**3GPP TSG-CT WG1 Meeting #141eC1-23xxxx**

**Online 17– 21 April 2023 *was* C1-232134**

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

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|  |
| ***Title:***  | UAC for RAN timing synchronization status change - RRC inactive UE |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** | 2023-04-10 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-18 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe 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:*** | As states in the LS from RAN2(R2-2302106), UAC can be used to randomize the UE(s) re-connection to the cell due to a new clock quality information available in the cell.For UE(s) in 5GMM-CONNECTED mode with RRC inactive indication to transition to 5GMM-CONNECTED mode, when the RRC receives the information of RAN timing synchronization status change, RRC notifies NAS, and NAS requests the lower layer to transfer to the RRC\_CONNECTED state.However, the UAC for the access attmpt for UE(s) in 5GMM-CONNECTED mode with RRC inactive indication reconnecting to the NW due to RAN timing synchronization status change is not specified. |
|  |  |
| ***Summary of change:*** | 1. Add an event for RAN timing synchronization status change under bullet b) in sc 4.5.1;2. Add an EN in sc 4.5.2 about the access category for the access attempt due to RAN timing synchronization status change. |
|  |  |
| ***Consequences if not approved:*** | Unclear about how the UAC is performed for the UE in 5GMM-CONNECTED mode with RRC inactive indication to transition to 5GMM-CONNECTED mode for the case of RAN timing synchronization status change. |
|  |  |
| ***Clauses affected:*** | 4.5.1, 4.5.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR … CR …  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

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

### 4.5.1 General

When the UE needs to access the 5GS, the UE not operating as an IAB-node (see 3GPP TS 23.501 [8]) and not acting as a 5G ProSe layer-2 UE-to-network relay UE (see 3GPP TS 23.304 [6E]) whose access attempt is triggered by a 5G ProSe layer-2 remote UE, first performs access control checks to determine if the access is allowed. Access control checks shall be performed for the access attempts defined by the following list of events:

NOTE 1: Although the UE operating as an IAB-node skips the access control checks, the UE operating as an IAB-node determines an access category and one or more access identities for each access attempt in order to derive an RRC establishment cause. In this case the NAS provides the RRC establishment cause but does not provide the access category and the one or more access identities to the lower layers.

a) the UE is in 5GMM-IDLE mode or 5GMM-IDLE mode with suspend indication over 3GPP access and an event that requires a transition to 5GMM-CONNECTED mode occurs; and

b) the UE is in 5GMM-CONNECTED mode over 3GPP access or 5GMM-CONNECTED mode with RRC inactive indication and one of the following events occurs:

1) 5GMM receives an MO-IMS-registration-related-signalling-started indication, an MO-MMTEL-voice-call-started indication, an MO-MMTEL-video-call-started indication or an MO-SMSoIP-attempt-started indication from upper layers;

2) 5GMM receives a request from upper layers to send a mobile originated SMS over NAS unless the request triggered a service request procedure to transition the UE from 5GMM-IDLE mode or 5GMM-IDLE mode with suspend indication to 5GMM-CONNECTED mode;

3) 5GMM receives a request from upper layers to send an UL NAS TRANSPORT message for the purpose of PDU session establishment unless the request triggered a service request procedure to transition the UE from 5GMM-IDLE mode or 5GMM-IDLE mode with suspend indication to 5GMM-CONNECTED mode;

4) 5GMM receives a request from upper layers to send an UL NAS TRANSPORT message for the purpose of PDU session modification unless the request triggered a service request procedure to transition the UE from 5GMM-IDLE mode or 5GMM-IDLE mode with suspend indication to 5GMM-CONNECTED mode;

5) 5GMM receives a request to re-establish the user-plane resources for an existing PDU session;

6) 5GMM is notified that an uplink user data packet is to be sent for a PDU session with suspended user-plane resources;

7) 5GMM receives a request from upper layers to send a mobile originated location request unless the request triggered a service request procedure to transition the UE from 5GMM-IDLE mode or 5GMM-IDLE mode with suspend indication to 5GMM-CONNECTED mode;

8) 5GMM receives a request from upper layers to send a mobile originated signalling transaction towards the PCF by sending an UL NAS TRANSPORT message including a UE policy container (see 3GPP TS 24.587 [19B] and 3GPP TS 24.554 [19E]) unless the request triggered a service request procedure to transition the UE from 5GMM-IDLE mode to 5GMM-CONNECTED mode; and

X) 5GMM receives a notification from lower layers about the RAN timing synchronization status change, and decides to transition the UE from 5GMM-CONNECTED mode with RRC inactive indication to 5GMM-CONNECTED mode as specified in subclause 5.3.1.4.

