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| ECC PT1 |  ECC PT1(20)xxx |
| ECC PT1 CG MFCN 5G 2300-2400 MHz |
| 1st Web-meeting  |
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| Date issued:  | 5th of November 2020 |
| Source:  | Sweden |
| Subject:  | Technical conditions for 5G and AAS in the 2300-2400 MHz band |
| Group membership required to read? (Y/N)N |
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| Summary:  |
| Sweden is going to issue licences for MFCN in the frequency band 2300-2380 MHz through an auction starting 10th November 2020. The licence conditions are designed to enable both 5G services and the use of active antenna systems (AAS) in the band. There are also conditions for the protection of radio astronomy (RAS) in the frequency band 2200-2290 MHz.The BEM used for AAS within the 2.3 GHz band has the same levels as the BEM for 3.5 GHz as they are both developed based on ETSI TS 138.104, table 6.6.4.2.2.1-2 3. The licence conditions for non-AAS are based on those provided in ECC Dec (14)02. |
| Proposal: ECC PT1 CG “MFCN 5G 2300-2400 MHz band” is invited to consider the Swedish proposed licence conditions for information and, as appropriate, for possible inclusion in the draft ECC Report. |
| Background:The CG will in line with WI PT1\_28 initiate the work on the basis of existing work and reports in order to draft an ECC Report to review the harmonised technical and regulatory conditions to enable timely introduction of 5G NR and, when applicable, AAS in the 2300-2400 MHz band while ensuring adequate protection of other services.  |

Extract from Swedish licence conditions for the 2300-2380 MHz frequency band

* **Area of use and technical conditions**
1. Within the licence holder’s own frequency range, the average radiated power from base stations may not exceed
* 68 dBm/5 MHz e.i.r.p.[[1]](#footnote-2) per antenna, without AAS[[2]](#footnote-3)
* 47 dBm/5 MHz TRP[[3]](#footnote-4) per cell, with AAS. For base stations with multiple sectors, the conditions apply per sector.
1. For synchronised base stations[[4]](#footnote-5) without AAS, the conditions for Block Edge Mask (BEM) as shown in Table 1 must be met.

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| **Frequency range 2300–2380 MHz**  | **Maximum average radiated power as e.i.r.p. per antenna (dBm/5 MHz)**  |
| *Transitional region* | 0 to 5 MHz outside of the licence holder’s own range | Min(Pmax-40, 21) |
| 5 to 10 MHz outside of the licence holder’s own range | Min(Pmax-43, 15) |
| *Baseline* | >10 MHz outside of the licence holder’s own range, but within the 2300–2380 MHz range | Min(Pmax-43, 13) |

**Table 1 BEM for base stations without AAS with synchronised use within the 2.3 GHz band. Pmax is the maximum average power in dBm expressed as e.i.r.p. per carrier and antenna.**

1. For synchronised base stations5 with AAS, the conditions for BEM as shown in Table 2 must be met.

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| **Frequency range 2300–2380 MHz** | **Maximum average radiated power expressed as TRP per cell (dBm/5 MHz)** |
| *Transitional region* | 0 to 5 MHz outside of the licence holder’s own range | Min(Pmax’-40, 16) |
| 5 to 10 MHz outside of the licence holder’s own range | Min(Pmax’-43, 12) |
| *Baseline* | >10 MHz outside of the licence holder’s own range, but within the 2300–2380 MHz range | Min(Pmax’-43, 1) |

**Table 2 BEM for base station with AAS with synchronised use within the 2.3 GHz band. For base stations with multiple sectors, the maximum radiated power applies per sector. Pmax’ is the maximum average power in dBm expressed as TRP per carrier in a given cell.**

1. For unsynchronised and semi-synchronised base stations[[5]](#footnote-6), the *restricted baseline* must be met:
* Maximum average radiated power without AAS: -36 dBm/5 MHz e.i.r.p. per cell
* Maximum average radiated power with AAS: -45 dBm/5 MHz TRP per cell

The *restricted baseline* applies directly outside the licence holder’s own range without a *transitional region*. For base stations with multiple sectors, the conditions apply per sector.

1. For base stations in the frequency range 2300–2310 MHz, the maximum average radiated power according to the *transitional region* in Table 1 and Table 2 shall be applied within the
2290–2300 MHz range.
2. For base stations in the frequency range 2310–2380 MHz, the maximum average radiated power according to the *baseline* in Table 1 and Table 2 shall be applied within the 2290–2300 MHz range.
3. For base stations in the frequency range 2370–2380 MHz, the maximum average radiated power according to the *transitional region* and *baseline* in Table 1 and Table 2 shall be applied within the 2380–2403 MHz range.
4. For base stations in the frequency range 2300–2370 MHz range, the maximum average radiated power according to the *baseline* in Table 1 and Table 2 shall be applied within the 2380–2403 MHz range.
5. Directly above 2403 MHz, the *additional baseline* must be met:
* Maximum average radiated power without AAS: Min(Pmax-41, 1) dBm/5 MHz e.i.r.p. per antenna
* Maximum average radiated power with AAS: Min(Pmax’-41, -11) dBm/5 MHz TRP per cell. For base stations with multiple sectors, the conditions apply per sector.
1. The radiated power for terminals must be limited to 25 dBm TRP. For fixed installed terminals, a higher radiated power of up to 35 dBm e.i.r.p. is allowed, as long as the conditions regarding protection of other use and coordination are met.
* **Conditions for the protection of certain other use (RAS)**
1. VLBI[[6]](#footnote-7) measurements in the 2200–2290 MHz range at Onsala space observatory[[7]](#footnote-8) shall be protected as follows:

1) The contribution to the spectral flux density in the 2200–2290 MHz range at the observatory from each 10 MHz block in the frequency range 2300–2380 MHz may not exceed -215 dBW/m2/Hz at a height of 10 m above ground.

2) Within a radius of 5 km around the observatory, no terminals may use the frequency range 2300–2380 MHz.

Before deployment in the area, the licence holder shall inform PTS of how they intend to meet these conditions.

1. e.i.r.p., Equivalent Isotropically Radiated Power [↑](#footnote-ref-2)
2. AAS, Active Antenna System [↑](#footnote-ref-3)
3. TRP, Total Radiated Power [↑](#footnote-ref-4)
4. Synchronised operation is defined in section 6.1.4 of ECC Report 281, July 2018 [↑](#footnote-ref-5)
5. Unsynchronised and semi-synchronised operation is defined in section 6.1.4 of ECC Report 281, July 2018 [↑](#footnote-ref-6)
6. VLBI, Very Long Baseline Interferometry [↑](#footnote-ref-7)
7. 57°23' 45,0" N, 11° 55' 34,9" E (WGS84) [↑](#footnote-ref-8)