**Comments on ECC Deliverable**

**“Draft ECC Report 358”**

**1 Sources**

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**2 General Comments**

**3 Proposals related to the ECC Deliverables**

| **Comment number** | **Section number**  **Clause** | **Paragraph**  **Figure**  **Table** | **Type of comment**  (General,  Technical or  Editorial) | **Comment** | **Proposed change** |
| --- | --- | --- | --- | --- | --- |
| ER/1 | 0 | Synchronisation of WBB LMP | General | Adding some details on DECT functionality. Ref section 6.4.3.1 (last para) of draft report. | **Current text:** “To note, two WBB LMP technologies have been considered, one based on 3GPP technical specifications and the other based on DECT-2020 NR technical specifications. While both technologies can support unsynchronised operation, synchronisation between different WBB LMP can be only supported for WBB LMP based on 3GPP technical specifications. Synchronised operation of WBB LMP with MFCN below 3800 MHz is only possible for WBB LMP based on 3GPP technical specifications. The study results of these two technologies are presented separately.  **Proposed replacement text:** “To note, two WBB LMP technologies have been considered, one based on 3GPP (LTE/NR) technical specifications and the other based on DECT-2020 NR+ technical specifications. Both technologies need special arrangement/ working principle between their systems to coexist. For example for 3GPP based WBB LMP, TDD frame synchronisation between different WBB LMP systems can improve coexistence. Whereas, DECT uses Listen Before Talk (LBT) protocol and other techniques to synchronize to avoid collision with other transmissions in a network. However, these two technologies cannot synchronize with each other based on the different method used for synchronization. Synchronised operation of WBB LMP with MFCN below 3800 MHz is only possible for WBB LMP based on 3GPP technical specifications. Therefore, study results of these two technologies are presented separately.” |
| ER/2 | 0 | Power levels and antenna heights studied for WBB LMP | Editorial | Add ‘BS’ with low and medium power in the last line. | “Covering both AAS and non-AAS scenarios for medium power BS and only non-AAS for low power BS.” |
| ER/3 | 0 | Studies on WBB LMP networks with no synchronisation to other WBB LMP nor to MFCN | General | Add the proposed text in the end of 2nd para. | “However, coordination on case-by-case basis is required”. |
| ER/4 | 0 | Studies on WBB LMP networks with no synchronisation to other WBB LMP nor to MFCN | General | Replacement text for 3rd para  Study 3 shows: When the WBB LMP BS and 5G MFCN smallcell BS are deployed in the same street in outdoor area or in the same indoor area, synchronization or other coordination measures are required.  More strict Requirement for rural areas.  Separation distances are larger then cell size in study 7 considering I/N -6 criteria. | **Current text :** Some studies show that for the unsynchronised operation between 3GPP WBB LMP and MFCN (below 3.8 GHz) out of band emission and receiver blocking levels and frequency separation will reduce the need for coordination between WBB LMP and MFCN. ~~The following were investigated:~~  ~~§ 60 MHz frequency separation for WBB MP to accommodate MFCN blocking;~~  ~~§ out of band emission level of -45 dBm/MHz conducted per BS (sector) below 3800 MHz for LP and MP non-AAS BS (sector) and -45 dBm/MHz TRP per BS for MP AAS BS (sector);~~  ~~§ WBB LMP receiver blocking level of -15 dBm below 3800 MHz for wanted signal level: P\_ref\_sens +6 dB.~~  **Proposed text :** “ The studies considering unsynchronised operation between WBB LMP and MFCN (below 3.8 GHz) shows that lower out of band emission and frequency separation of at least 60 MHz can facilitate the coexistence and reduce the size of coordination distance required between the two services. However, coordination of unsynchronized WBB LMP and MFCN in all scenarios may not be possible, synchronization or other coordination measures will be required.  And remove striked text as shown above. |
| ER/5 | 0 | Adjacent channel coexistence for WBB LMP networks with synchronisation to other WBB LMP and MFCN | General | Add also AAS as highlighted yellow. | Such synchronized coexistence scenarios across the frequency band 3.4-4.2 GHz for non-AAS and AAS scenario takes part of possible coordination solutions for WBB LMP based on 3GPP technical specifications |
| ER/6 | 2.1.4 | First para, first line | General | Addition of text highlighted in yellow. | **Current text:** In this Report, a specific sub-case of semi-synchronised operation, in which only DL to UL modifications are allowed to WBB LMP network compared to MFCN network, is considered  **Proposed Text:** In this Report, a specific sub-case of semi-synchronised operation, in which only DL to UL modifications are allowed to WBB LMP network compared to MFCN network frame structure, is considered. |
| ER/7 | 2.2 | 1 | General | In the UK, a Latitude/Longitude for the BS is given in the application.  For LP the licensed area is a 50 m radius circle  For MP there does not seem to be a licensed area definition. Maybe there is.  Licensed area would be expected to be included in the license, or in some other way be publicly available. | The licensed area needs a definition which either is valid for both LP and MP, or separately defines licensed area for LP and MP. |
| ER/8 | 4.1 | Entire section | General | Table 2 refers to “[Review of the use case requirements in the 3.8-4.2 GHz band via Ofcomm's Shared Access framework](https://www.techuk.org/resource/uk-spf-report-review-of-use-case-requirements-in-the-3-8-4-2ghz-band-via-ofcom-s-shared-access-licence-framework.html)” by Analysys Mason in 2023.  On page 9 in the Analysys Mason report you find “Figure 3.1: 5G use cases [Source: "Ensuring wireless connectivity needs are met" study prepared by Analysys Mason and Oxera on behalf of DCMS, 2022]”.  Figure 3.1, which already is a compilation from another source, has been used as basis for compiling Table 2. That is why there are general 5G use cases in Table 2. Then there are modifications, for example for the construction class, site survey originally included drones. | Delete Table 2 and connected text. Proposal below from text in the Mandate  5G is a key enabler of the digitalisation of “vertical industries” such as transport, logistics, automotive, health, energy, smart factories, media and entertainment. Deployments of terrestrial wireless broadband systems provide local-area network connectivity (with base stations operating at low/medium power) with focus on vertical users and other terrestrial wireless use cases. |
