Agreement

between the Telecommunications Administration of Norway and the Telecommunications Administration of the Russian Federation concerning the use of the frequency band 790 – 862 MHz for terrestrial systems

Bucharest, November 2011

Preamble

According to Article 6 of the Radio Regulations, the Telecommunications Administration of Norway and the Telecommunications Administration of the 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.

1 Principles

1.1 This Agreement is based on the concept of coordination thresholds and the idea of symmetrical conditions for both Administrations.

1.2 This Agreement covers the coordination[1] 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 stations and user terminals in accordance with ECC/DEC(09)03. TDD frequency arrangement of fixed and land mobile services are not covered by this Agreement.

1.4 This Agreement applies to stations of the services listed in 1.2 and brought into use after the date of signing of this Agreement.

1.5 This Agreement does not include provisions concerning the use of the frequency band 821-832 MHz.

2 Use of frequencies

2.1 Norway 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 of Norway limited by latitude lower than or equal to 69N47'21'' and longitude to the East of 28E48'19'':

- the predicted field strength produced by a station does not exceed 51 dB(μV/m)/1 MHz at a height of 10 m above the ground at the border;
- base stations of the land mobile service are located at a distance from the border not less than 10 km;
- the base station e.i.r.p. of the land mobile service shall not exceed 57 dBm/1 MHz in any direction towards the border of the Russian Federation. Service area for base station should not include areas closer than 3 km from the border;
- the effective antenna height (as defined in Recommendation ITU-R P.1546-4) of a land mobile service base station located at a distance of less than 70 km from the border shall not be more than 150 m Deployment density of base stations of the land mobile service operating simultaneously in the common frequency band shall not exceed: 2 base stations per 100 km^2 in the area from 10 to 20 km from the border; 4 base stations per 100 km^2 in

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

the area from 20 to 40 km from the border; 10 base stations per 100 km^2 in area from 40 to 70 km from the border.

2.1.2 In the coastal Norwegian area of the Barents Sea with latitude higher than 69N47'21'' and longitude to the East of 28E13'51'':

- the predicted field strength produced by a station does not exceed 51 dB(μV/m)/1 MHz at a height of 10 m above the ground at the border;
- base stations of the land mobile service are located at a distance from the border not less than 10 km;
- the base station e.i.r.p. of the land mobile service shall not exceed 57 dBm/1 MHz in any direction towards the border of the Russian Federation. Service area for base station should not include areas closer than 3 km from the border;
- the effective antenna height (as defined in Recommendation ITU-R P.1546-4) of a land mobile service base station located at a distance of less than 70 km from the border shall not be more than 150 m. Deployment density of base stations operating simultaneously in the common frequency band of the land mobile service shall not exceed: 1 base station per 100 km^2 in the area from 10 to 20 km from the border; 2 base station per 100 km^2 in the area from 20 to 40 km from the border; 5 base station per 100 km^2 in area from 40 to 100 km from the border.

Information with respect to a planned frequency assignment of base station in the ITU filing format shall be provided by the Administration of Norway to the Administration of the Russian Federation preferably before but not later than 2 weeks after bringing into use this frequency assignment in the border area with latitude lower than or equal to 69N47'21" at a distance of up to 70 km from the border and in the border area with latitude higher than 69N47'21" at a distance of up to 100 km from the border.

2.2 Norway and the Russian Federation may use the frequency band 820 - 821 MHz without coordination if the predicted field strength produced by a station does not exceed 15 dB(μV/m)/1 MHz at a height of 10 m above the ground at the border.

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

2.3.1 In the border area of Russian Federation with latitude lower than or equal to 69N47'21'' and longitude to the West of 32E38'08'':

- the predicted field strength produced by a station does not exceed 51 dB(μV/m)/1 MHz at a height of 10 m above the ground at the border;
- base stations of the land mobile service are located at a distance from the border not less than 10 km;
- the base station e.i.r.p. of the land mobile service shall not exceed 57 dBm/1 MHz in any direction towards the border of Norway. Service area for base station should not include areas closer than 3 km from the border;
- the effective antenna height (as defined in Recommendation ITU-R P.1546-4) of a land mobile service base station located at a distance of less than 70 km from the border shall not be more than 150 m.

