TECHNICAL ARRANGEMENT

between the Electronic Communications Office of the Republic of Latvia and the Communications Regulatory Authority of the Republic of Lithuania concerning the use of the frequency band 3400-3800 MHz for terrestrial Mobile/Fixed Communications Networks (MFCN) in border areas

Liepaja, 14 September 2023

Preamble

According to Article 6 of the ITU Radio Regulations, representatives of the Electronic Communications Office of the Republic of Latvia and the Communications Regulatory Authority of the Republic of Lithuania (hereinafter referred to as the Parties) have concluded this Technical Arrangement concerning the use of the 3400-3800 MHz frequency band for terrestrial mobile/fixed communications networks (MFCN)[1] in border areas (hereinafter referred to as the Arrangement) with the aim of optimizing the use of the frequency band and avoiding mutual interference on a mutually coordinated basis.

This Arrangement supersedes the "Technical criteria and principles concerning the use of the frequency band 3400-3800 MHz for terrestrial Mobile/Fixed Communications Networks (MFCN) in border areas between the Electronic Communications Office of the Republic of Latvia and the Communications Regulatory Authority of the Republic of Lithuania" (Bucharest, 17 November 2017).

1. Principles

1.1. This Arrangement is based on the concept of field strength levels for MFCN base stations, distribution of preferential and non-preferential Physical Cell Identities (PCIs) for 5G NR system as described in ECC Recommendation (15)01 of 13 February 2015 "Cross-border coordination for mobile/fixed communications networks (MFCN) in the frequency bands: 694-790 MHz, 1427-1518 MHz, 3400-3800 MHz" (amended 10 June 2022) (hereinafter referred to as ECC/REC/(15)01) and the principle of the equal access to spectrum by both Parties.

1.2. The following operational mode is used: TDD[2] mode where base stations and mobile stations transmit and receive in the frequency band 3400-3800 MHz. This frequency arrangement conforms to ECC Decision (11)06 of 9 December 2011 (amended 26 October 2018) "Harmonised frequency arrangements and least restrictive technical conditions (LRTC) for mobile/fixed communications networks (MFCN) operating in the band 3400-3800 MHz".

1.3. The frame structure for 5G NR TDD system and related parameters conform to the Frame A of ECC Recommendation (20)03 "Frame structures to facilitate cross-border coordination of TDD MFCN in the frequency band 3400-3800 MHz" (approved 23 October 2020) (hereinafter referred to as ECC/REC/(20)03).

1.4. Distribution of preferential and non-preferential PCIs for 5G NR system between Parties is given in Annex 1 of this Arrangement.

1.5. Field strength values in this Arrangement are based on a receiving antenna height of 3 m above ground for 10 % of time and 50 % of locations.

1.6. This Arrangement covers coordination of base stations using AAS[3] and non-AAS[4]. The coordination of mobile stations in mobile and fixed services is covered by coordination of base stations.

1.7. Field strength values in this Arrangement are mean values for non-AAS base stations and median values for AAS base stations.

1.8. In the context of this Arrangement the term "border" is understood as the international borderline between the countries of the Parties.

[1] Mobile/fixed communications networks (MFCN) includes IMT and other communications networks in the mobile and fixed services

[2] TDD – Time Division Duplex

[3] AAS – Active Antenna System (stations that use an antenna that consists of an array of active elements)

[4] Non-AAS – not Active Antenna System

1.9. Synchronised operation – operation with common phase clock reference (i.e. a reference clock with consistent time offsets relative to a common UTC-based time reference to ensure full alignment of transmissions) and compatible frame structures (to be used on both sides of the border to avoid simultaneous UL/DL transmissions). ECC Report 216 provides practical guidance for transmission of reference phase/time clock.

1.10. Unsynchronised operation – operation with common phase clock reference and non-compatible frame structures or without common phase clock reference and compatible or non-compatible frame structures. This Arrangement covers unsynchronised operation without preferential frequency blocks.

2. Use of frequencies

2.1. Each Party may use the frequency band 3400-3800 MHz for base stations of unsynchronised MFCN TDD systems with non-preferential frequency blocks on both sides of the borderline without coordination with the other Party if the field strength of each cell produced by the base station does not exceed the field strength level given in Annex 3.

2.2. Each Party may use the frequency band 3400-3800 MHz for base stations of synchronised 5G NR TDD system on both sides of the borderline without coordination with the other Party if the field strength of each cell produced by the base station does not exceed the field strength level given in Annex 4.

2.3. For synchronised operation of 5G NR TDD system Parties shall use the frame structure and related parameters given in Annex 2 of this Arrangement.

2.4. If frequency block size is other than 5 MHz, a correction, calculated by the formula $10 \times \log_{10}$ (frequency block size, MHz / 5 MHz), dB, shall be added to the field strength values indicated in items 2.1 and 2.2.

3. Procedure

3.1. If the field strength value produced by the base station exceeds the levels indicated in items 2.1 and 2.2 the frequency assignment shall be coordinated with the other Party.

3.2. The period of coordination shall not exceed 45 days from the date of receiving the request and 20 days after the reminder. If no reply is received within 65 days the frequency assignment shall be considered as coordinated. The exchange of coordination information shall take place by e-mail or other electronic means.

3.3. Coordination requests shall be drawn up according to Annex 3 of ECC/REC/(15)01 in the appropriate ITU electronic format.

