

Agreement

**between the Telecommunications Administration of the
Republic of Estonia and the Telecommunications
Administration of the Russian Federation concerning the use of
the frequency band 790-862 MHz for terrestrial systems**

Moscow, 2011

PREAMBLE

According to Article 6 of the Radio Regulations, the representatives of Telecommunications Administration of the Republic of Estonia (hereinafter referred to as Republic of Estonia) and the Telecommunications Administration of the Russian Federation (hereinafter referred to as Russian Federation) have concluded the present Agreement concerning the use of the frequency band 790 - 862 MHz with the purpose of avoiding mutual interference and optimising the use of the above-stated frequency band on a mutually coordinated basis.

This Agreement does not abrogate the fulfilment of protection requirements for broadcasting service stipulated in GE-06 Regional Agreement until TV broadcasting is cancelled in the frequency band 790-862 MHz and the respective administration informs about it.

1 PRINCIPLES

- 1.1 This Agreement is based on the concept of coordination threshold and the idea of symmetrical conditions for both administrations.
- 1.2 This Agreement covers the coordination¹ of land mobile service, fixed service and aeronautical radionavigation service.
- 1.3 The frequency arrangement for Land Mobile Service conforms to the FDD frequency arrangement and parameters of transmission for base and user stations in accordance with ECC/DEC(09)03.
- 1.4 TDD frequency arrangement of fixed and mobile services is not covered by this Agreement.
- 1.5 This Agreement applies to stations of the services listed in 1.2 and brought into use after the date of signing of this Agreement. The frequency assignments of aeronautical radionavigation systems operated in the frequency band 790-862 MHz in the Russian Federation will also be presented during but not later than two months after the signing of this Agreement.
- 1.6 This Agreement is not implemented for the frequency band 821-832 MHz.

2 USE OF FREQUENCIES

- 2.1 The Republic of Estonia may use the frequency band 790-820 MHz without coordination with the Russian Federation if the following conditions are met:
 - 2.1.1 In the border area except border area from 58° 25' to 59° 02' latitude:
 - ♦ if the predicted mean field strength produced by a station during transmission does not exceed 51 dB(μV/m)/1 MHz and 58 dB(μV/m)/5 MHz at a height of 10m above the ground at the border;
 - ♦ if the base stations of land mobile service are located at a distance from the border not less than 10 km;
 - ♦ the base station e.i.r.p. of land mobile service shall not exceed 55 dBm in the frequency band 5 MHz in any direction to the border of the Russian Federation. Service radius for base station should not cover areas which are closer than 2 km from a border;

¹ The term «coordination» should be understood as bilateral coordination between administrations without involving BR in this process. The agreement given under this bilateral coordination shall be considered by administrations as an agreement under relevant RR procedure.

- ♦ the base station antenna height of land mobile service located at the distance of less than 50 km from the border shall not be more than 70 m. Deployment density of base station operating simultaneously in the common frequency band of land mobile service shall not exceed 1 base station per 100 km² in area of 10 – 30 km from the border and 10 base stations per 100 km² in the area of 30 – 50 km from the border;

2.1.2 In the border area from 58° 25' to 59° 02' latitude:

- ♦ if the predicted mean field strength produced by a station during transmission does not exceed 44 dB(μV/m)/1 MHz and 51 dB(μV/m)/5 MHz at a height of 10m above the ground at the border;
- ♦ if the base stations of land mobile service are located at a distance from the border not less than 20 km;
- ♦ The base station e.i.r.p. of land mobile service shall not exceed 55 dBm in the frequency band 5 MHz in any direction to the border of the Russian Federation. Service radius for base station should not cover areas which are closer than 12 km from a border;
- ♦ The base station antenna height of land mobile service located at the distance of less than 50 km from the border shall not be more than 70 m. Deployment density of base station operating simultaneously in the common frequency band of land mobile service shall not exceed 1 base station per 100 km² in area of 20 – 50 km from the border.

Information with respect to a planned frequency assignment of base station in the ITU filing format shall be provided by Administration of the Republic of Estonia to the Russian Federation preferably before but not later than 2 weeks after bringing into use this frequency assignment in the border area at distance of up to 50 km from the border.