| ER/9 | 6.1.2 | Table 29 and 30 | General | Both tables have same heading. | Difference needs to be cleared between two tables. And correct the table no 28 to 31 in text under table 30. |
| ER/9 | 6.3.1 | Table 36 | Editorial | - | Change ‘long term’ to ‘short term’ in last column. |
| ER/10 | 6.4.3.1 | Last para, last line | General | May increase collision as 3GPP systems do not use LBT mechanism. | **Current text:** These polite protocols would enhance spectrum sharing but have not been considered in the MCL analyses.  **Proposed text:** These polite protocols may enhance spectrum sharing but have not been considered in the MCL analyses. |
| ER/11 | 7.1.7 | Para 6 | General | The para to be removed, nothing to do with study conclusion. Assumprions of the study are clearly mentioned in para 1. Furthermore, the section is dedicated for result of a specific study in question not comparison with other studies. | **Para to be removed:** ~~Study 7 is quite similar to the Study 2 with Monte-Carlo simulations of interference from WBB LMP BS to 5G MFCN by modelling the local area network with a single BS and 5G MFCN network as a single BS, this single BS to single BS simulation scenario does not take into account the inter-cell interference within 5G MFCN network, the simulation results are worse than that of the Study 3 where the 5G MFCN network is modelled as multi-sites (cluster of 19 tr-sector sites: 57 cells) cellular network. Both Study 2 and Study 7 considered the 5G MFCN BS type 1-H with an out of band blocking level of -15 dBm at frequency off\_set of 60 MHz. Study 7 considered a 5G MFCN BS receiver 5 dB noise figure, while the study 2 used a 5G MFCN BS noise figure of 3 dB.~~ |
| ER/12 | 7.1.8 | Para 3, Issue 3  Issue 2 and 1 | General | - | **Current text:** Issue 3: Need for defining blocking levels below 3.8 GHz for WBB LMPs to ensure they are not impacted by the emissions of MFCN below 3.8 GHz  **Proposed text :** Need to define Better Rx blocking levels below 3.8 GHz for WBB LMP BS to avoid blocking of WBB Rx from MFCN transmission below 3.8 GHz incase of unsynchronized operation.  Issue 2 should become issue 1 as agreed in all studies i.e. 60 Mhz needed to avoid MFCN blocking. |
| ER/13 | 7.1.8 | Issue 1 (unwanted emissions below 3.8 GHz): | General | Remove bullets below table 53 on study 7. For following reason :   * The results of the studies are not comparable, one is conducted values and other is EIRP. * There is evidence from one study that more stringent values required in rural area. * Other study finds with proposed conducted level and 60 MHz GB the separation distance should be minimum 350 for MP which is more than 200 m cell radius considered in the same study. How coordination points are reduced in this case ? and for sub-urban/ rural envirnoment separation distance is higher. | * ~~Study 7 considered throughput loss metric for the MFCN and the Monte-Carlo simulation was performed over a single MFCN Macro BS isolated from the network i.e. without calculating intra-network inter-cell interference (i.e. interference caused from adjacent cells of the same MFCN) in the assessment of the throughput loss.~~ * ~~Such approach may result in overestimating the degradation of the MFCN throughput. [if the reference throughput (over which the loss is calculated) did not cover the intra-network intercell interference and the associated conclusion (e.g. -43dBm/5 MHz TRP for WBB MP AAS, -40dBm/MHz EIRP for WBB LMP non-AAS) would appear to be very pessimistic and then not realistic.]~~ |
| ER/14 | 7.1.8 | Issue 3 (blocking levels below 3.8 GHz for WBB LMP receivers) | General | - | **Current text :** Study 6 suggests that to avoid interference from MFCN below 3.8 GHz, WBB LMP receivers should have blocking level of -15 dBm at 6 dB desensitisation below 3.8 GHz.  **Proposed text :** Study 6 suggests that to avoid blocking from MFCN below 3.8 GHz, unsynchronized WBB LMP receivers should have blocking level of -15 dBm at 6 dB desensitisation below 3.8 GHz. |
| ER/15 | 7.1.8 | Conclusions | General. | Repetition of text.  No need of this sub section FM60 task. In study 6 cell size urban is 200 m and separation distance required min 350 m. How the coordination is reduced ? separation distance for other scenarios is even higher. | Change heading from conclusion to further considerations.  Remove table 54, 55 and 56. Everything explained with proposed values in issue 1 to 4. Text after table 56 can be kept. |
| ER/16 | 5.1.1 | Table 18 | General | The column “Generic case” has no explanation and is used as comparison with the case studies. This is the only place in the document that a “generic case” is referenced, so it is unclear what it is referring to. | An explanation should be provided. |
| ER/17 | 7.1.8 | Table 53 | General | Change table 53 title and text above the table.  The unwanted emission level proposed are to ease the coexistence not as protection criteria of MFCN. | **Current title:** The conclusions from Study 3, Study 6 and Study 7 regarding the need for lower unwanted emissions for WBB LMPs to protect MFCN below 3.8 GHz  **Proposed title:**  Proposed unwanted emissions for WBB LMPs BS to facilitate coexistence with MFCN below 3.8 GHz for unsynchronized scenario.  Table 53 should be updated with underlying assumptions and resulting separation distances, modified table provided below. |
| ER/18 | 7.1.8 | Table 53 | General | Text to be added below table 53 | **From Issue 2 move this text under table 53”** Analysis in Study 3 suggests that for Medium Power AAS BS operating in 3860-4200 MHz, an OOBE of -35 dBm/MHz TRP can provide sufficient protection, but in Rural Areas with large cell size of 5G MFCN network, an OOBE of WBB MR AAS BS should be -54 dBm/MHz TRP.  **Also add:** Furthermore studies also highlight scenarios where unsynchronzied,operation will not be feasible, synchronization or other coordination measures are required. (ref study 3) |
| ER/19 | 0 | Semi-synchronised operation of WBB LMP | General | Additional text proposed is highlighted in yellow. | “Studies were also performed for semi-synchronised operation with DL to UL modifications for WBB LMP operating based on 3GPP technical specifications, showing that it can ensure the same protection of MFCN base stations below 3.8 GHz as synchronised operation considering BS to BS interference. This approach could be considered on a case-by-case basis. It could better facilitate coexistence with some limitations on UL/DL sequences on WBB LMP frame structure providing higher uplink capacity but with possible constraints on WBB LMP uplink performance.” |
| ER/20 | 4.2.1 | Table 5 | General | Text to be added under table 5 to be consistent with CEPT report. Text added in CEPT report during the joint FM60/CG4GHz meeting 17-18 April. | “For WBB MP AAS BS the emission mask in TRP from 3GPP TS 38-104 was used.” |

