**3GPP TSG-CT WG1 Meeting #127-eC1-20xxxx**

**Electronic meeting, 13-20 November 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
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|  | **24.301** | **CR** | **3470** | **rev** | **1** | **Current version:** | **17.0.0** |  |
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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 |  |

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|  |
| ***Title:***  | Correction to timeout cases for Attach and TAU procedures |
|  |  |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | TEI17 |  | ***Date:*** | 2020-10-28 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-17 |
|  | *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-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)* |
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| ***Reason for change:*** | For T3410 timeout (abnormal case c in subclause 5.5.1.2.6 of Attach procedure), the UE shall proceed as described at the end of the subclause, i.e. to increment the attach attempt counter if applicable and such, after releasing the NAS signalling connection.However, it was mentioned in middle of the text to "proceed as described below" i.e. before completing all the actions in the section.This was already taken care in all the other abnormal cases in subclause 5.5.1.2.6 when applicable, i.e. by stating that "*The UE shall proceed as described below*" at end of the text.Same issue exists in abnormal case c (T3430 timeout) in subclause 5.5.3.2.6 for TAU procedure. |
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| ***Summary of change:*** | Abnormal cases c in both subclauses 5.5.1.2.6 and 5.5.3.2.6 are corrected by indicating that the UE shall proceed as described in the rest of the subclause at the end of the text, i.e. by correcting the order of the text. |
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| ***Consequences if not approved:*** | Can lead to skipping some actions from the abnormal case c, like releasing the connection, due to the wrong order of the text. |
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| ***Clauses affected:*** | 5.5.1.2.6, 5.5.3.2.6 |
|  |  |
|  | **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:*** | Revision 1: Correcting parts that were missed from the change. |

\*\*\*\*\* First change \*\*\*\*\*

5.5.1.2.6 Abnormal cases in the UE

The following abnormal cases can be identified:

a) Access barred because of access class barring, EAB, ACDC or NAS signalling connection establishment rejected by the network without "Extended wait time" received from lower layers

 In WB-S1 mode, if access is barred for "originating signalling" (see 3GPP TS 36.331 [22]), the attach procedure shall not be started. The UE stays in the current serving cell and applies the normal cell reselection process. The attach procedure is started as soon as possible, i.e. when access for "originating signalling" is granted on the current cell or when the UE moves to a cell where access for "originating signalling" is granted.

 In NB-S1 mode, if access is barred for "originating signalling" (see 3GPP TS 36.331 [22]), the attach procedure shall not be started. The UE stays in the current serving cell and applies the normal cell reselection process. Further UE behaviour is implementation specific, e.g. the attach procedure is started again after an implementation dependent time.

 In NB-S1 mode, if access is barred for "originating signalling" (see 3GPP TS 36.331 [22]), a request for an exceptional event is received from the upper layers, then the attach procedure shall be started.

NOTE 1: In NB-S1 mode, the EMM layer cannot receive the access barring alleviation indication from the lower layers (see 3GPP TS 36.331 [22]).

 If access is barred because of access class barring for "originating signalling" (see 3GPP TS 36.331 [22]), ACDC is applicable to the request from the upper layers and the UE supports ACDC, then the attach procedure shall be started.

 If access is barred for a certain ACDC category (see 3GPP TS 36.331 [22]), a request with a higher ACDC category is received from the upper layers and the UE supports ACDC, then the attach procedure shall be started.

 If an access request for an uncategorized application is barred due to ACDC (see 3GPP TS 36.331 [22]), a request with a certain ACDC category is received from the upper layers and the UE supports ACDC, then the attach procedure shall be started.

b) Lower layer failure or release of the NAS signalling connection without "Extended wait time" and without "Extended wait time CP data" received from lower layers before the ATTACH ACCEPT or ATTACH REJECT message is received

 The attach procedure shall be aborted, and the UE shall proceed as described below.

c) T3410 timeout

 The UE shall abort the attach procedure. The NAS signalling connection, if any, shall be released locally.

