN (see 3GPP TS 23.122 [5]); or

- the "permanently forbidden SNPNs for access for localized services in SNPN" list or the " temporarily forbidden SNPNs for access for localized services in SNPN" list, if the SNPN is an SNPN selected for localized services in SNPN (see 3GPP TS 23.122 [5]).

If the UE is not registered for emergency services and there is an emergency PDU session established, the UE shall remove from the list of equivalent SNPNs any SNPN identity present in the "permanently forbidden SNPNs" list or the "temporarily forbidden SNPNs" list, when the emergency PDU session is released. The UE shall add to the stored list the SNPN identity of the registered SNPN that sent the list. The UE shall replace the stored list on each receipt of the REGISTRATION ACCEPT message. If the REGISTRATION ACCEPT message does not contain a list, then the UE shall delete the stored list. The AMF of an SNPN shall not include a list of equivalent PLMNs.

NOTE 3A0: If N1 mode was disabled for an SNPN due to reception of 5GMM cause #27 or #62, the UE implementation ensures that it does not register to this SNPN due to being part of the list of "equivalent SNPNs" received while registered in another SNPN.

If the UE is not registered for emergency services, and if the PLMN identity of the registered PLMN is a member of the forbidden PLMN list as specified in subclause 5.3.13A, any such PLMN identity shall be deleted from the corresponding list(s).

The AMF may include new service area restrictions in the Service area list IE in the REGISTRATION ACCEPT message. The UE, upon receiving a REGISTRATION ACCEPT message with new service area restrictions shall act as described in subclause 5.3.5.

If the Service area list IE is not included in the REGISTRATION ACCEPT message, any tracking area in the registered PLMN and its equivalent PLMN(s) in the registration area, or in the registered SNPN, is considered as an allowed tracking area as described in subclause 5.3.5.

The AMF shall include the MICO indication IE in the REGISTRATION ACCEPT message only if the MICO indication IE was included in the REGISTRATION REQUEST message, the AMF supports and accepts the use of MICO mode. If the AMF supports and accepts the use of MICO mode, the AMF may indicate "all PLMN registration area allocated" in the MICO indication IE in the REGISTRATION ACCEPT message. If "all PLMN registration area allocated" is indicated in the MICO indication IE, the AMF shall not assign and include the TAI list in the REGISTRATION ACCEPT message. If the REGISTRATION ACCEPT message includes an MICO indication IE indicating "all PLMN registration area allocated", the UE shall treat all TAIs in the current PLMN as a registration area and delete its old TAI list. If "strictly periodic registration timer supported" is indicated in the MICO indication IE in the REGISTRATION REQUEST message, the AMF may indicate "strictly periodic registration timer supported" in the MICO indication IE and may include the T3512 value IE in the REGISTRATION ACCEPT message. If the timer value received in T3512 IE is different from the already stored value of the timer T3512 and the timer T3512 is running, the UE shall restart T3512 with the new value received in the T3512 value IE.

The AMF shall include an active time value in the T3324 IE in the REGISTRATION ACCEPT message if the UE requested an active time value in the REGISTRATION REQUEST message and the AMF accepts the use of MICO mode and the use of active time.

If the UE does not include MICO indication IE in the REGISTRATION REQUEST message, then the AMF shall disable MICO mode if it was already enabled.

If the AMF supports and accepts the use of MICO, and the UE included the Requested T3512 value IE in the REGISTRATION REQUEST message, then the AMF shall take into account the T3512 value requested when providing the T3512 value IE in the REGISTRATION ACCEPT message.

NOTE 3A: The T3512 value assigned to the UE by AMF can be different from the T3512 value requested by the UE. AMF can take several factors into account when assigning the T3512 value, e.g. local configuration, expected UE behaviour, UE requested T3512 value, UE subscription data, network policies.

The AMF may include the T3512 value IE in the REGISTRATION ACCEPT message only if the REGISTRATION REQUEST message was sent over the 3GPP access.

The AMF may include the non-3GPP de-registration timer value IE in the REGISTRATION ACCEPT message only if the REGISTRATION REQUEST message was sent for the non-3GPP access.

If the UE indicates support of the N1 NAS signalling connection release in the REGISTRATION REQUEST message and the network decides to accept the N1 NAS signalling connection release, then the AMF shall set the N1 NAS signalling connection release bit to "N1 NAS signalling connection release supported" in the 5GS network feature support IE of the REGISTRATION ACCEPT message.

If the UE indicates support of the paging indication for voice services in the REGISTRATION REQUEST message and the network decides to accept the paging indication for voice services, then the AMF shall set the paging indication for voice services bit to "paging indication for voice services supported" in the 5GS network feature support IE of the REGISTRATION ACCEPT message. If the UE receives the REGISTRATION ACCEPT message with the paging indication for voice services bit set to "paging indication for voice services supported", the UE NAS layer informs the lower layers that paging indication for voice services is supported. Otherwise, the UE NAS layer informs the lower layers that paging indication for voice services is not supported.

If the UE indicates support of the reject paging request in the REGISTRATION REQUEST message and the network decides to accept the reject paging request, then the AMF shall set the reject paging request bit to "reject paging request supported" in the 5GS network feature support IE of the REGISTRATION ACCEPT message.

If the UE indicates support of the paging restriction in the REGISTRATION REQUEST message, and the AMF sets:

- the reject paging request bit to "reject paging request supported";

- the N1 NAS signalling connection release bit to "N1 NAS signalling connection release supported"; or

- both of them;

in the 5GS network feature support IE of the REGISTRATION ACCEPT message, and the network decides to accept the paging restriction, then the AMF shall set the paging restriction bit to "paging restriction supported" in the 5GS network feature support IE of the REGISTRATION ACCEPT message.

If the MUSIM UE does not include the Paging restriction IE in the REGISTRATION REQUEST message, the AMF shall delete any stored paging restriction for the UE and stop restricting paging.

If the MUSIM UE requests the release of the NAS signalling connection, by setting Request type to "NAS signalling connection release" in the UE request type IE included in the REGISTRATION REQUEST message, and the AMF supports the N1 NAS signalling connection release, the AMF shall initiate the release of the NAS signalling connection after the completion of the registration procedure for mobility and periodic registration update. If the UE requests restriction of paging by including the Paging restriction IE and the AMF supports the paging restriction, the AMF:

- if accepts the paging restriction, shall include the 5GS additional request result IE in the REGISTRATION ACCEPT message and set the Paging restriction decision to "paging restriction is accepted". The AMF shall store the paging restriction of the UE and enforce these restrictions in the paging procedure as described in subclause 5.6.2; or

- if rejects the paging restriction, shall include the 5GS additional request result IE in the REGISTRATION ACCEPT message and set the Paging restriction decision to "paging restriction is rejected", and shall discard the received paging restriction. The AMF shall delete any stored paging restriction for the UE and stop restricting paging.

If the UE requests "control plane CIoT 5GS optimization" in the 5GS update type IE, indicates support of control plane CIoT 5GS optimization in the 5GMM capability IE and the AMF decides to accept the requested CIoT 5GS optimization and the registration request, the AMF shall indicate "control plane CIoT 5GS optimization supported" in the 5GS network feature support IE of the REGISTRATION ACCEPT message.

If the UE has indicated support for the control plane CIoT 5GS optimizations, and the AMF decides to activate the congestion control for transport of user data via the control plane, then the AMF shall include the T3448 value IE in the REGISTRATION ACCEPT message.

If the AMF decides to deactivate the congestion control for transport of user data via the control plane, then the AMF shall delete the stored control plane data back-off time for the UE and the AMF shall not include timer T3448 value IE in the REGISTRATION ACCEPT message.

If:

- the UE in NB-N1 mode is using control plane CIoT 5GS optimization; and

- the network is configured to provide the truncated 5G-S-TMSI configuration for control plane CIoT 5GS optimizations;

the AMF shall include the Truncated 5G-S-TMSI configuration IE in the REGISTRATION ACCEPT message and set the "Truncated AMF Set ID value" and the "Truncated AMF Pointer value" in the Truncated 5G-S-TMSI configuration IE based on network policies. The AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

For inter-system change from S1 mode to N1 mode in 5GMM-IDLE mode, if the UE has included a ngKSI indicating a current 5G NAS security context in the REGISTRATION REQUEST message by which the REGISTRATION REQUEST message is integrity protected, the AMF shall take one of the following actions:

a) if the AMF retrieves the current 5G NAS security context as indicated by the ngKSI and 5G-GUTI sent by the UE, the AMF shall integrity check the REGISTRATION REQUEST message using the current 5G NAS security context and integrity protect the REGISTRATION ACCEPT message using the current 5G NAS security context;

b) if the AMF cannot retrieve the current 5G NAS security context as indicated by the ngKSI and 5G-GUTI sent by the UE, the AMF shall treat the REGISTRATION REQUEST message fails the integrity check and take actions as specified in subclause 4.4.4.3; or

c) if the UE has not included an Additional GUTI IE, the AMF may treat the REGISTRATION REQUEST message as in the previous item, i.e. as if it cannot retrieve the current 5G NAS security context.

NOTE 4: The handling described above at failure to retrieve the current 5G NAS security context or if no Additional GUTI IE was provided does not preclude the option for the AMF to perform a primary authentication and key agreement procedure and create a new native 5G NAS security context.

For inter-system change from S1 mode to N1 mode in 5GMM-CONNECTED mode, the AMF shall integrity check REGISTRATION REQUEST message using the current K'AMF as derived when triggering the handover to N1 mode (see subclause 4.4.2.2). The AMF shall verify the received UE security capabilities in the REGISTRATION REQUEST message. The AMF shall then take one of the following actions:

a) if the REGISTRATION REQUEST does not contain a valid KSIAMF in the Non-current native NAS key set identifier IE, the AMF shall remove the non-current native 5G NAS security context, if any, for any 5G-GUTI for this UE. The AMF shall then integrity protect and cipher the REGISTRATION ACCEPT message using the security context based on K'AMF and take the mapped 5G NAS security context into use; or

b) if the REGISTRATION REQUEST contains a valid KSIAMF in the Non-current native NAS key set identifier IE and:

1) the AMF decides to take the native 5G NAS security context into use, the AMF shall initiate a security mode control procedure to take the corresponding native 5G NAS security context into use and then integrity protect and cipher the REGISTRATION ACCEPT message using the corresponding native 5G NAS security context; and

2) otherwise, the AMF shall then integrity protect and cipher the REGISTRATION ACCEPT message using the security context based on K'AMF and take the mapped 5G NAS security context into use.

NOTE 5: In above bullet b), it is recommended for the AMF to initiate a security mode control procedure to take the corresponding native 5G NAS security context into use.

If the UE has included the service-level device ID set to the CAA-level UAV ID in the Service-level-AA container IE of the REGISTRATION REQUEST message, and if:

- the UE has a valid aerial UE subscription information; and

- the UUAA procedure is to be performed during the registration procedure according to operator policy; and

- there is no valid successful UUAA result for the UE in the UE 5GMM context,

then the AMF shall initiate the UUAA-MM procedure with the UAS-NF as specified in 3GPP TS 23.256 [6AB] and shall include a service-level-AA pending indication in the Service-level-AA container IE of the REGISTRATION ACCEPT message. The AMF shall store in the UE 5GMM context that a UUAA procedure is pending. The AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If the UE has included the service-level device ID set to the CAA-level UAV ID in the Service-level-AA container IE of the REGISTRATION REQUEST message, and if:

- the UE has a valid aerial UE subscription information;

- the UUAA procedure is to be performed during the registration procedure according to operator policy; and

- there is a valid successful UUAA result for the UE in the UE 5GMM context,

then the AMF shall include a service-level-AA response in the Service-level-AA container IE of the REGISTRATION ACCEPT message and set the SLAR field in the service-level-AA response to "Service level authentication and authorization was successful".

If the AMF determines that the UUAA-MM procedure needs to be performed for a UE, the AMF has not received the service -level device ID set to the CAA-level UAV ID in the Service-level-AA container IE of the REGISTRATION REQUEST message from the UE and the AMF decides to accept the UE to be registered for other services than UAS services based on the user's subscription data and the operator policy, the AMF shall accept the registration update request and shall mark in the UE's 5GMM context that the UE is not allowed to request UAS services.

If the UE supports MINT, the AMF may include the List of PLMNs to be used in disaster condition IE in the REGISTRATION ACCEPT message.

If the UE supports MINT, the AMF may include the Disaster roaming wait range IE in the REGISTRATION ACCEPT message.

If the UE supports MINT, the AMF may include the Disaster return wait range IE in the REGISTRATION ACCEPT message.

NOTE 6: The AMF can determine the content of the "list of PLMN(s) to be used in disaster condition", the value of the disaster roaming wait range and the value of the disaster return wait range based on the network local configuration.

If the AMF received the list of TAIs from the satellite NG-RAN as described in 3GPP TS 23.501 [8], and determines that, by UE subscription and operator's preferences, any but not all TAIs in the received list of TAIs is forbidden for roaming or for regional provision of service, the AMF shall include the TAI(s) in:

a) the Forbidden TAI(s) for the list of "5GS forbidden tracking areas for roaming" IE; or

b) the Forbidden TAI(s) for the list of "5GS forbidden tracking areas for regional provision of service" IE; or

c) both;

in the REGISTRATION ACCEPT message.

NOTE 7A: Void.

If the UE has set the Reconnection to the network due to RAN timing synchronization status change (RANtiming) bit to "Reconnection to the network due to RAN timing synchronization status change supported" in the 5GMM capability IE of the REGISTRATION REQUEST message, the AMF may include the RAN timing synchronization IE with the RecReq bit set to "Reconnection requested" in the REGISTRATION ACCEPT message.

If the AMF receives the mobility and periodic registration request along with along with the mobile IAB-indication over N2 reference point (see TS 38.413 [31]) from an UE and the UE is authorized to operate as an MBSR based on the subscription information and local policy (see 3GPP TS 23.501 [8]), the AMF shall include the Feature authorization indication IE in the REGISTRATION ACCEPT message and shall set the MBSRAI field to "authorized to operate as MBSR". If the AMF receives the mobility and periodic registration request along with along with the mobile IAB-indication over N2 reference point (see TS 38.413 [31]) from a UE and the UE is not authorized operate as an MBSR based on the subscription information and local policy but can operate as a UE, the AMF shall include the Feature authorization indication IE in the REGISTRATION ACCEPT message and shall set the MBSRAI field to "not authorized to operate as MBSR but allowed to operate as a UE".

If the UE supports user plane positioning using LCS-UPP, SUPL, or both, the AMF shall set the LCS-UPP bit, the SUPL bit, or both in the 5GS network feature support IE of the REGISTRATION ACCEPT message as specified in 3GPP TS 24.572 [64].

Upon receipt of the REGISTRATION ACCEPT message, the UE shall reset the registration attempt counter and service request attempt counter, enter state 5GMM-REGISTERED and set the 5GS update status to 5U1 UPDATED.

If the UE receives the REGISTRATION ACCEPT message from a PLMN, then the UE shall reset the PLMN-specific attempt counter for that PLMN for the specific access type for which the message was received. The UE shall also reset the PLMN-specific N1 mode attempt counter for that PLMN for the specific access type for which the message was received. If the message was received via 3GPP access, the UE shall reset the counter for "SIM/USIM considered invalid for GPRS services" events and the counter for "SIM/USIM considered invalid for non-GPRS services", if any. If the message was received via non-3GPP access, the UE shall reset the counter for "USIM considered invalid for 5GS services over non-3GPP" events.

If the UE receives the REGISTRATION ACCEPT message from an SNPN, then the UE shall reset the SNPN-specific attempt counter for the current SNPN for the specific access type for which the message was received. If the message was received via 3GPP access, the UE shall reset the counter for "the entry for the current SNPN considered invalid for 3GPP access" events. If the message was received via non-3GPP access, the UE shall reset the counter for "the entry for the current SNPN considered invalid for non-3GPP access" events.

If the REGISTRATION ACCEPT message included a T3512 value IE, the UE shall use the value in T3512 value IE as periodic registration update timer (T3512). If the T3512 value IE is not included, the UE shall use the value currently stored, e.g. from a prior REGISTRATION ACCEPT message.

If the REGISTRATION ACCEPT message include a T3324 value IE, the UE shall use the value in the T3324 value IE as active time timer (T3324). If the REGISTRATION ACCEPT message does not include a T3324 value IE, UE shall not start the timer T3324 until a new value is received from the network.

If the REGISTRATION ACCEPT message included a non-3GPP de-registration timer value IE, the UE shall use the value in non-3GPP de-registration timer value IE as non-3GPP de-registration timer. If non-3GPP de-registration timer value IE is not included, the UE shall use the value currently stored, e.g. from a prior REGISTRATION ACCEPT message. If non-3GPP de-registration timer value IE is not included and there is no stored non-3GPP de-registration timer value in the UE, the UE shall use the default value of the non-3GPP de-registration timer.

If the REGISTRATION ACCEPT message contains a 5G-GUTI, the UE shall return a REGISTRATION COMPLETE message to the AMF to acknowledge the received 5G-GUTI, stop timer T3519 if running, and delete any stored SUCI. The UE shall provide the 5G-GUTI to the lower layer of 3GPP access if the REGISTRATION ACCEPT message is sent over the non-3GPP access, and the UE is in 5GMM-REGISTERED in both 3GPP access and non-3GPP access in the same PLMN.

If the REGISTRATION ACCEPT message contains

a) the Network slicing indication IE with the Network slicing subscription change indication set to "Network slicing subscription changed";

b) a Configured NSSAI IE with a new configured NSSAI for the current PLMN or SNPN and optionally the mapped S-NSSAI(s) for the configured NSSAI for the current PLMN or SNPN;

c) an NSSRG information IE with a new NSSRG information;

d) an Alternative NSSAI IE with a new alternative NSSAI;

e) an S-NSSAI location validity information in the Registration accept type 6 IE container IE with a new S-NSSAI location validity information;

f) an S-NSSAI time validity information IE with a new S-NSSAI time validity information; or

g) an On-demand NSSAI IE with a new on-demand NSSAI or an updated slice deregistration inactivity timer value,

the UE shall return a REGISTRATION COMPLETE message to the AMF to acknowledge the successful update of the network slicing information. If the UE has set the RCMAN bit to "Sending of REGISTRATION COMPLETE message for NSAG information supported" in the 5GMM capability IE of the REGISTRATION REQUEST message and if REGISTRATION ACCEPT message contains the NSAG information IE, the UE shall return REGISTRATION COMPLETE message to the AMF to acknowledge the reception of the NSAG information IE.

NOTE 7B: When the UE receives the NSSRG information IE, the UE may provide the NSSRG information to lower layers for the purpose of NSAG-aware cell reselection.

If the REGISTRATION ACCEPT message contains the CAG information list IE or the Extended CAG information list IE and the UE had set the CAG bit to "CAG supported" in the 5GMM capability IE of the REGISTRATION REQUEST message, the UE shall:

a) replace the "CAG information list" stored in the UE with the received CAG information list IE or the Extended CAG information list IE when received in the HPLMN or EHPLMN;

b) replace the serving VPLMN's entry of the "CAG information list" stored in the UE with the serving VPLMN's entry of the received CAG information list IE or the Extended CAG information list IE when the UE receives the CAG information list IE or the Extended CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN; or

NOTE 7: When the UE receives the CAG information list IE or the Extended CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN, entries of a PLMN other than the serving VPLMN, if any, in the received CAG information list IE or the Extended CAG information list IE are ignored.

c) remove the serving VPLMN's entry of the "CAG information list" stored in the UE when the UE receives the CAG information list IE or the Extended CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN and the CAG information list IE or the Extended CAG information list IE does not contain the serving VPLMN's entry.

The UE shall store the "CAG information list" received in the CAG information list IE or the Extended CAG information list IE as specified in annex C.

If the received "CAG information list" includes an entry containing the identity of the registered PLMN, the UE shall operate as follows.

a) if the UE receives the REGISTRATION ACCEPT message via a CAG cell, none of the CAG-ID(s) supported by the current CAG cell is authorized based on the "Allowed CAG list" of the entry for the registered PLMN in the received "CAG information list", and:

1) the entry for the registered PLMN in the received "CAG information list" does not include an "indication that the UE is only allowed to access 5GS via CAG cells", then the UE shall enter the state 5GMM-REGISTERED.LIMITED-SERVICE and shall search for a suitable cell according to 3GPP TS 38.304 [28] or 3GPP TS 36.304 [25C] with the updated "CAG information list"; or

2) the entry for the registered PLMN in the received "CAG information list" includes an "indication that the UE is only allowed to access 5GS via CAG cells" and:

i) if one or more CAG-ID(s) are authorized based on the "Allowed CAG list" of the entry for the registered PLMN in the received "CAG information list", the UE shall enter the state 5GMM-REGISTERED.LIMITED-SERVICE and shall search for a suitable cell according to 3GPP TS 38.304 [28] with the updated "CAG information list"; or

ii) if no CAG-ID is authorized based on the "Allowed CAG list" of the entry for the registered PLMN in the received "CAG information list" and:

A) the UE does not have an emergency PDU session, then the UE shall enter the state 5GMM-REGISTERED.PLMN-SEARCH and shall apply the PLMN selection process defined in 3GPP TS 23.122 [5] with the updated "CAG information list"; or

B) the UE has an emergency PDU session, then the UE shall perform a local release of all PDU sessions associated with 3GPP access except for the emergency PDU session and enter the state 5GMM-REGISTERED.LIMITED-SERVICE; or

b) if the UE receives the REGISTRATION ACCEPT message via a non-CAG cell and the entry for the registered PLMN in the received "CAG information list" includes an "indication that the UE is only allowed to access 5GS via CAG cells" and:

1) if one or more CAG-ID(s) are authorized based on the "allowed CAG list" for the registered PLMN in the received "CAG information list", the UE shall enter the state 5GMM-REGISTERED.LIMITED-SERVICE and shall search for a suitable cell according to 3GPP TS 38.304 [28] with the updated "CAG information list"; or

2) if no CAG-ID is authorized based on the "Allowed CAG list" of the entry for the registered PLMN in the received "CAG information list" and:

i) the UE does not have an emergency PDU session, then the UE shall enter the state 5GMM-REGISTERED.PLMN-SEARCH and shall apply the PLMN selection process defined in 3GPP TS 23.122 [5] with the updated "CAG information list"; or

ii) the UE has an emergency PDU session, then the UE shall perform a local release of all PDU sessions associated with 3GPP access except for the emergency PDU session and enter the state 5GMM-REGISTERED.LIMITED-SERVICE.

If the received "CAG information list" does not include an entry containing the identity of the registered PLMN and the UE receives the REGISTRATION ACCEPT message via a CAG cell, the UE shall enter the state 5GMM-REGISTERED.LIMITED-SERVICE and shall search for a suitable cell according to 3GPP TS 38.304 [28] or 3GPP TS 36.304 [25C] with the updated "CAG information list".

If the REGISTRATION ACCEPT message contains the Operator-defined access category definitions IE, the Extended emergency number list IE, the CAG information list IE or the Extended CAG information list IE, the UE shall return a REGISTRATION COMPLETE message to the AMF to acknowledge reception of the operator-defined access category definitions or the extended local emergency numbers list or the CAG information list.

If the UE has set the RCMAP bit to " Sending of REGISTRATION COMPLETE message for negotiated PEIPS assistance information supported " in the 5GMM capability IE of the REGISTRATION REQUEST message and if REGISTRATION ACCEPT message contains the Negotiated PEIPS assistance information IE, the UE shall return a REGISTRATION COMPLETE message to the AMF to acknowledge reception of the Negotiated PEIPS assistance information IE.

If the REGISTRATION ACCEPT message contains the UE radio capability ID IE or the UE radio capability ID deletion indication IE, the UE shall return a REGISTRATION COMPLETE message to the AMF to acknowledge reception of the UE radio capability ID IE or the UE radio capability ID deletion indication IE.

If the T3448 value IE is present in the received REGISTRATION ACCEPT message and the value indicates that this timer is neither zero nor deactivated, the UE shall:

a) stop timer T3448 if it is running; and

b) start timer T3448 with the value provided in the T3448 value IE.

If the UE is using 5GS services with control plane CIoT 5GS optimization, the T3448 value IE is present in the REGISTRATION ACCEPT message and the value indicates that this timer is either zero or deactivated, the UE shall ignore the T3448 value IE and proceed as if the T3448 value IE was not present.

If the UE in 5GMM-IDLE mode initiated the registration procedure for mobility and periodic registration update and the REGISTRATION ACCEPT message does not include the T3448 value IE and if timer T3448 is running, then the UE shall stop timer T3448.

Upon receiving a REGISTRATION COMPLETE message, the AMF shall stop timer T3550 and change to state 5GMM-REGISTERED. The 5G-GUTI, if sent in the REGISTRATION ACCEPT message, shall be considered as valid, the PEIPS assistance information, if sent in the REGISTRATION ACCEPT message, shall be considered as valid, and the UE radio capability ID, if sent in the REGISTRATION ACCEPT message, shall be considered as valid.

If the 5GS update type IE was included in the REGISTRATION REQUEST message with the SMS requested bit set to "SMS over NAS supported" and:

a) the SMSF address is stored in the UE 5GMM context and:

1) the UE is considered available for SMS over NAS; or

2) the UE is considered not available for SMS over NAS and the SMSF has confirmed that the activation of the SMS service is successful; or

b) the SMSF address is not stored in the UE 5GMM context, the SMSF selection is successful and the SMSF has confirmed that the activation of the SMS service is successful;

then the AMF shall set the SMS allowed bit of the 5GS registration result IE in the REGISTRATION ACCEPT message as specified in subclause 5.5.1.2.4. If the UE 5GMM context does not contain an SMSF address or the UE is not considered available for SMS over NAS, then the AMF shall:

a) store the SMSF address in the UE 5GMM context if not stored already; and

b) store the value of the SMS allowed bit of the 5GS registration result IE in the UE 5GMM context and consider the UE available for SMS over NAS.

If SMSF selection in the AMF or SMS activation via the SMSF is not successful, or the AMF does not allow the use of SMS over NAS, then the AMF shall set the SMS allowed bit of the 5GS registration result IE to "SMS over NAS not allowed" in the REGISTRATION ACCEPT message.

If the 5GS update type IE was included in the REGISTRATION REQUEST message with the SMS requested bit set to "SMS over NAS not supported" or the 5GS update type IE was not included in the REGISTRATION REQUEST message, then the AMF shall:

a) mark the 5GMM context to indicate that the UE is not available for SMS over NAS; and

NOTE 8: The AMF can notify the SMSF that the UE is deregistered from SMS over NAS based on local configuration.

b) set the SMS allowed bit of the 5GS registration result IE to "SMS over NAS not allowed" in the REGISTRATION ACCEPT message.

