**Comments on ECC Deliverable**

**“Draft ECC Report 358”**

**1 Sources**

**Administration/Company/Entity: GSMA Revision 1**

**Name of contributor: Torben Themsen**

**2 General Comments**

[Please provide here any general comments which do not contain specific change proposals or which are not related to specific sections of the deliverable. Please leave blank if not applicable]

**3 Proposals related to the ECC Deliverables**

**Note:** Contributors shall use the following table to provide comments. It is also encouraged to provide as an annex a separate document showing the proposals with track changes. Minor editorial corrections do not need to be recorded in the table. The table is used in the resolution meeting to record how each proposal is addressed.

*The* following information must be included.

* **Comment number**: Sequential numbering of comments in the format “XX/1”, “XX/2” etc, where “XX” is the organisation name or a suitable abbreviation. Administrations may use CEPT country codes
* **Section number/Clause**: Relevant section number of the deliverable, use numbers where applicable e.g. “1.1”, “A1.4”, “List of abbreviations”
* **Paragraph/Figure/Table**: Paragraph number in section, e.g. “1”,”2”.. or Figure/Table, e.g. “Figure 1”, “Table 2”
* **Type of comment**: “General”, “Technical” or “Editorial” depending on the nature of the proposed changes
* **Comment**: Background/justification for proposed changes
* **Proposed change**: Proposed modifications shown in revision marks where possible. For more complicated changes (e.g. proposed deletion/addition of whole sections) or changes to tables it is sufficient to refer to the annex including the changes

| **Comment number** | **Section number**  **Clause** | **Paragraph**  **Figure**  **Table** | **Type of comment**  (General,  Technical or  Editorial) | **Comment** | **Proposed change** |
| --- | --- | --- | --- | --- | --- |
| GSMA/1 | 7.2.1 | Last paragraph | General/Technical | The current conclusion in draft ECC Report 358 is limited to a specific MFCN cell radius of 600 m and only deploys a single MFCN UE. In the annexed new study it can be seen that for smaller MFCN sizes and with more than one active UE the interference are reaching unacceptable levels. | [Change as it should appear in the working document]  Add the following additional text at the end of the current last paragraph.  However, a subsequent study indicates that the probability of interference increases to unacceptable levels when the MFCN MNO's cell sizes decreases and/or more active MFCN UEs are deployed, hence more work is needed to address this in the planned guidelines. |
| GSMA/2 | 7.2.1 | Last paragraph | General/Technical | In case the ‘new DECT Study’ as presented at ECC#63 is accepted to replace the current study. The same comment as above is still valid also, there is a new last sentence which clearly is not correct and needs deletion.  Also, delete the word ‘very’ in the first line of the last paragraph. This is subjective and we do not believe 1.74 % is very low. | In the first line of the last Paragraph; delete the word ‘very’.  Add the following additional text at the end of the current last paragraph and delete current last sentence of the paragraph.  However, a subsequent study indicates that the probability of interference increases to unacceptable levels when the MFCN MNO's cell sizes decreases and/or more active MFCN UEs are deployed, hence more work is needed to address this in the planned guidelines. |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

**Annex, Supporting Material**

Study of the probability of interference from a single DECT outdoor station with a 10 m antenna height into MFCN uplink.

In reply to the Public Consultation for ECC Report 358 the GSMA has performed a study looking at the feasibility of deploying DECT NR+ within a MFCN cell. The GSMA has earlier asked questions to the study provided by DECT Forum for DECT above 3800 MHz and MFCN below. The GSMA also has had an informative meeting with DECT Forum where we unfortunately have been unable to find a solution to our fear that DECT in its current form will cause serious interference to MFCN below 3800 MHz.

We therefore have to maintain that, at least for outdoor DECT NR+ using an antenna height of up to 10 m, additional mitigation is required to avoid serious interference into MFCN.

The below study highlights areas where problems are foreseen, it does not address other types of DECT stations as this study is only dealing with an outdoor station with antenna heights of up to 10 m.

The study uses two distinct different geometry approaches, the cell layout to the left shows a situation where the DECT station and the MFCN UE are randomly located in the three sectors and the impact is measured on the MFCN BS receiver marked with a red arrow. In the other approach the DECT station and the MFCN UE are limited to be randomly located in the sector of interest where the MFCN BS receiver where interference is measured is located.

This geometry is also shown below where the first of the two screen shots illustrates a snapshot of the left geometry and the second the right geometry.

A screenshot of a computer

Description automatically generated

A screenshot of a computer

Description automatically generated

The study has used the agreed parameters from ECC Report 358 for both MFCN and DECT.

This includes random power of the DECT station in the range -40 to 23 dBm and also P.2108 used in the same way as in the DECT Forum study.

Initially simulations with only one MFCN UE were performed and then 2 more UEs was added to the cell to see the impact of growing numbers of active UEs. Throughout the study only a single transmitting DECT station has been used.

The study investigates what happens when the MFCN cells are decreasing in size, something that has been reported during our work on ECC Report 358, ANFR has reported cell radius sizes in the range of 200 m or slightly smaller in Paris, hence it is important that the Report and Decision are robust and able to scale for when the MFCN MNOs are densifying their networks. The study therefore includes results for 3 different cell radii of 200, 400 and 600 m.

At first, the study reproduces the DECT Forum study as close as possible, the 600 m result for the DECT station and one UE randomly distributed over 3 sectors is 1.45%. This is within 1.2 dB of the result reported in the DECT study. This study has however introduced a 50 m exclusion zone around the MFCN BS to avoid DECT stations climbing the mast.

Below is the table of results for the different iterations.

|  |  |  |  |
| --- | --- | --- | --- |
| Cell radius (m) | # of sectors | # of active UEs | Result in % |
| 600 | 3 | 1 | 1.45 |
| 600 | 3 | 3 | 2.44 |
| 600 | 1 | 1 | 3.63 |
| 600 | 1 | 3 | 4.91 |
| 400 | 3 | 1 | 3.29 |
| 400 | 3 | 3 | 5.41 |
| 400 | 1 | 1 | 8.41 |
| 400 | 1 | 3 | 11.26 |
| 200 | 3 | 1 | 11.5 |
| 200 | 3 | 3 | 20.08 |
| 200 | 1 | 1 | 29.35 |
| 200 | 1 | 3 | 41.82 |

As a sensitivity analysis 20 MHz of frequency separation was added to the two last rows of the table above, to explore if this would solve the problem.

|  |  |  |  |
| --- | --- | --- | --- |
| Cell radius (m) | # of sectors | # of active UEs | Result in % |
| 200 | 1 | 1 | 16.27 |
| 200 | 1 | 3 | 23.89 |

As can be seen from the results, additional mitigation will be required even with the additional frequency separation included. Adding a 20 dB attenuation below 3800 MHz reduced the probability of interference to 0.86 %. This would indicate that a frequency separation with a filter capable of providing 20 dB below 3800 MHz should be able to provide compatibility with MFCN below 3800 MHz even with the expected smaller cell sizes.

Specific proposal for the PC of ECC Report 358

On Page 63 of ECC Report 358, just above the Table 58 the below conclusion is located. The GSMA proposes the inclusion of the text in continuation of this conclusion to ensure that the concern will be addressed by FM 60.

‘This study indicates a low risk of interference into MFCN from adjacent WBB LMP devices operating at a maximum of 23 dBm e.i.r.p. and employing transmission power control.’ However, a subsequent study indicates that the probability of interference increases to unacceptable levels when the MFCN MNO's cell sizes decreases and/or more active UEs are deployed, hence more work is needed to address this in the planned guidelines.