NOTE 2: The NAS signalling connection can also be released if the UE deems that the network has failed the authentication check as specified in subclause 5.4.2.7.

 The UE shall proceed as described below.

d) ATTACH REJECT, other EMM cause values than those treated in subclause 5.5.1.2.5, and cases of EMM cause values #22, #25 and #31, if considered as abnormal cases according to subclause 5.5.1.2.5

 Upon reception of the EMM cause #19 "ESM failure", if the UE is not configured for NAS signalling low priority and the ESM cause value received in the PDN CONNECTIVITY REJECT message is not #54 "PDN connection does not exist", the UE may set the attach attempt counter to 5. Subsequently, if the UE needs to retransmit the ATTACH REQUEST message to request PDN connectivity towards a different APN, the UE may stop T3411 or T3402, if running, and send the ATTACH REQUEST message. If the UE needs to attempt EPS attach to request transfer of a PDN connection for emergency bearer services by including a PDN CONNECTIVITY REQUEST message with request type set to "handover of emergency bearer services", the UE shall stop T3411 or T3402, if running, and send the ATTACH REQUEST message.

NOTE 3: When receiving EMM cause #19 "ESM failure", coordination is required between the EMM and ESM sublayers in the UE to determine whether to set the attach attempt counter to 5.

 If the attach request is neither for emergency bearer services nor for initiating a PDN connection for emergency bearer services with attach type not set to "EPS emergency attach", upon reception of the EMM causes #95, #96, #97, #99 and #111 the UE should set the attach attempt counter to 5.

 The UE shall proceed as described below.

e) Change of cell into a new tracking area

 If a cell change into a new tracking area occurs before the attach procedure is completed, the attach procedure shall be aborted and re-initiated immediately. If a tracking area border is crossed when the ATTACH ACCEPT message has been received but before an ATTACH COMPLETE message is sent, the attach procedure shall be re-initiated. If a GUTI was allocated during the attach procedure, this GUTI shall be used in the attach procedure.

f) Mobile originated detach required

 The attach procedure shall be aborted, and the UE initiated detach procedure shall be performed.

g) Detach procedure collision

 If the UE receives a DETACH REQUEST message from the network in state EMM-REGISTERED-INITIATED and the detach type indicates "re-attach not required" and no EMM cause IE, or "re-attach not required" and the EMM cause value is not #2 "IMSI unknown in HSS", the detach procedure shall be progressed and the attach procedure shall be aborted. If the UE receives a DETACH REQUEST message from the network in state EMM-REGISTERED-INITIATED and the detach type indicates "re-attach required", the detach procedure shall be progressed and the UE shall locally release the NAS signalling connection, before re-initiating the attach procedure. Otherwise the attach procedure shall be progressed and the DETACH REQUEST message shall be ignored.

h) Transmission failure of ATTACH REQUEST message indication from lower layers

 The UE shall restart the attach procedure immediately.

i) Transmission failure of ATTACH COMPLETE message indication from lower layers

 If the current TAI is not in the TAI list, the UE shall restart the attach procedure.

 If the current TAI is still in the TAI list, it is up to the UE implementation how to re-run the ongoing procedure. The EMM sublayer notifies the ESM sublayer that the ESM message in the ESM message container IE of the ATTACH COMPLETE has failed to be transmitted.

j) If EMM-REGISTERED without PDN connection is not supported by the UE or the MME, and the ACTIVATE DEFAULT BEARER CONTEXT REQUEST message combined with the ATTACH ACCEPT is not accepted by the UE due to failure in the UE ESM sublayer, then the UE shall initiate the detach procedure by sending a DETACH REQUEST message to the network. Further UE behaviour is implementation specific.