2.2 The Republic of Estonia and the Russian Federation may use the frequency band 820-821 MHz without coordination if the predicted mean field strength produced by a station during transmission does not exceed 15 dB(μV/m)/1 MHz and 22 dB(μV/m)/5 MHz at a height of 10 m above the ground at the border. Protection criteria will be in force until 01.01.2015. Parties will revise and confirm the protection criteria not later than 30.06.2014. If no criteria are agreed, provisions of the Radio Regulations will be applied.

2.3 The Russian Federation may use the frequency band 790 - 820 MHz without coordination with Estonia if the following conditions are met:

- ♦ if the predicted mean field strength produced by a station during transmission does not exceed 51 dB(μV/m)/1 MHz and 58 dB(μV/m)/5 MHz at a height of 10 m above the ground at the border, and;
- ♦ if the base stations are located at a distance from the border not less than 10 km;
- ♦ the base station e.i.r.p. of land mobile service shall not exceed 55 dBm in the frequency band 5 MHz in any direction to the border of the

Estonia. Service radius for base station should not cover areas which are closer than 2 km from a border;

- ♦ the base station antenna height of land mobile service located at the distance of less than 50 km from the border shall not be more than 70 m.

Information with respect to a planned frequency assignment of base station in the ITU filing format shall be provided by the Russian Federation to Administration of the Republic of Estonia preferably before but not later than 2 weeks after bringing into use this frequency assignment in the border area at distance of up to 50 km from the border.

- 2.4 The Republic of Estonia may use the frequency band 832 - 862 MHz for user equipment of the land mobile service without coordination with the Russian Federation if compliance with 2.1 is ensured.

The aggregate e.i.r.p. value of all user equipment operating simultaneously with one base station shall not exceed 28 dBm in any frequency band of 5 MHz and 21 dBm in 1 MHz².

- 2.5 The Russian Federation may use the frequency band 832 - 862 MHz for user equipment of the land mobile service without coordination with the Republic of Estonia if compliance with 2.3 is ensured.

The aggregate e.i.r.p. value of all user equipment operating simultaneously with one base station shall not exceed 28 dBm in any frequency band of 5 MHz and 21 dBm in 1 MHz².

- 2.6 Aeronautical radionavigation stations of the Russian Federation may use the frequency bands 832-862 MHz without coordination with the Republic of Estonia provided that technical characteristics except carrier frequency of the stations brought into use before the date of signing of this Agreement (see item 1.5) are kept unchanged. In case carrier frequency of aeronautical radio navigation stations is changed in the above-mentioned frequency band Administration of the Russian Federation shall inform Administration of the Republic of Estonia indicating new carrier frequency not later than 10 weeks before these assignments are brought into use (see also "Preamble").

3 GENERAL

- 3.1 A new frequency assignment exceeding the above-mentioned coordination threshold values shall be coordinated with the other party.
- 3.2 The coordination procedure shall be performed in accordance with Article 4 of this Agreement.
- 3.3 Preliminary coordination may take place between the Land Mobile Service operators concerned. The results of such preliminary coordination must be approved by the administrations.
- 3.4 In the presence of interference produced by a station covered by this agreement, the Report of harmful interference shall be presented in accordance with Appendix 10 of the Radio Regulations. The parties shall take all possible measures in order to eliminate the interference in due time.
- 3.5 The field strength specified in the interference report (see item 3.4) shall be based on the median values of measurements of field strength performed at

² The maximum e.i.r.p. of user equipment is equal to 23 dBm in frequency band of 5 MHz.

antenna height stipulated in Article 2 at least in two different points over a range of at least 100 m along the border.

- 3.6 The field strength values in this agreement are calculated according to ITU-R Recommendation P.1546-4 for 10% time and 50% locations.
- 3.7 ITU-R Recommendation P.1546-4 "Method for point-to area predictions for terrestrial services in the frequency range 30-3000 MHz" shall be used for calculations of the field strength value produced by ground stations.
- 3.8 ITU-R Recommendation P.525-2 "Calculation of free space attenuation" shall be used for calculations of the field strength value produced by or to airborne station.
- 3.9 The deployment density calculation method is presented in the Attachment 1 to this Agreement.