When the UE receives the REGISTRATION ACCEPT message, if the UE is also registered over another access to the same PLMN, the UE considers the value indicated by the SMS allowed bit of the 5GS registration result IE as applicable for both accesses over which the UE is registered.

If the 5GS update type IE was included in the REGISTRATION REQUEST message with the NG-RAN-RCU bit set to "UE radio capability update needed", the AMF shall delete the stored UE radio capability information or the UE radio capability ID, if any.

The AMF shall include the 5GS registration result IE in the REGISTRATION ACCEPT message. If the 5GS registration result value in the 5GS registration result IE indicates:

a) "3GPP access", the UE:

1) shall consider itself as being registered to 3GPP access; and

2) if in 5GMM-REGISTERED state over non-3GPP access and on the same PLMN or SNPN as 3GPP access, shall enter state 5GMM-DEREGISTERED.ATTEMPTING-REGISTRATION over non-3GPP access and set the 5GS update status to 5U2 NOT UPDATED over non-3GPP access; or

b) "Non-3GPP access", the UE:

1) shall consider itself as being registered to non-3GPP access; and

2) if in the 5GMM-REGISTERED state over 3GPP access and is on the same PLMN or SNPN as non-3GPP access, shall enter the state 5GMM-DEREGISTERED.ATTEMPTING-REGISTRATION over 3GPP access and set the 5GS update status to 5U2 NOT UPDATED over 3GPP access; or

c) "3GPP access and non-3GPP access", the UE shall consider itself as being registered to both 3GPP access and non-3GPP access.

If the UE is not currently registered for emergency services and the emergency registered bit of the 5GS registration result IE in the REGISTRATION ACCEPT message is set to "Registered for emergency services", the UE shall consider itself registered for emergency services and shall locally release all non-emergency PDU sessions, if any.

In roaming scenarios, the AMF shall provide mapped S-NSSAI(s) for the configured NSSAI, the allowed NSSAI, the partially allowed NSSAI, the rejected NSSAI (if Extended rejected NSSAI IE is used), the partially rejected NSSAI, the pending NSSAI or NSSRG information when included in the REGISTRATION ACCEPT message.

The AMF shall include the allowed NSSAI for the current PLMN or SNPN, in roaming scenarios, and shall include the mapped S-NSSAI(s) for the allowed NSSAI contained in the requested NSSAI (i.e. Requested NSSAI IE or Requested mapped NSSAI IE) from the UE, in the REGISTRATION ACCEPT message if the UE included the requested NSSAI in the REGISTRATION REQUEST message and the AMF allows one or more S-NSSAIs for the current PLMN or SNPN in the Requested NSSAI IE or one or more mapped S-NSSAIs in the Requested NSSAI IE or Requested mapped NSSAI IE. Additionally, if the AMF allows one or more subscribed S-NSSAIs for the UE, the AMF may include the allowed subscribed S-NSSAI(s) in the allowed NSSAI in the REGISTRATION ACCEPT message. The S-NSSAI associated with each of the active PDN connections for which interworking to 5GS is supported, shall be included in the allowed NSSAI if the UE included the UE status IE with the EMM registration status set to "UE is in EMM-REGISTERED state" in the REGISTRATION REQUEST message and the AMF supports N26 interface.

The AMF may also include rejected NSSAI in the REGISTRATION ACCEPT message if the UE is not registered for onboarding services in SNPN. If the UE has set the ER-NSSAI bit to "Extended rejected NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message, the rejected NSSAI shall be included in the Extended rejected NSSAI IE in the REGISTRATION ACCEPT message; otherwise the rejected NSSAI shall be included in the Rejected NSSAI IE in the REGISTRATION ACCEPT message. If the UE is registered for onboarding services in SNPN, the AMF shall not include rejected NSSAI in the REGISTRATION ACCEPT message.

If the UE has indicated the support for partial network slice and the AMF determines one or more S-NSSAI(s) in the requested NSSAI are to be included in the partially rejected NSSAI as specified in subclause 4.6.2.11, the AMF shall include the Partially rejected NSSAI IE in the Registration accept type 6 IE container IE of the REGISTRATION ACCEPT message.

If the UE receives the Partially rejected NSSAI IE in the Registration accept type 6 IE container IE of the REGISTRATION ACCEPT message, the UE shall store the partially rejected NSSAI as specified in subclause 4.6.2.2.

If the UE has set the ER-NSSAI bit to "Extended rejected NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message, the rejected NSSAI contains S-NSSAI(s) which was included in the requested NSSAI but rejected by the network associated with rejection cause(s); otherwise the rejected NSSAI contains S-NSSAI(s) which was included in the requested NSSAI but rejected by the network associated with rejection cause(s) with the following restrictions:

a) rejected NSSAI for the current PLMN or SNPN shall not include an S-NSSAI for the current PLMN or SNPN which is associated to multiple mapped S-NSSAIs and some of these but not all mapped S-NSSAIs are not allowed; and

b) rejected NSSAI for the current registration area shall not include an S-NSSAI for the current PLMN or SNPN which is associated to multiple mapped S-NSSAIs and some of these but not all mapped S-NSSAIs are not allowed.

NOTE 9: The UE that does not support extended rejected NSSAI can avoid requesting an S-NSSAI associated with a mapped S-NSSAI, which was included in the previous requested NSSAI but neither in the allowed NSSAI nor in the rejected NSSAI in the consequent registration procedures.

If the UE indicated the support for network slice-specific authentication and authorization, and if the requested NSSAI (i.e. the Requested NSSAI IE or the Requested mapped NSSAI IE) includes one or more S-NSSAIs subject to network slice-specific authentication and authorization, the AMF shall in the REGISTRATION ACCEPT message include:

a) the allowed NSSAI containing the S-NSSAI(s) or the mapped S-NSSAI(s), if any:

1) which are not subject to network slice-specific authentication and authorization and are allowed by the AMF; or

2) for which the network slice-specific authentication and authorization has been successfully performed;

aa) the partially allowed NSSAI containing the S-NSSAI(s) or the mapped S-NSSAI(s), if any:

1) which are not subject to network slice-specific authentication and authorization and are allowed by the AMF; or

2) for which the network slice-specific authentication and authorization has been successfully performed;

b) optionally, the rejected NSSAI;

ba) optionally, the partially rejected NSSAI;

c) pending NSSAI containing one or more S-NSSAIs for which network slice-specific authentication and authorization (except for re-NSSAA) will be performed or is ongoing, and one or more S-NSSAIs from the pending NSSAI which the AMF provided to the UE during the previous registration procedure for which network slice-specific authentication and authorization will be performed or is ongoing, if any; and

d) the "NSSAA to be performed" indicator in the 5GS registration result IE set to indicate that the network slice-specific authentication and authorization procedure will be performed by the network, if the allowed NSSAI is not included in the REGISTRATION ACCEPT message.

If the UE is not registered for onboarding services in SNPN, the UE indicated the support for network slice-specific authentication and authorization, and:

a) the UE did not include the requested NSSAI in the REGISTRATION REQUEST message or none of the S-NSSAIs in the requested NSSAI in the REGISTRATION REQUEST message are allowed;

b) all default S-NSSAIs are subject to network slice-specific authentication and authorization; and

c) the network slice-specific authentication and authorization procedure has not been successfully performed for any of the default S-NSSAIs,

the AMF shall in the REGISTRATION ACCEPT message include:

a) the "NSSAA to be performed" indicator in the 5GS registration result IE to indicate that the network slice-specific authentication and authorization procedure will be performed by the network; and

b) pending NSSAI containing one or more default S-NSSAIs for which network slice-specific authentication and authorization will be performed or is ongoing and one or more S-NSSAIs from the pending NSSAI which the AMF provided to the UE during the previous registration procedure for which network slice-specific authentication and authorization will be performed or is ongoing (if any); and

c) optionally, the rejected NSSAI.

If the UE is not registered for onboarding services in SNPN, the UE indicated the support for network slice-specific authentication and authorization, and:

a) the UE did not include the requested NSSAI in the REGISTRATION REQUEST message or none of the S-NSSAIs in the requested NSSAI in the REGISTRATION REQUEST message are allowed; and

b) one or more default S-NSSAIs are not subject to network slice-specific authentication and authorization or the network slice-specific authentication and authorization procedure has been successfully performed for one or more default S-NSSAIs;

the AMF shall in the REGISTRATION ACCEPT message include:

a) pending NSSAI containing one or more default S-NSSAIs for which network slice-specific authentication and authorization will be performed or is ongoing (if any) and one or more S-NSSAIs from the pending NSSAI which the AMF provided to the UE during the previous registration procedure for which network slice-specific authentication and authorization will be performed or is ongoing (if any);

b) allowed NSSAI containing S-NSSAI(s) for the current PLMN or SNPN each of which corresponds to a default S-NSSAI which are not subject to network slice-specific authentication and authorization or for which the network slice-specific authentication and authorization has been successfully performed;

c) allowed NSSAI containing one or more default S-NSSAIs, as the mapped S-NSSAI(s) for the allowed NSSAI in roaming scenarios, which are not subject to network slice-specific authentication and authorization or for which the network slice-specific authentication and authorization has been successfully performed; and

d) optionally, the rejected NSSAI; and

e) optionally, the partially rejected NSSAI.

If the UE did not include the requested NSSAI in the REGISTRATION REQUEST message or none of the S-NSSAIs in the requested NSSAI in the REGISTRATION REQUEST message are allowed, the allowed NSSAI shall not contain default S-NSSAI(s) that are subject to NSAC. If the subscription information includes the NSSRG information, the S-NSSAIs of the allowed NSSAI shall be associated with at least one common NSSRG value. If the network has pending NSSAI, the S-NSSAIs in the pending NSSAI and allowed NSSAI shall be associated with at least one common NSSRG value.

When the REGISTRATION ACCEPT message includes a pending NSSAI, the pending NSSAI shall contain all S-NSSAIs for which network slice-specific authentication and authorization (except for re-NSSAA) will be performed or is ongoing from the requested NSSAI of the REGISTRATION REQUEST message that was received over the 3GPP access, non-3GPP access, or both the 3GPP access and non-3GPP access.

If the UE supports extended rejected NSSAI and the AMF determines that maximum number of UEs reached for all S-NSSAIs in the requested NSSAI as specified in subclause 4.6.2.5, the AMF shall include the rejected NSSAI containing one or more S-NSSAIs with the rejection cause "S-NSSAI not available due to maximum number of UEs reached" in the Extended rejected NSSAI IE in the REGISTRATION ACCEPT message. In addition, the AMF may include a back-off timer value for each S-NSSAI with the rejection cause "S-NSSAI not available due to maximum number of UEs reached" included in the Extended rejected NSSAI IE of the REGISTRATION ACCEPT message. To avoid that large numbers of UEs simultaneously initiate deferred requests, the network should select the value for the backoff timer for each S-NSSAI for the informed UEs so that timeouts are not synchronised.

If the UE does not indicate support for extended rejected NSSAI and the maximum number of UEs has been reached, the AMF should include the rejected NSSAI containing one or more S-NSSAIs with the rejection cause "S-NSSAI not available in the current registration area" in the Rejected NSSAI IE and should not include these S-NSSAIs in the allowed NSSAI in the REGISTRATION ACCEPT message.

NOTE 10: Based on network policies, the AMF can include the S-NSSAI(s) for which the maximum number of UEs has been reached in the rejected NSSAI with rejection causes other than "S-NSSAI not available in the current registration area".

If the UE indicates support for network slice usage control and the AMF determines to provide the on-demand NSSAI, the AMF shall include the On-demand NSSAI IE in the REGISTRATION ACCEPT message. In addition, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If the UE receives the On-demand NSSAI IE in the REGISTRATION ACCEPT message, the UE shall store the on-demand NSSAI as specified in subclause 4.6.2.2.

If the AMF has a new configured NSSAI for the current PLMN or SNPN, the AMF shall include the configured NSSAI for the current PLMN or SNPN in the REGISTRATION ACCEPT message.

NOTE 10A: A new configured NSSAI can be available at the AMF following an indication that the subscription data for network slicing has changed.

The AMF may include a new configured NSSAI for the current PLMN or SNPN in the REGISTRATION ACCEPT message if:

a) the REGISTRATION REQUEST message did not include a requested NSSAI and the UE is not registered for onboarding services in SNPN;

b) the REGISTRATION REQUEST message included a requested NSSAI containing an S-NSSAI that is not valid in the serving PLMN or SNPN;

c) the REGISTRATION REQUEST message included a requested NSSAI containing an S-NSSAI with incorrect mapped S-NSSAI(s);

d) the REGISTRATION REQUEST message included the Network slicing indication IE with the Default configured NSSAI indication bit set to "Requested NSSAI created from default configured NSSAI";

e) the REGISTRATION REQUEST message included the requested mapped NSSAI;

f) the S-NSSAIs of the requested NSSAI in the REGISTRATION REQUEST message are not associated with any common NSSRG value, except for the case that the AMF, based on the indication received from the UDM as specified in 3GPP TS 23.501 [8], has provided all subscribed S-NSSAIs in the configured NSSAI to a UE who does not support NSSRG;

NOTE 11: If the S-NSSAIs of the requested NSSAI in the REGISTRATION REQUEST message are not associated with any common NSSRG value, it is possible that at least one of the S-NSSAIs is not included in any of new allowed NSSAI, new (extended) rejected NSSAI (if applicable), and new pending NSSAI (if applicable).

g) the UE is in 5GMM-REGISTERED state over the other access and the S-NSSAIs of the requested NSSAI in the REGISTRATION REQUEST message over the current access and the allowed NSSAI over the other access are not associated with any common NSSRG value;

h) the REGISTRATION REQUEST message included a 5GS mobile identity IE containing a mapped 5G-GUTI and did not include an Additional GUTI IE; or

i) the REGISTRATION REQUEST message included an Additional GUTI IE containing a valid native 5G-GUTI which was not allocated by the current PLMN or SNPN.

The AMF may include a new configured NSSAI for the current PLMN or SNPN in the REGISTRATION ACCEPT message if the REGISTRATION REQUEST message includes a requested NSSAI containing an S-NSSAI and the S-NSSAI time validity information, if available, indicates that the S-NSSAI is not available (see 3GPP TS 23.501 [8]). In this case, if the TempNS bit of the 5GMM capability IE in the REGISTRATION REQUEST message is set to:

a) "S-NSSAI time validity information supported" and the S-NSSAI time validity information indicates that the S-NSSAI will:

1) become available again, then the AMF shall also send S-NSSAI time validity information; or

2) not become available again, then the AMF shall not include the S-NSSAI in the new configured NSSAI; or

b) "S-NSSAI time validity information not supported" and the AMF sends a new configured NSSAI, then the AMF shall not include the S-NSSAI in the new configured NSSAI.

If a new configured NSSAI for the current PLMN or SNPN is included and the UE is roaming, the AMF shall also include the mapped S-NSSAI(s) for the configured NSSAI for the current PLMN or SNPN in the REGISTRATION ACCEPT message. In this case the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If a new configured NSSAI for the current PLMN or SNPN is included, the subscription information includes the NSSRG information, and the NSSRG bit in the 5GMM capability IE of the REGISTRATION REQUEST message is set to:

a) "NSSRG supported", then the AMF shall include the NSSRG information in the REGISTRATION ACCEPT message; or

b) "NSSRG not supported", then the configured NSSAI shall include S-NSSAIs each of which is associated with all the NSSRG value(s) of the default S-NSSAI(s), or the configured NSSAI shall include, based on the indication received from the UDM as specified in 3GPP TS 23.501 [8], all subscribed S-NSSAIs even if these S-NSSAIs do not share any common NSSRG value.

If the AMF needs to update the NSSRG information and the UE has set the NSSRG bit to "NSSRG supported" in the 5GMM capability IE of the REGISTRATION REQUEST message, then the AMF shall include the new NSSRG information in the REGISTRATION ACCEPT message. In addition, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If the UE supports S-NSSAI time validity information and the AMF needs to update the S-NSSAI time validity information, then the AMF shall include the S-NSSAI time validity information IE in the REGISTRATION ACCEPT message. In addition, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If the UE supports S-NSSAI location validity information and the AMF needs to update the S-NSSAI location validity information, then the AMF shall include the S-NSSAI location validity information IE in the Registration accept type 6 IE container IE of the REGISTRATION ACCEPT message. In addition, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

The AMF shall include the Network slicing indication IE with the Network slicing subscription change indication set to "Network slicing subscription changed" in the REGISTRATION ACCEPT message if the UDM has indicated that the subscription data for network slicing has changed. In this case the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If the S-NSSAI(s) associated with the existing PDU session(s) of the UE is not included in the requested NSSAI (i.e. Requested NSSAI IE or Requested mapped NSSAI IE) of the REGISTRATION REQUEST message, the AMF shall perform a local release of the PDU session(s) associated with the S-NSSAI(s) except for a PDU session associated with DNN and S-NSSAI in the AMF onboarding configuration data and shall request the SMF to perform a local release of those PDU session(s).

The UE that has indicated the support for network slice-specific authentication and authorization receiving the pending NSSAI in the REGISTRATION ACCEPT message shall store the S-NSSAI(s) in the pending NSSAI as specified in subclause 4.6.2.2. If the registration area contains TAIs belonging to different PLMNs, which are equivalent PLMNs, the UE shall store the received pending NSSAI for each of the equivalent PLMNs as specified in subclause 4.6.2.2. If the pending NSSAI is not included 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, then the UE shall delete the pending NSSAI for the current PLMN and its equivalent PLMN(s) or SNPN, if existing, as specified in subclause 4.6.2.2.

The UE receiving the rejected NSSAI in the REGISTRATION ACCEPT message takes the following actions based on the rejection cause in the rejected S-NSSAI(s):

"S-NSSAI not available in the current PLMN or SNPN"

The UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the current PLMN or SNPN as specified in subclause 4.6.2.2 and shall not attempt to use this S-NSSAI(s) in the current PLMN or SNPN over any access until switching off the UE, the UICC containing the USIM is removed, the entry of the "list of subscriber data" with the SNPN identity of the current SNPN is updated, or the rejected S-NSSAI(s) are removed as described in subclause 4.6.2.2.

"S-NSSAI not available in the current registration area"

The UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the current registration area as specified in subclause 4.6.2.2 and shall not attempt to use this S-NSSAI(s) in the current registration area over the current until switching off the UE, the UE moving out of the current registration area, the UICC containing the USIM is removed, the entry of the "list of subscriber data" with the SNPN identity of the current SNPN is updated, or the rejected S-NSSAI(s) are removed as described in subclause 4.6.2.2.

"S-NSSAI not available due to the failed or revoked network slice-specific authentication and authorization"

The UE shall store the rejected S-NSSAI(s) in the rejected NSSAI for the failed or revoked NSSAA as specified in subclause 4.6.2.2 and shall not attempt to use this S-NSSAI in the current PLMN or SNPN over any access until switching off the UE, the UICC containing the USIM is removed, the entry of the "list of subscriber data" with the SNPN identity of the current SNPN is updated, or the rejected S-NSSAI(s) are removed as described in subclause 4.6.1 and 4.6.2.2.

"S-NSSAI not available due to maximum number of UEs reached"

Unless the back-off timer value received along with the S-NSSAI is zero, the UE shall add the rejected S-NSSAI(s) in the rejected NSSAI for the maximum number of UEs reached as specified in subclause 4.6.2.2 and shall not attempt to use this S-NSSAI in the current PLMN or SNPN over the current access until switching off the UE, the UICC containing the USIM is removed, the entry of the "list of subscriber data" with the SNPN identity of the current SNPN is updated, or the rejected S-NSSAI(s) are removed as described in subclauses 4.6.1 and 4.6.2.2.

NOTE 12: If the back-off timer value received along with the S-NSSAI in the rejected NSSAI for the maximum number of UEs reached is zero as specified in subclause 10.5.7.4a of 3GPP TS 24.008 [12], the UE does not consider the S-NSSAI as the rejected S-NSSAI.

If there is one or more S-NSSAIs in the rejected NSSAI with the rejection cause "S-NSSAI not available due to maximum number of UEs reached", then for each S-NSSAI, the UE shall behave as follows:

a) stop the timer T3526 associated with the S-NSSAI, if running;

b) start the timer T3526 with:

1) the back-off timer value received along with the S-NSSAI, if a back-off timer value is received along with the S-NSSAI that is neither zero nor deactivated; or

2) an implementation specific back-off timer value, if no back-off timer value is received along with the S-NSSAI; and

c) remove the S-NSSAI from the rejected NSSAI for the maximum number of UEs reached when the timer T3526 associated with the S-NSSAI expires.

If the UE sets the NSSAA bit in the 5GMM capability IE to "Network slice-specific authentication and authorization not supported", and:

a) if the Requested NSSAI IE only includes the S-NSSAI(s) subject to network slice-specific authentication and authorization and one or more default S-NSSAIs (containing one or more S-NSSAIs each of which may be associated with a new S-NSSAI) which are not subject to network slice-specific authentication and authorization are available, the AMF shall in the REGISTRATION ACCEPT message include:

1) the allowed NSSAI or the partially allowed NSSAI containing S-NSSAI(s) for the current PLMN or SNPN each of which corresponds to a default S-NSSAI which are not subject to network slice-specific authentication and authorization;

2) the allowed NSSAI or the partially allowed NSSAI containing the default S-NSSAIs, as the mapped S-NSSAI(s) for the allowed NSSAI in roaming scenarios, which are not subject to network slice-specific authentication and authorization; and

3) the rejected NSSAI containing the S-NSSAI(s) subject to network slice specific authentication and authorization with the rejection cause indicating "S-NSSAI not available in the current PLMN or SNPN", except if the UE has not set the ER-NSSAI bit to "Extended rejected NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message and the S-NSSAI(s) is associated to multiple mapped S-NSSAIs and some of these but not all mapped S-NSSAIs are subject to NSSAA; or

b) if the Requested NSSAI IE includes one or more S-NSSAIs subject to network slice-specific authentication and authorization, the AMF shall in the REGISTRATION ACCEPT message include:

1) the allowed NSSAI or the partially allowed NSSAI containing the S-NSSAI(s) or the mapped S-NSSAI(s) which are not subject to network slice-specific authentication and authorization; and

2) the rejected NSSAI containing:

i) the S-NSSAI(s) subject to network slice specific authentication and authorization with the rejection cause indicating "S-NSSAI not available in the current PLMN or SNPN", except if the UE has not set the ER-NSSAI bit to "Extended rejected NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message and the S-NSSAI(s) is associated to multiple mapped S-NSSAIs and some of these but not all mapped S-NSSAIs are subject to NSSAA; and

ii) the S-NSSAI(s) which was included in the requested NSSAI but rejected by the network associated with the rejection cause indicating "S-NSSAI not available in the current PLMN or SNPN" or the rejection cause indicating "S-NSSAI not available in the current registration area", if any.

For a REGISTRATION REQUEST message with a 5GS registration type IE indicating "mobility registration updating", if the UE does not indicate support for network slice-specific authentication and authorization, the UE is not registered for onboarding services in SNPN, and:

a) the UE is not in NB-N1 mode; and

b) if:

1) the UE did not include the requested NSSAI in the REGISTRATION REQUEST message; or

2) none of the S-NSSAIs in the requested NSSAI in the REGISTRATION REQUEST message are allowed;

and one or more default S-NSSAIs which are not subject to network slice-specific authentication and authorization are available, the AMF shall:

a) put the allowed S-NSSAI(s) for the current PLMN or SNPN each of which corresponds to a default S-NSSAI and not subject to network slice-specific authentication and authorization in the allowed NSSAI of the REGISTRATION ACCEPT message;

b) put the default S-NSSAIs and not subject to network slice-specific authentication and authorization, as the mapped S-NSSAI(s) for the allowed NSSAI in roaming scenarios, in the allowed NSSAI of the REGISTRATION ACCEPT message; and

c) determine a registration area such that all S-NSSAIs of the allowed NSSAI are available in the registration area.

During a registration procedure for mobility and periodic registration update for which the 5GS registration type IE indicates:

a) "periodic registration updating"; or

b) "mobility registration updating" and the UE is in NB-N1 mode;

and the UE is not registered for onboarding services in SNPN, the AMF:

a) may provide a new allowed NSSAI, a new partially allowed NSSAI, or both to the UE;

b) shall provide a pending NSSAI to the UE if the UE has indicated the support for network slice-specific authentication and authorization and there are S-NSSAIs for which network slice-specific authentication and authorization (except for re-NSSAA) will be performed or is ongoing for the current PLMN or SNPN; or

c) may provide both a new allowed NSSAI and a pending NSSAI to the UE;

in the REGISTRATION ACCEPT message. Additionally, if a pending NSSAI is provided without an allowed NSSAI and no S-NSSAI is currently allowed for the UE, the REGISTRATION ACCEPT message shall include the 5GS registration result IE with the "NSSAA to be performed" indicator set to "Network slice-specific authentication and authorization is to be performed".

If the REGISTRATION ACCEPT message contains the Network slicing indication IE with the Network slicing subscription change indication set to "Network slicing subscription changed", the UE shall delete the network slicing information for each and every PLMN or SNPN except for the current PLMN or SNPN as specified in subclause 4.6.2.2 and remove all tracking areas from the list of "5GS forbidden tracking areas for roaming" which were added due to rejection of S-NSSAI due to "S-NSSAI not available in the current registration area".

If the REGISTRATION ACCEPT message contains the allowed NSSAI, then the UE shall store the included allowed NSSAI together with the PLMN identity of the registered PLMN or the SNPN identity of the registered SNPN and the registration area as specified in subclause 4.6.2.2. If the registration area contains TAIs belonging to different PLMNs, which are equivalent PLMNs, the UE shall store the received allowed NSSAI in each of allowed NSSAIs which are associated with each of the PLMNs.

For each of the PDU session(s) active in the UE:

a) iif the allowed NSSAI contains an HPLMN S-NSSAI (e.g., mapped S-NSSAI, in roaming scenarios) matching to the HPLMN S-NSSAI of the PDU session, the UE shall locally update the S-NSSAI associated with the PDU session to the corresponding S-NSSAI received in the allowed NSSAI;

b) if the allowed NSSAI does not contain an HPLMN S-NSSAI (e.g., mapped S-NSSAI, in roaming scenarios) matching to the HPLMN S-NSSAI of the PDU session, the UE may perform a local release of the PDU session except for an emergency PDU session, if any, and except for a PDU session established when the UE is registered for onboarding services in SNPN, if any; and

c) if the partially allowed NSSAI contains an S-NSSAI associated with a PDU session, and the UE is in the TA where the S-NSSAI is not supported:

1) the UE may initiate:

i) the PDU session release procedure; or

ii) the PDU session modification procedure to set the 3GPP PS data off status to "deactivated" as specified in 3GPP TS 24.008 [13]; and

2) the SMF may initiate the PDU session release procedure.

