



**MEMORANDUM OF UNDERSTANDING ON
FREQUENCY CO-ORDINATION BETWEEN
FRANCE AND THE UNITED KINGDOM
CONCERNING THE SPECTRUM COORDINATION
OF
LAND MOBILE RADIOCOMMUNICATION NETWORKS
IN THE FREQUENCY BAND 3400 – 3800 MHz
TO BE APPLIED IN THE AREA INCLUDING FRANCE, THE
UNITED KINGDOM AND THE CHANNEL ISLANDS**



1. INTRODUCTION

The representatives of the Administrations of United Kingdom (UK) and France (F), taking into account the recommendations of the International Telecommunication Union, have concluded this present MoU, under Article 6 of the Radio Regulations on the coordination of frequencies used by land mobile radio communication networks in the 3400 MHz - 3800 MHz frequency band.

This MoU covers frequency coordination for International Mobile Telecommunication (IMT) systems following the spectrum arrangements below as provided in ECC Decisions (11)06:

Frequency Band	Base receive	Base transmit
TDD 3600 MHz	3400-3800 MHz	3400-3800 MHz

This MoU abrogates the previous MoU concluded in the frequency bands above between France and United Kingdom, and listed hereafter:

- 2300-2400 MHz and 3400-3800 MHz included Channel island (London, 19th November 2014)

The provisions of this MoU add to the mandatory requirements of the ITU Constitution and the ITU Radio Regulations, which have both the status of an International Treaty, and in particular:

- Article°15.2 of the ITU Radio Regulations: “Transmitting stations shall radiate only as much power as is necessary to ensure a satisfactory service”
- Articles°15.3, 15.4 & 15.5 of the ITU Radio Regulations: “In order to avoid interference [...], a) locations of transmitting stations and, where the nature of the service permits, locations of receiving stations shall be selected with particular care; b) radiation in and reception from unnecessary directions shall be minimized by taking the maximum practical advantage of the properties of directional antenna whenever the nature of the service permits”

The present frequency coordination MoU has been established with a view to:

- reducing problems of harmful interference¹ between land mobile radio communication systems operating in neighbouring countries;
- Optimising the use of spectrum resources in the border areas.

In particular, this MoU has been established with a view to finding a balanced solution between:

- On the one hand, minimising harmful emissions coming from the neighbouring territories. These harmful emissions may cause harmful interference, harmful coverage (international roaming issues) or may prevent an Administration from utilising / allocating portions of its national spectrum.

¹ Article°1.169 of the ITU Radio Regulations

- On the other hand, defining satisfactory frequency-usage conditions for land mobile operators to operate their networks while maintaining a good quality of service and good coverage upon the national territory.

This leads Administrations to accept and agree upon a certain level of interference (as defined in Article°1.168 of the ITU Radio Regulations) and/or a certain level of coverage from neighbouring countries.

This MoU applies in the main land areas of France and the United Kingdom and the Channel Islands.

The co-ordination procedure is based on the principle of equitable access to the spectrum resource.

2. SYNCHRONISATION

The administrations are agreed to deploy NR/LTE base stations with the following parameters for synchronisation:

- 1) The time reference (t0) of base stations deployed in the frequency band 3400-3800 MHz, is defined according to Coordinated Universal Time (UTC) +/-1.5 µs.
- 2) The frame structure reference is the LTE frame n° 2 DSUDD (periodicity 5ms, with an SCS of 15 kHz).

The special subframe identified in LTE is:

- In France, the SS n° 7, 10:2:2 (number of symbols, DL: GP: UL)
- In United Kingdom, the SS n° 6, 9:3:2 (number of symbols, DL: GP: UL)

3) NR Frame

Any NR frame structure which is compatible with the LTE frame structure defined above.

The following NR frame structure (periodicity 5ms, with an SCS of 30 kHz) is compatible:

- DDDSUUDDDD
- Or DDDDDDDSUU + 3ms delay

The slot format S identified in France is 6:4:4 and in United Kingdom 4:6:4.