Table 53: The conclusions from Study 3, Study 6 and Study 7 regarding the need for lower unwanted emissions for WBB LMPs to protect MFCN below 3.8 GHz

|  |  |  |  |
| --- | --- | --- | --- |
| Studies | Low and Medium Power non-AAS unwanted emissions below 3.8 GHz | Medium Power AAS unwanted emissions below 3.8 GHz | Required separation distances |
| Study 3 | -45 dBm/MHz conducted | -45 dBm/MHz TRP | 100 m separation assumed for all cases (urban, Sub-uran and rural). The WBB LMP BS out of band emission level below 3800 MHz is tuned to reach the target 5G MFCN BS uplink throughput of 5%.  More stringent values for found for rural scenario. |
| Study 6 | -45 dBm/MHz conducted | -45 dBm/MHz TRP | Separation distances were calculated assuming -45dBm/Mhz conducted/ TRP value below 3800 MHz and I/N -6 protection criteria.  Resulting separation distances:  **LP case:** 95m to 929m (For different Scenarios i.e. urban/sub-urband/rural)  **MP case:** 350m - 827m (For different Scenarios i.e. urban/sub-urband/rural) |
| Study 7 | -40 dBm/MHz EIRP | -43 dBm/5 MHz TRP | 100 m separation assuming urban scenario only. The WBB LMP BS out of band emission level below 3800 MHz is tuned to reach the target 5G MFCN BS uplink throughput of 5% |
| In all studies 60 MHz GB was considered to avoid blocking. | | | |