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| SE19 |  ECC PT1(17)119SE19(17)30 |
| #2 SE19 Web-meeting on FS parameters in 26 GHz |
| Web-meeting, 12 July 2017 |
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| Date issued:  | 20 July 2017 |
| Subject:  | Reply on parameters for Fixed Links in 26 GHz |
| **To:** | Mr Steve Green, ECC PT1 Chairman E-mail: steve.green@ofcom.org.uk |
| **Cc:** | Mr Karl Löw, WG SE Chairman E-mail: karl.loew@bnetza.de |

Dear Steve,

The PT SE19 considered your request for guidance on FS system parameters and protection requirements for the 26 GHz (24.5 – 26.5 GHz) band. PT SE19 is pleased to provide following information.

1. **FS System Parameters**

PT SE19 informs ECC PT1 that ITU-R Recommendation F.758-6 is currently going through a revision in ITU-R WP 5C. It has to be noted that some FS systems parameters are either missing or requiring updating. Therefore, PT SE19 provides in Annex 1 to this document P-P FS parameters.

If ECC PT1 decides to investigate adjacent channel compatibility for P-P FS links, Tx spectrum masks and guidance on the derivation of Rx selectivity mask can be found in ETSI EN 302 217-2. PT SE19 will be glad to provide further detailed information on these masks if required.

PT SE19 has also considered P-MP fixed service parameters provided in Table 12 of ITU-R F.758-6 and notes that there is a difference between these parameters and those that are currently presented in ETSI standards (e.g. EN 302 326). PT SE19 assumes that CEPT FS deployment is based on those ETSI standards and will provide some further clarifications on FS P-MP parameters at a later stage.

1. **FS antenna Patterns**

The FS antenna patterns for P-P FS are given in ITU-R Recommendations F.699 (for single entry analysis) and F.1245 (for aggregate analysis). For P-MP FS, ITU-R Recommendation F.1336 is relevant.

1. **FS Protection Criteria**

***General provisions***

According to Annex 1 section 4 Recommendation ITU-R F.758-6:

* *“To simplify the analysis of interference, separate consideration is given to short-term interference, which is the term used to describe the highest levels of interference power that occur for less than 1 per cent of the time, and to long-term interference, which addresses the remaining portion of the interference power distribution.”*
* “*A short-term interference criterion is set based on the interference power necessary to cause a particular error performance defect (such as an errored second) when the desired signal is unfaded.*”
* “*In sharing and compatibility studies, long-term interference is usually characterized as the interference power that is exceeded by 20% of the time, at the victim receiver input*.”

***Long-term Criteria***

Table 4 of Recommendation ITU-R F. 758 defines long-term criteria applicable for sharing with more than one co-primary service in frequency bands above 3 GHz as *I*/*N* value of -10 dB not to be exceeded for more than 20% of the time.

However according to Recommendation ITU-R F. 758:

"*Interference power that is between the percentage of time defined for short-term criteria (< 1% of the time) and the time defined for the long-term criteria (> 20% of the time) could be evaluated on a case-by-case basis, but such considerations should take into account also* ***the occurrence of interference power levels that are less than that expected for 20% of the time***."

Therefore ECC PT1 should concider if the dynamic characteristics of IMT systems the relevent time persentage limit is appropriate taking into account one the for the long term criteria. In fact, any phenomena affecting an FS receiver every second should be considered as a long-term interference (Annex 1 section 4 Recomendation ITU-R F.758-6, Annex 1 section 2.1.4 ECC Report 64). If necessary SE19 could further ellaborate this issue.

***Short term Criteria***

Based on methodology given in ITU-R Recommendations F.1495, and information provided in F.1565, and assuming a net fade margin of 10 dB for BER 1 x 10-6 and 12dB for BER 1 x 10-3, the short-term criteria has been estimated by SE19 for this scenario as follows:

1. *I*/*N* of 7 dB not to be exceeded for more than 0.0051% of the time in any month (for errored seconds (ES));
2. *I*/*N* of 11 dB not to be exceeded for more than 0.0003% of the time in any month (for severely errored seconds (SES)).
3. **Antenna height and elevation angle**

ITU-R Recommendation F.2086 provides antenna height and elevation angle information for some administrations. PT SE19 would recommend using the antenna heights of 5, 15, 30 and 60 m, noting that an antenna height of 5 m would only be utilised in a rural environment. The appropriate antenna elevation angle would be in the range −2.5 to 2.5 degrees.

PT SE19 would be happy to provide further information and guidance for PT1 as necessary.

Best regards,

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PT SE19 Chairperson

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Annex 1

System parameters for PP FS systems in 26GHz band (24.5 – 26.5 GHz)

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| Frequency range (GHz) | 24.5 – 26.5 GHz |
| Reference ITU-R Recommendation | F.748 (channel arrangment)  |
| Modulation (for info) | QPSK and 16/64/128/512 QAM |
| Channel spacing (MHz) | 3.5, 7, 14, 28, 56, 112 |
| Feeder/multiplexer loss (dB) | 0 |
| Antenna gain range (dBi) | 0.2 m antenna diameter: 31.5 0.3 m antenna diameter: 36.60.6 m antenna diameter: 421.2 m antenna diameter: 47 |
| e.i.r.p. range (dBW) | −8...38  |
| Receiver noise figure typical (dB) | 6.5  |
| Receiver noise power density typical (=*NRX*) (dBW/MHz) | −137.5 |
| Polarization  | V, H or both |