4 COORDINATION PROCEDURE

- 4.1 The Administration wishing to initiate use of a frequency assignment to the station covered by this agreement that does not correspond to the terms specified in Article 2 of this Agreement shall send to the other Administration a request to coordinate such frequency assignment. A request can be sent by mail, fax or e-mail. In case if a request is sent by e-mail the requesting Administration shall send by fax a covering letter to the affected Administration and to receive a confirmation of its receipt.
- 4.2 The affected Administration shall provide a feedback in respect of the request to coordinate assignments within 10 weeks from the date of the request receipt. If no feedback was received, an urgent reminder shall be sent. Administrations that failed to respond within 2 weeks from the date of an urgent reminder receipt shall be deemed agreeing if the administration, a consent of which is sought, did not ask for extra time needed to coordinate the request review.
- 4.3 In case of a refusal of the affected administration to satisfy a request for coordination the requesting administration shall provide to the affected administration results of its calculations, or any new technical characteristics of the assignment.
- 4.4 If no response from the affected administration to the proposals provided in Item 4.3 was received within 10 weeks from the date of proposals receipt, an urgent reminder shall be sent. Administrations that failed to respond within 2 weeks from the date of receipt of an urgent reminder shall be deemed agreed to the provided proposals on coordination.
- 4.5 The administration objecting to the received request for coordination shall provide results of its calculations and a proposal for reasonable changing of the request that shall not only provide for adequate protection for its available and planned services, but to the maximal possible extent shall preserve an initial objective of the request for coordination.
- 4.6 In case of controversies originating from this document applying administrations shall be governed by provisions and procedures of the Radio Regulations, as well as applicable International and bilateral Agreements.

5 REVISION AND CANCELLATION

- 5.1 This Agreement may be cancelled as desired by one of the Administrations with a notice of at least one year. This does not affect the operation of stations already brought into use or coordinated under this agreement.
- 5.2 After such cancellation, administrations will exchange the list of stations already brought into use or coordinated under this agreement.
- 5.3 This Agreement may be revised or cancelled without previous notice, if mutual understanding is reached between the Administrations.
- 5.4 This Agreement is subject to be revised in case one of the parties decides to suspend the use of the frequency band 790-862 MHz in the border area by any service indicated in item 1.2.
- 5.5 In case the current procedures and frequency allocations of the Radio Regulations for the frequency band 790-862 MHz are changed this Agreement shall be confirmed or revised.
- 5.6 In case the study results concerning the usage of the frequency band 790-862 MHz by radio services indicated in item 1.2 agreed by both parties are obtained this Agreement should be confirmed or revised taking into account these results.

6 COMING INTO FORCE

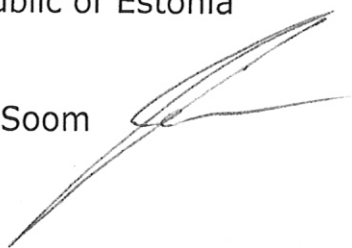
This Agreement shall come into force from the date of signing.

This Agreement has been drawn up in two identical copies, one for the Republic of Estonia and one for the Russian Federation.

Moscow, 12 August 2011.

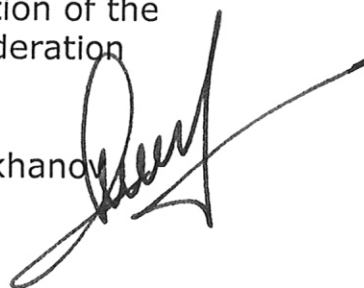
For the Telecommunications
Administration of the
Republic of Estonia

Priit Soom



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Andrey Mukhanov



Algorithm to define maximum deployment density of base stations

- A.1. In order to have common understanding of maximum deployment density of base station it is necessary to define unambiguous method of calculation. The definition of maximum deployment density of base stations should be done with the use of circle with the area equal to 100 km^2 . The maximum deployment density requirement is fulfilled if the circle (its center) positioned at any point within described deployment density zone (e.g. 10-30 km or 30-60 km) doesn't enclose more than the number of base stations stated in the Agreement. See figure A.1 for illustration.

