**3GPP TSG-RAN WG2 Meeting # *R2-2505221***

**Bengaluru, India, Aug 25th –**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.300** | **CR** | **1004** | **rev** |  | **Current version:** |  |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | Introduction of UAV mobility enhancements [UAV\_Mobility] | | | | | | | | | |
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| ***Source to WG:*** | CATT, NTT DOCOMO, LG Electronics Inc., Kyocera, LGU+, China Telecom, NEC, SK Telecom, Qualcomm Incorporated, Ericsson, Nokia | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | 19 | | | | |  | ***Date:*** | | | 2025-08-15 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | |  |
|  | *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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
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| ***Reason for change:*** | | To introudce CHO enhancement and idle/inactive enhancement for UAV | | | | | | | | |
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| ***Summary of change:*** | | To support the following mobility enhancements for UAV:   1. Altitude based CHO events 2. Altitude based SSB measurement for idle/inactive UE 3. UAV dedicated frequency for cell reselection | | | | | | | | |
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| ***Consequences if not approved:*** | | CHO enhancement and idle/inactive enhancement are not supported for UAV. | | | | | | | | |
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| ***Clauses affected:*** | | 16.8.4, 16.18.X, 16.18.Y | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 38.306 CR 1319  TS 38.304 CR 0439  TS 38.331 CR 6399 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

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| CHANGE START |

## 16.18 Support for Aerial UE Communication

### 16.18.1 General

NR connectivity for UEs capable of Aerial communication is supported via the following functionalities:

- subscription-based Aerial UE identification and authorization, as specified in TS 23.502 [22], clause 5.2.3.3.1;

- altitude reporting based on the measurement event(s) where the UE's altitude has crossed a network-configured reference altitude threshold;

- altitude-dependent configurations which apply only to specific altitude regions;

- interference detection based on a measurement reporting that is triggered when a configured number of cells (i.e. larger than one) fulfils the triggering criteria simultaneously;

- signalling of flight path information from UE to NG-RAN and from the source gNB to target gNB during handover;

- location information reporting, including UE's horizontal and vertical velocity;

- transmitting of BRID and DAA messages via PC5 interface.

### 16.18.2 Subscription-based Identification of Aerial UE

Support for Aerial UE functions is stored in the user's subscription information in UDM. UDM transfers this information to the AMF during Registration, Service Request and Mobility Registration Update procedures.

The Aerial UEsubscription information can be provided by the AMF to the NG-RAN node via the NGAP INITIAL CONTEXT SETUP REQUEST message during the Registration, Mobility Registration Update and Service Request procedures. The subscription information can also be updated via the NGAP UE Context Modification procedure and NGAP Path Switch Request procedure. In addition, for Xn-based handover, the source NG-RAN node can include the Aerial UEsubscription information in the XnAP HANDOVER REQUEST message and RETRIEVE UE CONTEXT RESPONSE message to the target NG-RAN node.

For intra- and inter-AMF NG-based handover, the AMF provides the Aerial UEsubscription information to the target NG-RAN node after the handover procedure.

### 16.18.3 Altitude-based Reporting for Aerial UE Communication

An Aerial UE can be configured with altitude-dependent, event-based measurement reporting (i.e., *eventH1* and *eventH2* as defined in TS 38.331 [12]). An Aerial UE sends a measurement report when its altitude becomes higher or lower than configured threshold. The UE includes its altitude and location information in the measurement report if configured to do so by NG-RAN.

The Aerial UE can also be configured to trigger measurement reporting only when both an altitude-dependent condition and an RSRP/RSRQ/SINR-based condition are met (i.e., *eventA3H1*, *eventA3H2*, *eventA4H1*, *eventA4H2*, *eventA5H1* and *eventA5H2* in TS 38.331 [12], commonly denoted as *eventAxHy*). For the content of *eventAxHy* measurement report, the same rules as described above for *eventH1* and *eventH2* apply.