 If EMM-REGISTERED without PDN connection is supported by the UE and the MME, and the ACTIVATE DEFAULT BEARER CONTEXT REQUEST message combined with the ATTACH ACCEPT is not accepted by the UE due to failure in the UE ESM sublayer, then the UE shall either send an ATTACH COMPLETE message together with an ACTIVATE DEFAULT EPS BEARER CONTEXT REJECT contained in the ESM message container information element to the network or initiate the detach procedure by sending a DETACH REQUEST message. Further UE behaviour is implementation specific.

k) Indication from the lower layers that an S101 mode to S1 mode handover has been cancelled (S101 mode only)

 The UE shall abort the attach procedure and enter state EMM-DEREGISTERED.NO-CELL-AVAILABLE.

l) "Extended wait time" from the lower layers

 If the ATTACH REQUEST message contained the low priority indicator set to "MS is configured for NAS signalling low priority", the UE shall start timer T3346 with the "Extended wait time" value and reset the attach attempt counter.

 If the ATTACH REQUEST message did not contain the low priority indicator set to "MS is configured for NAS signalling low priority", the UE is operating in NB-S1 mode and the UE is not a UE configured to use AC11 – 15 in selected PLMN, then the UE shall start timer T3346 with the "Extended wait time" value and reset the attach attempt counter.

 In other cases the UE shall ignore the "Extended wait time".

 The UE shall abort the attach procedure, stay in the current serving cell, change the state to EMM-DEREGISTERED.ATTEMPTING-TO-ATTACH and apply the normal cell reselection process.

 The UE shall proceed as described below.

la) "Extended wait time CP data" from the lower layers

 If the UE is operating in NB-S1 mode, the UE shall start the timer T3346 with the "Extended wait time CP data" value and reset the attach attempt counter.

 In other cases the UE shall ignore the "Extended wait time CP data".

 The UE shall abort the attach procedure, stay in the current serving cell, change the state to EMM-DEREGISTERED.ATTEMPTING-TO-ATTACH and apply the normal cell reselection process.

 The UE shall proceed as described below.

m) Timer T3346 is running

 The UE shall not start the attach procedure unless:

- the UE is a UE configured to use AC11 – 15 in selected PLMN;

- the UE needs to attach for emergency bearer services;

- the UE in NB-S1 mode is requested by the upper layer to transmit user data related to an exceptional event and

i) the UE is allowed to use exception data reporting (see the ExceptionDataReportingAllowed leaf of the NAS configuration MO in 3GPP TS 24.368 [15A] or the USIM file EFNASCONFIG in 3GPP TS 31.102 [17]); and

ii) timer T3346 was not started when NAS signaling connection was established with RRC establishment cause set to "MO exception data"; or

- the UE needs to attach without the NAS signalling low priority indication and if the timer T3346 was started due to rejection of a NAS request message (e.g. ATTACH REQUEST, TRACKING AREA UPDATE REQUEST or EXTENDED SERVICE REQUEST) which contained the low priority indicator set to "MS is configured for NAS signalling low priority".

 The UE stays in the current serving cell and applies the normal cell reselection process.

NOTE 4: It is considered an abnormal case if the UE needs to initiate an attach procedure while timer T3346 is running independent on whether timer T3346 was started due to an abnormal case or a non successful case.

 The UE shall proceed as described below.

n) If EMM-REGISTERED without PDN connection is supported by the UE and the MME, an ESM DUMMY MESSAGE is included in the ESM message container information element of the ATTACH REQUEST message and the UE receives the ATTACH ACCEPT message combined with a PDN CONNECTIVITY REJECT message, the UE shall send an ATTACH COMPLETE message together with an ESM DUMMY MESSAGE contained in the ESM message container information element to the network. Further UE behaviour is implementation specific.

o) Timer T3447 is running

 The UE shall not start the attach procedure unless:

- the UE is a UE configured to use AC11 – 15 in selected PLMN;

- the UE attempts to attach for emergency bearer services; or

- the UE attempts to attach without PDN connection request.

 The UE stays in the current serving cell and applies the normal cell reselection process. The attach request procedure is started, if still necessary, when timer T3447 expires.

For the cases b, c, d, l, la and m:

- Timer T3410 shall be stopped if still running.

- For the cases b, c, d, l when the "Extended wait time" is ignored, and la when the "Extended wait time CP data" is ignored, if the attach request is neither for emergency bearer services nor for initiating a PDN connection for emergency bearer services with attach type not set to "EPS emergency attach", the attach attempt counter shall be incremented, unless it was already set to 5.