NOTE 13: According to 3GPP TS 23.501 [8], also the AMF will determine which PDU sessions can no longer be supported based on the new allowed NSSAI, and it will cause a release on the UE side either by indicating in the PDU session status IE which PDU sessions are inactive on the network side or by triggering the SMF to initiate a release via 5GSM signalling.

If the REGISTRATION ACCEPT message contains a configured NSSAI IE with a new configured NSSAI for the current PLMN or SNPN and optionally the mapped S-NSSAI(s) for the configured NSSAI for the current PLMN or SNPN, the UE shall store the contents of the configured NSSAI IE as specified in subclause 4.6.2.2. In addition, if the REGISTRATION ACCEPT message contains:

a) an NSSRG information IE, the UE shall store the contents of the NSSRG information IE as specified in subclause 4.6.2.2. If the UE receives a Configured NSSAI IE in the REGISTRATION ACCEPT message and no NSSRG information IE, the UE shall delete any stored NSSRG information, if any, as specified in subclause 4.6.2.2;

b) an S-NSSAI location validity information IE in the Registration accept type 6 IE container IE, the UE shall store the contents of the S-NSSAI location validity information as specified in subclause 4.6.2.2. If the UE receives a Configured NSSAI IE in the REGISTRATION ACCEPT message and no S-NSSAI location validity information IE, the UE shall delete any stored S-NSSAI location validity information as specified in subclause 4.6.2.2;

c) an S-NSSAI time validity information IE, the UE shall store the contents of the S-NSSAI time validity information IE as specified in subclause 4.6.2.2. If the UE receives a Configured NSSAI IE in the REGISTRATION ACCEPT message and no S-NSSAI time validity information IE, the UE shall delete any stored S-NSSAI time validity information as specified in subclause 4.6.2.2; or

d) an On-demand NSSAI IE, the UE shall store the contents of the On-demand NSSAI IE as specified in subclause 4.6.2.2. If the UE receives a Configured NSSAI IE in the REGISTRATION ACCEPT message and no On-demand NSSAI IE, the UE shall delete any stored on-demand NSSAI as specified in subclause 4.6.2.2. The UE shall stop any slice deregistration inactivity timer associated with an S-NSSAI which is deleted from the on-demand NSSAI.

If the UE has set the NSAG bit to "NSAG supported" in the 5GMM capability IE of the REGISTRATION REQUEST message over 3GPP access, the AMF may include the NSAG information IE in the REGISTRATION ACCEPT message. Up to 4 NSAG entries are allowed to be associated with a TAI list in the NSAG information IE. If the UE has set the RCMAN bit to "Sending of REGISTRATION COMPLETE message for NSAG information supported" in the 5GMM capability IE of the REGISTRATION REQUEST message and if the NSAG information IE is included in the REGISTRATION ACCEPT message, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

NOTE 13A: How the AMF selects NSAG entries to be included in the NSAG information IE is implementation specific, e.g. take the NSAG priority and the current registration area into account.

NOTE 13B: If the NSAG for the PLMN and its equivalent PLMN(s) have different associations with S-NSSAIs, then the AMF includes a TAI list for the NSAG entry in the NSAG information IE.

NOTE 13C: If the NSAG for the PLMN and its equivalent PLMN(s) have different associations with S-NSSAIs, then the AMF includes a TAI list for the NSAG entry in the NSAG information IE.

If the UE receives the NSAG information IE in the REGISTRATION ACCEPT message, the UE shall store the NSAG information as specified in subclause 4.6.2.2.

If the UE supports network slice replacement and the AMF determines to provide the mapping information between the S-NSSAI to be replaced and the alternative S-NSSAI to the UE, then the AMF shall include the Alternative NSSAI IE, the Allowed NSSAI IE including the alternative S-NSSAI, if not included in the current allowed NSSAI, and the Configured NSSAI IE including the alternative S-NSSAI, if not included in the current configured NSSAI, in the REGISTRATION ACCEPT message. If the AMF determines that the replaced S-NSSAI is available, then the AMF shall provide the updated alternative NSSAI excluding the replaced S-NSSAI and the corresponding alternative S-NSSAI in the Alternative NSSAI IE in the REGISTRATION ACCEPT message. If the AMF determines that all the replaced S-NSSAI(s) are available, then the AMF shall provide the Alternative NSSAI IE with Length of Alternative NSSAI contents set to 0 in the REGISTRATION ACCEPT message. If the AMF determines that the replaced S-NSSAI is not supported due to the UE moving outside of NS-AoS of the S-NSSAI while the alternative S-NSSAI is available, then the AMF shall provide the updated allowed NSSAI and partially allowed NSSAI, if available, excluding the replaced S-NSSAI, if included, in the allowed NSSAI or partially allowed NSSAI in the REGISTRATION ACCEPT message. In addition, the AMF shall start timer T3550 and enter state 5GMM-COMMON-PROCEDURE-INITIATED as described in subclause 5.1.3.2.3.3.

If the UE receives the Alternative NSSAI IE in the REGISTRATION ACCEPT message, the UE shall store the alternative NSSAI as specified in subclause 4.6.2.2.

If the UE has indicated the support for partial network slice and the AMF determines one or more S-NSSAI(s) in the requested NSSAI are to be included in the partially allowed NSSAI as specified in subclause 4.6.2.11, the AMF shall include the Partially allowed NSSAI IE in the Registration accept type 6 IE container IE of the REGISTRATION ACCEPT message.

If the UE receives the Partially allowed NSSAI IE in the Registration accept type 6 IE container IE of the REGISTRATION ACCEPT message, the UE shall store the partially allowed NSSAI as specified in subclause 4.6.2.2.

If the REGISTRATION ACCEPT message:

a) includes the 5GS registration result IE with the "NSSAA to be performed" indicator set to "Network slice-specific authentication and authorization is to be performed";

b) includes a pending NSSAI;

c) does not include an allowed NSSAI;

d) does not include a partially allowed NSSAI;

the UE:

a) shall not perform the registration procedure for mobility and periodic registration update with the Uplink data status IE except for emergency services;

b) shall not initiate a service request procedure except for emergency services, for responding to paging or notification over non-3GPP access, for cases f), i), m) and o) in subclause 5.6.1.1;

c) shall not initiate a 5GSM procedure except for emergency services, indicating a change of 3GPP PS data off UE status, or to request the release of a PDU session; and

d) shall not initiate the NAS transport procedure except for sending a CIoT user data container, SMS, an LPP message, a UPP-CMI container, an SLPP message, a location services message, an SOR transparent container, a UE policy container or a UE parameters update transparent container;

until the UE receives an allowed NSSAI, a partially allowed NSSAI, or both.

During a registration procedure for mobility and periodic registration update for which the 5GS registration type IE indicates:

a) "mobility registration updating" and the UE is in NB-N1 mode; or

b) "periodic registration updating";

if the REGISTRATION ACCEPT message includes the 5GS registration result IE with the "NSSAA to be performed" indicator not set to "Network slice-specific authentication and authorization is to be performed" and the message does not contain an allowed NSSAI and no new allowed NSSAI, the UE shall consider the previously received allowed NSSAI as valid.

During a registration procedure for mobility and periodic registration update for which the 5GS registration type IE indicates:

a) "mobility registration updating"; or

b) "periodic registration updating";

if the REGISTRATION ACCEPT message includes the 5GS registration result IE with the "NSSAA to be performed" indicator set to "Network slice-specific authentication and authorization is to be performed" and the message contains a pending NSSAI, the UE shall delete any stored allowed NSSAI as specified in subclause 4.6.2.2.

If the Uplink data status IE is included in the REGISTRATION REQUEST message:

a) if the AMF determines that the UE is in non-allowed area or is not in allowed area; and

1) the PDU session(s) indicated by the Uplink data status IE is non-emergency PDU session(s);

2) the UE is not configured for high priority access in selected PLMN or SNPN; or

3) the UE is configured for high priority access in selected PLMN or SNPN and service area restrictions are applicable for high priority access based on operator policy;

the AMF shall include the PDU session reactivation result IE in the REGISTRATION ACCEPT message indicating that user-plane resources for the corresponding PDU session(s) cannot be re-established, and shall include the PDU session reactivation result error cause IE with the 5GMM cause set to #28 "Restricted service area";

b) otherwise, the AMF shall:

1) indicate the SMF to re-establish the user-plane resources for the corresponding PDU session;

2) include PDU session reactivation result IE in the REGISTRATION ACCEPT message to indicate the user-plane resources re-establishment result of the PDU sessions for which the UE requested to re-establish the user-plane resources; and

3) determine the UE presence in LADN service area (see subclause 6.2.6) and forward the UE presence in LADN service area towards the SMF, if the corresponding PDU session is a PDU session for LADN.

If the Uplink data status IE is not included in the REGISTRATION REQUEST message and the REGISTRATION REQUEST message is sent for the trigger d) in subclause 5.5.1.3.2, the AMF may indicate the SMF to re-establish the user-plane resources for the PDU sessions.

If the registration procedure for mobility registration update is triggered for non-3GPP access path switching from the old non-3GPP access to the new non-3GPP access and there are:

a) one or more single access PDU sessions whose user plane resources are associated to the old non-3GPP access but whose PDU session ID(s) are not indicated in the Uplink data status IE in the REGISTRATION REQUEST message; or

b) one or more MA PDU sessions whose PDU session ID(s) are not indicated in the Uplink data status IE in the REGISTRATION REQUEST message;

the AMF shall not release those PDU session(s) and shall release the user plane resources of the old non-3GPP access of those PDU session(s), so that the UE or the network can re-establish user-plane resources on the new non-3GPP access by triggering a service request procedure.

If a PDU session status IE is included in the REGISTRATION REQUEST message:

a) for single access PDU sessions, the AMF shall:

1) perform a local release of all those PDU sessions which are not in 5GSM state PDU SESSION INACTIVE on the AMF side associated with the access type the REGISTRATION REQUEST message is sent over, but are indicated by the UE as being in 5GSM state PDU SESSION INACTIVE. If any of those PDU sessions is associated with one or more MBS multicast sessions, the SMF shall consider the UE as removed from the associated multicast MBS sessions; and

2) include a PDU session status IE in the REGISTRATION ACCEPT message to indicate which PDU sessions associated with the access type the REGISTRATION ACCEPT message is sent over are not in 5GSM state PDU SESSION INACTIVE in the AMF; and

b) for MA PDU sessions:

1) for all those PDU sessions which are not in 5GSM state PDU SESSION INACTIVE and have user plane resources being established or established on the access the REGISTRATION REQUEST message is sent over on the AMF side, but are indicated by the UE as no user plane resources are being established or established:

i) for PDU sessions having user plane resources being established or established only on the access the REGISTRATION REQUEST message is sent over, the AMF shall perform a local release of all those PDU sessions. If the MA PDU session is associated with one or more multicast MBS sessions, the SMF shall consider the UE as removed from the associated multicast MBS sessions; and

ii) for PDU sessions having user plane resources being established or established on both accesses, the AMF shall perform a local release on the user plane resources associated with the access type the REGISTRATION REQUEST message is sent over. If the REGISTRATION REQUEST message is sent over 3GPP access and the MA PDU session is associated with one or more multicast MBS sessions, the SMF shall consider the UE as removed from the associated multicast MBS sessions; and

2) the AMF shall include a PDU session status IE in the REGISTRATION ACCEPT message to indicate which MA PDU sessions having the corresponding user plane resources are being established or established on the AMF side on the access the REGISTRATION ACCEPT message is sent over.

If the Allowed PDU session status IE is included in the REGISTRATION REQUEST message, the AMF shall:

a) for a 5GSM message from each SMF that has indicated pending downlink signalling only, forward the received 5GSM message via 3GPP access to the UE after the REGISTRATION ACCEPT message is sent;

b) for each SMF that has indicated pending downlink data only:

1) notify the SMF that reactivation of the user-plane resources for the corresponding PDU session(s) associated with non-3GPP access cannot be performed if the corresponding PDU session ID(s) are not indicated in the Allowed PDU session status IE; and

2) notify the SMF that reactivation of the user-plane resources for the corresponding PDU session(s) associated with non-3GPP access can be performed if the corresponding PDU session ID(s) are indicated in the Allowed PDU session status IE.

c) for each SMF that have indicated pending downlink signalling and data:

1) notify the SMF that reactivation of the user-plane resources for the corresponding PDU session(s) associated with non-3GPP access cannot be performed if the corresponding PDU session ID(s) are not indicated in the Allowed PDU session status IE;

2) notify the SMF that reactivation of the user-plane resources for the corresponding PDU session(s) associated with non-3GPP access can be performed if the corresponding PDU session ID(s) are indicated in the Allowed PDU session status IE; and

3) discard the received 5GSM message for PDU session(s) associated with non-3GPP access; and

d) include the PDU session reactivation result IE in the REGISTRATION ACCEPT message to indicate the successfully re-established user-plane resources for the corresponding PDU sessions, if any.

If the PDU session reactivation result IE is included in the REGISTRATION ACCEPT message indicating that the user-plane resources have been successfully reactivated for a PDU session that was indicated by the UE in the Allowed PDU session status IE as allowed to be re-established over 3GPP access, the UE considers the corresponding PDU session to be associated with the 3GPP access. If the user-plane resources of a PDU session have been successfully reactivated over the 3GPP access, the AMF and SMF update the associated access type of the corresponding PDU session.

If the PDU session reactivation result IE is included in the REGISTRATION ACCEPT message indicating that the user-plane resources cannot be established for a PDU session that was indicated by the UE in the Allowed PDU session status IE as allowed to be re-established over 3GPP access, the UE considers the corresponding PDU session to be associated with the non-3GPP access.

If an EPS bearer context status IE is included in the REGISTRATION REQUEST message, the AMF handles the received EPS bearer context status IE as specified in 3GPP TS 23.502 [9].

If the EPS bearer context status information is generated for the UE during the inter-system change from S1 mode to N1 mode as specified in 3GPP TS 23.502 [9] and the AMF supports N26 interface, the AMF shall include an EPS bearer context status IE in the REGISTRATION ACCEPT message to indicate the UE which mapped EPS bearer contexts are active in the network.

If the user-plane resources cannot be established for a PDU session, the AMF shall include the PDU session reactivation result IE in the REGISTRATION ACCEPT message indicating that user-plane resources for the corresponding PDU session cannot be re-established, and:

a) if the user-plane resources cannot be established because the SMF indicated to the AMF that the UE is located out of the LADN service area (see 3GPP TS 29.502 [20A]), the AMF shall include the PDU session reactivation result error cause IE with the 5GMM cause set to #43 "LADN not available";

b) if the user-plane resources cannot be established because the SMF indicated to the AMF that only prioritized services are allowed (see 3GPP TS 29.502 [20A]), the AMF shall include the PDU session reactivation result error cause IE with the 5GMM cause set to #28 "restricted service area";

c) if the user-plane resources cannot be established because the SMF indicated to the AMF that the resource is not available in the UPF (see 3GPP TS 29.502 [20A]), the AMF shall include the PDU session reactivation result error cause IE with the 5GMM cause set to #92 "insufficient user-plane resources for the PDU session";

d) if the user-plane resources cannot be established because the SMF indicated to the AMF that the S-NSSAI associated with the PDU session is unavailable due to NSAC (see 3GPP TS 29.502 [20A]), the AMF shall include the PDU session reactivation result error cause IE with the 5GMM cause set to #69 "insufficient resources for specific slice"; or

e) otherwise, the AMF may include the PDU session reactivation result error cause IE to indicate the cause of failure to re-establish the user-plane resources.

NOTE 14: It is up to UE implementation when to re-send a request for user-plane re-establishment for the associated PDU session after receiving a PDU session reactivation result error cause IE with a 5GMM cause set to #92 "insufficient user-plane resources for the PDU session".

NOTE 15: The UE can locally start a back-off timer after receiving a PDU session reactivation result error cause IE with a 5GMM cause set to #69 "insufficient resources for specific slice". The value of the back-off timer is up to UE implementation. Upon expiry of the back-off timer, the UE can re-send a request for user-plane re-establishment for the associated PDU session.

If the AMF needs to initiate PDU session status synchronization the AMF shall include a PDU session status IE in the REGISTRATION ACCEPT message to indicate the UE:

- which single access PDU sessions associated with the access the REGISTRATION ACCEPT message is sent over are not in 5GSM state PDU SESSION INACTIVE in the AMF; and

- which MA PDU sessions are not in 5GSM state PDU SESSION INACTIVE and having user plane resources established in the AMF on the access the REGISTRATION ACCEPT message is sent over.

The AMF may include the LADN information IE in the REGISTRATION ACCEPT message as described in subclause 5.5.1.2.4. The UE, upon receiving the REGISTRATION ACCEPT message with the LADN information IE, shall delete its old LADN information (if any) and store the received new LADN information.

If the UE has set the LADN-DS bit to "LADN per DNN and S-NSSAI supported" in the 5GMM capability IE of the REGISTRATION REQUEST message, the AMF may include the Extended LADN information IE in the Registration accept type 6 IE container IE in the REGISTRATION ACCEPT message as described in subclause 5.5.1.2.4. The UE, upon receiving the REGISTRATION ACCEPT message with the Registration accept type 6 IE container IE which includes the Extended LADN information IE, shall delete its old extended LADN information (if any) and store the received new extended LADN information.

NOTE 15A0: The AMF allocates the LADN service area and the TAI list associated with the S-NSSAI in the partially allowed NSSAI independently, if applicable.

If:

- the UE does not support LADN per DNN and S-NSSAI;

- the UE is subscribed to the LADN DNN for a single S-NSSAI only; and

- the AMF has the extended LADN information but no LADN information;

the AMF may decide to provide the LADN service area for that LADN DNN of the extended LADN information as the LADN information and include the LADN information in the LADN information IE of the REGISTRATION ACCEPT message.

NOTE 15A: If the LADN service area is configured per DNN and S-NSSAI, in order to serve the UEs that do not support LADN per DNN and S-NSSAI, it is recommended that the LADN DNN is only served by a single S-NSSAI.

NOTE 15B: In case of the UE is subscribed to the LADN DNN for multiple S-NSSAIs, the AMF can treat this as no extended LADN information is available.

If the UE does not support LADN per DNN and S-NSSAI and the AMF has neither the LADN information nor the extended LADN information, the AMF shall not provide any LADN information to the UE.

If the AMF does not include:

- the LADN information IE; or

- the Extended LADN information IE in the Registration accept type 6 IE container IE,

in the REGISTRATION ACCEPT message during registration procedure for mobility and periodic registration update, the UE shall delete its old LADN information or old extended LADN information respectively.

If the PDU session status IE is included in the REGISTRATION ACCEPT message:

a) for single access PDU sessions, the UE shall perform a local release of all those PDU sessions associated with the access type the REGISTRATION ACCEPT message is sent over which are not in 5GSM state PDU SESSION INACTIVE or PDU SESSION ACTIVE PENDING on the UE side, but are indicated by the AMF as being in 5GSM state PDU SESSION INACTIVE. If a locally released PDU session is associated with one or more multicast MBS sessions, the UE shall locally leave the associated multicast MBS sessions; and

b) for MA PDU sessions, for all those PDU sessions which are not in 5GSM state PDU SESSION INACTIVE and have the corresponding user plane resources being established or established in the UE on the access the REGISTRATION ACCEPT message is sent over, but are indicated by the AMF as no user plane resources are being established or established:

1) for MA PDU sessions having the corresponding user plane resources being established or established only on the access the REGISTRATION ACCEPT message is sent over, the UE shall perform a local release of those MA PDU sessions. If a locally released MA PDU session is associated with one or more multicast MBS sessions, the UE shall locally leave the associated multicast MBS sessions; and

2) for MA PDU sessions having user plane resources being established or established on both accesses, the UE shall perform a local release on the user plane resources on the access the REGISTRATION ACCEPT message is sent over. If the user plane resources over 3GPP access are released and the MA PDU session is associated with one or more multicast MBS sessions, the UE shall locally leave the associated multicast MBS sessions.

If:

a) the UE included a PDU session status IE in the REGISTRATION REQUEST message;

b) the UE is operating in the single-registration mode;

c) the UE is performing inter-system change from S1 mode to N1 mode in 5GMM-IDLE mode; and

d) the UE has received the IWK N26 bit set to "interworking without N26 interface supported";

the UE shall ignore the PDU session status IE if received in the REGISTRATION ACCEPT message.

If the EPS bearer context status IE is included in the REGISTRATION ACCEPT message, the UE shall locally delete all those QoS flow descriptions and all associated QoS rules, if any, which are associated with inactive EPS bearer contexts as indicated by the AMF in the EPS bearer context status IE.

If the UE included S1 mode supported indication in the REGISTRATION REQUEST message, the AMF supporting interworking with EPS shall set the IWK N26 bit to either:

a) "interworking without N26 interface not supported" if the AMF supports N26 interface; or

b) "interworking without N26 interface supported" if the AMF does not support N26 interface

in the 5GS network feature support IE in the REGISTRATION ACCEPT message.

The UE supporting S1 mode shall operate in the mode for inter-system interworking with EPS as follows:

a) if the IWK N26 bit in the 5GS network feature support IE is set to "interworking without N26 interface not supported", the UE shall operate in single-registration mode;

b) if the IWK N26 bit in the 5GS network feature support IE is set to "interworking without N26 interface supported" and the UE supports dual-registration mode, the UE may operate in dual-registration mode; or

NOTE 16: The registration mode used by the UE is implementation dependent.

c) if the IWK N26 bit in the 5GS network feature support IE is set to "interworking without N26 interface supported" and the UE only supports single-registration mode, the UE shall operate in single-registration mode.

The UE shall store the received interworking without N26 interface indicator for inter-system change with EPS as specified in annex C.1 and treat it as valid in the entire PLMN and its equivalent PLMN(s).

The network informs the UE about the support of specific features, such as IMS voice over PS session, location services (5G-LCS), emergency services, emergency services fallback, ATSSS and non-3GPP access path switching, in the 5GS network feature support information element. In a UE with IMS voice over PS session capability, the IMS voice over PS session indicator, Emergency services support indicator and Emergency services fallback indicator shall be provided to the upper layers. The upper layers take the IMS voice over PS session indicator into account when selecting the access domain for voice sessions or calls. When initiating an emergency call, the upper layers take the IMS voice over PS session indicator, Emergency services support indicator and Emergency services fallback indicator into account for the access domain selection. When the UE determines via the IMS voice over PS session indicator that the network does not support IMS voice over PS sessions in N1 mode, then the UE shall not perform a local release of any persistent PDU session if the AMF does not indicate that the PDU session is in 5GSM state PDU SESSION INACTIVE via the PDU session status IE. When the UE determines via the Emergency services support indicator that the network does not support emergency services in N1 mode, then the UE shall not perform a local release of any emergency PDU session if user-plane resources associated with that emergency PDU session are established if the AMF does not indicate that the PDU session is in 5GSM state PDU SESSION INACTIVE via the PDU session status IE. In a UE with LCS capability, location services indicators (5G-LCS) shall be provided to the upper layers. In a UE with the capability for ATSSS, the network support for ATSSS shall be provided to the upper layers. If the UE receives the 5GS network feature support IE with the ATSSS support indicator set to "ATSSS not supported", the UE shall perform a local release of the MA PDU session, if any. If a locally released MA PDU session is associated with one or more multicast MBS sessions, the UE shall locally leave the associated multicast MBS sessions. In a UE that supports non-3GPP access path switching, the network support for non-3GPP access path switching shall be provided to the upper layers. If the UE receives the 5GS network feature support IE with the non-3GPP access path switching bit set to "non-3GPP access path switching not supported", the UE shall not perform the registration procedure for mobility registration update for non-3GPP access path switching.

NOTE 16A: If the UE is registered to different PLMNs over 3GPP and non-3GPP accesses, the UE uses the capability received over non-3GPP access to determine whether to initiate the registration procedure for mobility registration update for non-3GPP path switching.

The AMF shall set the EMF bit in the 5GS network feature support IE to:

a) "Emergency services fallback supported in NR connected to 5GCN and E-UTRA connected to 5GCN" if the network supports the emergency services fallback procedure when the UE is in an NR cell connected to 5GCN or an E-UTRA cell connected to 5GCN;

b) "Emergency services fallback supported in NR connected to 5GCN only" if the network supports the emergency services fallback procedure when the UE is in an NR cell connected to 5GCN and does not support the emergency services fallback procedure when the UE is in an E-UTRA cell connected to 5GCN;

c) "Emergency services fallback supported in E-UTRA connected to 5GCN only" if the network supports the emergency services fallback procedure when the UE is in an E-UTRA cell connected to 5GCN and does not support the emergency services fallback procedure when the UE is in an NR cell connected to 5GCN; or

d) "Emergency services fallback not supported" if network does not support the emergency services fallback procedure when the UE is in any cell connected to 5GCN.

NOTE 17: If the emergency services are supported in neither the EPS nor the 5GS homogeneously, based onoperator policy, the AMF will set the EMF bit in the 5GS network feature support IE to "Emergency services fallback not supported".

NOTE 18: Even though the AMF's support of emergency services fallback is indicated per RAT, the UE's support of emergency services fallback is not per RAT, i.e. the UE's support of emergency services fallback is the same for both NR connected to 5GCN and E-UTRA connected to 5GCN.

If the UE indicates support for restriction on use of enhanced coverage in the REGISTRATION REQUEST message and:

a) in WB-N1 mode, the AMF decides to restrict the use of CE mode B for the UE, then the AMF shall set the RestrictEC bit to "CE mode B is restricted";

b) in WB-N1 mode, the AMF decides to restrict the use of both CE mode A and CE mode B for the UE, then the AMF shall set the RestrictEC bit to " Both CE mode A and CE mode B are restricted"; or

c) in NB-N1 mode, the AMF decides to restrict the use of enhanced coverage for the UE, then the AMF shall set the RestrictEC bit to "Use of enhanced coverage is restricted",

in the 5GS network feature support IE in the REGISTRATION ACCEPT message.

Access identity 1 is only applicable while the UE is in N1 mode. Access identity 2 is only applicable while the UE is in N1 mode.