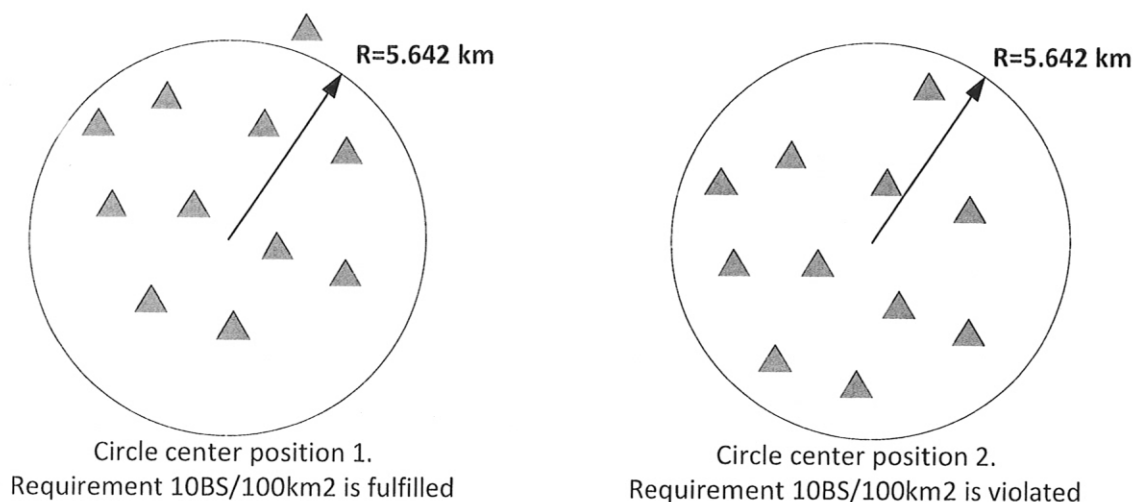


Fig.A.1. Maximum permissible deployment density calculation

- A.2. In the cases when circle area is intersected by the zone line (i.e. line parallel to the border and delineating zones with deployment density requirements), the area outside the zone (but still inside the circle) is ignored (i.e. base stations outside the zone are not accounted). For each deployment density zone separate analysis is performed. See figure A.2 for illustration.