NOTE 2: 5GMM specific procedures initiated by NAS in 5GMM-CONNECTED mode or 5GMM-CONNECTED mode with RRC inactive indication are not subject to access control, e.g. a registration procedure after PS handover will not be prevented by access control (see subclause 5.5).

NOTE 3: LPP messages or location event report messages transported in the UL NAS TRANSPORT message sent in response to a mobile terminating or network induced location request, and the corresponding access attempts are handled as MT access.

NOTE 4: Initiating a mobile originated signalling transaction towards the UDM by sending an UL NAS TRANSPORT message including an SOR transparent container is not supported. Therefore, access control for these cases has not been specified.

When the NAS detects one of the above events, the NAS needs to perform the mapping of the kind of request to one or more access identities and one access category and lower layers will perform access barring checks for that request based on the determined access identities and access category.

NOTE 5: The NAS is aware of the above events through indications provided by upper layers or through determining the need to start 5GMM procedures through normal NAS behaviour, or both.

To determine the access identities and the access category for a request, the NAS checks the reason for access, types of service requested and profile of the UE including UE configurations, against a set of access identities and access categories defined in 3GPP TS 22.261 [3], namely:

a) a set of standardized access identities;

b) a set of standardized access categories; and

c) a set of operator-defined access categories, if available.

For the purpose of determining the applicable access identities from the set of standardized access identities defined in 3GPP TS 22.261 [3], the NAS shall follow the requirements set out in:

a) subclause 4.5.2 and the rules and actions defined in table 4.5.2.1, if the UE is not operating in SNPN access operation mode over 3GPP access; or

b) subclause 4.5.2A and the rules and actions defined in table 4.5.2A.1, if the UE is operating in SNPN access operation mode over 3GPP access.

In order to enable access barring checks for access attempts identified by lower layers in 5GMM-CONNECTED mode with RRC inactive indication, the UE provides the applicable access identities to lower layers.

NOTE 6: When and how the NAS provides the applicable access identities to lower layers is UE implementation specific.

NOTE 7: Although the UE operating as an IAB-node skips the access control checks, the UE provides the applicable access identities to lower layers for access attempts identified by lower layers in 5GMM-CONNECTED mode with RRC inactive indication.

For the purpose of determining the applicable access category from the set of standardized access categories and operator-defined access categories defined in 3GPP TS 22.261 [3], the NAS shall follow the requirements set out in:

a) subclause 4.5.2 and the rules and actions defined in table 4.5.2.2, if the UE is not operating in SNPN access operation mode over 3GPP access; or

b) subclause 4.5.2A and the rules and actions defined in table 4.5.2A.2, if the UE is operating in SNPN access operation mode over 3GPP access.

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

### 4.5.2 Determination of the access identities and access category associated with a request for access for UEs not operating in SNPN access operation mode over 3GPP access

When the UE needs to initiate an access attempt in one of the events listed in subclause 4.5.1, the UE shall determine one or more access identities from the set of standardized access identities, and one access category from the set of standardized access categories and operator-defined access categories, to be associated with that access attempt.

The set of the access identities applicable for the request is determined by the UE in the following way:

a) for each of the access identities 1, 2, 3, 11, 12, 13, 14 and 15 in table 4.5.2.1, the UE shall check whether the access identity is applicable in the selected PLMN, if a new PLMN is selected, or otherwise if it is applicable in the RPLMN or equivalent PLMN; and

b) if none of the above access identities is applicable, then access identity 0 is applicable.