- If the attach attempt counter is less than 5:

- for the cases l, la and m, the attach procedure is started, if still necessary, when timer T3346 expires or is stopped;

- for the cases b, c, d, l when the "Extended wait time" is ignored, and la when the "Extended wait time CP data" is ignore, if the attach request is neither for emergency bearer services nor for initiating a PDN connection for emergency bearer services with attach type not set to "EPS emergency attach", timer T3411 is started and the state is changed to EMM-DEREGISTERED.ATTEMPTING-TO-ATTACH. When timer T3411 expires the attach procedure shall be restarted, if still required by ESM sublayer.

- If the attach attempt counter is equal to 5:

- the UE shall delete any GUTI, TAI list, last visited registered TAI, list of equivalent PLMNs and KSI, shall set the update status to EU2 NOT UPDATED, and shall start timer T3402. The state is changed to EMM-DEREGISTERED.ATTEMPTING-TO-ATTACH or optionally to EMM-DEREGISTERED.PLMN-SEARCH in order to perform a PLMN selection according to 3GPP TS 23.122 [6]; and

- if A/Gb mode, Iu mode or N1 mode is supported by the UE:

- if A/Gb mode or Iu mode is supported by the UE, the UE shall in addition handle the GMM parameters GMM state, GPRS update status, P-TMSI, P-TMSI signature, RAI and GPRS ciphering key sequence number as specified in 3GPP TS 24.008 [13] for the abnormal case when a normal attach procedure fails and the attach attempt counter is equal to 5;

- if the UE is operating in single-registration mode, the UE shall in addition handle the 5GMM parameters 5GMM state, 5GS update status, 5G-GUTI, last visited registered TAI, TAI list and ngKSI as specified in 3GPP TS 24.501 [54] for the abnormal case when an initial registration procedure performed over 3GPP access fails and the registration attempt counter is equal to 5; and

- the UE shall attempt to select GERAN, UTRAN or NG-RAN radio access technology and proceed with appropriate GMM or 5GMM specific procedures. Additionally, the UE may disable the E-UTRA capability as specified in subclause 4.5.

\*\*\*\*\* Next change \*\*\*\*\*

5.5.3.2.6 Abnormal cases in the UE

The following abnormal cases can be identified:

a) Access barred because of access class barring, EAB, ACDC or NAS signalling connection establishment rejected by the network without "Extended wait time" received from lower layers

 In WB-S1 mode, if the tracking area updating procedure is started in response to a paging request from the network, access class barring, EAB or ACDC is not applicable.

 In NB-S1 mode, if the tracking area updating procedure is started in response to a paging request from the network, access barring is not applicable.

 In WB-S1 mode, if access is barred for "originating signalling" (see 3GPP TS 36.331 [22]), the tracking area updating procedure shall not be started. The UE stays in the current serving cell and applies the normal cell reselection process. The tracking area updating procedure is started as soon as possible and if still necessary, e.g. when access for "originating signalling" is granted on the current cell or when the UE moves to a cell where access for "originating signalling" is granted.

 In NB-S1 mode, if access is barred for "originating signalling" (see 3GPP TS 36.331 [22]), the tracking area updating procedure shall not be started. The UE stays in the current serving cell and applies the normal cell reselection process. Further UE behaviour is implementation specific, e.g. the tracking area updating procedure is started again after an implementation dependent time.

 In NB-S1 mode, if access is barred for "originating signalling" (see 3GPP TS 36.331 [22]), a request for an exceptional event is received from the upper layers, then the tracking area updating procedure shall be started.

NOTE 1: In NB-S1 mode, the EMM layer cannot receive the access barring alleviation indication from the lower layers (see 3GPP TS 36.331 [22]).

