3GPP TSG-RAN WG2 Meeting #109e R2-200xxxx

Online, 24 February – 6 March 2020

**Agenda item: 4.1**

**Source: Huawei (offline email discussion rapporteur)**

**Title: Report of [AT109e][303][NBIOT R15] System support for Wake Up Signal (Huawei)**

**Document for: Report**

# 1 Scope of the offline email discussion

This document contains the summary of the offline email discussion “[AT109e][303][NBIOT R15] System support for Wake Up Signal (Huawei)”, as indicated below:

* [AT109e][303][NBIOT R15] System support for Wake Up Signal (Huawei)

Scope: Discuss and review the CRs

Intended outcome: Agreeable CRs, or decision to e.g. postpone/not agree.

Deadline: 06-03-2020, 12:00 CET

Timeline:

* + - Companies input: Wednesday, Mar 04th 12:00 CET
    - Rapporteur summary and updated CRs (if needed): Wednesday, Mar 04th 17:00 CET
    - Wording comment, if any, on updated CRs: Thursday, Mar 05th 12:00 CET
    - Final check, including shadow CR, e-mail discussion stops, Mar 06th 12:00 CET

# 2 Offline email discussion

[R2-2000809](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e\Docs\R2-2000809.zip) System support for Wake Up Signal Huawei, HiSilicon CR Rel-15 36.300 F

Companies are requested to provide comments in the table below (one row for each new comment to better keep track of the discussion – please don’t edit the previous comments).

|  |  |  |
| --- | --- | --- |
| **Company** | **Do you agree with the intent of the CR?** | **Detailed comments** |
| Qualcom | **Yes** | Think this CR should be checked by RAN3 before agreeing as it has impact on RAN3 specifications too. |
| Apple | **Yes** |  |
| Nokia | **No** | If eNB can avoid scheduling WUS in other cells than last connected cells, this will be sufficient to solve the problem. Disabling WUS on moving out to neighbour cells will lead to the UE false-wake-up in neighbouring cells for paging in these cells whereas UE is not expected to receive any paging in this cell. We propose to discuss the above impact before conclusion. |
| NTT DOCOMO, Inc. | **Yes** | SA2 asked both RAN2 and RAN3 to take the information in the LS In into account, so we have the same view as Qualcomm.  However, RAN3 is likely already aware of this, since there’s a 36.413 CR under “Other specs” in this CR (the CR number for the 36.413 CR is xxxx, though). We assume that on that 36.413 CR, R2-2000809 is properly referenced. |
| Thales | **Yes** | We agree on the principle, i.e. if UE’s last used cell ID is known and indicated in the S1-AP message from MME, the eNB shall use WUS only in said last used cell.  The absence of cell ID in the S1-AP message should occur in error case only, which is our interpretation of, information is included whenever the MME has this information available. As this leads to multi-cell WUS usage.  However, in the CR it should be clarified, that a UE re-selecting to another cell, camping, monitoring, etc can, after another re-selection to the “last used cell”, resume monitoring WUS only. But in case it restarts monitoring in the time between WUS and the paging occasion (PO) the UE needs to monitor said coming POs directly.  - The UE only monitors WUS in the cell where it was last released; unless it missed monitoring WUS and the UE needs to **monitor POs** untill start of next WUS or PTW ends, whichever is earlier. |

Conclusion: TBC

Proposal: TBC

[R2-2000638](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e\Docs\R2-2000638.zip) System support for Wake Up Signal Huawei, HiSilicon CR Rel-15 36.304 F

Companies are requested to provide comments in the table below (one row for each new comment to better keep track of the discussion – please don’t edit the previous comments).