When the UE is registered to the same PLMN or SNPN over 3GPP and non-3GPP access, the UE and the AMF maintain one MPS indicator and one MCS indicator that are common to both 3GPP and non-3GPP access. When the UE is registered to different PLMNs or SNPNs over 3GPP access and non-3GPP access, the UE maintains two MPS indicators and two MCS indicators separately for different accesses i.e., an MPS indicator and an MCS indicator for the 3GPP access and another MPS indicator and an MCS indicator for the non-3GPP access. For both 3GPP and non-3GPP access, the access identity is determined according to subclause 4.5.2:

- if the UE is not operating in SNPN access operation mode:

a) the network informs the UE that the use of access identity 1 is valid in the RPLMN or equivalent PLMN by setting the MPS indicator bit of the 5GS network feature support IE to "Access identity 1 valid", in the REGISTRATION ACCEPT message. Based on operator policy, the AMF sets the MPS indicator bit in the REGISTRATION ACCEPT message based on the MPS priority information in the user's subscription context obtained from the UDM;

b) upon receiving a REGISTRATION ACCEPT message with the MPS indicator bit set to "Access identity 1 valid":

- via 3GPP access; or

- via non-3GPP access if the UE is registered to the same PLMN over 3GPP access and non-3GPP access;

the UE shall act as a UE with access identity 1 configured for MPS, as described in subclause 4.5.2, in all NG-RAN of the registered PLMN and its equivalent PLMNs. The MPS indicator bit in the 5GS network feature support IE provided in the REGISTRATION ACCEPT message is valid in all NG-RAN of the registered PLMN and its equivalent PLMNs until the UE receives a REGISTRATION ACCEPT message or a CONFIGURATION UPDATE COMMAND message with the MPS indicator bit set to "Access identity 1 not valid":

- via 3GPP access; or

- via non-3GPP access if the UE is registered to the same PLMN over 3GPP access and non-3GPP access; or

until the UE selects a non-equivalent PLMN over 3GPP access;

b1) upon receiving a REGISTRATION ACCEPT message with the MPS indicator bit set to "Access identity 1 valid":

- via non-3GPP access; or

- via 3GPP access if the UE is registered to the same PLMN over 3GPP access and non-3GPP access;

the UE shall act as a UE with access identity 1 configured for MPS, as described in subclause 4.5.2, in non-3GPP access of the registered PLMN and its equivalent PLMNs. The MPS indicator bit in the 5GS network feature support IE provided in the REGISTRATION ACCEPT message is valid in non-3GPP access of the registered PLMN and its equivalent PLMNs until the UE receives a REGISTRATION ACCEPT message or a CONFIGURATION UPDATE COMMAND message with the MPS indicator bit set to "Access identity 1 not valid":

- via non-3GPP access; or

- via 3GPP access if the UE is registered to the same PLMN over 3GPP access and non-3GPP access; or

until the UE selects a non-equivalent PLMN over non-3GPP access;

c) during ongoing active PDU sessions that were set up relying on the MPS indicator bit being set to "Access identity 1 valid", if the network indicates in a registration update that the MPS indicator bit is reset to "Access identity 1 not valid", then the UE shall no longer act as a UE with access identity 1 configured for MPS as described in subclause 4.5.2 unless the USIM contains a valid configuration for access identity 1 in RPLMN or equivalent PLMN. In the UE, the ongoing active PDU sessions are not affected by the change of the MPS indicator bit;

d) the network informs the UE that the use of access identity 2 is valid in the RPLMN or equivalent PLMN by setting the MCS indicator bit of the 5GS network feature support IE to "Access identity 2 valid", in the REGISTRATION ACCEPT message. Based on operator policy, the AMF sets the MCS indicator bit in the REGISTRATION ACCEPT message based on the MCS priority information in the user's subscription context obtained from the UDM;

e) upon receiving a REGISTRATION ACCEPT message with the MCS indicator bit set to "Access identity 2 valid":

- via 3GPP access; or

- via non-3GPP access if the UE is registered to the same PLMN over 3GPP access and non-3GPP access;

the UE shall act as a UE with access identity 2 configured for MCS, as described in subclause 4.5.2, in all NG-RAN of the registered PLMN and its equivalent PLMNs. The MCS indicator bit in the 5GS network feature support IE provided in the REGISTRATION ACCEPT message is valid in all NG-RAN of the registered PLMN and its equivalent PLMNs until the UE receives a REGISTRATION ACCEPT message or a CONFIGURATION UPDATE COMMAND message with the MCS indicator bit set to "Access identity 2 not valid":

- via 3GPP access; or

- via non-3GPP access if the UE is registered to the same PLMN over 3GPP access and non-3GPP access; or

until the UE selects a non-equivalent PLMN over 3GPP access;

e1) upon receiving a REGISTRATION ACCEPT message with the MCS indicator bit set to "Access identity 2 valid":

- via non-3GPP access; or

- via 3GPP access if the UE is registered to the same PLMN over 3GPP access and non-3GPP access;

the UE shall act as a UE with access identity 2 configured for MCS, as described in subclause 4.5.2, in non-3GPP access of the registered PLMN and its equivalent PLMNs. The MCS indicator bit in the 5GS network feature support IE provided in the REGISTRATION ACCEPT message is valid in non-3GPP access of the registered PLMN and its equivalent PLMNs until the UE receives a REGISTRATION ACCEPT message or a CONFIGURATION UPDATE COMMAND message with the MCS indicator bit set to "Access identity 2 not valid":

- via non-3GPP access; or

- via 3GPP access if the UE is registered to the same PLMN over 3GPP access and non-3GPP access; or

until the UE selects a non-equivalent PLMN over non-3GPP access; and

f) during ongoing active PDU sessions that were set up relying on the MCS indicator bit being set to "Access identity 2 valid", if the network indicates in a registration update that the MCS indicator bit is reset to "Access identity 2 not valid", then the UE shall no longer act as a UE with access identity 2 configured for MCS as described in subclause 4.5.2 unless the USIM contains a valid configuration for access identity 2 in RPLMN or equivalent PLMN. In the UE, the ongoing active PDU sessions are not affected by the change of the MCS indicator bit; or

- if the UE is operating in SNPN access operation mode:

a) the network informs the UE that the use of access identity 1 is valid in the RSNPN or equivalent SNPN by setting the MPS indicator bit of the 5GS network feature support IE to "Access identity 1 valid", in the REGISTRATION ACCEPT message. Based on operator policy, the AMF sets the MPS indicator bit in the REGISTRATION ACCEPT message based on the MPS priority information in the user's subscription context obtained from the UDM;

b) upon receiving a REGISTRATION ACCEPT message with the MPS indicator bit set to "Access identity 1 valid":

- via 3GPP access; or

- via non-3GPP access if the UE is registered to the same SNPN over 3GPP access and non-3GPP access;

the UE shall act as a UE with access identity 1 configured for MPS, as described in subclause 4.5.2A, in all NG-RAN of the registered SNPN and its equivalent SNPNs. The MPS indicator bit in the 5GS network feature support IE provided in the REGISTRATION ACCEPT message is valid in all NG-RAN of the registered SNPN and its equivalent SNPNs until the UE receives a REGISTRATION ACCEPT message or a CONFIGURATION UPDATE COMMAND message with the MPS indicator bit set to "Access identity 1 not valid":

- via 3GPP access; or

- via non-3GPP access if the UE is registered to the same SNPN over 3GPP access and non-3GPP access; or

until the UE selects a non-equivalent SNPN over 3GPP access;

b1) upon receiving a REGISTRATION ACCEPT message with the MPS indicator bit set to "Access identity 1 valid":

- via non-3GPP access; or

- via 3GPP access if the UE is registered to the same SNPN over 3GPP access and non-3GPP access;

the UE shall act as a UE with access identity 1 configured for MPS, as described in subclause 4.5.2A, in non-3GPP access of the registered SNPN and its equivalent SNPNs. The MPS indicator bit in the 5GS network feature support IE provided in the REGISTRATION ACCEPT message is valid in non-3GPP access of the registered SNPN and its equivalent SNPNs until the UE receives a REGISTRATION ACCEPT message or a CONFIGURATION UPDATE COMMAND message with the MPS indicator bit set to "Access identity 1 not valid":

- via non-3GPP access; or

- via 3GPP access if the UE is registered to the same SNPN over 3GPP access and non-3GPP access; or

until the UE selects a non-equivalent SNPN over non-3GPP access;

c) during ongoing active PDU sessions that were set up relying on the MPS indicator bit being set to "Access identity 1 valid", if the network indicates in a registration update that the MPS indicator bit is reset to "Access identity 1 not valid", then the UE shall no longer act as a UE with access identity 1 configured for MPS as described in subclause 4.5.2A unless the unified access control configuration in the "list of subscriber data" stored in the ME (see 3GPP TS 23.122 [5]) indicates the UE is configured for access identity 1 in the RSNPN or equivalent SNPN. In the UE, the ongoing active PDU sessions are not affected by the change of the MPS indicator bit;

d) the network informs the UE that the use of access identity 2 is valid in the RSNPN or equivalent SNPN by setting the MCS indicator bit of the 5GS network feature support IE to "Access identity 2 valid", in the REGISTRATION ACCEPT message. Based on operator policy, the AMF sets the MCS indicator bit in the REGISTRATION ACCEPT message based on the MCS priority information in the user's subscription context obtained from the UDM;

e) upon receiving a REGISTRATION ACCEPT message with the MCS indicator bit set to "Access identity 2 valid":

- via 3GPP access; or

- via non-3GPP access if the UE is registered to the same SNPN over 3GPP access and non-3GPP access;

the UE shall act as a UE with access identity 2 configured for MCS, as described in subclause 4.5.2A, in all NG-RAN of the registered SNPN and its equivalent SNPNs. The MCS indicator bit in the 5GS network feature support IE provided in the REGISTRATION ACCEPT message is valid in all NG-RAN of the registered SNPN and its equivalent SNPNs until the UE receives a REGISTRATION ACCEPT message or a CONFIGURATION UPDATE COMMAND message with the MCS indicator bit set to "Access identity 2 not valid":

- via 3GPP access; or

- via non-3GPP access if the UE is registered to the same SNPN over 3GPP access and non-3GPP access; or

until the UE selects a non-equivalent SNPN;

e1) upon receiving a REGISTRATION ACCEPT message with the MCS indicator bit set to "Access identity 2 valid":

- via non-3GPP access; or

- via 3GPP access if the UE is registered to the same SNPN over 3GPP access and non-3GPP access;

the UE shall act as a UE with access identity 2 configured for MCS, as described in subclause 4.5.2A, in non-3GPP access of the registered SNPN and its equivalent SNPNs. The MCS indicator bit in the 5GS network feature support IE provided in the REGISTRATION ACCEPT message is valid in non-3GPP access of the registered SNPN and its equivalent SNPNs until the UE receives a REGISTRATION ACCEPT message or a CONFIGURATION UPDATE COMMAND message with the MCS indicator bit set to "Access identity 2 not valid":

- via non-3GPP access; or

- via 3GPP access if the UE is registered to the same SNPN over 3GPP access and non-3GPP access; or

until the UE selects a non-equivalent SNPN over non-3GPP access; and

f) during ongoing active PDU sessions that were set up relying on the MCS indicator bit being set to "Access identity 2 valid", if the network indicates in a registration update that the MCS indicator bit is reset to "Access identity 2 not valid", then the UE shall no longer act as a UE with access identity 2 configured for MCS as described in subclause 4.5.2A unless the unified access control configuration in the "list of subscriber data" stored in the ME (see 3GPP TS 23.122 [5]) indicates the UE is configured for access identity 2 in the RSNPN or equivalent SNPN. In the UE, the ongoing active PDU sessions are not affected by the change of the MCS indicator bit.

If the UE has set the Follow-on request indicator to "Follow-on request pending" in the REGISTRATION REQUEST message, or the network has downlink signalling pending, the AMF shall not immediately release the NAS signalling connection after the completion of the registration procedure.

If the UE is authorized to use V2X communication over PC5 reference point based on:

a) at least one of the following bits in the 5GMM capability IE of the REGISTRATION REQUEST message set by the UE, or already stored in the 5GMM context in the AMF during the previous registration procedure as follows:

1) the V2XCEPC5 bit to "V2X communication over E-UTRA-PC5 supported"; or

2) the V2XCNPC5 bit to "V2X communication over NR-PC5 supported"; and

b) the user's subscription context obtained from the UDM as defined in 3GPP TS 23.287 [6C];

the AMF should not immediately release the NAS signalling connection after the completion of the registration procedure.

If the UE is authorized to use A2X communication over PC5 reference point based on:

a) at least one of the following bits in the 5GMM capability IE of the REGISTRATION REQUEST message set by the UE, or already stored in the 5GMM context in the AMF during the previous registration procedure as follows:

1) the A2XEPC5 bit to "A2X over E-UTRA-PC5 supported"; or

2) the A2XNPC5 bit to "A2X over NR-PC5 supported"; and

b) the user's subscription context obtained from the UDM as defined in 3GPP TS 23.256 [6C];

the AMF should not immediately release the NAS signalling connection after the completion of the registration procedure.

If the UE is authorized to use 5G ProSe services based on:

a) at least one of the following bits in the 5GMM capability IE of the REGISTRATION REQUEST message set by the UE, or already stored in the 5GMM context in the AMF during the previous registration procedure as follows:

1) the 5G ProSe direct discovery bit to "5G ProSe direct discovery supported"; or

2) the 5G ProSe direct communication bit to "5G ProSe direct communication supported"; and

b) the user's subscription context obtained from the UDM as defined in 3GPP TS 23.304 [6E];

the AMF should not immediately release the NAS signalling connection after the completion of the registration procedure.

If the UE indicates support of ranging and sidelink positioning in the REGISTRATION REQUEST message and the network supports and accepts the use of ranging and sidelink positioning, the AMF shall set the ranging and sidelink positioning support bit to "Ranging and sidelink positioning supported" in the 5GS network feature support IE of the REGISTRATION ACCEPT message.

If the UE supports HPAOP and if the AMF supports HPAOP, the AMF shall set the High priority access service area restriction exempt bit in the 5GS network feature support IE in the REGISTRATION ACCEPT message to indicate the operator policy on UE exemption for service area restrictions.

If the UE has included the Non-3GPP path switching information IE in the REGISTRATION REQUEST message with the NSONR bit set to "non-3GPP path switching while using old non-3GPP resources requested" and the AMF supports non-3GPP path switching while using old non-3GPP resources , the AMF shall not release the user plane resources of the old non-3GPP access of the PDU sessions supporting non-3GPP access path switching and whose PDU session IDs are included in the Uplink data status IE of the REGISTRATION REQUEST message until the user plane resources of the new non-3GPP access are established. Otherwise, the AMF shall release the user plane resources of the old non-3GPP access before proceeding with the registration procedure.

If the UE has triggered the registration procedure for mobility registration update for non-3GPP access path switching from the old non-3GPP access to the new non-3GPP access and the UE receives the REGISTRATION ACCEPT message over the new non-3GPP access, the UE shall consider itself as de-registered for 5GS services over the old non-3GPP access.

If the Requested DRX parameters IE was included in the REGISTRATION REQUEST message, the AMF shall include the Negotiated DRX parameters IE in the REGISTRATION ACCEPT message and replace any stored Negotiated DRX parameter and use it for the downlink transfer of signalling and user data. The AMF may set the Negotiated DRX parameters IE based on the received Requested DRX parameters IE and operator policy if available.

If the Requested NB-N1 mode DRX parameters IE was included in the REGISTRATION REQUEST message and replace any stored Negotiated NB-N1 mode DRX parameters and use it for the downlink transfer of signalling and user data in NB-N1 mode, the AMF shall include the Negotiated NB-N1 mode DRX parameters IE in the REGISTRATION ACCEPT message. The AMF may set the Negotiated NB-N1 mode DRX parameters IE based on the received Requested NB-N1 mode DRX parameters IE and operator policy if available.

The AMF shall include the Negotiated extended DRX parameters IE in the REGISTRATION ACCEPT message only if the Requested extended DRX parameters IE was included in the REGISTRATION REQUEST message, and the AMF supports and accepts the use of eDRX. The AMF may set the Negotiated extended DRX parameters IE based on the received Requested extended DRX parameters IE, operator policy, information from NG-RAN and the user's subscription context obtained from the UDM if available.

If the network cannot derive the UE's identity from the 5G-GUTI because of e.g. no matching identity/context in the network, failure to validate the UE's identity due to integrity check failure of the received message, the AMF may operate as described in subclause 5.5.1.2.4 and include a PDU session status IE indicating all PDU sessions are in 5GSM state PDU SESSION INACTIVE in the AMF. If the UE included in the REGISTRATION REQUEST message the UE status IE with the EMM registration status set to "UE is in EMM-REGISTERED state" and the AMF does not support N26 interface, the AMF shall operate as described in subclause 5.5.1.2.4.

If the UE has indicated support for service gap control in the REGISTRATION REQUEST message, a service gap time value is available in the 5GMM context, the AMF may include the T3447 value IE set to the service gap time value in the REGISTRATION ACCEPT message.

If the UE requests ciphering keys for ciphered broadcast assistance data in the REGISTRATION REQUEST message and the AMF has valid ciphering key data applicable to the UE's subscription and current tracking area, then the AMF shall include the ciphering key data in the Ciphering key data IE of the REGISTRATION ACCEPT message.

If the UE supports WUS assistance information and the AMF supports and accepts the use of WUS assistance information for the UE, then the AMF shall determine the negotiated UE paging probability information for the UE, store it in the 5GMM context of the UE, and if the UE does not have an active emergency PDU session, the AMF shall include it in the Negotiated WUS assistance information IE in the REGISTRATION ACCEPT message. The AMF may consider the UE paging probability information received in the Requested WUS assistance information IE when determining the negotiated UE paging probability information for the UE.

NOTE 19: Besides the UE paging probability information requested by the UE, the AMF can take local configuration or previous statistical information for the UE into account when determining the negotiated UE paging probability information for the UE.

If the UE sets the NR-PSSI bit to "NR paging subgrouping supported" in the 5GMM capability IE in the REGISTRATION REQUEST message and the AMF supports and accepts the use of PEIPS assistance information for the UE, then the AMF shall determine the Paging subgroup ID for the UE, store it in the 5GMM context of the UE, and include it in the Negotiated PEIPS assistance information IE in the REGISTRATION ACCEPT message or in the Updated PEIPS assistance information IE in the CONFIGURATION UPDATE COMMAND message as part of the registration procedure. The AMF may consider the UE paging probability information received in the Requested PEIPS assistance information IE when determining the Paging subgroup ID for the UE.

NOTE 20: Besides the UE paging probability information when provided by the UE, the AMF can also take local configuration, whether the UE is likely to receive IMS voice over PS session calls, UE mobility pattern or previous statistical information for the UE or information provided by the NG-RAN into account when determining the Paging subgroup ID for the UE.

If the UE sets the UN-PER bit to "unavailability period supported" in the 5GMM capability IE in the REGISTRATION REQUEST message and the AMF supports and accepts the use of unavailability period for the UE, then the AMF shall set the UN-PER bit to "unavailability period supported" in the 5GS network feature support IE in the REGISTRATION ACCEPT message.

If the UE sets the Unavailability type to "unavailability due to UE reasons" in the Unavailability information IE in the REGISTRATION REQUEST message, then the AMF shall:

a1) determine the Unavailability period duration value as:

- A value that was provided by the UE; or

- A value that was determined by the AMF; and

a2) determine the Start of the unavailability period value as:

- A value that was provided by the UE; or

- A value that was determined by the AMF; and

the AMF shall store the Start of unavailability period value and the Unavailability period duration. When the time of the Start of unavailability period arrives, the AMF shall consider the UE as unreachable until the UE registers for normal service;

b) store the received unavailability period duration, if any and the received start of unavailability period, if any;

c) the AMF shall determine whether the UE is required to perform the registration procedure when the unavailability period has ended and set the EURP bit to "UE needs to report end of unavailability period" or "UE does not need to report end of unavailability period" in the Unavailability configuration IE in the REGISTRATION ACCEPT message; and

d) release the signalling connection immediately after the completion of the registration procedure.

If the UE sets the Unavailability type to "unavailability due to discontinuous coverage" in the Unavailability information IE and the UE provides the Unavailability information IE in the REGISTRATION REQUEST message then:

a) if the AMF is able to determine an unavailability period duration for the UE based on satellite coverage availability information (see 3GPP TS 23.401 [7]) and the value of the Unavailability information IE in the REGISTRATION REQUEST message if available, the AMF shall store the determined unavailability period duration and provide the expected unavailability period duration to the UE by including the Unavailability period duration in the Unavailability configuration IE in the REGISTRATION ACCEPT message. If the AMF is able to determine the start of the unavailability period based on satellite coverage availability information and the value of the Unavailability information IE in the REGISTRATION REQUEST message if available, the AMF shall store the determined start of the unavailability period and provide the expected start of the unavailability period to the UE by including the start of the unavailability period in the Unavailability configuration IE in the REGISTRATION ACCEPT message; and

b1) the AMF shall determine the unavailability period duration value as:

- A value that was provided by the UE; or

- A value that was determined by the AMF based on satellite coverage availability information; and

b2) the AMF shall determine the start of the unavailability period value as:

- A value that was provided by the UE; or

- A value that was determined by the AMF based on satellite coverage availability information; and

the AMF shall store the unavailability period duration and the start of unavailability period value. When the unavailability period starts, the AMF shall consider the UE as unreachable until the UE registers for normal service again;

c) the AMF shall determine whether the UE is required to perform the registration procedure in NG-RAN satellite access when the unavailability period has ended and set the EURP bit to "UE needs to report end of unavailability period" or "UE does not need to report end of unavailability period" in the Unavailability configuration IE in the REGISTRATION ACCEPT message.

The AMF may determine the periodic registration update timer value based on the stored value of the received unavailability period duration if any, the received Start of unavailability period if any, the network determined unavailability period duration if any and the network determined Start of unavailability period if any. If the UE does not provide the Unavailability information IE in the REGISTRATION REQUEST message, the AMF shall delete any stored value of the Unavailability information IE if exists.

If the UE receives the Unavailability configuration IE with a value of the unavailability period duration in the REGISTRATION ACCEPT message, then the UE may either:

a) delete a UE determined value and start using the received value; or

b) use a UE determined value.

If the UE receives the Unavailability configuration IE with a value of the start of the unavailability period in the REGISTRATION ACCEPT message, then the UE may either:

a) delete a UE determined value and start using the received value; or

b) use a UE determined value.

NOTE 20a: The UE can consider the received value from the network when determining the value for unavailability period duration and the start of the unavailability period.

If due to regional subscription restrictions or access restrictions the UE is not allowed to access the TA or due to CAG restrictions the UE is not allowed to access the cell, but the UE has an emergency PDU session established, the AMF may accept the REGISTRATION REQUEST message and indicate to the SMF to perform a local release of all non-emergency PDU sessions (associated with 3GPP access if it is due to CAG restrictions) and informs the UE via the PDU session status IE in the REGISTRATION ACCEPT message. The AMF shall not indicate to the SMF to release the emergency PDU session. If the AMF indicated to the SMF to perform a local release of all non-emergency PDU sessions (associated with 3GPP access if it is due to CAG restrictions), the network shall behave as if the UE is registered for emergency services and shall set the emergency registered bit of the 5GS registration result IE to "Registered for emergency services" in the REGISTRATION ACCEPT message.

If the REGISTRATION ACCEPT message includes the PDU session reactivation result error cause IE with the 5GMM cause set to #28 "Restricted service area", the UE shall enter the state 5GMM-REGISTERED.NON-ALLOWED-SERVICE and behave as specified in subclause 5.3.5.

If the REGISTRATION ACCEPT message includes the SOR transparent container IE and:

a) the SOR transparent container IE does not successfully pass the integrity check (see 3GPP TS 33.501 [24]); and

b) if the UE attempts obtaining service on another PLMNs or SNPNs as specified in 3GPP TS 23.122 [5] annex C;

then the UE shall release locally the established NAS signalling connection after sending a REGISTRATION COMPLETE message.

If the REGISTRATION ACCEPT message includes the SOR transparent container IE and the SOR transparent container IE successfully passes the integrity check (see 3GPP TS 33.501 [24]), the ME shall store the received SOR counter as specified in annex C and proceed as follows:

a) the UE shall proceed with the behaviour as specified in 3GPP TS 23.122 [5] annex C; and

b) if the registration procedure is performed over 3GPP access and the UE attempts obtaining service on another PLMNs or SNPNs as specified in 3GPP TS 23.122 [5] annex C then the UE may release locally the established NAS signalling connection after sending a REGISTRATION COMPLETE message. Otherwise the UE shall send a REGISTRATION COMPLETE message and not release the current N1 NAS signalling connection locally. If an acknowledgement is requested in the SOR transparent container IE of the REGISTRATION ACCEPT message, the UE acknowledgement is included in the SOR transparent container IE of the REGISTRATION COMPLETE message. In the SOR transparent container IE carrying the acknowledgement, the UE shall set the ME support of SOR-CMCI indicator to "SOR-CMCI supported by the ME". Additionally, if the UE supports access to an SNPN using credentials from a credentials holder and the UE is not operating in SNPN access operation mode, the UE may set the ME support of SOR-SNPN-SI indicator to "SOR-SNPN-SI supported by the ME". Additionally, if the UE supports access to an SNPN providing access for localized services in SNPN, the UE shall set the ME support of SOR-SNPN-SI-LS indicator to "SOR-SNPN-SI-LS supported by the ME".

If the SOR transparent container IE successfully passes the integrity check (see 3GPP TS 33.501 [24]), and:

a) the SOR transparent container IE indicates a list of preferred PLMN/access technology combinations is provided and the list type indicates "PLMN ID and access technology list", then the ME shall replace the highest priority entries in the "Operator Controlled PLMN Selector with Access Technology" list stored in the ME and shall proceed with the behaviour as specified in 3GPP TS 23.122 [5] annex C.

If the SOR-CMCI is present and the Store SOR-CMCI in ME indicator is set to "Store SOR-CMCI in ME" then the UE shall store or delete the SOR-CMCI in the non-volatile memory of the ME as described in annex C.1;

b) the list type indicates "secured packet", then the ME shall behave as if a SMS is received with protocol identifier set to SIM data download, data coding scheme set to class 2 message and SMS payload as secured packet contents of SOR transparent container IE. The SMS payload is forwarded to UICC as specified in 3GPP TS 23.040 [4A]; or

c) the SOR transparent container IE indicates "HPLMN indication that 'no change of the "Operator Controlled PLMN Selector with Access Technology" list stored in the UE is needed and thus no list of preferred PLMN/access technology combinations is provided'", the UE operates in SNPN access operation mode and the SOR transparent container IE includes SOR-SNPN-SI, the ME shall replace SOR-SNPN-SI of the selected entry of the "list of subscriber data" or associated with the selected PLMN subscription, as specified in 3GPP TS 23.122 [5] with the received SOR-SNPN-SI. Additionally, if the SOR transparent container IE includes SOR-SNPN-SI-LS, the ME shall replace SOR-SNPN-SI-LS of the selected entry of the "list of subscriber data" or associated with the selected PLMN subscription, as specified in 3GPP TS 23.122 [5] with the received SOR-SNPN-SI-LS.

