

TECHNICAL AND PROCEDURAL ARRANGEMENT

concerning frequency coordination in the band
880-890 MHz

between the Frequency Management Authorities of
Poland and Ukraine

1. Introduction

- 1.1. In the framework of the Article 6 of the Radio Regulations the Office of Electronic Communications of Poland and the Ukrainian State Centre of Radio Frequencies (hereinafter called Regulatory Authorities) concluded this Arrangement concerning the usage of frequencies in the 880-890 MHz band.

2. Background and arrangement principles

- 2.1. The frequency band 880-890 MHz in Poland is used for GSM and UMTS base stations reception and mobile stations transmission. This usage of the 880-890 MHz in Poland is compliant with the ECC Decision (06)13 which designates the band 880-915 MHz, in addition to GSM, for terrestrial UMTS and LTE systems.
- 2.2. The frequency band 880-888 MHz in Ukraine is used for CDMA base stations transmission and mobile stations reception. This use of the 880-888 MHz band in Ukraine has been determined by historical reasons and specific circumstances in the Ukrainian market. Such usage is allowed by the ECC Decision (06)13 which stipulates that the frequency band 880-915 MHz may be used by other mobile systems provided that they can coexist with GSM, UMTS, LTE and WiMAX and systems in adjacent bands.
- 2.3. The usage of the 880-890 MHz band in Poland and Ukraine, described above, causes a collision case when Polish base stations' receivers are interfered by the Ukrainian base stations' transmitters.
- 2.4. The technical provisions given in the item 3 of the Arrangement should be applied to all base stations deployed in the 880-888 MHz in Ukraine not later than 15th of September 2014. The Ukrainian Party should inform the Polish Party on progress of network adjustment. The Polish operators should investigate any reasonable actions which they can undertake in order to adapt their networks to the new interference situation.
- 2.5. The provisions stipulated by this Arrangement apply to all base stations operating in the 880-888 MHz band deployed in Ukraine, including these stations which were put into operation before the date mentioned in the item 2.4 of this Arrangement or before the date of entry into force of the Arrangement given in the item 9.1.
- 2.6. After the date mentioned in the item 2.4 the Regulatory Authorities should meet and assess the networks adjustment in terms of scale of actions undertaken by the Ukrainian Party and their impact on improvement of interference situation for Polish operators. The Arrangement should be redefined if the network adjustment undertaken by the Ukrainian operators is deemed not proportional to burden born by the Polish operators in order to adapt their networks to the new interference situation. If the assessment of the networks adjustments results in conclusion that the

technical provisions given in the item 3 are acceptable for both parties, this fact should be expressed in a memorandum of understanding annexed to this Arrangement.

- 2.7. The Arrangement withdraws the preferential division of frequency in the bands 880-890 MHz and 925-935 MHz agreed by Administrations of Poland and Ukraine for E-GSM and CDMA systems during the coordination meeting held in Warsaw from 15th to 17th of December 2009.

3. General technical provisions

- 3.1. For the protection of UMTS base stations operating in Poland, networks deployed in Ukraine may operate if a field strength produced by CDMA stations at any point of the borderline does not exceed 22 dB μ V/m (further called as trigger value) at a height of 10 m above ground level measured in 1.25 MHz bandwidth.

4. Harmful interference

- 4.1. In case of harmful interference experienced by the receivers of UMTS base stations of the Polish operators the Polish Regulatory Authority shall perform measurements in order to verify the agreed level of interferences mentioned in the item 3.1. The measurements should be performed in accordance with the procedure of measurements given in the Annex 1 to the Arrangement.
- 4.2. If the measurements mentioned in the item 4.1 show that agreed level of interference is higher than trigger value level mentioned in the item 3.1 the Polish Regulatory Authority shall notify the Ukrainian Regulatory Authority of interference case providing the information specified in the Annex 2 to the Arrangement.
- 4.3. The Ukrainian Regulatory Authority shall present its statement on the notice mentioned in the item 4.2 provided by the Polish Regulatory Authority within 15 days. If there is no statement within the aforementioned period it is deemed that the Ukrainian Regulatory Authority confirms the excess of the interference limit.
- 4.4. On confirmation of excess of the interference level the Ukrainian Regulatory Authority within 10 days after confirmation of the excess of the interference limit mentioned in item 4.3 shall adjust the characteristics of interfering system in order to fulfil the limit of interference mentioned in the item 3.1 and inform the Polish Regulatory Authority on the undertaken actions.
- 4.5. If analyses and measurements performed by the Ukrainian Regulatory Authority do not confirm the excess of interference level reported by the Polish Regulatory Authority then both Regulatory Authorities should cooperate in order to investigate the matter. If it is deemed favourable for the investigation then both parties may agree on mutual measurement activities.

- 4.6. When performing measurements both Regulatory Authorities uses all information available, especially information received from both sides operators which are dealing in cooperation manner in accordance with item 4.7 of this arrangement.
- 4.7. If the operator affected by interference concerns it appropriate and beneficial, it may communicate directly to the operator of the interfering network in order to establish cooperation aimed at finding solution of the interference case. Interested operators can cooperate without appealing to Regulatory Authorities of their countries in accordance with item 5.