|  |  |  |
| --- | --- | --- |
| **Company** | **Do you agree with the intent of the CR?** | **Detailed comments** |
| Qualcomm | **Yes** | We think the wording in the CR should be changed to  The SA2 mechanism requires network to use WUS only in the cell where core network had S1 connection for the UE. This implies this is the last cell where UE was in NAS CONNECTED mode. Therefore we propose the following changes.  Cover sheet changes:  “Specify that the UE monitors WUS ~~camping~~ only when **camping** in the cell it was last connected to **core network**.  CR changes:  “When the UE supports WUS and is camping on the cell where it last left EMM-CONNECTED mode (see TS 24.301 [16]) (NOTE) and WUS configuration is provided in system information, the UE shall monitor WUS using the WUS parameters provided in System Information. When DRX is used and the UE detects WUS the UE shall monitor the following PO. When extended DRX is used and the UE detects WUS the UE shall monitor the following *numPOs* POs or until a paging message including the UE's NAS identity is received, whichever is earlier. If the UE does not detect WUS the UE is not required to monitor the following PO(s). If the UE missed a WUS occasion (e.g. due to cell reselection), it monitors every PO until the start of next WUS or until the PTW ends, whichever is earlier.  NOTE: UE may have beenin EMM-CONNECTED mode because of RRC connection establishment, RRC connenction resumption or EDT  ” |
| Apple | **Yes** | Should the Cover sheet change be rephrased as  “Specify that the UE monitors WUS ~~camping~~ only when **camping back** in the cell **where** it was last connected to **a** **core network**. |
| Nokia | **No** | Same as above. |
| NTT DOCOMO, Inc. | **Yes** | The SA2 CR (S2-2002119) uses the following wording:  “…the use of WUS by the UE is restricted (in this release) to the cell in which the UE’s RRC connection was last released.”  That seems to imply just RRC\_CONNECTED mode. Shouldn’t the RAN2 CR and the SA2 CR use similar wording? If so, we could just swap out EMM-CONNECTED for RRC\_CONNECTED in Qualcomm’s suggestion above.  Combining Qualcomm’s and Apple’s suggestions, we think that the following might be more readable on the cover sheet:  “Specify that the UE monitors WUS ~~camping~~ only when **camping** in the cell **where** it was last connected to **a** **core network**.  We also thought about whether or not the note from Qualcomm is necessary, and in the end it could be useful for clarification. Tidying it up a little bit as follows:  NOTE: UE may have been in RRC\_CONNECTED mode because of RRC connection establishment, RRC connection resumption or EDT. |
| Thales | **Yes** | Monitoring WUS only in last connected cell is fine, but when monitoring is restarted in the time between WUS and the paging occasion (PO) the UE needs to monitor said coming POs till next WUs or PTW ends..  Cover sheet changes:  “Specify that the UE **can** monitor WUS ~~camping~~ only, when **camping** in the cell **where** it was last connected to **a** **core network.**  In case of **camping back** on said cell, **in the time between WUS and the paging occasion (PO)** the UE needs to **monitor POs** untill start of next WUS or PTW ends, whichever is earlier. |

Conclusion: TBC

Proposal: TBC

# 3 Conclusions

**Conclusions:**

TBC

**Agreed CRs:**

TBC –agreed Rel-15 CRs and shadow Rel-16 CR (with Tdoc numbers).

# 4 List of referenced documents

[1] [R2-2000638](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e\Docs\R2-2000638.zip) System support for Wake Up Signal Huawei, HiSilicon CR Rel-15 36.304 15.5.0 0779 - F NB\_IOTenh2-Core, LTE\_eMTC4-Core

[2] [R2-2000809](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e\Docs\R2-2000809.zip) System support for Wake Up Signal Huawei, HiSilicon CR Rel-15 36.300 15.8.0 1264 - F NB\_IOTenh2-Core, LTE\_eMTC4-Core

[3] [R2-2000810](http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_109_e\Docs\R2-2000810.zip) System support for Wake Up Signal Huawei, HiSilicon CR Rel-16 36.300 16.0.0 1265 - A NB\_IOTenh2-Core, LTE\_eMTC4-Core