 If access is barred because of access class barring for "originating signalling" (see 3GPP TS 36.331 [22]) and if:

- one of the MO MMTEL voice call is started, MO MMTEL video call is started or MO SMSoIP is started conditions is satisfied;

- the upper layers request to send a mobile originated SMS over NAS or SMS over S102; or

- the upper layers request user plane radio resources, ACDC is applicable to the request and the UE supports ACDC.

 then the tracking area updating procedure shall be started according to subclause 5.5.3.2.2. The call type used shall be per annex D of this document.

NOTE 2: If more than one of MO MMTEL voice call is started, MO MMTEL video call is started or MO SMSoIP is started conditions are satisfied, it is left to UE implementation to determine the call type based on Annex D of this document.

 If access is barred for a certain ACDC category (see 3GPP TS 36.331 [22]), and if the upper layers request user plane radio resources for a higher ACDC category and the UE supports ACDC, then the tracking area updating procedure shall be started according to subclause 5.5.3.2.2.

 If an access request for an uncategorized application is barred due to ACDC (see 3GPP TS 36.331 [22]), and if the upper layers request user plane radio resources for a certain ACDC category and the UE supports ACDC, then the tracking area updating procedure shall be started according to subclause 5.5.3.2.2.

 If the trigger for the tracking area updating procedure is the response to a paging request from the network and the NAS signalling connection establishment is rejected by the network, the tracking area updating procedure shall not be started. The UE stays in the current serving cell and applies normal cell reselection process. The tracking area updating procedure may be started if it is still necessary when access for "terminating calls" is granted or because of a cell change.

b) Lower layer failure or release of the NAS signalling connection without "Extended wait time" and without "Extended wait time CP data" received from lower layers before the TRACKING AREA UPDATE ACCEPT or TRACKING AREA UPDATE REJECT message is received

 The tracking area updating procedure shall be aborted, and the UE shall proceed as described below.

c) T3430 timeout

 The UE shall abort the procedure. The NAS signalling connection, if any, shall be released locally.

NOTE 3: The NAS signalling connection can also be released if the UE deems that the network has failed the authentication check as specified in subclause 5.4.2.7.

 The UE shall proceed as described below.

d) TRACKING AREA UPDATE REJECT, other causes than those treated in subclause 5.5.3.2.5, and cases of EMM cause values #22, #25 and #31, if considered as abnormal cases according to subclause 5.5.3.2.5

 If the tracking area updating request is not for initiating a PDN connection for emergency bearer services, upon reception of the EMM causes #95, #96, #97, #99 and #111 the UE should set the tracking area updating attempt counter to 5.

 The UE shall proceed as described below.

e) Change of cell into a new tracking area

 If a cell change into a new tracking area occurs before the tracking area updating procedure is completed, the tracking area updating procedure shall be aborted and re-initiated immediately. The UE shall set the EPS update status to EU2 NOT UPDATED.

 The UE shall proceed as described below.

f) Tracking area updating and detach procedure collision

 EPS detach containing detach type "re-attach required" or "re-attach not required":

 If the UE receives a DETACH REQUEST message before the tracking area updating procedure has been completed, the tracking area updating procedure shall be aborted and the detach procedure shall be progressed. If the DETACH REQUEST message contains detach type "re-attach not required" and EMM cause #2 "IMSI unknown in HSS", the UE will follow the procedure as described below for the detach type "IMSI detach".

 EPS detach containing detach type "IMSI detach":

 If the UE receives a DETACH REQUEST message before the tracking area updating procedure has been completed, the DETACH REQUEST message shall be ignored and tracking area updating procedure shall be progressed.

 The UE shall proceed as described below.

g) Tracking area updating and GUTI reallocation procedure collision

 If the UE receives a GUTI REALLOCATION COMMAND message before the tracking area updating procedure has been completed, this message shall be ignored and the tracking area updating procedure shall be progressed.

h) Transmission failure of TRACKING AREA UPDATE REQUEST message indication from lower layers

 The tracking area updating procedure shall be aborted and re-initiated immediately. The UE shall set the EPS update status to EU2 NOT UPDATED.

i) Transmission failure of TRACKING AREA UPDATE COMPLETE message indication with TAI change from lower layers

 If the current TAI is not in the TAI list, the tracking area updating procedure shall be aborted and re-initiated immediately. The UE shall set the EPS update status to EU2 NOT UPDATED.