2.3.2 In the Russian coastal area of Barents Sea with latitude higher than 69N47'21'' and longitude to the WEST of 33E24'41'':

- the predicted field strength produced by a station does not exceed 51dB(μV/m)/1 MHz at a height of 10 m above the ground at the border;
- base stations of the land mobile service are located at a distance from the border not less than 10 km;
- the base station e.i.r.p. of the land mobile service shall not exceed 57 dBm/1 MHz in any direction towards the border of Norway. Service area for base station should not include areas closer than 3 km from the border;
- the effective antenna height (as defined in Recommendation ITU-R P.1546-4) of a land mobile service base station located at a distance of less than 100 km from the border shall not be more than 150 m.

Information with respect to a planned frequency assignment of base station in the ITU filing format shall be provided by Administration of the Russian Federation to Norway preferably before but not later than 2 weeks after bringing into use this frequency assignment in the border area with latitude lower than or equal to 69N47'21'' at a distance of up to70 km from the border and in the border area with latitude higher than 69N47'21'' at a distance of up to 100 km from the border.

2.4 Norway 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. Stations of the fixed service may use this frequency band without coordination with the Russian Federation if the predicted field strength produced by a station does not exceed 10 dB(μV/m)/1 MHz at a height of 10 m above the ground at the border (See also Note).

2.5 The Russian Federation may use the frequency band 832 - 862 MHz for user equipment of the land mobile service without coordination with Norway if compliance with 2.3 is ensured. Stations of the aeronautical radionavigation service of the Russian Federation may use this frequency band without coordination with Norway, if the predicted field strength produced by a station does not exceed 42 dB(μV/m)/1 MHz at a height of 10 m above the ground at the border. Stations of fixed service may use this frequency band without coordination with Norway, if the predicted field strength produced by a station does not exceed 10 dB(μV/m)/1 MHz at a height of 10 m above the ground at the border (See also Note).

3.General

3.1 The technical parameters related to any new frequency assignment causing the above-mentioned coordination threshold values to be exceeded shall be coordinated.

3.2 The coordination procedure shall be performed in accordance with Article 4 of this Agreement.

3.3 Preliminary coordination may take place between any land mobile service operators concerned. The results of such preliminary coordination must be approved by the Administrations.

Note: 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 MHz.

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 Administrations shall take all possible measures in order to eliminate the interference as soon as possible.

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

3.6 The predicted field strength values in this Agreement calculated with the ITU-R Recommendation P.1546-4 are based on antenna heights corresponding to those in Article 2 of this Agreement with 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 Deployment density of base stations is determined for base stations of land mobile service operating simultaneously in common frequency band.

3.10 The deployment density calculation method is presented in Attachment 1.

3.11 The term «border» for the purposes of the Agreement should be understood as the land border between Norway and the Russian Federation reaching the point having coordinates **30E49'23''** and **69N47'21''**.

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 feedback in respect of the request to coordinate assignments within 10 weeks from the date of the request receipt. If no feedback is received, an urgent reminder shall be sent. Administration 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 the 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 is received within 10 weeks from the date of proposals receipt, an urgent reminder shall be sent. Administration 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 a proposal for reasonable changing of the request that shall not only provide adequate protection for its existing

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 application of this Agreement, 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 Telecommunications Administrations with 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 shall 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 Telecommunications Administrations.

5.4 This Agreement may be revised in case the existing RR procedures in 790-862 MHz band, which deal with sharing of MS and ARNS, MS and FS, will be changed at WRC-12. In this case, if the Agreement's revision request will not be provided in one month (from the date of adopting the changes) by both Administrations the Agreement will be prolonged automatically. Otherwise this Agreement is suspended and it shall be revised.