Table 4.5.2.1: Access identities

|  |  |
| --- | --- |
| Access Identity number | UE configuration |
| 0 | UE is not configured with any parameters from this table |
| 1 (NOTE 1) | UE is configured for multimedia priority service (MPS). |
| 2 (NOTE 2) | UE is configured for mission critical service (MCS). |
| 3 (NOTE 4) | UE for which a disaster condition applies |
| 4-10 | Reserved for future use |
| 11 (NOTE 3) | Access Class 11 is configured in the UE. |
| 12 (NOTE 3) | Access Class 12 is configured in the UE. |
| 13 (NOTE 3) | Access Class 13 is configured in the UE. |
| 14 (NOTE 3) | Access Class 14 is configured in the UE. |
| 15 (NOTE 3) | Access Class 15 is configured in the UE. |
| NOTE 1: Access identity 1 is valid when:- the USIM file EFUAC\_AIC indicates the UE is configured for access identity 1 and the selected PLMN, if a new PLMN is selected, or RPLMN is the HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present), or a visited PLMN of the home country (see the definition of home country in 3GPP TS 24.301 [15]); - the UE receives the 5GS network feature support IE with the MPS indicator bit set to "Access identity 1 valid" from the RPLMN as described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4; or- the UE receives the Priority indicator IE with the MPS indicator bit set to "Access identity 1 valid" from the RPLMN as described in subclause 5.4.4.3.NOTE 2: Access identity 2 is used by UEs configured for MCS and is valid when:- the USIM file EFUAC\_AIC indicates the UE is configured for access identity 2 and the selected PLMN, if a new PLMN is selected, or RPLMN is the HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present), or a visited PLMN of the home country (see 3GPP TS 23.122 [5]); or- the UE receives the 5GS network feature support IE with the MCS indicator bit set to "Access identity 2 valid" from the RPLMN as described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4.NOTE 3: Access identities 11 and 15 are valid in HPLMN (if the EHPLMN list is not present or is empty) or EHPLMN (if the EHPLMN list is present). Access Identities 12, 13 and 14 are valid in HPLMN and visited PLMNs of home country only (see the definition of home country in 3GPP TS 24.301 [15]).NOTE 4: Access Identity 3 is valid when the UE is registering or registered for disaster roaming services (see 3GPP TS 23.122 [5]). |

The UE uses the MPS indicator bit of the 5GS network feature support IE or the Priority indicator IE to determine if access identity 1 is valid. Processing of the MPS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message is described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4. Processing of the MPS indicator bit of the Priority indicator IE in the CONFIGURATION UPDATE COMMAND message is described in subclause 5.4.4.3. The UE shall not consider access identity 1 to be valid when the UE is not in the country of its HPLMN or in an EHPLMN (if the EHPLMN list is present) prior to receiving the MPS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message or of the Priority indicator IE in the CONFIGURATION UPDATE COMMAND message being set to "Access identity 1 valid".

When the UE is in the country of its HPLMN or in an EHPLMN (if the EHPLMN list is present), the contents of the USIM file EFUAC\_AIC as specified in 3GPP TS 31.102 [22] and the rules specified in table 4.5.2.1 are used to determine the applicability of access identity 1. When the UE is in the country of its HPLMN or in an EHPLMN (if the EHPLMN list is present), and the USIM file EFUAC\_AIC does not indicate the UE is configured for access identity 1, the UE uses the MPS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message or of the Priority indicator IE in the CONFIGURATION UPDATE COMMAND message to determine if access identity 1 is valid. When the UE is in the country of its HPLMN or in an EHPLMN (if the EHPLMN list is present), and the USIM file EFUAC\_AIC indicates the UE is configured for access identity 1, the MPS indicator bit of the 5GS network feature support IE and the Priority indicator IE are not applicable. When the UE is not in the country of its HPLMN or in an EHPLMN (if the EHPLMN list is present), the contents of the USIM file EFUAC\_AIC are not applicable.

The UE uses the MCS indicator bit of the 5GS network feature support IE to determine if access identity 2 is valid. Processing of the MCS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message is described in subclause 5.5.1.2.4 and subclause 5.5.1.3.4. The UE shall not consider access identity 2 to be valid when the UE is not in the country of its HPLMN or in an EHPLMN (if the EHPLMN list is present) prior to receiving the MCS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message being set to "Access identity 2 valid".

When the UE is in the country of its HPLMN or in an EHPLMN (if the EHPLMN list is present), the contents of the USIM file EFUAC\_AIC as specified in 3GPP TS 31.102 [22] and the rules specified in table 4.5.2.1 are used to determine the applicability of access identity 2. When the UE is in the country of its HPLMN or in an EHPLMN (if the EHPLMN list is present), and the USIM file EFUAC\_AIC does not indicate the UE is configured for access identity 2, the UE uses the MCS indicator bit of the 5GS network feature support IE in the REGISTRATION ACCEPT message to determine if access identity 2 is valid. When the UE is in the country of its HPLMN or in an EHPLMN (if the EHPLMN list is present), and the USIM file EFUAC\_AIC indicates the UE is configured for access identity 2, the MCS indicator bit of the 5GS network feature support IE is not applicable. When the UE is not in the country of its HPLMN or in an EHPLMN (if the EHPLMN list is present), the contents of the USIM file EFUAC\_AIC are not applicable.

The UE checks the conditions specified in subclause 4.4.3.1.1 of 3GPP TS 23.122 [5] to determine if access identity 3 is valid, and the applicability of access identity 3.