If the SOR-CMCI is present and the Store SOR-CMCI in ME indicator is set to "Store SOR-CMCI in ME" then the UE shall store or delete the SOR-CMCI in the non-volatile memory of the ME as described in annex C.1;

and the UE shall proceed with the behaviour as specified in 3GPP TS 23.122 [5] annex C.

If the SOR transparent container IE does not pass the integrity check successfully, then the UE shall discard the content of the SOR transparent container IE.

If required by operator policy, the AMF shall include the NSSAI inclusion mode IE in the REGISTRATION ACCEPT message (see table 4.6.2.3.1 of subclause 4.6.2.3). Upon receipt of the REGISTRATION ACCEPT message:

a) if the message includes the NSSAI inclusion mode IE, the UE shall operate in the NSSAI inclusion mode indicated in the NSSAI inclusion mode IE over the current access within the current PLMN and its equivalent PLMN(s), if any, or the current SNPN, in the current registration area; or

b) otherwise:

1) if the UE has NSSAI inclusion mode for the current PLMN or SNPN and access type stored in the UE, the UE shall operate in the stored NSSAI inclusion mode;

2) if the UE does not have NSSAI inclusion mode for the current PLMN or SNPN and the access type stored in the UE and if the UE is performing the registration procedure over:

i) 3GPP access, the UE shall operate in NSSAI inclusion mode D in the current PLMN or SNPN and the current access type;

ii) untrusted non-3GPP access, the UE shall operate in NSSAI inclusion mode C in the current PLMN and the current access type; or

iii) trusted non-3GPP access, the UE shall operate in NSSAI inclusion mode D in the current PLMN and the current access type; or

3) if the 5G-RG does not have NSSAI inclusion mode for the current PLMN and wireline access stored in the 5G-RG, and the 5G-RG is performing the registration procedure over wireline access, the 5G-RG shall operate in NSSAI inclusion mode B in the current PLMN and the current access type.

The AMF may include operator-defined access category definitions in the REGISTRATION ACCEPT message.

If there is a running T3447 timer in the AMF and the Uplink data status IE is included or the Follow-on request indicator is set to "Follow-on request pending" in the REGISTRATION REQUEST message, the AMF shall ignore the Uplink data status IE or that the Follow-on request indicator is set to "Follow-on request pending" and proceed as if the Uplink data status IE was not received or the Follow-on request indicator was not set to "Follow-on request pending" except for the following case:

- the PDU session indicated by the Uplink data status IE is emergency PDU session;

- the UE is configured for high priority access in selected PLMN;

- the REGISTRATION REQUEST message is as a paging response; or

- the UE is establishing an emergency PDU session or performing emergency services fallback.

If the UE receives Operator-defined access category definitions IE in the REGISTRATION ACCEPT message and the Operator-defined access category definitions IE contains one or more operator-defined access category definitions, the UE shall delete any operator-defined access category definitions stored for the RPLMN and shall store the received operator-defined access category definitions for the RPLMN. If the UE receives the Operator-defined access category definitions IE in the REGISTRATION ACCEPT message and the Operator-defined access category definitions IE contains no operator-defined access category definitions, the UE shall delete any operator-defined access category definitions stored for the RPLMN. If the REGISTRATION ACCEPT message does not contain the Operator-defined access category definitions IE, the UE shall not delete the operator-defined access category definitions stored for the RPLMN.

If the UE has indicated support for service gap control in the REGISTRATION REQUEST message and:

- the REGISTRATION ACCEPT message contains the T3447 value IE, then the UE shall store the new T3447 value, erase any previous stored T3447 value if exists and use the new T3447 value with the timer T3447 next time it is started; or

- the REGISTRATION ACCEPT message does not contain the T3447 value IE, then the UE shall erase any previous stored T3447 value if exists and stop the timer T3447 if running.

If the REGISTRATION ACCEPT message contains the Truncated 5G-S-TMSI configuration IE, then the UE shall store the included truncated 5G-S-TMSI configuration and return a REGISTRATION COMPLETE message to the AMF to acknowledge reception of the truncated 5G-S-TMSI configuration.

NOTE 21: The UE provides the truncated 5G-S-TMSI configuration to the lower layers.

If the UE is not in NB-N1 mode, the UE has set the RACS bit to "RACS supported" in the 5GMM Capability IE of the REGISTRATION REQUEST message, and the REGISTRATION ACCEPT message includes:

a) a UE radio capability ID deletion indication IE set to "Network-assigned UE radio capability IDs deletion requested", the UE shall delete any network-assigned UE radio capability IDs associated with the RPLMN or RSNPN 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 stored at the UE, then the UE shall initiate a registration procedure for mobility and periodic registration update as specified in subclause 5.5.1.3.2 over the existing N1 NAS signalling connection; or

b) a UE radio capability ID IE, the UE shall store the UE radio capability ID as specified in annex C.

If the registration procedure for mobility and periodic registration update was initiated and there is a request from the upper layers to perform "emergency services fallback" pending, the UE shall restart the service request procedure after the successful completion of the mobility and periodic registration update.

When AMF re-allocation occurs in the registration procedure for mobility and periodic registration update, if the new AMF receives in the 5GMM context of the UE the indication that the UE is registered for onboarding services in SNPN, the new AMF may start an implementation specific timer for onboarding services when the registration procedure for mobility and periodic registration update is successfully completed.

If the UE has included the service-level device ID set to the CAA-level UAV ID in the Service-level-AA container IE of the REGISTRATION REQUEST message and the REGISTRATION ACCEPT message contains the service-level-AA pending indication in the Service-level-AA container IE, the UE shall return a REGISTRATION COMPLETE message to the AMF to acknowledge reception of the service-level-AA pending indication, and the UE shall not attempt to perform another registration procedure for UAS services until the UUAA-MM procedure is completed, or to establish a PDU session for USS communication or a PDU session for C2 communication until the UUAA-MM procedure is completed successfully.

If the UE has included the service-level device ID set to the CAA-level UAV ID in the Service-level-AA container IE of the REGISTRATION REQUEST message and the REGISTRATION ACCEPT message does not contain the service-level-AA pending indication in the Service-level-AA container IE, the UE shall consider the UUAA-MM procedure is not triggered.

If the UE is registered for onboarding services in SNPN or the network determines that the UE's subscription only allows for configuration of SNPN subscription parameters in PLMN via the user plane, the AMF may start an implementation specific timer for onboarding services, if not running already, when the network considers that the UE is in 5GMM-REGISTERED (i.e. the network receives the REGISTRATION COMPLETE message from UE).

NOTE 22: If the AMF considers that the UE is in 5GMM-IDLE, when the implementation specific timer for onboarding services expires and the network considers that the UE is still in state 5GMM-REGISTERED, the AMF can locally de-register the UE; or if the UE is in 5GMM-CONNECTED, the AMF can initiate the network-initiated de-registration procedure (see subclause 5.5.2.3).

NOTE 23: The value of the implementation specific timer for onboarding services needs to be large enough to allow a UE to complete the configuration of one or more entries of the "list of subscriber data" taking into consideration that configuration of SNPN subscription parameters in PLMN via the user plane or onboarding services in SNPN involves third party entities outside of the operator's network.

If the UE receives the List of PLMNs to be used in disaster condition IE in the REGISTRATION ACCEPT message and the UE supports MINT, the UE shall delete the "list of PLMN(s) to be used in disaster condition" stored in the ME together with the PLMN ID of the RPLMN, if any, and may store the "list of PLMN(s) to be used in disaster condition" included in the List of PLMNs to be used in disaster condition IE in the ME together with the PLMN ID of the RPLMN.

If the UE receives the Disaster roaming wait range IE in the REGISTRATION ACCEPT message and the UE supports MINT, the UE shall delete the disaster roaming wait range stored in the ME, if any, and store the disaster roaming wait range included in the Disaster roaming wait range IE in the ME.

If the UE receives the Disaster return wait range IE in the REGISTRATION ACCEPT message and the UE supports MINT, the UE shall delete the disaster return wait range stored in the ME, if any, and store the disaster return wait range stored included in the Disaster return wait range IE in the ME.

If the 5GS registration type IE is set to "disaster roaming mobility registration updating" and:

a) the UE determined PLMN with disaster condition IE is included in the REGISTRATION REQUEST message, the AMF shall determine the PLMN with disaster condition in the UE determined PLMN with disaster condition IE;

b) the UE determined PLMN with disaster condition IE is not included in the REGISTRATION REQUEST message and the Additional GUTI IE is included in the REGISTRATION REQUEST message and contains 5G-GUTI of a PLMN of the country of the PLMN providing disaster roaming, the AMF shall determine the PLMN with disaster condition in the PLMN identity of the 5G-GUTI;

c) the UE determined PLMN with disaster condition IE and the Additional GUTI IE are not included in the REGISTRATION REQUEST message and:

1) the 5GS mobile identity IE contains 5G-GUTI of a PLMN of the country of the PLMN providing disaster roaming, the AMF shall determine the PLMN with disaster condition in the PLMN identity of the 5G-GUTI; or

2) the 5GS mobile identity IE contains SUCI of a PLMN of the country of the PLMN providing disaster roaming, the AMF shall determine the PLMN with disaster condition in the PLMN identity of the SUCI; or

d) the UE determined PLMN with disaster condition IE is not included in the REGISTRATION REQUEST message, NG-RAN of the PLMN providing disaster roaming broadcasts disaster roaming indication and:

- the Additional GUTI IE is included in the REGISTRATION REQUEST message and contains 5G-GUTI of a PLMN of a country other than the country of the PLMN providing disaster roaming; or

- the Additional GUTI IE is not included and the 5GS mobile identity IE contains 5G-GUTI or SUCI of a PLMN of a country other than the country of the PLMN providing disaster roaming;

the AMF shall determine the PLMN with disaster condition based on the disaster roaming agreement arrangement between mobile network operators.

NOTE 24: The disaster roaming agreement arrangement between mobile network operators is out scope of 3GPP.

If the AMF determines that a disaster condition applies to the PLMN with disaster condition, and the UE is allowed to be registered for disaster roaming services, the AMF shall set the Disaster roaming registration result value bit in the 5GS registration result IE to "no additional information" in the REGISTRATION ACCEPT message. If the AMF determines that the UE can be registered to the PLMN for normal service, the AMF shall set the Disaster roaming registration result value bit in the 5GS registration result IE to "request for registration for disaster roaming service accepted as registration not for disaster roaming service " in the REGISTRATION ACCEPT message.

If the UE indicates "disaster roaming mobility registration updating" in the 5GS registration type IE in the REGISTRATION REQUEST message and the 5GS registration result IE value in the REGISTRATION ACCEPT message is set to:

- "request for registration for disaster roaming service accepted as registration not for disaster roaming service", the UE shall consider itself registered for normal service. If the PLMN identity of the registered PLMN is a member of the forbidden PLMN list as specified in subclause 5.3.13A, any such PLMN identity shall be deleted from the corresponding list(s). If UE supports S1 mode, the UE shall initiate the registration procedure for mobility and periodic registration update and indicate that S1 mode is supported as described in subclause 5.5.1.3.2; or

- "no additional information", the UE shall consider itself registered for disaster roaming.

If the UE receives the Forbidden TAI(s) for the list of "5GS forbidden tracking areas for roaming" IE in the REGISTRATION ACCEPT message and the TAI(s) included in the IE is not part of the list of "5GS forbidden tracking areas for roaming", the UE shall store the TAI(s) belonging to the serving PLMN or equivalent PLMN(s) and ignore the TAI(s) which do not belong to the serving PLMN or equivalent PLMN(s) included in the IE into the list of "5GS forbidden tracking areas for roaming" and remove the TAI(s) from the stored TAI list if present.

If the UE receives the Forbidden TAI(s) for the list of "5GS forbidden tracking areas for regional provision of service" IE in the REGISTRATION ACCEPT message and the TAI(s) included in the IE is not part of the list of "5GS forbidden tracking areas for regional provision of service", the UE shall store the TAI(s) belonging to the serving PLMN or equivalent PLMN(s) and ignore the TAI(s) which do not belong to the serving PLMN or equivalent PLMN(s) included in the IE into the list of "5GS forbidden tracking areas for regional provision of service" and remove the TAI(s) from the stored TAI list if present.

If the ESI bit of the 5GMM capability IE of the REGISTRATION REQUEST message is set to "equivalent SNPNs supported", and the serving SNPN changes, the AMF shall indicate the NID of the serving SNPN in the REGISTRATION ACCEPT message. The UE shall determine the SNPN identity of the RSNPN from the NID received in the REGISTRATION ACCEPT message and the MCC and the MNC of the new 5G-GUTI.

If the UE supporting the reconnection to the network due to RAN timing synchronization status change receives the RAN timing synchronization IE with the RecReq bit set to "Reconnection requested" in the REGISTRATION ACCEPT message, the UE shall operate as specified in subclauses 5.3.1.4, 5.5.1.3.2 and 5.6.1.1.

If the UE supports discontinuous coverage, the AMF may include the Discontinuous coverage maximum time offset IE in the REGISTRATION ACCEPT message.

If the UE receives, the Discontinuous coverage maximum time offset IE in the REGISTRATION ACCEPT message, the UE shall replace any previously received maximum time offset value on the same satellite NG-RAN RAT type and PLMN with the latest received timer value.

If the AMF includes Unavailability configuration IE in the REGISTRATION ACCEPT message and sets the EUPR bit to "UE does not need to report end of unavailability", the UE is not required to initiate the registration procedure for mobility registration update when the unavailability period duration has ended. If the UE does not receive the Unavailability configuration IE or the EUPR bit is set to "UE needs to report end of unavailability period", the UE should trigger registration procedure for mobility registration update when the unavailability period duration has ended. If the UE has stored a discontinuous coverage maximum time offset timer value, upon returning to coverage after being out of coverage due to discontinuous coverage, the UE starts a timer with a random value up to the discontinuous coverage maximum time offset value and the UE should trigger the registration procedure for mobility registration update at the expiry of this timer.

If the UE operating as MBSR receives the MBSRAI field of the Feature authorization indication IE in the REGISTRATION ACCEPT message, the UE NAS layer informs the lower layers of the status of MBSR authorization as specified in subclause 5.35A.4 of 3GPP TS 23.501 [8].

\*\*\*\*\* Ninth change \*\*\*\*\*

#### 5.6.1.5 Service request procedure not accepted by the network

If the service request cannot be accepted, the network shall return a SERVICE REJECT message to the UE including an appropriate 5GMM cause value.

If the SERVICE REJECT message with 5GMM cause #76 or #78 was received without integrity protection, then the UE shall discard the message.

If the AMF needs to initiate PDU session status synchronisation or a PDU session status IE was included in the SERVICE REQUEST message, the AMF shall include a PDU session status IE in the SERVICE REJECT message to indicate which PDU sessions associated with the access type the SERVICE REJECT message is sent over are active in the AMF. If the PDU session status IE is included in the SERVICE REJECT message and if the message is integrity protected, then:

a) for single access PDU sessions, the UE shall perform a local release of all those PDU sessions which are not in 5GSM state PDU SESSION INACTIVE or PDU SESSION ACTIVE PENDING on the UE side associated with the access type the SERVICE REJECT message is sent over, but are indicated by the AMF as being in 5GSM state PDU SESSION INACTIVE. If a locally released PDU session is associated with one or more MBS sessions, the UE shall locally leave the associated MBS multicast sessions; and

b) for MA PDU sessions, for all those PDU sessions which are not in 5GSM state PDU SESSION INACTIVE or PDU SESSION ACTIVE PENDING and have user plane resources established on the UE side associated with the access the SERVICE REJECT message is sent over, but are indicated by the AMF as no user plane resources established:

1) for MA PDU sessions having user plane resources established only on the access type the SERVICE REJECT message is sent over, the UE shall perform a local release of those MA PDU sessions. If a locally released PDU session is associated with one or more MBS sessions, the UE shall locally leave the associated MBS multicast sessions; and

2) for MA PDU sessions having user plane resources established on both accesses, the UE shall perform a local release on the user plane resources on the access type the SERVICE REJECT message is sent over. If a locally released PDU session is associated with one or more MBS sessions, the UE shall locally leave the associated MBS multicast sessions.

If the service request for mobile originated services is rejected due to general NAS level mobility management congestion control, the network shall set the 5GMM cause value to #22 "congestion" and assign a value for back-off timer T3346.

If the service request for mobile originated services is rejected due to general NAS level mobility management congestion control for the SNPN selected for localized services in SNPN (see 3GPP TS 23.122 [5]), the network may set an appropriate cause value other than 5GMM cause value to #22 "congestion" and does not assign a value for back-off timer T3346.

In NB-N1 mode, if the service request for mobile originated services is rejected due to operator determined barring (see 3GPP TS 29.503 [20AB]), the network shall set the 5GMM cause value to #22 "congestion" and assign a value for back-off timer T3346.

If the service request from a UE supporting CAG is rejected due to CAG restrictions, the network shall set the 5GMM cause value to #76 "Not authorized for this CAG or authorized for CAG cells only" and should include the "CAG information list" in the CAG information list IE or the Extended CAG information list IE in the SERVICE REJECT message.

NOTE 1: The network cannot be certain that "CAG information list" stored in the UE is updated as result of sending of the SERVICE REJECT message with the CAG information list IE or the Extended CAG information list IE, as the SERVICE REJECT message is not necessarily delivered to the UE (e.g., due to abnormal radio conditions).

NOTE 2: The "CAG information list" can be provided by the AMF and include no entry if no "CAG information list" exists in the subscription.

NOTE 2A: If the UE supports extended CAG information list, the CAG information list can be included either in the CAG information list IE or Extended CAG information list IE.

NOTE 2B: It is unexpected for network to send REGISTRATION REJECT message to the UE with 5GMM cause value #76 in non-CAG cell and not indicate "Indication that the UE is only allowed to access 5GS via CAG cells" for the serving PLMN in the Extended CAG information list or the CAG information list.

If the UE does not support extended CAG information list, the CAG information list shall not be included in the Extended CAG information list IE.

If the service request from a UE not supporting CAG is rejected due to CAG restrictions, the network shall operate as described in bullet h) of subclause 5.6.1.8.

Upon receipt of the CONTROL PLANE SERVICE REQUEST message with uplink data:

- if the AMF decides to not forward the uplink data piggybacked in the CONTROL PLANE SERVICE REQUEST message; and

- if the AMF decides to activate the congestion control for transport of user data via the control plane,

then the AMF shall send a SERVICE REJECT message and set the 5GMM cause value to #22 "congestion" and assign a value for control plane data back-off timer T3448.

If the AMF determines that the UE is in a non-allowed area or is not in an allowed area as specified in subclause 5.3.5, then:

a) if the service type IE in the SERVICE REQUEST message is set to "high priority access" and service area restrictions are applicable for high priority access based on operator policy, or set to "signalling" or "data", the AMF shall send a SERVICE REJECT message with the 5GMM cause value set to #28 "Restricted service area";

b) otherwise, if the service type IE in the SERVICE REQUEST message is set to "high priority access" and service area restrictions are not applicable for high priority access based on operator policy, or set to "mobile terminated services", "emergency services", "emergency services fallback" or "elevated signalling", the AMF shall continue the process as specified in subclause 5.6.1.4 unless for other reasons the service request cannot be accepted.

If the service request for mobile originated services is rejected due to service gap control as specified in subclause 5.3.17, i.e. the T3447 timer is running in AMF, the network shall set the 5GMM cause value to #22 "Congestion" and may include T3346 value IE in the SERVICE REJECT message set to the remaining time of the running T3447 timer.

Based on operator policy, if the service request procedure is rejected due to core network redirection for CIoT optimizations, the network shall set the 5GMM cause value to #31 "Redirection to EPC required".

NOTE 3: The network can take into account the UE's S1 mode capability, the EPS CIoT network behaviour supported by the UE or the EPS CIoT network behaviour supported by the EPC to determine the rejection with the 5GMM cause value #31 "Redirection to EPC required".

If the service request is via a satellite NG-RAN cell, and the network determines that the UE is in a location where the network is not allowed to operate, see 3GPP TS 23.502 [9], the network shall set the 5GMM cause value in the SERVICE REJECT message to #78 "PLMN not allowed to operate at the present UE location".

NOTE 3A: While location determination is ongoing to ensure that operator and regulatory policies are met, the AMF can perform DNN-based or S-NSSAI based congestion control as specified in subclauses 5.3.10 and 5.3.11 to prevent the UE from accessing network.

If the service request from a UE supporting MINT is rejected due to a disaster condition no longer being applicable in the current location of the UE, the network shall set the 5GMM cause value to #11 "PLMN not allowed" or #13 "Roaming not allowed in this tracking area" and may include a disaster return wait range in the Disaster return wait range IE in the SERVICE REJECT message.

On receipt of the SERVICE REJECT message, if the UE is in state 5GMM-SERVICE-REQUEST-INITIATED, the UE shall reset the service request attempt counter and stop timer T3517 if running.

If the AMF received multiple TAIs from the satellite NG-RAN as described in 3GPP TS 23.501 [8], and determines that, by UE subscription and operator's preferences, all of the received TAIs are forbidden, for roaming or for regional provision of service, the AMF shall include the TAI(s) in:

a) the Forbidden TAI(s) for the list of "5GS forbidden tracking areas for roaming" IE; or

b) the Forbidden TAI(s) for the list of "5GS forbidden tracking areas for regional provision of service" IE; or

c) both;

in the SERVICE REJECT message.

Regardless of the 5GMM cause value received in the SERVICE REJECT message via satellite NG-RAN,

- if the UE receives the Forbidden TAI(s) for the list of "5GS forbidden tracking areas for roaming" IE in the SERVICE REJECT message, the UE shall store the TAI(s) belonging to the serving PLMN or equivalent PLMN(s) and ignore the TAI(s) which do not belong to the serving PLMN or equivalent PLMN(s) included in the IE, if not already stored, into the list of "5GS forbidden tracking areas for roaming"; and

- if the UE receives the Forbidden TAI(s) for the list of "5GS forbidden tracking areas for regional provision of service" IE in the SERVICE REJECT message, the UE shall store the TAI(s) belonging to the serving PLMN or equivalent PLMN(s) and ignore the TAI(s) which do not belong to the serving PLMN or equivalent PLMN(s) included in the IE, if not already stored, into the list of "5GS forbidden tracking areas for regional provision of service".

Furthermore, the UE shall take the following actions depending on the 5GMM cause value received in the SERVICE REJECT message.

#3 (Illegal UE);

#6 (Illegal ME);

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list and ngKSI.

In case of PLMN, the UE shall consider the USIM as invalid for 5GS services until switching off, the UICC containing the USIM is removed or the timer T3245 expires as described in subclause 5.3.19A.1;

In case of SNPN, if the UE is not registered for onboarding services in SNPN and the UE does not support access to an SNPN using credentials from a credentials holder and does not support equivalent SNPNs, the UE shall consider the selected entry of the "list of subscriber data" with the SNPN identity of the current SNPN as invalid until the UE is switched off, the entry is updated or the timer T3245 expires as described in subclause 5.3.19A.2. In case of SNPN, if the UE is not registered for onboarding services in SNPN and the UE supports access to an SNPN using credentials from a credentials holder, equivalent SNPNs, or both, the UE shall consider the selected entry of the "list of subscriber data" as invalid for 3GPP access until the UE is switched off, the entry is updated or the timer T3245 expires as described in subclause 5.3.19A.2. Additionally, if EAP based primary authentication and key agreement procedure using EAP-AKA' or 5G AKA based primary authentication and key agreement procedure was performed in the current SNPN, the UE shall consider the USIM as invalid for the current SNPN until switching off, the UICC containing the USIM is removed or the timer T3245 expires as described in subclause 5.3.19A.2.

If the UE is not registered for onboarding services in SNPN, the UE shall delete the list of equivalent PLMNs (if any) or the list of equivalent SNPNs (if any), and shall enter the state 5GMM-DEREGISTERED.NO-SUPI. If the message has been successfully integrity checked by the NAS, then the UE shall:

1) set the counter for "SIM/USIM considered invalid for GPRS services" events and the counter for "USIM considered invalid for 5GS services over non-3GPP access" events to UE implementation-specific maximum value in case of PLMN if the UE maintains these counters;

2) set the counter for "the entry for the current SNPN considered invalid for 3GPP access" events and the counter for "the entry for the current SNPN considered invalid for non-3GPP access" events to UE implementation-specific maximum value in case of SNPN if the UE maintains these counters; and

If the message was received via 3GPP access and the UE is operating in the single-registration mode, the UE shall handle the EMM parameters EMM state, EPS update status, 4G-GUTI, last visited registered TAI, TAI list and eKSI as specified in 3GPP TS 24.301 [15] for the case when the service request procedure is rejected with the EMM cause with the same value. The USIM shall be considered as invalid also for non-EPS services until switching off, the UICC containing the USIM is removed or the timer T3245 expires as described in subclause 5.3.7a in 3GPP TS 24.301 [15]. If the message has been successfully integrity checked by the NAS and the UE maintains a counter for "SIM/USIM considered invalid for non-GPRS services", then the UE shall set this counter to UE implementation-specific maximum value.

If the UE is registered for onboarding services in SNPN, the UE shall store the SNPN identity in the "permanently forbidden SNPNs for onboarding services in SNPN" list, enter state 5GMM-DEREGISTERED.PLMN-SEARCH, and perform an SNPN selection or an SNPN selection for onboarding services according to 3GPP TS 23.122 [5]. If the message has been successfully integrity checked by the NAS, the UE shall set the SNPN-specific attempt counter to the UE implementation-specific maximum value.

If the message has been successfully integrity checked by the NAS and the UE also supports the registration procedure over the other access, the UE shall in addition handle 5GMM parameters and 5GMM state for this access, as described for this 5GMM cause value.

#7 (5GS services not allowed).

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list and ngKSI.

In case of PLMN, the UE shall consider the USIM as invalid for 5GS services until switching off, the UICC containing the USIM is removed or the timer T3245 expires as described in subclause 5.3.19A.1;

In case of SNPN, if the UE is not registered for onboarding services in SNPN and the UE does not support access to an SNPN using credentials from a credentials holder and does not support equivalent SNPNs, the UE shall consider the selected entry of the "list of subscriber data" with the SNPN identity of the current SNPN as invalid for 5GS services until the UE is switched off, the entry is updated or the timer T3245 expires as described in subclause 5.3.19A.2. In case of SNPN, if the UE is not registered for onboarding services in SNPN and the UE supports access to an SNPN using credentials from a credentials holder, equivalent SNPNs, or both, the UE shall consider the selected entry of the "list of subscriber data" as invalid for 3GPP access until the UE is switched off, the entry is updated or the timer T3245 expires as described in subclause 5.3.19A.2. Additionally, if EAP based primary authentication and key agreement procedure using EAP-AKA' or 5G AKA based primary authentication and key agreement procedure was performed in the current SNPN, the UE shall consider the USIM as invalid for the current SNPN until switching off, the UICC containing the USIM is removed or the timer T3245 expires as described in subclause 5.3.19A.2.