 If the current TAI is still part of the TAI list, it is up to the UE implementation how to re-run the ongoing procedure.

j) Transmission failure of TRACKING AREA UPDATE COMPLETE message indication without TAI change from lower layers

 It is up to the UE implementation how to re-run the ongoing procedure.

k) "Extended wait time" from the lower layers

 If the TRACKING AREA UPDATE REQUEST message contained the low priority indicator set to "MS is configured for NAS signalling low priority", the UE shall start timer T3346 with the "Extended wait time" value and reset the tracking area updating attempt counter.

 If the TRACKING AREA UPDATE REQUEST message did not contain the low priority indicator set to "MS is configured for NAS signalling low priority", the UE is operating in NB-S1 mode and the UE is not a UE configured to use AC11 – 15 in selected PLMN, then the UE shall start timer T3346 with the "Extended wait time" value and reset the tracking area updating attempt counter.

 In other cases the UE shall ignore the "Extended wait time".

 The UE shall abort the tracking area updating procedure, stay in the current serving cell, set the EPS update status to EU2 NOT UPDATED, change the state to EMM-REGISTERED.ATTEMPTING-TO-UPDATE and apply the normal cell reselection process.

 If the UE had used eDRX before initiating tracking area updating procedure, then the UE shall continue to use the eDRX with the extended DRX parameters IE received during the last attach or tracking area updating procedure.

 The UE shall proceed as described below.

ka) "Extended wait time CP data" from the lower layers

 If the UE is operating in NB-S1 mode and supports the timer T3448, the UE shall start the timer T3448 with the "Extended wait time CP data" value. If the UE is operating in NB-S1 mode and does not support the timer T3448, the UE shall start the timer T3346 with the "Extended wait time CP data" value and reset the tracking area updating attempt counter.

 In other cases the UE shall ignore the "Extended wait time CP data".

 The UE shall abort the tracking area updating procedure, stay in the current serving cell, set the EPS update status to EU2 NOT UPDATED, change the state to EMM-REGISTERED.ATTEMPTING-TO-UPDATE and apply the normal cell reselection process.

 If the UE had used eDRX before initiating tracking area updating procedure, then the UE shall continue to use the eDRX with the extended DRX parameters IE received during the last attach or tracking area updating procedure.

 The UE shall proceed as described below.

l) Timer T3346 is running

 The UE shall not start the tracking area updating procedure unless:

- the UE is in EMM-CONNECTED mode;

- the UE received a paging;

- the UE is a UE configured to use AC11 – 15 in selected PLMN;

- the UE has a PDN connection for emergency bearer services established or is establishing a PDN connection for emergency bearer services;

- the UE is requested by the upper layer for a CS fallback for emergency call or a 1xCS fallback for emergency call;

- the UE in NB-S1 mode is requested by the upper layer to transmit user data related to an exceptional event and

i) the UE is allowed to use exception data reporting (see the ExceptionDataReportingAllowed leaf of the NAS configuration MO in 3GPP TS 24.368 [15A] or the USIM file EFNASCONFIG in 3GPP TS 31.102 [17]); and

ii) timer T3346 was not started when NAS signaling connection was established with RRC establishment cause set to "MO exception data"; or

- the UE has a PDN connection established without the NAS signalling low priority indication or is establishing a PDN connection without the NAS signalling low priority indication, the timer T3402 and the timer T3411 are not running and the timer T3346 was started due to rejection of a NAS request message (e.g. ATTACH REQUEST, TRACKING AREA UPDATE REQUEST or EXTENDED SERVICE REQUEST) which contained the low priority indicator set to "MS is configured for NAS signalling low priority".

 The UE stays in the current serving cell and applies the normal cell reselection process.

NOTE 4: It is considered an abnormal case if the UE needs to initiate a tracking area updating procedure while timer T3346 is running independent on whether timer T3346 was started due to an abnormal case or a non successful case.