6 Entering into force

6.1 This Agreement shall enter into force on the date of the signing.

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

3rd of November 2011

For the Telecommunications Administration of Norway

Geir Jan Sundal

For the Telecommunications Administration of the Russian Federation

Nikolay Varlamov

Algorithm to define maximum deployment density of base stations

A.1. In order to have a common understanding of maximum deployment density of base stations 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. 15-60 km or 60-100 km) does not enclose more than the number of base stations stated in the Agreement. See figure A.1 for illustration.

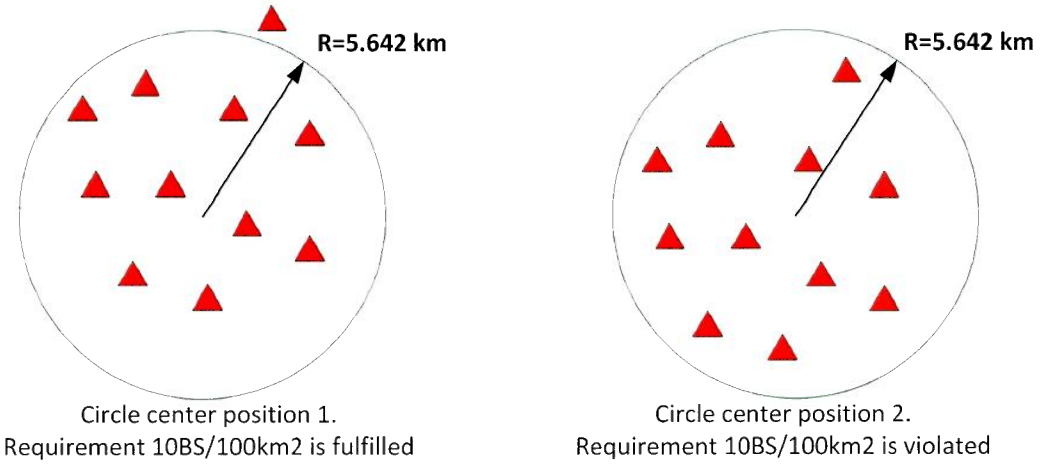

Fig.A.1. Maximum permissible deployment density calculation

A.2. In 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 a separate analysis is performed. See figure A.2 for illustration.

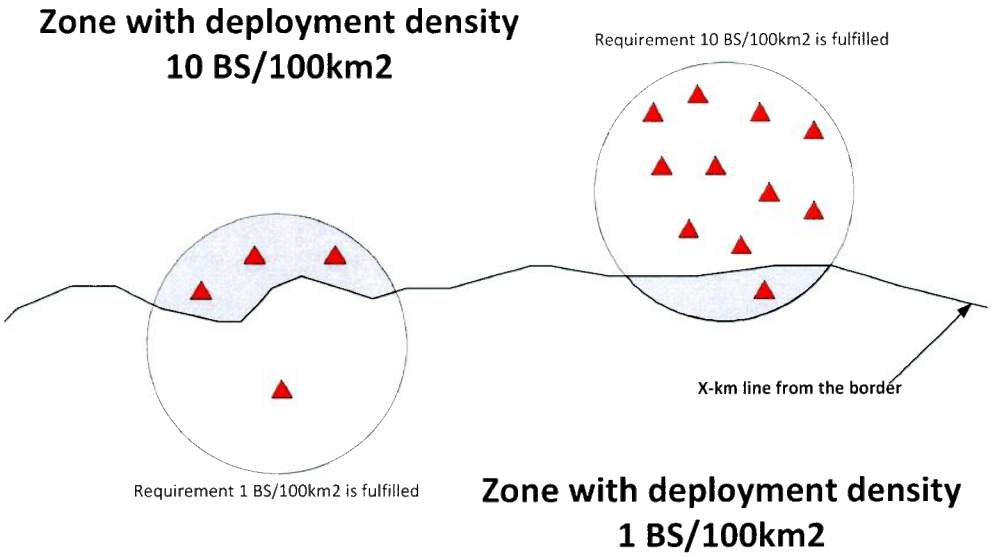

Fig.A.2. Deployment density calculation at the edge of deployment density zone

A.3. In order to achieve high accuracy implementation of the algorithm should use a high number of points defining the center of the positioned circle . It is assumed that the regular grid of points