If the UE is not registered for onboarding services in SNPN, the UE shall enter the state 5GMM-DEREGISTERED.NO-SUPI. If the message has been successfully integrity checked by the NAS, then the UE shall:

1) set the counter for "SIM/USIM considered invalid for GPRS services" events and the counter for "USIM considered invalid for 5GS services over non-3GPP access" events to UE implementation-specific maximum value in case of PLMN if the UE maintains these counters; or

2) set the counter for "the entry for the current SNPN considered invalid for 3GPP access" events and the counter for "the entry for the current SNPN considered invalid for non-3GPP access" events to UE implementation-specific maximum value in case of SNPN if the UE maintains these counters; and

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall handle the EMM parameters EMM state, EPS update status, 4G-GUTI, last visited registered TAI, TAI list and eKSI as specified in 3GPP TS 24.301 [15] for the case when the service request procedure is rejected with the EMM cause with the same value.

If the UE is registered for onboarding services in SNPN, the UE shall store the SNPN identity in the "permanently forbidden SNPNs for onboarding services in SNPN" list, enter state 5GMM-DEREGISTERED.PLMN-SEARCH, and perform an SNPN selection or an SNPN selection for onboarding services according to 3GPP TS 23.122 [5]. If the message has been successfully integrity checked by the NAS, the UE shall set the SNPN-specific attempt counter to the UE implementation-specific maximum value.

If the message has been successfully integrity checked by the NAS and the UE also supports the registration procedure over the other access, the UE shall in addition handle 5GMM parameters and 5GMM state for this access, as described for this 5GMM cause value.

NOTE 4: The possibility to configure a UE so that the radio transceiver for a specific radio access technology is not active, although it is implemented in the UE, is outside the scope of the present document.

#9 (UE identity cannot be derived by the network).

The UE shall set the 5GS update status to 5U2 NOT UPDATED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list and ngKSI. The UE shall enter the state 5GMM-DEREGISTERED.

If the service request was initiated for emergency services fallback, the UE shall attempt to select an E-UTRA cell connected to EPC or 5GCN according to the domain priority and selection rules specified in 3GPP TS 23.167 [6]. If the UE finds a suitable E-UTRA cell, it then proceeds with the appropriate EMM or 5GMM procedures. If the UE operating in single-registration mode has changed to S1 mode, it shall disable the N1 mode capability for 3GPP access.

If the service request was initiated for any reason other than emergency services fallback or initiating an emergency PDU session, the UE shall perform a new initial registration procedure.

NOTE 5: User interaction is necessary in some cases when the UE cannot re-establish the PDU session(s) automatically.

If the message was received via 3GPP access and the UE is operating in the single-registration mode, the UE shall handle the EMM parameters EMM state, EPS update status, 4G-GUTI, last visited registered TAI, TAI list and eKSI as specified in 3GPP TS 24.301 [15] for the case when the service request procedure is rejected with the EMM cause with the same value.

#10 (Implicitly de-registered).

The UE shall enter the state 5GMM-DEREGISTERED.NORMAL-SERVICE. The UE shall delete any mapped 5G NAS security context or partial native 5G NAS security context.

If the service request was initiated for emergency services fallback, the UE shall attempt to select an E-UTRA cell connected to EPC or 5GCN according to the domain priority and selection rules specified in 3GPP TS 23.167 [6]. If the UE finds a suitable E-UTRA cell, it then proceeds with the appropriate EMM or 5GMM procedures. If the UE operating in single-registration mode has changed to S1 mode, it shall disable the N1 mode capability for 3GPP access.

If the rejected request was neither for initiating an emergency PDU session nor for emergency services fallback, the UE shall perform a new initial registration procedure.

NOTE 6: User interaction is necessary in some cases when the UE cannot re-establish the PDU session(s) automatically.

If the message was received via 3GPP access and the UE is operating in the single-registration mode, the UE shall handle the EMM state as specified in 3GPP TS 24.301 [15] for the case when the service request procedure is rejected with the EMM cause with the same value.

#11 (PLMN not allowed).

This cause value received from a cell belonging to an SNPN and the UE is operating in SNPN access operation mode is considered as an abnormal case and the behaviour of the UE is specified in subclause 5.6.1.7.

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list and ngKSI. The UE shall delete the list of equivalent PLMNs and store the PLMN identity in the forbidden PLMN list as specified in subclause 5.3.13A and if the UE is configured to use timer T3245 then the UE shall start timer T3245 and proceed as described in subclause 5.3.19A.1. For 3GPP access, the UE shall enter the state 5GMM-DEREGISTERED.PLMN-SEARCH and perform a PLMN selection according to 3GPP TS 23.122 [5], and for non-3GPP access the UE shall enter state 5GMM-DEREGISTERED.LIMITED-SERVICE and perform network selection as defined in 3GPP TS 24.502 [18]. If the message has been successfully integrity checked by the NAS and the UE mantains the PLMN-specific attempt counter and the PLMN-specific attempt counter for non-3GPP access for that PLMN, the UE shall set the PLMN-specific attempt counter and the PLMN-specific attempt counter for non-3GPP access for that PLMN to the UE implementation-specific maximum value.

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall in addition handle the EMM parameters EMM state, EPS update status, 4G-GUTI, last visited registered TAI, TAI list and eKSI as specified in 3GPP TS 24.301 [15] for the case when the service request procedure is rejected with the EMM cause with the same value.

If the message has been successfully integrity checked by the NAS and the UE also supports the registration procedure over the other access to the same PLMN, the UE shall in addition handle 5GMM parameters and 5GMM state for this access, as described for this 5GMM cause value.

If the UE receives the Disaster return wait range IE in the SERVICE REJECT message and the UE supports MINT, the UE shall delete the disaster return wait range stored in the ME, if any, and store the disaster return wait range included in the Disaster return wait range IE in the ME.

#12 (Tracking area not allowed).

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete last visited registered TAI and TAI list. If the UE is not registering or has not registered to the same PLMN over both 3GPP access and non-3GPP access, the UE shall additionally delete 5G-GUTI and ngKSI.

If:

1) the UE is not operating in SNPN access operation mode, the UE shall store the current TAI in the list of "5GS forbidden tracking areas for regional provision of service" and enter the state 5GMM-DEREGISTERED.LIMITED-SERVICE. If the SERVICE REJECT message is not integrity protected, the UE shall memorize the current TAI was stored in the list of "5GS forbidden tracking areas for regional provision of service" for non-integrity protected NAS reject message; or

2) the UE is operating in SNPN access operation mode, the UE shall store the current TAI in the list of "5GS forbidden tracking areas for regional provision of service" for the current SNPN and the selected entry of the "list of subscriber data" or the selected PLMN subscription, and enter the state 5GMM-DEREGISTERED.LIMITED-SERVICE. If the SERVICE REJECT message is not integrity protected, the UE shall memorize the current TAI was stored in the list of "5GS forbidden tracking areas for regional provision of service" for the current SNPN and the selected entry of the "list of subscriber data" or the selected PLMN subscription, for non-integrity protected NAS reject message.

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall handle the EMM parameters EMM state, EPS update status, 4G-GUTI, last visited registered TAI, TAI list and eKSI as specified in 3GPP TS 24.301 [15] for the case when the service request procedure is rejected with the EMM cause with the same value.

#13 (Roaming not allowed in this tracking area).

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2). For 3GPP access the UE shall enter the state 5GMM-REGISTERED.PLMN-SEARCH, and for non-3GPP access the UE shall enter the state 5GMM-REGISTERED.LIMITED-SERVICE.

If:

1) the UE is not operating in SNPN access operation mode, the UE shall store the current TAI in the list of "5GS forbidden tracking areas for roaming" and remove the current TAI from the stored TAI list if present. If the SERVICE REJECT message is not integrity protected, the UE shall memorize the current TAI was stored in the list of "5GS forbidden tracking areas for roaming" for non-integrity protected NAS reject message; or

2) the UE is operating in SNPN access operation mode, the UE shall store the current TAI in the list of "5GS forbidden tracking areas for roaming" for the current SNPN and the selected entry of the "list of subscriber data" or the selected PLMN subscription, and remove the current TAI from the stored TAI list if present. If the SERVICE REJECT message is not integrity protected, the UE shall memorize the current TAI was stored in the list of "5GS forbidden tracking areas for roaming" for the current SNPN and the selected entry of the "list of subscriber data" or the selected PLMN subscription, for non-integrity protected NAS reject message.

For 3GPP access the UE shall perform a PLMN selection or SNPN selection according to 3GPP TS 23.122 [5], and for non-3GPP access the UE shall perform network selection as defined in 3GPP TS 24.502 [18].

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall handle the EMM parameters EMM state and EPS update status as specified in 3GPP TS 24.301 [15] for the case when the service request procedure is rejected with the EMM cause with the same value.

If the UE receives the Disaster return wait range IE in the SERVICE REJECT message and the UE supports MINT, the UE shall delete the disaster return wait range stored in the ME, if any, and store the disaster return wait range included in the Disaster return wait range IE in the ME.

#15 (No suitable cells in tracking area).

The UE shall enter the state 5GMM-REGISTERED.LIMITED-SERVICE.

If:

1) the UE is not operating in SNPN access operation mode, the UE shall store the current TAI in the list of "5GS forbidden tracking areas for roaming" and remove the current TAI from the stored TAI list if present. If the SERVICE REJECT message is not integrity protected, the UE shall memorize the current TAI was stored in the list of "5GS forbidden tracking areas for roaming" for non-integrity protected NAS reject message; or

2) the UE is operating in SNPN access operation mode, the UE shall store the current TAI in the list of "5GS forbidden tracking areas for roaming" for the current SNPN and the selected entry of the "list of subscriber data" or the selected PLMN subscription, and remove the current TAI from the stored TAI list if present. If the SERVICE REJECT message is not integrity protected, the UE shall memorize the current TAI was stored in the list of "5GS forbidden tracking areas for roaming" for the current SNPN and the selected entry of the "list of subscriber data" or the selected PLMN subscription, for non-integrity protected NAS reject message.

If the UE initiated service request for emergency services fallback, the UE shall attempt to select an E-UTRA cell connected to the EPC or the 5GCN according to the emergency services support indicator (see 3GPP TS 36.331 [25A]). If the UE finds a suitable E-UTRA cell, it then proceeds with the appropriate EMM or 5GMM procedures. If the UE operating in single-registration mode has changed to S1 mode, it shall disable the N1 mode capability for 3GPP access.

If the service request was not initiated for emergency services fallback, the UE shall search for a suitable cell in another tracking area according to 3GPP TS 38.304 [28] or 3GPP TS 36.304 [25C].

If the message was received via 3GPP access and the UE is operating in the single-registration mode, the UE shall handle the EMM parameters EMM state and EPS update status as specified in 3GPP TS 24.301 [15] for the case when the service request procedure is rejected with the EMM cause with the same value.

If received over non-3GPP access the cause shall be considered as an abnormal case and the behaviour of the UE for this case is specified in subclause 5.6.1.7.

#22 (Congestion).

If the T3346 value IE is present in the SERVICE REJECT message and the value indicates that this timer is neither zero nor deactivated, the UE shall proceed as described below, otherwise it shall be considered as an abnormal case and the behaviour of the UE for this case is specified in subclause 5.6.1.7.

If the rejected request was not for initiating an emergency PDU session, the UE shall abort the service request procedure and enter state 5GMM-REGISTERED and stop timer T3517 if still running.

The UE shall stop timer T3346 if it is running.

If the SERVICE REJECT message is integrity protected, the UE shall start timer T3346 with the value provided in the T3346 value IE.

If the SERVICE REJECT message is not integrity protected, the UE shall start timer T3346 with a random value from the default range specified in 3GPP TS 24.008 [12].

For all other cases the UE stays in the current serving cell and applies normal cell reselection process. The service request procedure is started, if still necessary, when timer T3346 expires or is stopped.

If the message was received via 3GPP access and the UE is operating in the single-registration mode, the UE shall handle the EMM parameters EMM state and EPS update status as specified in 3GPP TS 24.301 [15] for the case when the service request procedure is rejected with the EMM cause with the same value.

If the service request procedure was initiated for an MO MMTEL voice call (i.e. access category 4), or for an MO MMTEL video call (i.e. access category 5) or for an MO IMS registration related signalling (i.e. access category 9), a notification that the service request was not accepted due to congestion shall be provided to the upper layers.

If the UE is using 5GS services with control plane CIoT 5GS optimization and if the T3448 value IE is present in the SERVICE REJECT message and the value indicates that this timer is neither zero nor deactivated, the UE shall:

a) stop timer T3448 if it is running;

b) consider the transport of user data via the control plane as unsuccessful; and

c) start timer T3448:

1) with the value provided in the T3448 value IE if the SERVICE REJECT message is integrity protected; or

2) with a random value from the default range specified in 3GPP TS 24.301 [15] table 10.2.1 if the SERVICE REJECT message is not integrity protected.

If the UE is using 5GS services with control plane CIoT 5GS optimization, the T3448 value IE is present in the SERVICE REJECT message and the value indicates that this timer is either zero or deactivated, the UE shall ignore the T3448 value IE and:

a) stop timer T3448 if it is running; and

b) consider the transport of user data via the control plane as unsuccessful.

If the UE is using 5GS services with control plane CIoT 5GS optimization and if the T3448 value IE is not present in the SERVICE REJECT message, it shall be considered as an abnormal case and the behaviour of UE for this case is specified in subclause 5.6.1.7.

#27 (N1 mode not allowed).

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall enter the state 5GMM-REGISTERED.LIMITED-SERVICE. If the message has been successfully integrity checked by the NAS, the UE shall set:

1) the PLMN-specific N1 mode attempt counter for 3GPP access and the PLMN-specific N1 mode attempt counter for non-3GPP access for that PLMN in case of PLMN; or

2) the SNPN-specific attempt counter for 3GPP access for the current SNPN and the SNPN-specific attempt counter for non-3GPP access for the current SNPN in case of SNPN

to the UE implementation-specific maximum value.

The UE shall disable the N1 mode capability for the specific access type for which the message was received (see subclause 4.9).

If the message has been successfully integrity checked by the NAS, the UE shall disable the N1 mode capability also for the other access type (see subclause 4.9).

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall in addition set the EPS update status to EU3 ROAMING NOT ALLOWED and enter the state EMM-REGISTERED.

#28 (Restricted service area).

This cause value received from non-3GPP access other than wireline access is considered as an abnormal case, and the behaviour of the UE is specified in subclause 5.6.1.7.

The UE shall enter the state 5GMM-REGISTERED.NON-ALLOWED-SERVICE, wait for the release of the N1 NAS signalling connection and perform the registration procedure for mobility and periodic registration update if the service type IE in the SERVICE REQUEST message was not set to "elevated signalling" and the SERVICE REJECT message is received over 3GPP access (see subclause 5.3.5 and 5.5.1.3).

If the service type IE in the SERVICE REQUEST message was set to "elevated signalling", the UE shall not re-initiate service request procedure until the UE enters an allowed area or leaves a non-allowed area, except for emergency services, high priority access or responding to paging or notification.

If the service type IE in the SERVICE REQUEST message was set to "high priority access" and the network indicates "High priority access UEs are not exempt from service area restrictions", the UE shall not perform the procedure for mobility and periodic registration update or the service request procedure until the UE enters an allowed area or leaves a non-allowed area.

If the service type IE in the SERVICE REQUEST message was set to "high priority access" and the network does not indicate "High priority access UEs are not exempt from service area restrictions", the UE may perform the procedure for mobility and periodic registration update or the service request procedure.

#31 (Redirection to EPC required).

5GMM cause #31 received by a UE that has not indicated support for CIoT optimizations or received by a UE over non-3GPP access is considered an abnormal case and the behaviour of the UE is specified in subclause 5.6.1.7.

This cause value received from a cell belonging to an SNPN and the UE is operating in SNPN access operation mode is considered as an abnormal case and the behaviour of the UE is specified in subclause 5.6.1.7.

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2). The UE shall reset the service request attempt counter and enter the state 5GMM-REGISTERED.LIMITED-SERVICE.

The UE shall enable the E-UTRA capability if it was disabled and disable the N1 mode capability for 3GPP access (see subclause 4.9.2).

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall handle the EMM parameters, EMM state, and EPS update status as specified in 3GPP TS 24.301 [15] for the case when the service request procedure is rejected with the EMM cause with the same value.

#36 (IAB-node operation not authorized).

This cause value is only applicable when received over 3GPP access by a UE operating as an IAB-node. This cause value received from a 5G access network other than 3GPP access or received by a UE not operating as an IAB-node is considered as an abnormal case and the behaviour of the UE is specified in subclause 5.6.1.7.

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list and ngKSI.

If:

1) the UE is not operating in SNPN access operation mode,

i) the UE shall delete the list of equivalent PLMNs and store the PLMN identity in the forbidden PLMN list as specified in subclause 5.3.13A and if the UE is configured to use timer T3245 then the UE shall start timer T3245 and proceed as described in subclause 5.3.19a.1. The UE shall enter the state 5GMM-DEREGISTERED.PLMN-SEARCH and perform a PLMN selection according to 3GPP TS 23.122 [5]. If the message has been successfully integrity checked by the NAS and the UE maintains the PLMN-specific attempt counter for 3GPP access for that PLMN, the UE shall set the PLMN-specific attempt counter for 3GPP access for that PLMN to the UE implementation-specific maximum value; and

ii) If the UE is operating in single-registration mode, the UE shall in addition handle the EMM parameters EMM state, EPS update status, 4G-GUTI, last visited registered TAI, TAI list and eKSI as specified in 3GPP TS 24.301 [15] for the case when the service request procedure is rejected with the EMM cause with the same value; or

2) the UE is operating in SNPN access operation mode,

i) the UE shall delete the list of equivalent SNPNs (if available). The UE shall store the SNPN identity in the "temporarily forbidden SNPNs" list for 3GPP access 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 shall enter state 5GMM-DEREGISTERED.PLMN-SEARCH and perform an SNPN selection according to 3GPP TS 23.122 [5]. If the message has been successfully integrity checked by the NAS, the UE shall set the SNPN-specific attempt counter for 3GPP access for the current SNPN to the UE implementation-specific maximum value.

#72 (Non-3GPP access to 5GCN not allowed).

If the UE initiated the service request procedure over non-3GPP access, the UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete last visited registered TAI and TAI list. If the UE is not registering or has not registered to the same PLMN over both 3GPP access and non-3GPP access, the UE shall additionally delete 5G-GUTI and ngKSI. Additionally, the UE shall enter the state 5GMM-DEREGISTERED for non-3GPP access. If the message has been successfully integrity checked by the NAS, the UE shall set:

1) the PLMN-specific N1 mode attempt counter for non-3GPP access for that PLMN in case of PLMN; or

2) the SNPN-specific attempt counter for non-3GPP access for that SNPN in case of SNPN;

to the UE implementation-specific maximum value.

NOTE 7: The 5GMM sublayer states, the 5GMM parameters and the registration status are managed per access type independently, i.e. 3GPP access or non-3GPP access (see subclauses 4.7.2 and 5.1.3).

The UE shall disable the N1 mode capability for non-3GPP access (see subclause 4.9.3).

As an implementation option, if the UE is not currently registered over 3GPP access, the UE may enter the state 5GMM-DEREGISTERED.PLMN-SEARCH in order to perform a PLMN selection according to 3GPP TS 23.122 [5].

If received over 3GPP access the cause shall be considered as an abnormal case and the behaviour of the UE for this case is specified in subclause 5.6.1.7.

#73 (Serving network not authorized).

This cause value received from a cell belonging to an SNPN and the UE is operating in SNPN access operation mode is considered as an abnormal case and the behaviour of the UE is specified in subclause 5.6.1.7.

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list and ngKSI. The UE shall delete the list of equivalent PLMNs, store the PLMN identity in the forbidden PLMN list as specified in subclause 5.3.13A. For 3GPP access the UE shall enter state 5GMM-DEREGISTERED.PLMN-SEARCH in order to perform a PLMN selection according to 3GPP TS 23.122 [5], and for non-3GPP access the UE shall enter state 5GMM-DEREGISTERED.LIMITED-SERVICE in order to perform network selection as defined in 3GPP TS 24.502 [18]. If the message has been successfully integrity checked by the NAS, the UE shall set the PLMN-specific attempt counter and the PLMN-specific attempt counter for non-3GPP access for that PLMN to the UE implementation-specific maximum value.

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall in addition set the EPS update status to EU3 ROAMING NOT ALLOWED, enter the state EMM-DEREGISTERED and shall delete any 4G-GUTI, last visited registered TAI, TAI list and eKSI.

#74 (Temporarily not authorized for this SNPN).

5GMM cause #74 is only applicable when received from a cell belonging to an SNPN and the UE is operating in SNPN access operation mode. 5GMM cause #74 received from a cell not belonging to an SNPN is considered as an abnormal case and the behaviour of the UE is specified in subclause 5.6.1.7.

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list, ngKSI and the list of equivalent SNPNs (if available). The UE shall store the SNPN identity in the "temporarily forbidden SNPNs" list for the specific access type for which the message was received and the selected entry of the "list of subscriber data" or the selected PLMN subscription, or in the "temporarily forbidden SNPNs for onboarding services in SNPN" list, if the UE is registered for onboarding services in SNPN, for the specific access type for which the message was received. If the UE supports access to an SNPN using credentials from a credentials holder, the UE shall store the SNPN identity in the "temporarily forbidden SNPNs" list along with the GIN(s) broadcasted by the SNPN if any, for the selected entry of the "list of subscriber data" or the selected PLMN subscription. If the UE supports access to an SNPN providing access for localized services in SNPN and the access for localized services in SNPN has been enabled, the UE shall store the SNPN identity in the list of "temporarily forbidden SNPNs for access for localized services in SNPN" (if the SNPN is an SNPN selected for localized services in SNPN (see 3GPP TS 23.122 [5]) along with the GIN(s) broadcasted by the SNPN if any, for the selected entry of the "list of subscriber data" or the selected PLMN subscription. If the UE is not registered for onboarding services in SNPN, the UE shall enter state 5GMM-DEREGISTERED.PLMN-SEARCH and perform an SNPN selection according to 3GPP TS 23.122 [5]. If the UE is registered for onboarding services in SNPN, the UE shall enter state 5GMM-DEREGISTERED.PLMN-SEARCH and perform an SNPN selection or an SNPN selection for onboarding services according to 3GPP TS 23.122 [5]. If the message has been successfully integrity checked by the NAS, the UE shall set the SNPN-specific attempt counter for 3GPP access and the SNPN-specific attempt counter for non-3GPP access for the current SNPN to the UE implementation-specific maximum value.

If the message has been successfully integrity checked by the NAS and the UE also supports the registration procedure over the other access to the same SNPN, the UE shall in addition handle 5GMM parameters and 5GMM state for this access, as described for this 5GMM cause value.

#75 (Permanently not authorized for this SNPN).

5GMM cause #75 is only applicable when received from a cell belonging to an SNPN with a globally-unique SNPN identity and the UE is operating in SNPN access operation mode. 5GMM cause #75 received from a cell not belonging to an SNPN or a cell belonging to an SNPN with a non-globally-unique SNPN identity is considered as an abnormal case and the behaviour of the UE is specified in subclause 5.6.1.7.

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete any 5G-GUTI, last visited registered TAI, TAI list, ngKSI and the list of equivalent SNPNs (if available). The UE shall store the SNPN identity in the "permanently forbidden SNPNs" list for the specific access type for which the message was received and the selected entry of the "list of subscriber data" or the selected PLMN subscription, or in the "permanently forbidden SNPNs for onboarding services in SNPN" list, if the UE is registered for onboarding services in SNPN, for the specific access type for which the message was received. If the UE is not registered for onboarding services in SNPN, the UE shall enter state 5GMM-DEREGISTERED.PLMN-SEARCH and perform an SNPN selection according to 3GPP TS 23.122 [5]. If the UE supports access to an SNPN using credentials from a credentials holder, the UE shall store the SNPN identity in the "permanently forbidden SNPNs" list along with the GIN(s) broadcasted by the SNPN if any, for the selected entry of the "list of subscriber data" or the selected PLMN subscription. If the UE supports access to an SNPN providing access for localized services in SNPN and the access for localized services in SNPN has been enabled, the UE shall store the SNPN identity in the list of "permanently forbidden SNPNs for access for localized services in SNPN" (if the SNPN is an SNPN selected for localized services in SNPN (see 3GPP TS 23.122 [5]) along with the GIN(s) broadcasted by the SNPN if any, for the selected entry of the "list of subscriber data" or the selected PLMN subscription. If the UE is registered for onboarding services in SNPN, the UE shall enter state 5GMM-DEREGISTERED.PLMN-SEARCH and perform an SNPN selection or an SNPN selection for onboarding services according to 3GPP TS 23.122 [5]. If the message has been successfully integrity checked by the NAS, the UE shall set the SNPN-specific attempt counter for 3GPP access and the SNPN-specific attempt counter for non-3GPP access for the current SNPN to the UE implementation-specific maximum value.

If the message has been successfully integrity checked by the NAS and the UE also supports the registration procedure over the other access to the same SNPN, the UE shall in addition handle 5GMM parameters and 5GMM state for this access, as described for this 5GMM cause value.

#76 (Not authorized for this CAG or authorized for CAG cells only).

This cause value received via non-3GPP access or from a cell belonging to an SNPN and the UE is operating in SNPN access operation mode is considered as an abnormal case and the behaviour of the UE is specified in subclause 5.6.1.7.

The UE shall set the 5GS update status to 5U3.ROAMING NOT ALLOWED, store the 5GS update status according to subclause 5.1.3.2.2.

If 5GMM cause #76 is received from:

1) a CAG cell, and if the UE receives a "CAG information list" in the CAG information list IE or the Extended CAG information list IE included in the SERVICE REJECT message, the UE shall:

i) replace the "CAG information list" stored in the UE with the received "CAG information list" when received in the HPLMN or EHPLMN;

ii) replace the serving VPLMN's entry of the "CAG information list" stored in the UE with the serving VPLMN's entry of the received CAG information list IE or the Extended CAG information list IE when the UE receives the CAG information list IE or the Extended CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN; or

NOTE 8: When the UE receives the CAG information list IE or the Extended CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN, entries of a PLMN other than the serving VPLMN, if any, in the received CAG information list IE or the Extended CAG information list IE are ignored.

iii) remove the serving VPLMN's entry of the "CAG information list" stored in the UE when the UE receives the CAG information list IE or the Extended CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN and the CAG information list IE or the Extended CAG information list IE does not contain the serving VPLMN's entry.