 If the TAI of the current serving cell is not included in the TAI list or the TIN indicates "P-TMSI", the UE shall set the EPS update status to EU2 NOT UPDATED and change to state EMM-REGISTERED.ATTEMPTING-TO-UPDATE.

 If the tracking area updating procedure needs to be initiated for an MO MMTEL voice call is started, then a notification that the procedure was not initiated due to network congestion shall be provided to upper layers.

NOTE 5: This can result in the upper layers requesting establishment of the originating voice call on an alternative manner e.g. requesting establishment of a CS voice call (see 3GPP TS 24.173 [13E]).

 The UE shall proceed as described below.

la) Timer T3448 is running

 The UE shall not start the tracking area updating procedure with the "signalling active" flag set, unless:

- the UE is a UE configured to use AC11 – 15 in selected PLMN;

- the UE which is only using EPS services with control plane CIoT EPS optimization received a paging; or

- the UE in NB-S1 mode is requested by the upper layer to transmit user data related to an exceptional event and the UE is allowed to use exception data reporting (see the ExceptionDataReportingAllowed leaf of the NAS configuration MO in 3GPP TS 24.368 [15A] or the USIM file EFNASCONFIG in 3GPP TS 31.102 [17]).

 The UE stays in the current serving cell and applies the normal cell reselection process.

 The UE shall proceed as described below.

m) Mobile originated detach required

 Detach due to removal of USIM or due to switch off:

 The tracking area updating procedure shall be aborted, and the UE initiated detach procedure shall be performed.

 Detach not due to removal of USIM and not due to switch off:

 The UE initiated detach procedure shall be initiated after successful completion of the tracking area updating procedure.

o) Timer T3447 is running

 The UE shall not start the tracking area updating procedure with the "signalling active" flag set or the "active" flag set, unless:

- the UE received a paging;

- the UE is a UE configured to use AC11 – 15 in selected PLMN;

- the UE has a PDN connection for emergency bearer services established or is establishing a PDN connection for emergency bearer services;

 The UE stays in the current serving cell and applies the normal cell reselection process. The tracking area update request procedure is started, if still necessary, when timer T3447 expires.

p) Tracking area updating and paging procedure collision

 If the UE receives a CS SERVICE NOTIFICATION message before the tracking area updating procedure has been completed, the UE shall progress the tracking area updating procedure and respond to the CS SERVICE NOTIFICATION upon successful completion of the tracking area updating procedure.

For the cases b, c, d, e, f with detach type "re-attach required" or "re-attach not required" with EMM cause other than #2 "IMSI unknown in HSS", k and ka, the UE shall stop any ongoing transmission of user data.

For the cases b, c, d, k, ka, l and la, the UE shall proceed as follows:

 Timer T3430 shall be stopped if still running.

 For the cases b, c, d, la k when the "Extended wait time" is ignored, and ka when the "Extended wait time CP data" is ignored, if the tracking area updating request is not for initiating a PDN connection for emergency bearer services, the tracking area updating attempt counter shall be incremented, unless it was already set to 5.

 If the tracking area updating attempt counter is less than 5, the TAI of the current serving cell is included in the TAI list, the EPS update status is equal to EU1 UPDATED, the TIN does not indicate "P-TMSI" and the tracking area updating procedure is performed not due to an inter-system change from N1 mode to S1 mode and the tracking area updating procedure is not performed due to cases g, m, n, za, zc in subclause 5.5.3.2.2:

 the UE shall keep the EPS update status to EU1 UPDATED and enter state EMM-REGISTERED.NORMAL-SERVICE. The UE shall start timer T3411.

 If in addition the TRACKING AREA UPDATE REQUEST indicated "periodic updating" or if tracking area updating procedure was initiated to recover NAS signalling connection due to "RRC Connection failure" from the lower layers, none of the other reasons for initiating the tracking area updating procedure listed in subclause 5.5.3.2.2 was applicable, and the TRACKING AREA UPDATE REQUEST message did not include T3324 value IE, T3412 extended value IE or Extended DRX parameters IE, the timer T3411 may be stopped when the UE enters EMM-CONNECTED mode.