When the UE is in its HPLMN (if the EHPLMN list is not present or is empty) or in an EHPLMN (if the EHPLMN list is present), the contents of the USIM file EFACC as specified in 3GPP TS 31.102 [22] and the rules specified in table 4.5.2.1 are used to determine the applicability of access classes 11 and 15. When the UE is not in its HPLMN (if the EHPLMN list is not present or is empty) or in an EHPLMN (if the EHPLMN list is present), access classes 11 and 15 are not applicable.

When the UE is in the country of its HPLMN, the contents of the USIM file EFACC as specified in 3GPP TS 31.102 [22] and the rules specified in table 4.5.2.1 are used to determine the applicability of access classes 12 - 14. When the UE is not in the country of its HPLMN, access classes 12-14 are not applicable.

In order to determine the access category applicable for the access attempt, the NAS shall check the rules in table 4.5.2.2, and use the access category for which there is a match for barring check. If the access attempt matches more than one rule, the access category of the lowest rule number shall be selected. If the access attempt matches more than one operator-defined access category definition, the UE shall select the access category from the operator-defined access category definition with the lowest precedence value (see subclause 4.5.3).

NOTE: The case when an access attempt matches more than one rule includes the case when multiple events trigger an access attempt at the same time.

Table 4.5.2.2: Mapping table for access categories

|  |  |  |  |
| --- | --- | --- | --- |
| Rule # | Type of access attempt | Requirements to be met | Access Category |
| 1 | Response to paging or NOTIFICATION over non-3GPP access;5GMM connection management procedure initiated for the purpose of transporting an LPP message without an ongoing 5GC-MO-LR procedure;Access attempt to handover of ongoing MMTEL voice call, MMTEL video call or SMSoIP from non-3GPP access; orAccess attempt upon receipt of "call-pull-initiated" indication from the upper layers (see 3GPP TS 24.174 [13D]) | Access attempt is for MT access, or handover of ongoing MMTEL voice call, MMTEL video call or SMSoIP from non-3GPP access; orAccess attempt is made upon receipt of "call-pull-initiated" (3GPP TS 24.174 [13D]) | 0 (= MT\_acc) |
| 2 | Emergency | UE is attempting access for an emergency session (NOTE 1, NOTE 2) | 2 (= emergency) |
| 3 | Access attempt for operator-defined access category | UE stores operator-defined access category definitions valid in the current PLMN as specified in subclause 4.5.3, and access attempt is matching criteria of an operator-defined access category definition | 32-63 (= based on operator classification) |
| 3.1 | Access attempt for MO exception data | UE is in NB-N1 mode and allowed to use exception data reporting (see the ExceptionDataReportingAllowed leaf of the NAS configuration MO in 3GPP TS 24.368 [17] or the USIM file EFNASCONFIG in 3GPP TS 31.102 [22]), and access attempt is for MO data or for MO signalling initiated upon receiving a request from upper layers to transmit user data related to an exceptional event. | 10 (= MO exception data) |
| 4 | Access attempt for delay tolerant service | (a) UE is configured for NAS signalling low priority or UE supporting S1 mode is configured for EAB (see the "ExtendedAccessBarring" leaf of NAS configuration MO in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22]) where "EAB override" does not apply, and(b): the UE received one of the categories a, b or c as part of the parameters for unified access control in the broadcast system information, and the UE is a member of the broadcasted category in the selected PLMN or RPLMN/equivalent PLMN(NOTE 3, NOTE 5, NOTE 6, NOTE 7, NOTE 8) | 1 (= delay tolerant) |
| 5 | MO MMTel voice call; orMT MMTel voice call | Access attempt is for MO MMTel voice call or MT MMTel voice callor for NAS signalling connection recovery during ongoing MO MMTel voice call or ongoing MT MMTel voice call (NOTE 2) | 4 (= MO MMTel voice) |
| 6 | MO MMTel video call; orMT MMTel video call | Access attempt is for MO MMTel video call or MT MMTel video callor for NAS signalling connection recovery during ongoing MO MMTel video call or ongoing MT MMTel video call (NOTE 2) | 5 (= MO MMTel video) |
| 7 | MO SMS over NAS or MO SMSoIP; orMT SMSoIP | Access attempt is for MO SMS over NAS (NOTE 4) or MO SMS over SMSoIP transfer or MT SMS over SMSoIPor for NAS signalling connection recovery during ongoing MO SMS or SMSoIP transfer or ongoing MT MMTel video call (NOTE 2) | 6 (= MO SMS and SMSoIP) |
| 7.1 | MO IMS registration related signalling | Access attempt is for MO IMS registration related signalling (e.g. IMS initial registration, re-registration, subscription refresh)or for NAS signalling connection recovery during ongoing procedure for MO IMS registration related signalling (NOTE 2a) | 9 (= MO IMS registration related signalling) |