5. Cooperation between telecommunications operators of Poland and Ukraine

- 5.1. Cooperation between Ukrainian and Polish operators covers cases of preliminary actions for both sides operators directed to minimize interference effect before involving Regulatory Authorities such as: first appearance of constant or periodic short time interference, informing on launching of new or changing of parameters of existing CDMA base stations, informing on base stations involved into interference case, coordination of mitigation interference actions, etc.
- 5.2. In cases of interference mentioned in item 4.1 Polish operator measures interference parameters and informs Ukrainian operator of it. The Ukrainian operator checks the received information, confirms the receipt and adjusts the parameters of CDMA base station, if appropriate, within 5 days from the date of information receipt. After that or if there is no confirmation about interference case Ukrainian operator has to response to Polish operator. Both operators have to exchange mutually all information useful for the finding of solution.
- 5.3. If operators of both sides did not find right solution on minimizing of interference effect they report of it to the National Regulatory Authorities.

6. Review

- 6.1. This Arrangement can be revised in light of administrative, regulatory or technical developments, especially in order to comply with relevant amendments of CEPT ECC decisions and recommendations, at the proposal of any Signatory Authorities with the agreement of the second Signatory Authority.

7. Withdrawal

- 7.1. Any Authority may withdraw from this Arrangement by the end of a calendar month by giving notice of its intention at least six months in advance. A declaration to that action shall be addressed to the second Signatory Authority. Frequency assignments

made within the framework of this Arrangement prior to the date of entry into force of the withdrawal shall remain valid and be protected according to their status.

8. Language of the Arrangement

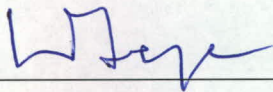
8.1. The original text of this Arrangement exists in English.

9. Date of entry into force of the Arrangement

9.1. This Arrangement will enter into force from the date of signing.

Done by correspondence 19 November 2014

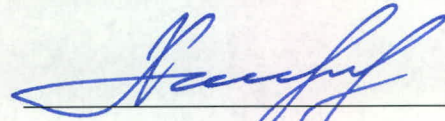
**For the Office of Electronic
Communications of Poland**



Victor Segal

**Director of Department of
Frequency Resources Management**

**For the Ukrainian State Centre of
Radio Frequencies**



Ievgen Khairov

**Director for Radio Frequency
Assignments**

Annex 1 to the Technical and procedural arrangement concerning frequency coordination in the band 880-890 MHz between the Frequency Management Authorities of Poland and Ukraine

Procedure of measurements in case of harmful interference

1 Common technical conditions

1.1 Measurements of interference level are carried out at the borderline or, if measurements at the borderline cannot be carried out due to practical reasons (e.g. the test point is not accessible), in a test point possibly close to the borderline. For purpose of the notification of harmful interference the measurements not performed at the borderline should be considered as measurements carried out at the borderline.

1.2 Basic provisions and procedure of measurements are in compliance with CEPT/ERC RECOMMENDATION 74-02 E (Bucharest 1999). Due to different distance to CDMA BS both kinds of measurement, cluster and over longer time periods have to be provided depending on information of interference.

2 Requirements to the monitoring equipment

2.1 Monitoring equipment has to comply with the following technical characteristics:

- sensitivity – not worse than minus 119 dBm at the antenna connector in the bandwidth 1,25 MHz;
- nonconformity of measured level (with S/N ratio more than 16 dB) – not higher than 1 dB;
- reference frequency stability 1×10^{-6} per 1 year.

3 Requirements to the antenna

3.1 Directional antenna with determined antenna factor at CDMA-800 frequencies is recommended.

4 Field strength calculations

4.1 Calculation of an average field strength value ($E_{meas\ av}$ [dB μ V/m]), for n measurements of $E_{meas\ i}$:

$$E_{meas\ av} = 20 \lg \left(\frac{\sum_{i=1}^n 10^{\frac{E_{meas\ i}}{20}}}{n} \right) \text{ dB}\mu\text{V/m.}$$

Examples of test points are given in the table below.

No	Coordinates of test points (POL)	Coordinates of test points (UKR)
1	51N33'07" 23E33'45"	51N29'49" 23E40'19"
2	51N24'08" 23E41'02"	51N23'44" 23E41'51"
3	51N13'00" 23E44'08"	51N13'13" 23E47'24"
4	51N03'00" 23E53'39"	51N03'16" 23E55'34"
5	50N51'21" 24E04'23"	50N49'54" 24E04'58"
6	50N34'38" 24E04'54"	50N35'20" 24E10'04"
7	50N25'36" 23E58'16"	50N25'22" 23E59'10"
8	50N16'36" 23E34'29"	50N16'04" 23E35'40"
9	50N08'33" 23E19'28"	50N07'28" 23E22'06"
10	50N01'05" 23E11'37"	50N05'11" 23E17'28"
11	49N47'41" 22E55'57"	49N48'33" 22E58'06"
12	49N41'44" 22E49'03"	49N41'19" 22E49'00"
13	49N37'44" 22E42'26"	49N38'53" 22E47'26"
14	49N28'55" 22E41'42"	49N28'42" 22E43'57"
15	49N17'35" 22E44'05"	49N16'49" 22E44'36"

Annex 2 to the Technical and procedural arrangement concerning frequency coordination in the band 880 890 MHz between the Frequency Management Authorities of Poland and Ukraine

Information to be provided by the affected Regulatory Authority in case of harmful interferences

1. Name of the point of measurements
2. Coordinates of the test point (DDNMM'SS" DDEMM'SS")
3. Height of the point of measurements above sea level (m)
4. Date of measurements
5. Azimuth of measurement antenna (degrees)
6. Polarization (degrees)
7. Antenna factor (dB/m)
8. Total attenuation (dB)
9. Channel width (MHz)
10. Central transmitting frequency of CDMA channel (MHz)
11. Measured channel power (dBm)
12. Field strength (dB μ V/m)
13. If available, other information which can be useful for investigation of the harmful interference cease