### 16.18.4 Altitude-dependent Configurations for Aerial UE Communication

An Aerial UE can be configured with multiple altitude-dependent configurations, each of which is applied in its corresponding altitude range. Altitude-dependent configurations can be provided independently in measurement object (i.e. *SSB-ToMeasureAltitudeBased* in TS 38.331 [12]) and an Aerial UE uses those when in RRC\_CONNECTED. Altitude-dependent measurement configurations can also be provided independently in SIB2 and/or SIB4 (i.e. *SSB-ToMeasureAltitudeBased* in TS 38.331 [12]) and an Aerial UE uses those when in RRC\_IDLE or RRC\_INACTIVE.

### 16.18.5 Interference Detection and Mitigation for Aerial UE Communication

For interference detection, an Aerial UE can be configured with RRM event A3, A4, A5 or AxHy that triggers measurement report when individual (per cell) RSRP/RSRQ/SINR values (for events A3, A4, A5) or RSRP/RSRQ/SINR and measured Aerial UE's altitude (for events AxHy) for a configured number of cells fulfil the configured event. Once such condition is met and a measurement report is sent, the list of triggered cells is updated when subsequent cell(s) fulfil the event. However, further measurement reports are not sent while the list of triggered cells remains larger than or equal to the configured number of cells unless *reportOnLeave* is configured (see TS 38.331 [12] for details).

### 16.18.6 Flight Path Information Reporting for Aerial UE Communication

NG-RAN can request the Aerial UE to report flight path information based on the indication from the Aerial UE that flight path information is available or without such indication from the Aerial UE. Flight path information consists of a number of waypoints defined as 3D locations, as defined in TS 37.355 [43]. Aerial UE reports up to a configured number of waypoints if flight path information is available at the UE. The report can also contain a time stamp per waypoint if configured by the NG-RAN and if available at the UE.

The flight path information can be also provided by the source gNB to the target gNB during handover. If configured by the NG-RAN and if the associated distance- or time-based condition (see *flightPathUpdateDistanceThr* and *flightPathUpdateTimeThr* in TS 38.331 [12], respectively) for indication reporting are met for any of the waypoints, the Aerial UE indicates the availability of the updated flight path information. The Aerial UE can also indicate the availability of the updated flight path information if a new waypoint has been added or if a future waypoint has been removed from the flight path information.

### 16.18.7 Location Reporting for Aerial UE Communication

Location information for Aerial UE communication can include horizontal and vertical speed if configured. Location information can be included in RRM report and in altitude-based reporting (as described in 16.18.3).

### 16.18.8 BRID and DAA Support via A2X Communication

The Aerial UE supports A2X communication, as defined in 3.2. BRID relies on broadcasting while DAA can be provided either via unicast or broadcast transmissions in NR sidelink. BRID and DAA message transmission is supported in both in-coverage and out-of-coverage scenarios and relies on UE autonomous resource selection for NR sidelink communication.

BRID and DAA follow the QoS framework defined for NR sidelink and dedicated A2X PQI values are specified in table 6.2.4.1-1 of TS 23.256 [60]. The NG-RAN can configure separate SL Tx resource pool(s) for BRID and/or DAA. The procedure for SL Tx pool selection for A2X is described in TS 38.321 [6], clause 5.22.

### 16.18.X Altitude-based CHO for Aerial UE Communication

An Aerial UE can be configured to trigger CHO execution only when both an altitude-dependent condition and an RSRP/RSRQ/SINR-based condition are met (i.e., *condEventA3H1*, *condEventA3H2*, *condEventA5H1* and *condEventA5H2* in TS 38.331 [12], commonly denoted as *condEventAxHy*).

### 16.18.Y UAV frequency prioritized cell reselection for Aerial UE Communication

UAV dedicated frequency can be indicated via SIB2 and/or SIB4, an Aerial UE may consider the cell reselection priority of the UAV frequency is higher than other frequencies. Optionally, an altitude range can be configured by network, and the Aerial UE may only consider the cell reselection priority of the UAV frequency is higher than other frequencies when it is within this altitude range.

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| CHANGE END |