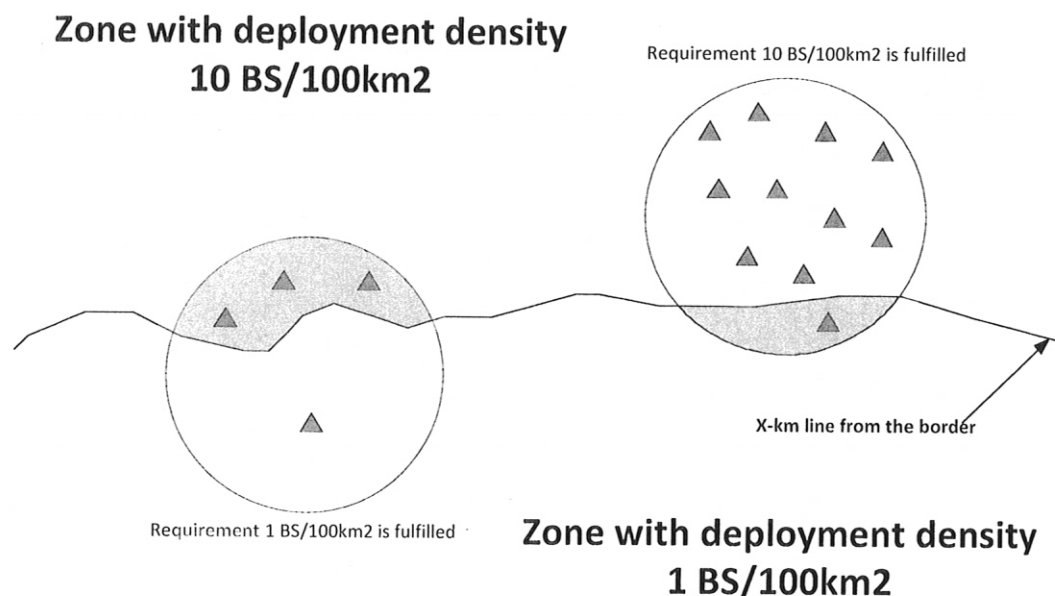
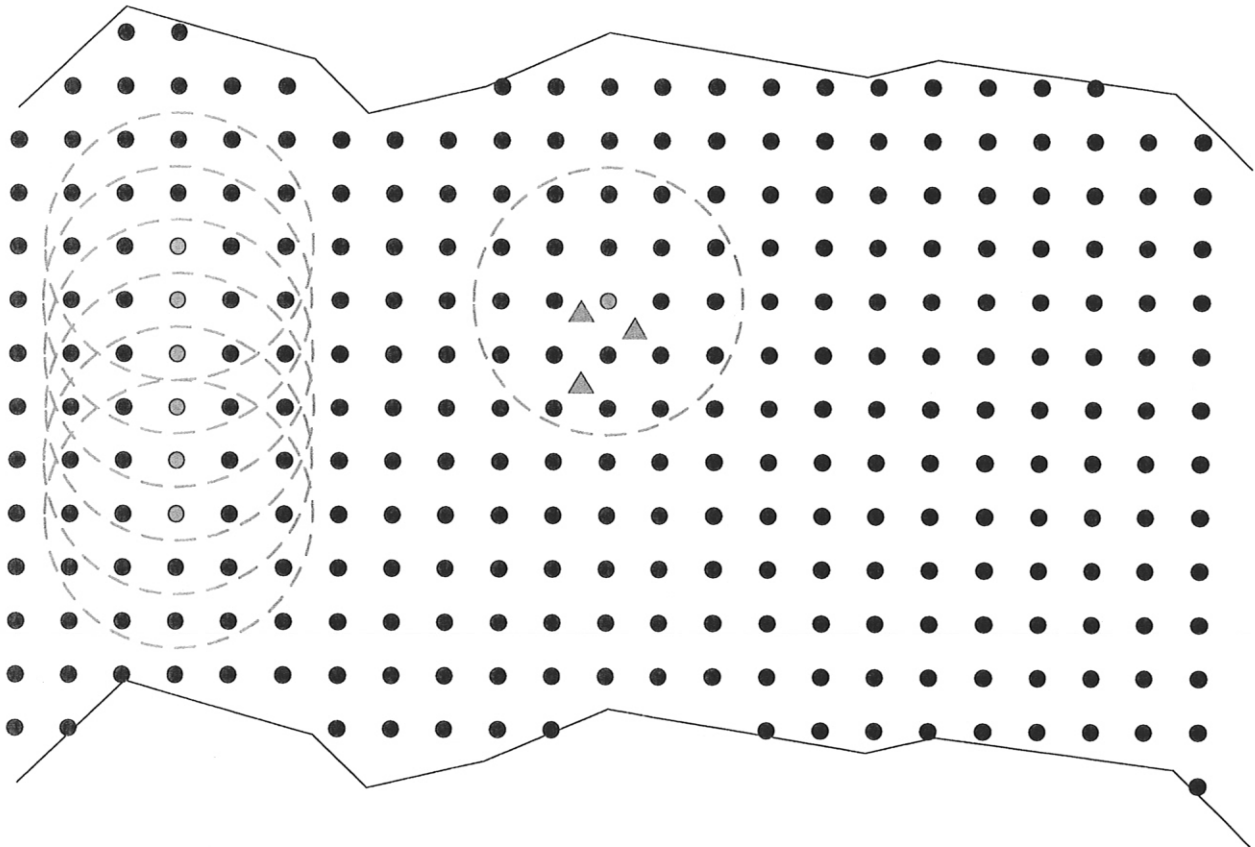


Fig.A.2. Deployment density calculation at the edge of deployment density zone

A.3. The implementation of the algorithm should use high number of points for the circle center positioning to achieve high accuracy. It is assumed that the regular grid of points covering deployment density zone with step less or equal to 100 m (e.g. 3 arc-seconds grid) is sufficient. For each point within the grid a separate check with circle area is performed. See figure A.3 for illustration.



*Fig.A.3. Application of the circle criteria to the deployment density zone
(sparser regular grid is used for illustration purpose only)*

A.4. All geographical derivations and input data should be based on WGS84 geodetic system.