**3GPP TSG RAN Meeting #103 RP-240031**

**Maastricht, Netherlands, March 18-21, 2024**

*SA WG2 Meeting #S2-161 S2-2403859*

*26 February - 1 March, 2024, Athens, Greece*

**Title: Clarification on the requirements for NTZ**

**Response to: -**

**Release: Rel-19**

**Work Item: FS\_UAS\_Ph3**

**Source: SA WG2**

**To: RAN WG2, RAN**

**CC: RAN WG1, RAN WG3**

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**Attachments: -**

# 1 LS to RAN1

# 1 Overall description

Based on RAN LS RP-231485, SA2 has initiated feasibility study on how to support UAVs and their operation on No-Transmit Zones (NTZs) under the Study on Phase 3 for UAS, UAV and UAM (FS\_UAS\_Ph3: TR 23.700-59). During the initial discussions and potential solutions, SA2 has encountered some difficulties on how to interpret the ECC decision and its implications to the overall 3GPP system, including RAN. SA2 believes that understanding the regulatory requirements that is dependent on RAN area of expertise will require sharing understanding between SA2 and relevant RAN WGs. In addition, SA2 requests any input from RAN WGs regarding potential conclusions/assumptions RAN may have taken when the initial considerations were made by RAN during/at the end of Rel-18.

[Story of RAN2 status –

RAN would like to thank SA2 for their LS. RAN would like to clarify that the operation on No-Transmit Zone was not in scope Rel-18 UAV work. Furthermore, currently RAN doesn’t have a Rel-19 WI on UAV or on NTZ’s operation. Approval of new Rel-19 RAN work are planned to be discussed in RAN105, at which point a new Rel-19 WI/SI NTZ operation may be discussed. Therefore, RAN hasn’t yet discussed any technical details or reached consensus on technical issues and requirements.

No Rel18 work

No WI for Rel-19 yet. Any possible new RAN2 WI may be discussed in RAN 105…etc]

In addition, various companies have expressed differing views regarding how to interpret NTZ and its impacts on UAVs ability to get any access/uplink connection (including attempting to Register) to the network from within/near/edge of an NTZ.

Other questions/issues discussed in SA2 are:

1. As per the ECC ruling, UAV UE(s) need to comply with NTZ restrictions (i.e. no-transmit zones for spectrum compatibility purposes when aerial UE (UAV) operating in the relevant frequency bands) based on its location in and around any NTZ-applicable area. What is the expectation/assumption, if any, RAN may have regarding per UE level or RAN node level NTZ information needed to enforce/apply NTZ?

**Answer**: As mentioned, RAN doesn’t have a WI approved for this topic to discuss and has not yet discussed technical details and requirements. Therefore, at this point in time RAN doesn’t have any expectations/assumptions.

From RAN perspective, it is not clear whether RAN needs to be involved in enforcing the regulation and whether it is RAN’s responsibility to enforce/apply NTZ regulation.]

[responsibility/requirement]

Nokia – assuming implicitly that RAN node will enforce and apply. There is no assumption or agreement that RAN node will enforce

LG – the question is it per UE or for all UEs

Huawei – thinks that this has to be per UE. Every UE needs to be notified or aware, so question is whether there is an additional RAN level control.

Whether should RAN enforce?

- what regulation does RAN need to enforce

- Does regulation require the system to enforce this?

Granularity of the signaling

[RAN doesn’t have any expectation/assumption yet as we have not yet discussed technical details, the requirements are not clear and further information is required.

It is not clear whether RAN needs to be involved in enforcing the regulation and whether it is RAN’s resposnsibility?]

If there is RAN involvement, we would assume that every UAV UE should be aware of the NTZ information].

[Potential question to ECC] – can NTZ be per UE?

1. Is RAN WG(s) planning to consider potentially how to restrict UAV UE’s initial cell connection if a cell is operating in the NTZ area (e.g. for Pre-Rel19 UAV UEs, and Rel-19 UAV UEs which do not have the latest/updated NTZ information)?

[**Answer:** Even though there is no Rel-19 WID plan yet, RAN assumes the delivery of the NTZ information can be done via non-3GPP approach for Pre-Rel-19 aerial UEs. RAN assumes that if the UE is expected to follow the regulation, the UE shall ensure it does not operate without valid NTZ information. ]

[RAN has not plan, however:

assume legacy is done outside of 3GPP – ZTE response]

[We assume UE would have the latest NTZ information and if the UE is expected to follow the regulation, it should have the latest NTZ information]

1. Is RAN WG(s) planning to investigate what and if any kind of information may be needed from 5GC to enable any such control?

[**Answer:** As previously discussed, RAN doesn’t have an agreed plan on what would need to be investigated and what kind of information may be needed to enable such control. The requirement on what type of control and from what entity would need to be further clarified.]

We have no plan as of Now.

[requirement/responsibility]

1. Is RAN WG(s) planning to implement any reporting of spurious UAV UE (those who do not follow frequency restrictions)? Can SA2 assume that RAN have ability of height detection mechanism to know at which height the UAV UE is operating, and if a certain frequency is restricted at a certain height, it can be reported to the core network or UAV UE.

**Answer:** Since we haven’t started any Rel-19 WI we do not have an agreed plan or consensus whether there will be any reporting of spurious UAV UEs.

Regarding ability of height detection mechanism, from Rel-18, a UAV UE is supposed to know its height. However, the RAN Nodes have limited knowledge in time and space on UE’s height and/or position, and such knowledge depend on UE reporting and supported capabilities.

[height detection – UE knows it’s height (Whether RAN can report for discussion and whether RAN knows UE height )]

We are not planning anything

[As of Rel-18RAN doesn’t have enough information to enforce/police the UE, even if RAN will be asked to enforce police, the feasibility is not clear?]

**To be added at the end**

[In general, as of Rel-18 RAN doesn’t have enough information to enforce/apply NTZs to UAV UEs, and would like to further understand the requirements. If RAN will be asked to enforce/apply these restrictions, the feasibility and complexity of solution will need to be further discussion in RAN WGs.]

SA2 assumes as the ECC report suggests, no base station coverage planning change is required for this.

[RAN confirms this assumption]

SA2 welcomes any feedback, even if RAN WGs may not be able to respond to all the questions raised by SA2 at the same time.

Think of additional possible questions:

Does the RAN need the knowledge of NTZ – no need to ask this yet?

Last thing to consider and feedback from company:

**Should we ask SA2 whether**: we need to consider the different type of UEs having different NTZ regulation

# 2 Actions

**To TSG RAN, RAN WG2**

**ACTION:** SA WG2 requests feedback/information regarding the questions above, or to inform SA2 if SA2 should proceed making their own assumptions and RAN WGs will align accordingly. The target completion date of FS\_UAS\_Ph3 is June 2024 and Rel-19 Stage 2 is planned to be frozen at December 2024, therefore, feedback/information from RAN and RAN WG2 considering these timelines would be appreciated.

# 3 Dates of next TSG SA WG2 meetings

SA2#162 2024-04-15 – 2024-04-19 Changsha, CN

SA2#163 2024-05-27 – 2024-05-31 Jeju, KR