Otherwise, the UE shall delete the CAG-ID(s) of the cell from the "allowed CAG list" for the current PLMN, if the CAG-ID(s) are authorized based on the "Allowed CAG list". In the case the "allowed CAG list" for the current PLMN only contains a range of CAG-IDs, how the UE deletes the CAG-ID(s) of the cell from the "allowed CAG list" for the current PLMN is up to UE implementation. In addition:

i) if the entry in the "CAG information list" for the current PLMN does not include an "indication that the UE is only allowed to access 5GS via CAG cells" or if the entry in the "CAG information list" for the current PLMN includes an "indication that the UE is only allowed to access 5GS via CAG cells" and one or more CAG-ID(s) are authorized based on the updated "allowed CAG list" for the current PLMN, then the UE shall enter the state 5GMM-REGISTERED.LIMITED-SERVICE and shall search for a suitable cell according to 3GPP TS 38.304 [28] or 3GPP TS 36.304 [25C] with the updated "CAG information list";

ii) if the entry in the "CAG information list" for the current PLMN includes an "indication that the UE is only allowed to access 5GS via CAG cells" and no CAG-ID is authorized based on the updated "allowed CAG list" for the current PLMN, then the UE shall enter the state 5GMM-REGISTERED.PLMN-SEARCH and shall apply the PLMN selection process defined in 3GPP TS 23.122 [5] with the updated "CAG information list"; or

iii) if the "CAG information list" does not include an entry for the current PLMN, then the UE shall enter the state 5GMM-REGISTERED.LIMITED-SERVICE and shall search for a suitable cell according to 3GPP TS 38.304 [28] or 3GPP TS 36.304 [25C] with the updated "CAG information list".

2) a non-CAG cell, and if the UE receives a "CAG information list" in the CAG information list IE or the Extended CAG information list IE included in the SERVICE REJECT message, the UE shall:

i) replace the "CAG information list" stored in the UE with the received "CAG information list" when received in the HPLMN or EHPLMN;

ii) replace the serving VPLMN's entry of the "CAG information list" stored in the UE with the serving VPLMN's entry of the received CAG information list IE or the Extended CAG information list IE when the UE receives the CAG information list IE or the Extended CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN; or

NOTE 9: When the UE receives the CAG information list IE or the Extended CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN, entries of a PLMN other than the serving VPLMN, if any, in the received CAG information list IE or the Extended CAG information list IE are ignored.

iii) remove the serving VPLMN's entry of the "CAG information list" stored in the UE when the UE receives the CAG information list IE or the Extended CAG information list IE in a serving PLMN other than the HPLMN or EHPLMN and the CAG information list IE or the Extended CAG information list IE does not contain the serving VPLMN's entry.

Otherwise, the UE shall store an "indication that the UE is only allowed to access 5GS via CAG cells" in the entry of the "CAG information list" for the current PLMN, if any. If the "CAG information list" stored in the UE does not include the current PLMN's entry, the UE shall add an entry for the current PLMN to the "CAG information list" and store an "indication that the UE is only allowed to access 5GS via CAG cells" in the entry of the "CAG information list" for the current PLMN. If the UE does not have a stored "CAG information list", the UE shall create a new "CAG information list" and add an entry with an "indication that the UE is only allowed to access 5GS via CAG cells" for the current PLMN.

In addition:

i) if one or more CAG-ID(s) are authorized based on the "allowed CAG list" for the current PLMN, then the UE shall enter the state 5GMM-REGISTERED.LIMITED-SERVICE and shall search for a suitable cell according to 3GPP TS 38.304 [28] with the updated CAG information; or

ii) if no CAG-ID is authorized based on the "allowed CAG list" for the current PLMN, then the UE shall enter the state 5GMM-REGISTERED.PLMN-SEARCH and shall apply the PLMN selection process defined in 3GPP TS 23.122 [5] with the updated "CAG information list".

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall in addition set the EPS update status to EU3 ROAMING NOT ALLOWED, reset the service request attempt counter and enter the state EMM-REGISTERED.

#77 (Wireline access area not allowed).

5GMM cause #77 is only applicable when received from a wireline access network by the 5G-RG or the W-AGF acting on behalf of the FN-CRG (or on behalf of the N5GC device). 5GMM cause #77 received from a 5G access network other than a wireline access network and 5GMM cause #77 received by the W-AGF acting on behalf of the FN-BRG are considered as abnormal cases and the behaviour of the UE is specified in subclause 5.6.1.7.

When received over wireline access network, the 5G-RG and the W-AGF acting on behalf of the FN-CRG (or on behalf of the N5GC device) shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2), shall delete 5G-GUTI, last visited registered TAI, TAI list and ngKSI, shall enter the state 5GMM-DEREGISTERED and shall act as specified in subclause 5.3.23.

NOTE 10: The 5GMM sublayer states, the 5GMM parameters and the registration status are managed per access type independently, i.e. 3GPP access or non-3GPP access (see subclauses 4.7.2 and 5.1.3).

#78 (PLMN not allowed to operate at the present UE location).

This cause value received from a non-satellite NG-RAN cell is considered as an abnormal case and the behaviour of the UE is specified in subclause 5.6.1.7.

The UE shall set the 5GS update status to 5U3 ROAMING NOT ALLOWED (and shall store it according to subclause 5.1.3.2.2) and shall delete last visited registered TAI and TAI list. If the UE is not registering or has not registered to the same PLMN over both 3GPP access and non-3GPP access, the UE shall additionally delete 5G-GUTI and ngKSI. Additionally, the UE shall reset the registration attempt counter. The UE shall store the PLMN identity and, if it is known, the current geographical location in the list of "PLMNs not allowed to operate at the present UE location" and shall start a corresponding timer instance (see subclause 4.23.2). The UE shall enter state 5GMM-DEREGISTERED.PLMN-SEARCH and perform a PLMN selection according to 3GPP TS 23.122 [5].

If the message was received via 3GPP access and the UE is operating in single-registration mode, the UE shall handle the EMM parameters EMM state, EPS update status, 4G-GUTI, last visited registered TAI, TAI list and eKSI as specified in 3GPP TS 24.301 [15] for the case when the service request procedure is rejected with the EMM cause with the same value.

\*\*\*\*\* Tenth change \*\*\*\*\*

#### 9.11.3.1 5GMM capability

The purpose of the 5GMM capability information element is to provide the network with information concerning aspects of the UE related to the 5GCN or interworking with the EPS. The contents might affect the manner in which the network handles the operation of the UE.

The 5GMM capability information element is coded as shown in figure 9.11.3.1.1 and table 9.11.3.1.1.

The 5GMM capability is a type 4 information element with a minimum length of 3 octets and a maximum length of 15 octets.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | | 7 | | 6 | | 5 | | 4 | | 3 | | 2 | | 1 | |  | |
| 5GMM capability IEI | | | | | | | | | | | | | | | | octet 1 | |
| Length of 5GMM capability contents | | | | | | | | | | | | | | | | octet 2 | |
| SGC | | 5G-IPHC-CP CIoT | | N3 data | | 5G-CP CIoT | | RestrictEC | | LPP | | HO attach | | S1 mode | | octet 3 | |
| RACS | | NSSAA | | 5G-LCS | | V2XCNPC5 | | V2XCEPC5 | | V2X | | 5G-UP CIoT | | 5GSRVCC | | octet 4\* | |
| 5G ProSe-l2relay | | 5G ProSe-dc | | 5G ProSe-dd | | ER-NSSAI | | 5G-EHC-CP CIoT | | multipleUP | | WUSA | | CAG | | octet 5\* | |
| PR | | RPR | | PIV | | NCR | | NR-PSSI | | 5G ProSe-l3rmt | | 5G ProSe-l2rmt | | 5G ProSe-l3relay | | octet 6\* | |
| MPSIU | | UAS | | NSAG | | Ex-CAG | | SSNPNSI | | EventNotification | | MINT | | NSSRG | | octet 7\* | |
| SBTS | | NSR | | LADN-DS | | RAN timing | | ECI | | ESI | | RCMAN | | RCMAP | | octet 8\* | |
| 5G ProSe-l2end | | 5G ProSe-l3U2U relay | | 5G ProSe-l2U2U relay | | RSLPS | | SBNS | | UN-PER | | A2XNPC5 | | A2XEPC5 | | octet 9\* | |
| A2X-Uu | | SLVI | | TempNS | | SUPL | | LCS-UPP | | PNS | | RSLP | | 5G ProSe-l3end | | octet 10\* | |
| 0  spare | | 0  spare | | 0  spare | | HPAOP | | NSUC | | RSLPL | | NVL-SATNR | | MCSIU | | octet 11\* | |
| 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | 0 | | octet 12\*-15\* | |
| Spare | | | | | | | | | | | | | | | |

Figure 9.11.3.1.1: 5GMM capability information element

Table 9.11.3.1.1: 5GMM capability information element

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| EPC NAS supported (S1 mode) (octet 3, bit 1)  Bit | | | | | | | | | | | | | | |
| 1 | | |  | | | |  | | | |  | |  | |
| 0 | | |  | | | |  | | | |  | | S1 mode not supported | |
| 1 | | |  | | | |  | | | |  | | S1 mode supported | |
|  | | | | | | | | | | | | | | |
| ATTACH REQUEST message containing PDN CONNECTIVITY REQUEST message for handover support (HO attach) (octet 3, bit 2)  Bit | | | | | | | | | | | | | | |
| 2 | |  | | | |  | | | |  | |  | | |
| 0 | |  | | | |  | | | |  | | ATTACH REQUEST message containing PDN CONNECTIVITY REQUEST message with request type set to "handover" or "handover of emergency bearer services" to transfer PDU session from N1 mode to S1 mode not supported | | |
| 1 | |  | | | |  | | | |  | | ATTACH REQUEST message containing PDN CONNECTIVITY REQUEST message with request type set to "handover" or "handover of emergency bearer services" to transfer PDU session from N1 mode to S1 mode supported | | |
|  | | | | | | | | | | | | | | |
| LTE Positioning Protocol (LPP) capability (octet 3, bit 3) | | | | | | | | | | | | | | |
| This bit indicates the capability to support LTE Positioning Protocol (LPP) (see 3GPP TS 37.355 [26]). | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 3 | | |  | | | |  | | | |  | |  | |
| 0 | | |  | | | |  | | | |  | | LPP in N1 mode not supported | |
| 1 | | |  | | | |  | | | |  | | LPP in N1 mode supported | |
|  | | | | | | | | | | | | | | |
| Restriction on use of enhanced coverage support (RestrictEC) (octet 3, bit 4)  This bit indicates the capability to support restriction on use of enhanced coverage.  Bit | | | | | | | | | | | | | | |
| 4 | | |  | | | |  | | | |  | |  | |
| 0 | | |  | | | |  | | | |  | | Restriction on use of enhanced coverage not supported | |
| 1 | | |  | | | |  | | | |  | | Restriction on use of enhanced coverage supported | |
|  | | | | | | | | | | | | | | |
| Control plane CIoT 5GS optimization (5G-CP CIoT) (octet 3, bit 5)  This bit indicates the capability for control plane CIoT 5GS optimization.  Bit | | | | | | | | | | | | | | |
| 5 |  | | | | | |  | | | |  | |  | |
| 0 |  | | | | | |  | | | |  | | Control plane CIoT 5GS optimization not supported | |
| 1 |  | | | | | |  | | | |  | | Control plane CIoT 5GS optimization supported | |
|  | | | | | | | | | | | | | | |
| N3 data transfer (N3 data) (octet 3, bit 6)  This bit indicates the capability for N3 data transfer.  Bit | | | | | | | | | | | | | | |
| 6 |  | | | | | |  | | | |  | |  | |
| 0 |  | | | | | |  | | | |  | | N3 data transfer supported | |
| 1 |  | | | | | |  | | | |  | | N3 data transfer not supported | |
|  | | | | | | | | | | | | | | |
| IP header compression for control plane CIoT 5GS optimization (5G-IPHC-CP CIoT) (octet 3, bit 7)  This bit indicates the capability for IP header compression for control plane CIoT 5GS optimization.  Bit | | | | | | | | | | | | | | |
| 7 |  | | | | | |  | | | |  | |  | |
| 0 |  | | | | | |  | | | |  | | IP header compression for control plane CIoT 5GS optimization not supported | |
| 1 |  | | | | | |  | | | |  | | IP header compression for control plane CIoT 5GS optimization supported | |
|  | | | | | | | | | | | | | | |
| Service gap control (SGC) (octet 3, bit 8)  Bit | | | | | | | | | | | | | | |
| 8 | | |  | | | |  | | | |  | |  | |
| 0 | | |  | | | |  | | | |  | | service gap control not supported | |
| 1 | | |  | | | |  | | | |  | | service gap control supported | |
|  | | | | | | | | | | | | | | |
| 5G-SRVCC from NG-RAN to UTRAN (5GSRVCC) capability (octet 4, bit 1) | | | | | | | | | | | | | | |
| This bit indicates the capability for 5G-SRVCC from NG-RAN to UTRAN (5GSRVCC) (see 3GPP TS 23.216 [6A]). | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 1 | | |  | | | |  | | | |  | |  | |
| 0 | | |  | | | |  | | | |  | | 5G-SRVCC from NG-RAN to UTRAN not supported | |
| 1 | | |  | | | |  | | | |  | | 5G-SRVCC from NG-RAN to UTRAN supported | |
|  | | | | | | | | | | | | | | |
| User plane CIoT 5GS optimization (5G-UP CIoT) (octet 4, bit 2)  This bit indicates the capability for user plane CIoT 5GS optimization.  Bit | | | | | | | | | | | | | | |
| 2 |  | | | | | |  | | | |  | |  | |
| 0 |  | | | | | |  | | | |  | | User plane CIoT 5GS optimization not supported | |
| 1 |  | | | | | |  | | | |  | | User plane CIoT 5GS optimization supported | |
|  | | | | | | | | | | | | | | |
| V2X capability (V2X) (octet 4, bit 3) | | | | | | | | | | | | | | |
| This bit indicates the capability for V2X, as specified in 3GPP TS 24.587 [19B].  Bit | | | | | | | | | | | | | | |
| 3 | |  | | | |  | | | |  | |  | | |
| 0 | |  | | | |  | | | |  | | V2X not supported | | |
| 1 | |  | | | |  | | | |  | | V2X supported | | |
|  | | | | | | | | | | | | | | |
| V2X communication over E-UTRA-PC5 capability (V2XCEPC5) (octet 4, bit 4) | | | | | | | | | | | | | | |
| This bit indicates the capability for V2X communication over E-UTRA-PC5, as specified in 3GPP TS 24.587 [19B]. | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 4 | |  | | | |  | | | |  | |  | | |
| 0 | |  | | | |  | | | |  | | V2X communication over E-UTRA-PC5 not supported | | |
| 1 | |  | | | |  | | | |  | | V2X communication over E-UTRA-PC5 supported | | |
|  | | | | | | | | | | | | | | |
| V2X communication over NR-PC5 capability (V2XCNPC5) (octet 4, bit 5) | | | | | | | | | | | | | | |
| This bit indicates the capability for V2X communication over NR-PC5, as specified in 3GPP TS 24.587 [19B]. | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 5 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | V2X communication over NR-PC5 not supported |
| 1 | | | |  | | | | |  | | |  | | V2X communication over NR-PC5 supported |
|  | | | | | | | | | | | | | | |
| Location Services (5G-LCS) notification mechanisms capability (octet 4, bit 6) | | | | | | | | | | | | | | |
| This bit indicates the capability to support Location Services (5G-LCS) notification mechanisms (see 3GPP TS 23.273 [6B]). | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 6 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | LCS notification mechanisms not supported |
| 1 | | | |  | | | | |  | | |  | | LCS notification mechanisms supported |
|  | | | | | | | | | | | | | | |
| Network slice-specific authentication and authorization (NSSAA) (octet 4, bit 7)  This bit indicates the capability to support network slice-specific authentication and authorization.  Bit | | | | | | | | | | | | | | |
| 7 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Network slice-specific authentication and authorization not supported |
| 1 | | | |  | | | | |  | | |  | | Network slice-specific authentication and authorization supported |
|  | | | | | | | | | | | | | | |
| Radio capability signalling optimisation (RACS) capability (octet 4, bit 8)  Bit | | | | | | | | | | | | | | |
| 8 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | RACS not supported |
| 1 | | | |  | | | | |  | | |  | | RACS supported |
|  | | | | | | | | | | | | | | |
| Closed Access Group (CAG) capability (octet 5, bit 1)  Bit | | | | | | | | | | | | | | |
| 1 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | CAG not supported |
| 1 | | | |  | | | | |  | | |  | | CAG supported |
|  | | | | | | | | | | | | | | |
| WUS assistance (WUSA) information reception capability (octet 5, bit 2)  Bit | | | | | | | | | | | | | | |
| 2 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | WUS assistance information reception not supported |
| 1 | | | |  | | | | |  | | |  | | WUS assistance information reception supported |
|  | | | | | | | | | | | | | | |
| Multiple user-plane resources support (multipleUP) (octet 5, bit 3) | | | | | | | | | | | | | | |
| This bit indicates the capability to support multiple user-plane resources in NB-N1 mode. | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 3 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Multiple user-plane resources not supported |
| 1 | | | |  | | | | |  | | |  | | Multiple user-plane resources supported |
|  | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
| Ethernet header compression for control plane CIoT 5GS optimization (5G-EHC-CP CIoT) (octet 5, bit 4)  Bit | | | | | | | | | | | | | | |
| 4 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Ethernet header compression for control plane CIoT 5GS optimization not supported |
| 1 | | | |  | | | | |  | | |  | | Ethernet header compression for control plane CIoT 5GS optimization supported |
|  | | | | | | | | | | | | | | |
| Extended rejected NSSAI support (ER-NSSAI) (octet 5, bit 5) | | | | | | | | | | | | | | |
| This bit indicates the capability to support extended rejected NSSAI.  Bit | | | | | | | | | | | | | | |
| 5 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Extended rejected NSSAI not supported |
| 1 | | | |  | | | | |  | | |  | | Extended rejected NSSAI supported |
|  | | | | | | | | | | | | | | |
| 5G ProSe direct discovery (5G ProSe-dd) (octet 5, bit 6)  This bit indicates the capability for 5G ProSe direct discovery.  Bit | | | | | | | | | | | | | | |
| 6 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | 5G ProSe direct discovery not supported |
| 1 | | | |  | | | | |  | | |  | | 5G ProSe direct discovery supported |
|  | | | | | | | | | | | | | | |
| 5G ProSe direct communication (5G ProSe-dc) (octet 5, bit 7)  This bit indicates the capability for 5G ProSe direct communication.  Bit | | | | | | | | | | | | | | |
| 7 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | 5G ProSe direct communication not supported |
| 1 | | | |  | | | | |  | | |  | | 5G ProSe direct communication supported |
|  | | | | | | | | | | | | | | |
| 5G ProSe layer-2 UE-to-network-relay (5G ProSe-l2relay) (octet 5, bit 8)  This bit indicates the capability to act as a 5G ProSe layer-2 UE-to-network relay UE.  Bit | | | | | | | | | | | | | | |
| 8 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Acting as a 5G ProSe layer-2 UE-to-network relay UE not supported |
| 1 | | | |  | | | | |  | | |  | | Acting as a 5G ProSe layer-2 UE-to-network relay UE supported |
|  | | | | | | | | | | | | | | |
| 5G ProSe layer-3 UE-to-network-relay (5G ProSe-l3relay) (octet 6, bit 1)  This bit indicates the capability to act as a 5G ProSe layer-3 UE-to-network relay UE  Bit | | | | | | | | | | | | | | |
| 1 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Acting as a 5G ProSe layer-3 UE-to-network relay UE not supported |
| 1 | | | |  | | | | |  | | |  | | Acting as a 5G ProSe layer-3 UE-to-network relay UE supported |
|  | | | | | | | | | | | | | | |
| 5G ProSe layer-2 UE-to-network-remote (5G ProSe-l2rmt) (octet 6, bit 2)  This bit indicates the capability to act as a 5G ProSe layer-2 UE-to-network remote UE  Bit | | | | | | | | | | | | | | |
| 2 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Acting as a 5G ProSe layer-2 UE-to-network remote UE not supported |
| 1 | | | |  | | | | |  | | |  | | Acting as a 5G ProSe layer-2 UE-to-network remote UE supported |
|  | | | | | | | | | | | | | | |
| 5G ProSe layer-3 UE-to-network-remote (5G ProSe-l3rmt) (octet 6, bit 3)  This bit indicates the capability to act as a 5G ProSe layer-3 UE-to-network remote UE  Bit | | | | | | | | | | | | | | |
| 3 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Acting as a 5G ProSe layer-3 UE-to-network remote UE not supported |
| 1 | | | |  | | | | |  | | |  | | Acting as a 5G ProSe layer-3 UE-to-network remote UE supported |
|  | | | | | | | | | | | | | | |
| NR paging subgroup support indication (NR-PSSI) (octet 6, bit 4) | | | | | | | | | | | | | | |
| This bit indicates the capability to support NR paging subgrouping | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 4 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | NR paging subgrouping not supported |
| 1 | | | |  | | | | |  | | |  | | NR paging subgrouping supported |
|  | | | | | | | | | | | | | | |
| N1 NAS signalling connection release (NCR) (octet 6, bit 5) | | | | | | | | | | | | | | |
| This bit indicates whether N1 NAS signalling connection release is supported. | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 5 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | N1 NAS signalling connection release not supported |
| 1 | | | |  | | | | |  | | |  | | N1 NAS signalling connection release supported |
|  | | | | | | | | | | | | | | |
| Paging indication for voice services (PIV) (octet 6, bit 6) | | | | | | | | | | | | | | |
| This bit indicates whether paging indication for voice services is supported. | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 6 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | paging indication for voice services not supported |
| 1 | | | |  | | | | |  | | |  | | paging indication for voice services supported |
|  | | | | | | | | | | | | | | |
| Reject paging request (RPR) (octet 6, bit 7) | | | | | | | | | | | | | | |
| This bit indicates whether reject paging request is supported. | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 7 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | reject paging request not supported |
| 1 | | | |  | | | | |  | | |  | | reject paging request supported |
|  | | | | | | | | | | | | | | |
| Paging restriction (PR) (octet 6, bit 8) | | | | | | | | | | | | | | |
| This bit indicates whether paging restriction is supported. | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 8 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | paging restriction not supported |
| 1 | | | |  | | | | |  | | |  | | paging restriction supported |
|  | | | | | | | | | | | | | | |
| NSSRG (octet 7, bit 1) | | | | | | | | | | | | | | |
| This bit indicates the capability to support the NSSRG.  Bit | | | | | | | | | | | | | | |
| 1 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | NSSRG not supported |
| 1 | | | |  | | | | |  | | |  | | NSSRG supported |
|  | | | | | | | | | | | | | | |
| Minimization of service interruption (MINT) (octet 7, bit 2) | | | | | | | | | | | | | | |
| This bit indicates the capability to support Minimization of service interruption (MINT)  Bit | | | | | | | | | | | | | | |
| 2 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | MINT not supported |
| 1 | | | |  | | | | |  | | |  | | MINT supported |
|  | | | | | | | | | | | | | | |
| Event notification (EventNotification) (octet 7, bit 3) | | | | | | | | | | | | | | |
| This bit indicates the capability to support event notification for upper layers  Bit | | | | | | | | | | | | | | |
| 3 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Event notification not supported |
| 1 | | | |  | | | | |  | | |  | | Event notification supported |
|  | | | | | | | | | | | | | | |
| SOR-SNPN-SI (SOR SNPN SI) (octet 7, bit 4) | | | | | | | | | | | | | | |
| This bit indicates the capability to support SOR-SNPN-SI.  Bit | | | | | | | | | | | | | | |
| 4 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | SOR-SNPN-SI not supported |
| 1 | | | |  | | | | |  | | |  | | SOR-SNPN-SI supported |
|  | | | | | | | | | | | | | | |
| Extended CAG information list support (Ex-CAG) (octet 7, bit 5) | | | | | | | | | | | | | | |
| This bit indicates the capability to support extended CAG information list.  Bit | | | | | | | | | | | | | | |
| 5 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Extended CAG information list not supported |
| 1 | | | |  | | | | |  | | |  | | Extended CAG information list supported |
|  | | | | | | | | | | | | | | |
| NSAG (octet 7, bit 6) | | | | | | | | | | | | | | |
| This bit indicates the capability to support NSAG.  Bit | | | | | | | | | | | | | | |
| 76 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | NSAG not supported |
| 1 | | | |  | | | | |  | | |  | | NSAG supported |
|  | | | | | | | | | | | | | | |
| UAS (octet 7, bit 7) | | | | | | | | | | | | | | |
| This bit indicates the capability to support UAS services.  Bit | | | | | | | | | | | | | | |
| 7 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | UAS services not supported |
| 1 | | | |  | | | | |  | | |  | | UAS services supported |
|  | | | | | | | | | | | | | | |
| MPS indicator update (MPSIU) (octet 7, bit 8) | | | | | | | | | | | | | | |
| This bit indicates the capability to support MPS indicator update via the UE configuration update procedure.  Bit | | | | | | | | | | | | | | |
| 8 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | MPS indicator update not supported |
| 1 | | | |  | | | | |  | | |  | | MPS indicator update supported |
|  | | | | | | | | | | | | | | |
| Registration complete message for acknowledging negotiated PEIPS assistance information (RCMAP) (octet 8, bit 1) | | | | | | | | | | | | | | |
| This bit indicates the capability for sending REGISTRATION COMPLETE message when Negotiated PEIPS assistance information IE is included in the REGISTRATION ACCEPT message.  Bit | | | | | | | | | | | | | | |
| 1 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Sending of REGISTRATION COMPLETE message for negotiated PEIPS assistance information not supported |
| 1 | | | |  | | | | |  | | |  | | Sending of REGISTRATION COMPLETE message for negotiated PEIPS assistance information supported |
|  | | | | | | | | | | | | | | |
| Registration complete message for acknowledging NSAG information (RCMAN) (octet 8, bit 2) | | | | | | | | | | | | | | |
| This bit indicates the capability for sending REGISTRATION COMPLETE message when NSAG information IE is included in the REGISTRATION ACCEPT message.  Bit | | | | | | | | | | | | | | |
| 2 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Sending of REGISTRATION COMPLETE message for NSAG information not supported |
| 1 | | | |  | | | | |  | | |  | | Sending of REGISTRATION COMPLETE message for NSAG information supported |
|  | | | | | | | | | | | | | | |
| Equivalent SNPNs indicator (ESI) (octet 8, bit 3) | | | | | | | | | | | | | | |
| This bit indicates the capability to support equivalent SNPNs.  Bit | | | | | | | | | | | | | | |
| 3 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Equivalent SNPNs not supported |
| 1 | | | |  | | | | |  | | |  | | Equivalent SNPNs supported |
|  | | | | | | | | | | | | | | |
| ECI (octet 8, bit 4) | | | | | | | | | | | | | | |
| This bit indicates the capability to support enhanced CAG information.  Bit | | | | | | | | | | | | | | |
| 4 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Enhanced CAG information not supported |
| 1 | | | |  | | | | |  | | |  | | Enhanced CAG information supported |
|  | | | | | | | | | | | | | | |
| Reconnection to the network due to RAN timing synchronization status change (RANtiming) (octet 8, bit 5) | | | | | | | | | | | | | | |
| This bit indicates the capability to support Reconnection to the network due to RAN timing synchronization status change.  Bit | | | | | | | | | | | | | | |
| 5 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Reconnection to the network due to RAN timing synchronization status change not supported |
| 1 | | | |  | | | | |  | | |  | | Reconnection to the network due to RAN timing synchronization status change supported |
|  | | | | | | | | | | | | | | |
| LADN per DNN and S-NSSAI support (LADN-DS) (octet 8, bit 6) | | | | | | | | | | | | | | |
| This bit indicates the capability to support LADN per DNN and S-NSSAI.  Bit | | | | | | | | | | | | | | |
| 6 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | LADN per DNN and S-NSSAI not supported |
| 1 | | | |  | | | | |  | | |  | | LADN per DNN and S-NSSAI supported |
|  | | | | | | | | | | | | | | |
| Network slice replacement (NSR) (octet 8, bit 7)  This bit indicates the capability to support network slice replacement.  Bit | | | | | | | | | | | | | | |
| 7 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Network slice replacement not supported |
| 1 | | | |  | | | | |  | | |  | | Network slice replacement supported |
|  | | | | | | | | | | | | | | |
| Slice-based TNGF selection support (SBTS) (octet 8, bit 8) | | | | | | | | | | | | | | |
| This bit indicates the capability to support slice-based TNGF selection.  Bit | | | | | | | | | | | | | | |
| 8 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Slice-based TNGF selection not supported |
| 1 | | | |  | | | | |  | | |  | | Slice-based TNGF selection supported |
|  | | | | | | | | | | | | | | |
| A2X over E-UTRA-PC5 (A2XEPC5) (octet 9, bit 1) | | | | | | | | | | | | | | |
| This bit indicates the capability for A2X over E-UTRA-PC5, as specified in 3GPP TS 24.577 [60].  Bit | | | | | | | | | | | | | | |
| 1 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | A2X over E-UTRA-PC5 not supported |
| 1 | | | |  | | | | |  | | |  | | A2X over E-UTRA-PC5 supported |
|  | | | | | | | | | | | | | | |
| A2X over NR-PC5 (A2XNPC5) (octet 9, bit 2) | | | | | | | | | | | | | | |
| This bit indicates the capability for A2X over NR-PC5, as specified in 3GPP TS 24.577 [60].  Bit | | | | | | | | | | | | | | |
| 2 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | A2X over NR-PC5 not supported |
| 1 | | | |  | | | | |  | | |  | | A2X over NR-PC5 supported |
|  | | | | | | | | | | | | | | |
| UN-PER(octet 9, bit 3) | | | | | | | | | | | | | | |
| This bit indicates the capability to support unavailability period. | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 3 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Unavailability period not supported |
| 1 | | | |  | | | | |  | | |  | | Unavailability period supported |
|  | | | | | | | | | | | | | | |
| Slice-based N3IWFselection support (SBNS) (octet 9, bit 4) | | | | | | | | | | | | | | |
| This bit indicates the capability to support slide-based N3IWF selection | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 4 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Slice-based N3IWF selection not supported |
| 1 | | | |  | | | | |  | | |  | | Slice-based N3IWF selection supported |
|  | | | | | | | | | | | | | | |
| SL positioning server UE (RSLPS) (octet 9, bit 5) | | | | | | | | | | | | | | |
| This bit indicates the capability for SL positioning server UE, as specified in 3GPP TS 24.586 [ts23586]. | | | | | | | | | | | | | | |
| Bit | | | |  | | | | |  | | |  | |  |
| 5 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Ranging and sidelink positioning for SL positioning server UE not supported |
| 1 | | | |  | | | | |  | | |  | | Ranging and sidelink positioning for SL positioning server UE supported |
|  | | | | | | | | | | | | | | |
| 5G ProSe layer-2 UE-to-UE relay (5G ProSe-l2U2U relay) (octet 9, bit 6) | | | | | | | | | | | | | | |
| This bit indicates the capability to act as a 5G ProSe layer-2 UE-to-UE relay UE. | | | | | | | | | | | | | | |
| Bit | | | |  | | | | |  | | |  | |  |
| 6 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Acting as a 5G ProSe layer-2 UE-to-UE relay UE not supported |
| 1 | | | |  | | | | |  | | |  | | Acting as a 5G ProSe layer-2 UE-to-UE relay UE supported |
|  | | | | | | | | | | | | | | |
| 5G ProSe layer-3 UE-to-UE relay (5G ProSe-l3U2U relay) (octet 9, bit 7) | | | | | | | | | | | | | | |
| This bit indicates the capability to act as a 5G ProSe layer-3 UE-to-UE relay UE. | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 7 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Acting as a 5G ProSe layer-3 UE-to-UE relay UE not supported |
| 1 | | | |  | | | | |  | | |  | | Acting as a 5G ProSe layer-3 UE-to-UE relay UE supported |
|  | | | | | | | | | | | | | | |
| 5G ProSe layer-2 end UE (5G ProSe-l2end) (octet 9, bit 8) | | | | | | | | | | | | | | |
| This bit indicates the capability to act as a 5G ProSe layer-2 end UE. | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 8 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Acting as a 5G ProSe layer-23 UE-to-UE relayend UE not supported |
| 1 | | | |  | | | | |  | | |  | | Acting as a 5G ProSe layer-23 UE-to-UE relayend UE supported |
|  | | | | | | | | | | | | | | |
| 5G ProSe layer-3 end UE (5G ProSe-l3end) (octet 10, bit 1) | | | | | | | | | | | | | | |
| This bit indicates the capability to act as a 5G ProSe layer-3 end UE. | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 1 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Acting as a 5G ProSe layer-3 end UE not supported |
| 1 | | | |  | | | | |  | | |  | | Acting as a 5G ProSe layer-3 end UE supported |
|  | | | | | | | | | | | | | | |
| Ranging and sidelink positioning support (RSLP) (octet 10, bit 2) | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 2 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Ranging and sidelink positioning not supported |
| 1 | | | |  | | | | |  | | |  | | Ranging and sidelink positioning supported |
|  | | | | | | | | | | | | | | |
| Partial network slice (PNS) (octet 10, bit 3) | | | | | | | | | | | | | | |
| This bit indicates whether the UE support partial network slice in the registration area. | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 3 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Partial network slice not supported |
| 1 | | | |  | | | | |  | | |  | | Partial network slice supported |
|  | | | | | | | | | | | | | | |
| LCS-UPP user plane positioning (LCS-UPP) (octet 10, bit 4) | | | | | | | | | | | | | | |
| This bit indicates the capability to support LCS-UPP user plane positioning (see 3GPP TS 23.273 [6B]). | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 4 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | User plane positioning using LCS-UPP not supported |
| 1 | | | |  | | | | |  | | |  | | User plane positioning using LCS-UPP supported |
|  | | | | | | | | | | | | | | |
| SUPL user plane positioning (SUPL) (octet 10, bit 5) | | | | | | | | | | | | | | |
| This bit indicates the capability to support SUPL user plane positioning (see 3GPP TS 38.305 [67] and 3GPP TS 23.271 [68]). | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 5 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | User plane positioning using SUPL not supported |
| 1 | | | |  | | | | |  | | |  | | User plane positioning using SUPL supported |
|  | | | | | | | | | | | | | | |
| S-NSSAI time validity information (TempNS) (octet 10, bit 6) | | | | | | | | | | | | | | |
| This bit indicates the capability to support the S-NSSAI time validity information. | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 6 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | S-NSSAI time validity information not supported |
| 1 | | | |  | | | | |  | | |  | | S-NSSAI time validity information supported |
|  | | | | | | | | | | | | | | |
| S-NSSAI location validity information (SLVI) (octet 10, bit 7) | | | | | | | | | | | | | | |
| This bit indicates the capability to support S-NSSAI location validity information. | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 7 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | S-NSSAI location validity information not supported |
| 1 | | | |  | | | | |  | | |  | | S-NSSAI location validity information supported |
|  | | | | | | | | | | | | | | |
| A2X over Uu capability (A2X-Uu) (octet 10, bit 8) | | | | | | | | | | | | | | |
| This bit indicates the capability for A2X over Uu, as specified in 3GPP TS 24.577 [60]. | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 8 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | A2X over Uu not supported |
| 1 | | | |  | | | | |  | | |  | | A2X over Uu supported |
|  | | | | | | | | | | | | | | |
| MCS indicator update (MCSIU) (octet 11, bit 1) | | | | | | | | | | | | | | |
| This bit indicates the capability to support MCS indicator update via the UE configuration update procedure. | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 1 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | MCS indicator update not supported |
| 1 | | | |  | | | | |  | | |  | | MCS indicator update supported |
|  | | | | | | | | | | | | | | |
| Network verified UE location over satellite NG-RAN (NVL-SATNR) (octet 11, bit 2) | | | | | | | | | | | | | | |
| This bit indicates the capability to support network verified UE location over satellite NG-RAN as specified in 3GPP TS 23.501 [8]. | | | | | | | | | | | | | | |
| Bit | | | |  | | | | |  | | |  | |  |
| 2 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Network verified UE location over satellite NG-RAN not supported |
| 1 | | | |  | | | | |  | | |  | | Network verified UE location over satellite NG-RAN supported |
| k | | | | | | | | | | | | | | |
| Ranging and sidelink positioning over PC5 for located UE support (RSLPL) (octet 11, bit 3) | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 3 | | | |  | | | | |  | | |  | |  |
| 0 | | | |  | | | | |  | | |  | | Ranging and sidelink positioning for located UE not supported |
| 1 | | | |  | | | | |  | | |  | | Ranging and sidelink positioning for located UE supported |
|  | | | | | | | | | | | | | | |
| Network slice usage control (NSUC) (octet 11, bit 4) | | | | | | | | | | | | | | |
| This bit indicates the capability to support network slice usage control. | | | | | | | | | | | | | | |
| Bit | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | |
| 0 | | | | | | | | | | | | | | |
| 1 | | | | | | | | | | | | | | |
| Network slice usage control (NSUC) (octet 11, bit 4) | | | | | | | | | | | | | | |
|  | | | | | | | | | | | | | | |
| Operator policy for high priority access exemptions for service area restrictions (HPAOP) (octet 11, bit 5) | | | | | | | | | | | | | | |
| This bit indicates the capability to support operator policy for high priority access exemptions for service area restrictions. | | | | | | | | | | | | | | |
| Bit | | | | |  | | |  | | | |  | |  |
| 5 | | | | |  | | |  | | | |  | |  |
| 0 | | | | |  | | |  | | | |  | | Operator policy for high priority access exemption for service area restrictions is not supported by the UE |
| 1 | | | | |  | | |  | | | |  | | Operator policy for high priority access exemption for service area restrictions is supported by the UE |
|  | | | | | | | | | | | | | | |
| Bits 6 to 8 in octet 11 and bits in octets 12 to 15 are spare and shall be coded as zero, if the respective octet is included in the information element. | | | | | | | | | | | | | | |