| 8 | UE NAS initiated 5GMM specific procedures | Access attempt is for MO signalling | 3 (= MO\_sig) |
| 8.1 | Mobile originated location request | Access attempt is for mobile originated location request (NOTE 9) | 3 (= MO\_sig) |
| 8.2 | Mobile originated signalling transaction towards the PCF | Access attempt is for mobile originated signalling transaction towards the PCF (NOTE 10) | 3 (= MO\_sig) |
| 9 | UE NAS initiated 5GMM connection management procedure or 5GMM NAS transport procedure | Access attempt is for MO data | 7 (= MO\_data) |
| 10 | An uplink user data packet is to be sent for a PDU session with suspended user-plane resources | No further requirement is to be met | 7 (= MO\_data) |
| NOTE 1: This includes 5GMM specific procedures while the service is ongoing and 5GMM connection management procedures required to establish a PDU session with request type = "initial emergency request" or "existing emergency PDU session", or to re-establish user-plane resources for such a PDU session. This further includes the service request procedure initiated with a SERVICE REQUEST message with the Service type IE set to "emergency services fallback".NOTE 2: Access for the purpose of NAS signalling connection recovery during an ongoing service as defined in subclause 4.5.5, or for the purpose of NAS signalling connection establishment following fallback indication from lower layers during an ongoing service as defined in subclause 4.5.5, is mapped to the access category of the ongoing service in order to derive an RRC establishment cause, but barring checks will be skipped for this access attempt.NOTE 2a: Access for the purpose of NAS signalling connection recovery during an ongoing procedure for MO IMS registration related signalling as defined in subclause 4.5.5, or for the purpose of NAS signalling connection establishment following fallback indication from lower layers during an ongoing procedure for MO IMS registration related signalling as defined in subclause 4.5.5, is mapped to the access category of the MO IMS registration related signalling in order to derive an RRC establishment cause, but barring checks will be skipped for this access attempt.NOTE 3: If the UE selects a new PLMN, then the selected PLMN is used to check the membership; otherwise the UE uses the RPLMNor a PLMN equivalent to the RPLMN.NOTE 4: This includes the 5GMM connection management procedures triggered by the UE-initiated NAS transport procedure for transporting the MO SMS.NOTE 5: The UE configured for NAS signalling low priority is not supported in this release of specification. If a UE supporting both S1 mode and N1 mode is configured for NAS signalling low priority in S1 mode as specified in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22], the UE shall ignore the configuration for NAS signalling low priority when in N1 mode.NOTE 6: If the access category applicable for the access attempt is 1, then the UE shall additionally determine a second access category from the range 3 to 7. If more than one access category matches, the access category of the lowest rule number shall be chosen. The UE shall use the second access category only to derive an RRC establishment cause for the access attempt.NOTE 7: "EAB override" does not apply, if the UE is not configured to allow overriding EAB (see the "Override\_ExtendedAccessBarring" leaf of NAS configuration MO in 3GPP TS 24.368 [17] or 3GPP TS 31.102 [22]), or if NAS has not received an indication from the upper layers to override EAB and the UE does not have a PDU session that was established with EAB override.NOTE 8: For the definition of categories a, b and c associated with access category 1, see 3GPP TS 22.261 [3]. The categories associated with access category 1 are distinct from the categories a, b and c associated with EAB (see 3GPP TS 22.011 [1A]).NOTE 9: This includes:a) the UE-initiated NAS transport procedure for transporting a mobile originated location request;b) the 5GMM connection management procedure triggered by a) above; andc) NAS signalling connection recovery during an ongoing 5GC-MO-LR procedure.NOTE 10: This includes:a) the UE-initiated NAS transport procedure for transporting a mobile originated signalling transaction towards the PCF;b) the 5GMM connection management procedure triggered by a) above; andc) NAS signalling connection recovery during an ongoing UE-requested policy provisioning procedure for V2XP, ProSeP or both (see 3GPP TS 24.587 [19B] and see 3GPP TS 24.554 [19E]). |

Editor's note: (WI: TRS\_URLLC, CR 5191) Whether to introduce a new access category for the access attempt to retrieve the latest available clock quality information is FFS.

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