covering deployment density zone with step less than or equal to 100 m (e.g. 3 seconds grid) is sufficient. For each point within the grid a separate check with circle area is performed. See figure A.3 for illustration.

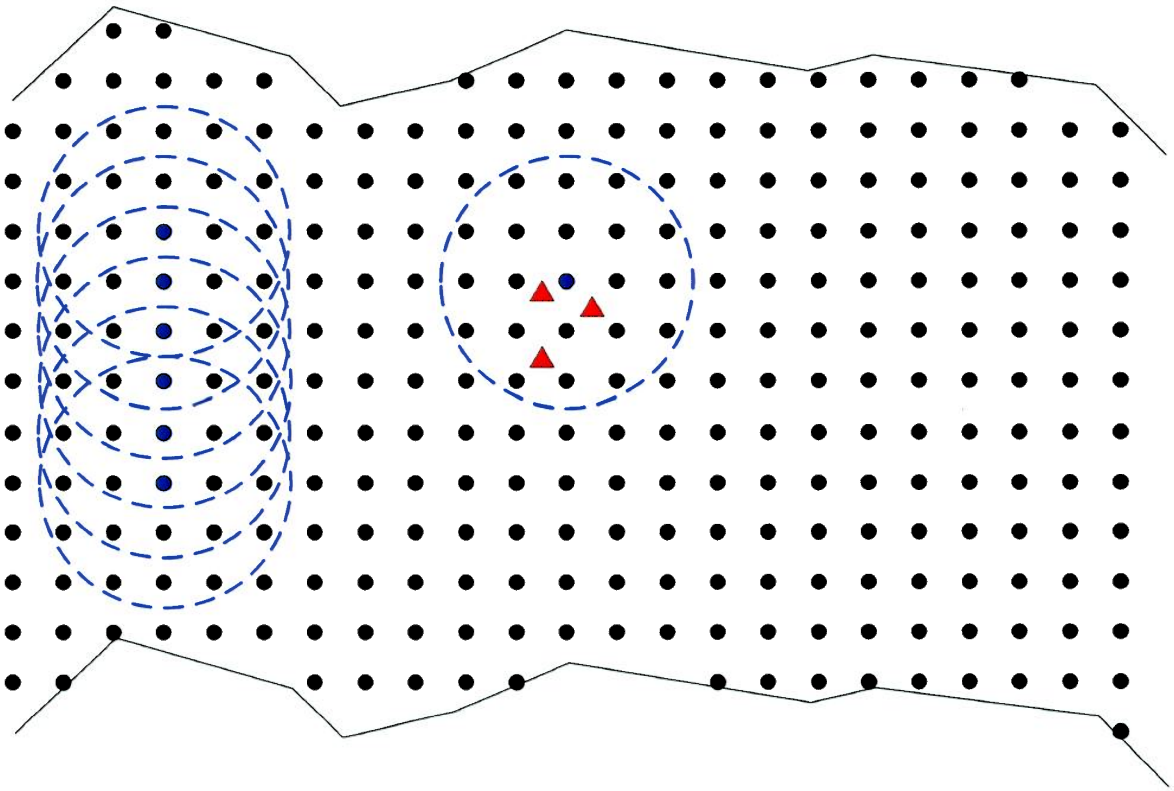

Fig.A.3. Application of the circle criteria to the deployment density zone (sparser regular grid is used for illustration purpose only)

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