\*\*\*\*\* Eleventh change \*\*\*\*\*

#### 9.11.3.5 5GS network feature support

The purpose of the 5GS network feature support information element is to indicate whether certain features are supported by the network.

The 5GS network feature support information element is coded as shown in figure 9.11.3.5.1 and table 9.11.3.5.1.

The 5GS network feature support is a type 4 information element with a minimum length of 3 octets and a maximum length of 6 octets.

If:

- the length of 5GS network feature support contents field is set to one, then the UE shall interpret this as a receipt of an information element with all bits of octet 4, octet 5 and octet 6 coded as zero.

- the length of 5GS network feature support contents field is set to two, the UE shall interpret this as a receipt of an information element with all bits of octet 5 and octet 6 coded as zero.

- the length of 5GS network feature support contents field is set to three, the UE shall interpret this as a receipt of an information element with all bits of octet 6 coded as zero.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| 5GS network feature support IEI | | | | | | | | octet 1 |
| Length of 5GS network feature support contents | | | | | | | | octet 2 |
| MPSI | IWK N26 | EMF | | EMC | | IMS- VoPS-N3GPP | IMS- VoPS-3GPP | octet 3 |
| 5G-UP CIoT | 5G-IPHC-CP CIoT | N3 data | 5G-CP CIoT | RestrictEC | | MCSI | EMCN3 | octet 4\* |
| UN-PER | PR | RPR | PIV | NCR | 5G-EHC-CP CIoT | ATS-IND | 5G-LCS | octet 5\* |
| 0  spare | 0  spare | 0  spare | HPASE | RSLP | SUPL | LCS-UPP | NAPS | octet 6\* |

Figure 9.11.3.5.1: 5GS network feature support information element

Table 9.11.3.5.1: 5GS network feature support information element

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| IMS voice over PS session over 3GPP access indicator (IMS-VoPS-3GPP) (octet 3, bit 1) | | | | | |
| This bit indicates the support of IMS voice over PS session over 3GPP access (see NOTE 1). | | | | | |
| Bit | | | | | |
| 1 |  |  |  |  | |
| 0 |  |  |  | IMS voice over PS session not supported over 3GPP access | |
| 1 |  |  |  | IMS voice over PS session supported over 3GPP access | |
|  | | | | | |
| IMS voice over PS session over non-3GPP access indicator (IMS-VoPS-N3GPP) (octet 3, bit 2) | | | | | |
| This bit indicates the support of IMS voice over PS session over non-3GPP access. | | | | | |
| Bit | | | | | |
| 2 |  |  |  |  | |
| 0 |  |  |  | IMS voice over PS session not supported over non-3GPP access | |
| 1 |  |  |  | IMS voice over PS session supported over non-3GPP access | |
|  | | | | | |
| Emergency service support indicator for 3GPP access (EMC) (octet 3, bit 3 and bit 4) | | | | | |
| These bits indicate the support of emergency services in 5GS for 3GPP access (see NOTE 1). | | | | | |
| Bits | | | | | |
| 4 | 3 |  |  |  | |
| 0 | 0 |  |  | Emergency services not supported | |
| 0 | 1 |  |  | Emergency services supported in NR connected to 5GCN only | |
| 1 | 0 |  |  | Emergency services supported in E-UTRA connected to 5GCN only | |
| 1 | 1 |  |  | Emergency services supported in NR connected to 5GCN and E-UTRA connected to 5GCN | |
|  | | | | | |
| Emergency services fallback indicator for 3GPP access (EMF) (octet 3, bit 5 and bit 6) | | | | | |
| These bits indicate the support of emergency services fallback for 3GPP access (see NOTE 1). | | | | | |
| Bits | | | | | |
| 6 | 5 |  |  |  | |
| 0 | 0 |  |  | Emergency services fallback not supported | |
| 0 | 1 |  |  | Emergency services fallback supported in NR connected to 5GCN only | |
| 1 | 0 |  |  | Emergency services fallback supported in E-UTRA connected to 5GCN only | |
| 1 | 1 |  |  | Emergency services fallback supported in NR connected to 5GCN and E-UTRA connected to 5GCN | |
|  | | | | | |
| Interworking without N26 interface indicator (IWK N26) (octet 3, bit 7) | | | | | |
| This bit indicates whether interworking without N26 interface is supported. | | | | | |
| Bit | | | | | |
| 7 |  |  |  |  | |
| 0 |  |  |  | Interworking without N26 interface not supported | |
| 1 |  |  |  | Interworking without N26 interface supported | |
|  | | | | | |
| MPS indicator (MPSI) (octet 3, bit 8) | | | | | |
| This bit indicates the validity of MPS. | | | | | |
| Bit | | | | | |
| 8 |  |  |  |  | |
| 0 |  |  |  | Access identity 1 not valid | |
| 1 |  |  |  | Access identity 1 valid | |
|  | | | | | |
| Emergency service support for non-3GPP access indicator (EMCN3) (octet 4, bit 1) | | | | | |
| This bit indicates the support of emergency services in 5GS for non-3GPP access. | | | | | |
| Bit (see NOTE 2) | | | | | |
| 1 |  |  |  |  | |
| 0 |  |  |  | Emergency services not supported over non-3GPP access | |
| 1 |  |  |  | Emergency services supported over non-3GPP access | |
|  |  |  |  |  | |
| MCS indicator (MCSI) (octet 4, bit 2) | | | | | |
| This bit indicates the validity of MCS. | | | | | |
| Bit | | | | | |
| 2 |  |  |  |  | |
| 0 |  |  |  | Access identity 2 not valid | |
| 1 |  |  |  | Access identity 2 valid | |
|  | | | | | |
| Restriction on enhanced coverage (RestrictEC) (octet 4, bit 3 and bit 4)  These bits indicate enhanced coverage restricted information. | | | | | |
| In WB-N1 mode these bits are set as follows:  Bits | | | | | |
| 4 | 3 |  |  |  | |
| 0 | 0 |  |  | Both CE mode A and CE mode B are not restricted | |
| 0 | 1 |  |  | Both CE mode A and CE mode B are restricted | |
| 1 | 0 |  |  | CE mode B is restricted | |
| 1 | 1 |  |  | Reserved | |
| In NB-N1 mode these bits are set as follows | | | | | |
| Bits | | | | | |
| 4 | 3 |  |  |  | |
| 0 | 0 |  |  | Use of enhanced coverage is not restricted | |
| 0 | 1 |  |  | Use of enhanced coverage is restricted | |
| 1 | 0 |  |  | Reserved | |
| 1 | 1 |  |  | Reserved | |
|  | | | | | |
| Control plane CIoT 5GS optimization (5G-CP CIoT) (octet 4, bit 5) | | | | | |
| This bit indicates the capability for control plane CIoT 5GS optimization. | | | | | |
| Bit | | | | | |
| **5** | | | | | |
| 0 |  |  |  | Control plane CIoT 5GS optimization not supported | |
| 1 |  |  |  | Control plane CIoT 5GS optimization supported | |
|  | | | | | |
| N3 data transfer (N3 data) (octet 4, bit 6) | | | | | |
| This bit indicates the capability for N3 data transfer. | | | | | |
| Bit | | | | | |
| **6** | | | | | |
| 0 |  |  |  | N3 data transfer supported | |
| 1 |  |  |  | N3 data transfer not supported | |
|  | | | | | |
| IP header compression for control plane CIoT 5GS optimization (5G-IPHC-CP CIoT) (octet 4, bit 7) | | | | | |
| This bit indicates the capability for IP header compression for control plane CIoT 5GS optimization. | | | | | |
| Bit | | | | | |
| 7 | | | | | |
| 0 |  |  |  | IP header compression for control plane CIoT 5GS optimization not supported | |
| 1 |  |  |  | IP header compression for control plane CIoT 5GS optimization supported | |
|  | | | | | |
| User plane CIoT 5GS optimization (5G-UP CIoT) (octet 4, bit 8) | | | | | |
| This bit indicates the capability for user plane CIoT 5GS optimization. | | | | | |
| Bit | | | | | |
| **8** | | | | | |
| 0 |  |  |  | User plane CIoT 5GS optimization not supported | |
| 1 |  |  |  | User plane CIoT 5GS optimization supported | |
|  | | | | | |
| Location Services indicator in 5GC (5G-LCS) (octet 5, bit 1) | | | | | |
| Bit | | | | | |
| **1** | | | | | |
| 0 |  |  |  | Location services via 5GC not supported | |
| 1 |  |  |  | Location services via 5GC supported | |
|  | | | | | |
| ATSSS support indicator (ATS-IND) (octet 5, bit 2) | | | | | |
| This bit indicates the network support for ATSSS. | | | | | |
| Bit | | | | | |
| **2** | | | | | |
| 0 |  |  |  | ATSSS not supported | |
| 1 |  |  |  | ATSSS supported | |
|  | | | | | |
|  | | | | | |
| Ethernet header compression for control plane CIoT 5GS optimization (5G-EHC-CP CIoT) (octet 5, bit 3) | | | | | |
| This bit indicates the capability for Ethernet header compression for control plane CIoT 5GS optimization | | | | | |
| Bit | | | | | |
| **3** | | | | | |
| 0 |  |  |  | Ethernet header compression for control plane CIoT 5GS optimization not supported | |
| 1 |  |  |  | Ethernet header compression for control plane CIoT 5GS optimization supported | |
|  |  |  |  |  | |
|  | | | | | |
| N1 NAS signalling connection release (NCR) (octet 5, bit 4) | | | | | |
| This bit indicates whether N1 NAS signalling connection release is supported. | | | | | |
| Bit | | | | | |
| **4** | | | | | |
| 0 |  |  |  | N1-NAS signalling connection release not supported | |
| 1 |  |  |  | N1-NAS signalling connection release supported | |
|  | | | | | |
| Paging indication for voice services (PIV) (octet 5, bit 5) | | | | | |
| This bit indicates whether paging indication for voice services is supported. | | | | | |
| Bit | | | | | |
| **5** | | | | | |
| 0 |  |  |  | paging indication for voice services not supported | |
| 1 |  |  |  | paging indication for voice services supported | |
|  | | | | | |
| Reject paging request (RPR) (octet 5, bit 6) | | | | | |
| This bit indicates whether reject paging request is supported. | | | | | |
| Bit | | | | | |
| **6** | | | | | |
| 0 |  |  |  | reject paging request not supported | |
| 1 |  |  |  | reject paging request supported | |
|  | | | | | |
| Paging restriction (PR) (octet 5, bit 7) | | | | | |
| This bit indicates whether paging restriction is supported. | | | | | |
| Bit | | | | | |
| **7** | | | | | |
| 0 |  |  |  | paging restriction not supported | |
| 1 |  |  |  | paging restriction supported | |
|  | | | | | |
|  | | | | | |
| UN-PER (octet 5, bit 8) | | | | | |
| This bit indicates the capability to support Unavailability period | | | | | |
| Bit | | | | | |
| 8 | | | | | |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | 0 |  |  |  | unavailability period not supported | | 1 |  |  |  | unavailability period supported | | | | | | |
|  | | | | | |
|  | | | | | |
| Non-3GPP access path switching (NAPS) (octet 6, bit 1) | | | | | |
| This bit indicates whether non-3GPP access path switching is supported. | | | | | |
| Bit | | | | | |
| **1** | | | | | |
| 0 |  |  |  | non-3GPP access path switching not supported | |
| 1 |  |  |  | non-3GPP access path switching supported | |
|  | | | | | |
|  | | | | | |
| LCS-UPP user plane positioning (LCS-UPP) (octet 6, bit 2) | | | | | |
| This bit indicates the capability to support LCS-UPP user plane positioning (see 3GPP TS 23.273 [6B]). | | | | | |
| Bit | | | | | |
| **2** | | | | | |
| 0 |  |  |  | User plane positioning using LCS-UPP not supported | |
| 1 |  |  |  | User plane positioning using LCS-UPP supported | |
|  | | | | | |
|  | | | | | |
| SUPL user plane positioning (SUPL) (octet 6, bit 3) | | | | | |
| This bit indicates the capability to support SUPL user plane positioning (see 3GPP TS 38.305 [67] and 3GPP TS 23.271 [68]). | | | | | |
| Bit | | | | | |
| **3** | | | | | |
| 0 |  |  |  | User plane positioning using SUPL not supported | |
| 1 |  |  |  | User plane positioning using SUPL supported | |
|  | | | | | |
| Ranging and sidelink positioning support (RSLP) (octet 6, bit 4) | | | | | |
| This bit indicates the capability to support ranging and sidelink positioning. | | | | | |
| Bit | | | | | |
| **4** | | | | | |
| 0 |  |  |  | Ranging and sidelink positioning not supported | |
| 1 |  |  |  | Ranging and sidelink positioning supported | |
|  | | | | | |
| High priority access service area restriction exempt (HPASE) (octet 6, bit 5) | | | | | |
| This bit indicates whether the high priority access UE is exempt from service area restrictions. | | | | | |
| Bit | | | | | |
| 5 | | | | | |
| 0 | | | | | High priority access UEs are exempt from service area restrictions. See NOTE 3 |
| 1 | | | | | High priority access UEs are not exempt from service area restrictions |
|  | | | | | |
| Bits 6 to 8 of octet 6 are spare and shall be coded as zero. | | | | | |
|  | | | | | |
| NOTE 1: For a registration procedure over non-3GPP access, bit 1 of octet 3 and bits 3 to 7 of octet 3 are ignored.  NOTE 2: For a registration procedure over 3GPP access, bit 2 of octet 3 and bit 1 of octet 4 are ignored.  NOTE 3: The zero value is also the default value sent by legacy networks, the policy indicated by zero is the legacy policy. | | | | | |

\*\*\*\*\* Twelfth change \*\*\*\*\*

#### 9.11.3.91 Priority indicator

The purpose of the Priority indicator information element is to convey a priority indication to the UE.

The Priority indicator information element is coded as shown in figure 9.11.3.91.1 and table 9.11.3.91.1.

The Priority indicator is a type 1 information element.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Priority indicator IEI | | | | 0  Spare | HPASE | MCSI | MPSI | octet 1 |

Figure 9.11.3.91.1: Priority indicator

Table 9.11.3.91.1: Priority indicator

|  |  |  |
| --- | --- | --- |
| MPS indicator (MPSI) (octet 1, bit 1) | | |
| Bit  **1** | | |
| 0  1 | | Access identity 1 not valid  Access identity 1 valid |
|  | | |
| MCS indicator (MCSI) (octet 1, bit 2) | | |
| Bit  **2** | | |
| 0 | Access identity 2 not valid | |
| 1 | Access identity 2 valid | |
|  | | |
| High priority access service area restriction exempt (HPASE) (Octet 1, bit 3) | | |
| Bit  3 | | |
| 0 | High priority access UEs are exempt from service area restrictions or the network does not support operator policy for high priority access exemptions for service area restrictions | |
| 1 | High priority access UEs are not exempt from service area restrictions | |
|  | | |
| Bit 4 is spare and shall be coded as zero. | | |

\*\*\*\*\* End of changes \*\*\*\*\*