3.4. Complaints of harmful interference shall be based on the median value of measurements of field strength, performed at a receiving antenna height of 3 m above ground at least in two different points over a distance of at least 100 m along the border.

3.5. Reports of harmful interference shall be presented in accordance to Appendix 10 of the ITU Radio Regulations and processed according to Article 15 of the ITU Radio Regulations. The Parties shall take all possible measures in order to eliminate harmful interference.

3.6. For field strength calculations the Parties shall use the latest version of Recommendation ITU-R P.1546 ”Method for point-to-area predictions for terrestrial services in the frequency range 30 MHz to 4000 MHz”.

4. Operators arrangement

4.1. Operators concerned may agree on synchronization technique used in their networks and to deviate from field strength level in items 2.1 and 2.2 by mutual consent, concluding

an arrangement between operators (hereinafter referred to as the AbO) with the written consent of the Parties concerned.

4.2. AbO shall only be valid as long as all participating operators hold exclusive rights of use of the common part of the frequency bands.

4.3. Operators should inform relevant Parties on the cancellation of the AbO. After such cancellation, base stations brought into use under AbO shall operate in accordance with Section 2.

5. Revision and cancellation

5.1. This Arrangement may be revised at any time on the initiative of any Party with the consent of the other Party.

5.2. This Arrangement may be cancelled by a mutual decision of both Parties on terms and conditions adopted by the Parties or by a decision of one Party notifying the other Party on its intention at least twelve months before.

6. Entry into force

6.1. This Arrangement shall come into force on the date of signing it by both Parties.

6.2. This Arrangement has been drawn in two identical copies, one for the Republic of Latvia and one for the Republic of Lithuania.

Liepaja, 14 September 2023

On behalf of the Electronic Communications Office of the Republic of Latvia	On behalf of the Communications Regulatory Authority of the Republic of Lithuania
.....	.....
Jānis Bārda	Jūratė Šovienė

Annex 1

Distribution[5] of preferential Physical Cell Identities (PCI) for 5G NR system in the 3400-3800 MHz frequency band between the Republic of Latvia and the Republic of Lithuania

Set	**A**	**B**	**C**	**D**	**E**	**F**
PCI for 5G NR	0 to 83 504 to 587	84 to 167 588 to 671	168 to 251 672 to 755	252 to 335 756 to 839	336 to 419 840 to 923	420 to 503 924 to 1007
Set preferential to	LTU[6]	LVA[7]	LTU	LVA	LVA	LTU

[5] According to Annex 4 of ECC/REC/(15)01
[6] LTU – the Republic of Lithuania
[7] LVA – the Republic of Latvia

Annex 2

Frame structure[8] and related parameters for 5G NR system in the 3400-3800 MHz frequency band

Parameter	**Value**		
Downlink and Uplink (DL/UL) slot pattern	DDDSU DDDSU DDDSU DDDSU		
Frame duration	10 ms		
Slot duration	0.5 ms		
Slot pattern periodicity	2.5 ms		
Special slot “S” configuration (i.e., DL:GP:UL symbols)	Downlink (DL)	Guard period (GP)	Uplink (UL)
	10	2	2
SCS (sub-carrier spacing)	30 kHz		
Time base	Start of UTC[9] second epoch +/- 1.5 µs		
D = Downlink slot; S = Special slot; U = Uplink slot UTC = Coordinated Universal Time			

[8] According to Annex 1 of ECC/REC/(20)03 (Table 1, Frame A)
[9] In accordance with Recommendation ITU-R TF.460

Annex 3

Field strength levels of unsynchronised MFCN TDD systems with non-preferential frequency blocks

	Unsynchronised operation with non-preferential frequency blocks
	Field strength level, dBµV/m / 5 MHz
	All PCIs
at the border	32
	For 5G NR base station using AAS considering the subcarrier spacing of 30 kHz the value of 32 dBµV/m / 5 MHz correspond to SSB[10] field strength level[11] of 19 dBµV/m / 30 kHz for single-beam antenna pattern and 24 dBµV/m / 30 kHz for multi-beam antenna pattern

[10] Synchronisation Signal Block for 5G NR
[11] Derived for one resource element (one subcarrier during one OFDM symbol) in secondary synchronisation signal (SSS) for the subcarrier spacing (SCS) of 30 kHz

Annex 4

Field strength levels of synchronised 5G NR TDD systems

	Synchronised operation	
	Field strength level, dBµV/m / 5 MHz	
	Synchronisation signal[12] centre frequencies aligned / not aligned	
	Preferential PCIs	**Non-preferential PCIs**
at the border	79	61
at a distance of 6 km inside the territory of the other Party	61	-
	For 5G NR base station using AAS considering the subcarrier spacing of 30 kHz the value of 79 dBµV/m / 5 MHz correspond to SSB field strength level[13] of 69 dBµV/m / 30 kHz for single-beam antenna pattern and 76 dBµV/m / 30 kHz) for multi-beam antenna pattern For 5G NR base station using AAS considering the subcarrier spacing of 30 kHz the value of 61 dBµV/m/(5 MHz) correspond to SSB field strength level of 51 dBµV/m / 30 kHz for single-beam antenna pattern and 58 dBµV/m / 30 kHz for multi-beam antenna pattern	

[12] Synchronisation signal means Synchronisation Signal Block (SSB) for 5G NR

[13] Derived for one resource element (one subcarrier during one OFDM symbol) in secondary synchronisation signal (SSS) for the subcarrier spacing (SCS) of 30 kHz