 If timer T3411 expires the tracking area updating procedure is triggered again.

 If the tracking area updating attempt counter is less than 5, and the TAI of the current serving cell is not included in the TAI list or the EPS update status is different to EU1 UPDATED or the TIN indicates "P-TMSI" or the tracking area updating procedure is performed due to an inter-system change from N1 mode to S1 mode or if the tracking area updating procedure is performed due to cases g, m, n, za, zc in subclause 5.5.3.2.2:

- for the cases k and l, the tracking area updating procedure is started, if still necessary, when timer T3346 expires or is stopped.

- for the case ka, if timer T3346 is started, the tracking area updating procedure is started, if still necessary, when timer T3346 expires or is stopped.

- for the case ka, if timer T3448 is started and the "signalling active" flag is set in the TRACKING AREA UPDATE REQUEST message, the tracking area updating procedure is started, if still necessary, when timer T3448 expires or is stopped.

- for the case la, if the "signalling active" flag is set in the TRACKING AREA UPDATE REQUEST message, the tracking area updating procedure is started, if still necessary, when timer T3448 expires or is stopped.

- for the cases b, c, d, k when the "Extended wait time" is ignored, and ka when the "Extended wait time CP data" is ignored, if the tracking area updating request is not for initiating a PDN connection for emergency bearer services, the UE shall start timer T3411, shall set the EPS update status to EU2 NOT UPDATED and change to state EMM-REGISTERED.ATTEMPTING-TO-UPDATE. When timer T3411 expires the tracking area updating procedure is triggered again.

 If A/Gb mode or Iu mode is supported by the UE, the UE shall in addition handle the GPRS update status as specified in 3GPP TS 24.008 [13] for the abnormal case when a normal or periodic routing area updating procedure fails and the routing area updating attempt counter is less than 5 and the GPRS update status is different from GU1 UPDATED.

 If the UE is operating in single-registration mode, the UE shall in addition handle the 5GS update status as specified in 3GPP TS 24.501 [54] for the abnormal cases when a registration procedure for mobility and periodic registration fails and the registration attempt counter is less than 5 and the 5GS update status is different from 5U1 UPDATED.

 If the tracking area updating attempt counter is equal to 5:

- the UE shall start timer T3402, shall set the EPS update status to EU2 NOT UPDATED;

- the UE shall delete the list of equivalent PLMNs and shall change to state EMM-REGISTERED.ATTEMPTING-TO-UPDATE or optionally to EMM-REGISTERED.PLMN-SEARCH in order to perform a PLMN selection according to 3GPP TS 23.122 [6]; and

- if A/Gb mode, Iu mode or N1 mode is supported by the UE:

- if A/Gb mode or Iu mode is supported by the UE, the UE shall in addition handle the GPRS update status as specified in 3GPP TS 24.008 [13] for the abnormal case when a normal or periodic routing area updating procedure fails and the routing area updating attempt counter is equal to 5;

- if the UE is operating in single-registration mode, the UE shall in addition handle the 5GS update status as specified in 3GPP TS 24.501 [54] for the abnormal case when a registration procedure for mobility or periodic registration update performed over 3GPP access fails and the registration attempt counter is equal to 5; and

- if the UE does not change to state EMM-REGISTERED.PLMN-SEARCH, the UE shall attempt to select GERAN. UTRAN or NG-RAN radio access technology.

 If a GERAN or UTRAN cell is selected:

- a UE in PS mode 1 or PS mode 2 of operation shall proceed with appropriate GMM specific procedures;

- a UE in CS/PS mode 1 or CS/PS mode 2 of operation shall proceed with appropriate MM or GMM specific procedures.

 If an NG-RAN cell is selected, the UE shall proceed with appropriate 5GMM specific procedures.

 Additionally, the UE may disable the E-UTRA capability as specified in subclause 4.5.

\*\*\*\*\* End of changes \*\*\*\*\*