Base stations compliant with the parameters given above and deployed in accordance with the coordination thresholds in section 3 may be used without prior coordination.

Base stations exceeding the applicable coordination threshold should be coordinated before being used.

The MoU has been developed on the assumption that base stations are synchronised on each side of the border.

3. SPECTRUM COORDINATION FOR LTE AND NR SYSTEMS IN THE 3400-3800 MHz FREQUENCY BANDS

Base stations may be operated without coordination with the neighbouring country if they are compliant with Section 2 and if the predicted mean field strength of each carrier produced by the base station does not exceed the following values at the given height of 3 m above ground at the coastline of the neighbouring country:

- a. In case of preferential PCI² usage:

79 dB μ V/m/5 MHz at the coastline of the neighbouring country

61 dB μ V/m/5 MHz at a distance of 6 km beyond the border

- b. In case of non-preferential PCI usage:

61 dB μ V/m/5 MHz at the coastline of the neighbouring country

In order to ensure the optimum network performance for LTE and NR systems deployed in the border areas, the administrations shall encourage operators to coordinate the use of physical-layer cell-identity groups for LTE/NR and other radio parameters, in accordance with ECC Recommendation (15)01 for LTE and NR signals where the synchronisation signals overlap in frequency in border areas.

Both administrations recognise that Base stations already installed before the date of entry into force of this MoU, and have adhered with previously agreed MoU's at the time of their deployment, are considered as already coordinated.

LTE:

3GPP TS 36.211 defines 168 "unique physical-layer cell-identity groups" in § 6.11, numbered 0...167, hereafter called "PCI groups". Within each PCI group there are three separate PCIs giving 504 PCIs in total. Each country can use all PCI groups away from the border areas.

PCI GROUPS	84-335	0-83 + 336-503
UK and Channel Island	PREFERENTIAL	NON-PREFERENTIAL
FRANCE	NON-PREFERENTIAL	PREFERENTIAL

² As defined in ECC/REC(15)01

NR:

3GPP TS 38.211 defines 336 “unique physical-layer cell-identity groups” in § 7.4.2.1, numbered 0...335, hereafter called “PCI groups”. Within each PCI group there are three separate PCIs giving 1008 PCIs in total. Each country can use all PCI groups away from the border areas.

PCI GROUPS	84-335	0-83 + 336-503
	588-839	504-587+840-1007
UK and Channel Island	PREFERENTIAL	NON-PREFERENTIAL
FRANCE	NON-PREFERENTIAL	PREFERENTIAL

4. PREDICTION OF PROPAGATION

The field strength prediction method shall be according to the latest version of ITU-R Recommendation P. 452 (10% of the time), and taking account of:

- Terrain profile for the base station in all main directions
- Type of terrain (e.g. land, sea, mixed path)
- Equivalent isotropic radiated power.
- Height of the transmitting antenna, tilt and azimuth.

Including model components, where appropriate:

- Mixed land/sea paths
- Receiving/mobile antenna height
- Terrain clearance angle

And standard values:

- $\Delta N = 40$ (N0m-N1000m)

5. ARRANGEMENT FOR PLANNING AT AN OPERATIONAL LEVEL

A “Framework” MoU between the administrations of France and the United Kingdom, which enables planning arrangements between mobile operators, subject to agreement of the Administrations, was signed on 13 October 1999³. The administrations of France and the

³ Agreement between the administrations of France and the United Kingdom concerning the approval of planning arrangements between mobile radio communications network operator, 13 October 1999.

United Kingdom agree to extend the applicability of this MoU to all operators of systems in the frequency bands that are the subject of the present MoU.

To facilitate reasonable and timely development of their systems, licensees are encouraged to develop Arrangements in accordance with the Framework MoU of 13 October 1999.

Operators may only negotiate Arrangements concerning the common part of those frequency bands for which they have been licensed by the National Administration. The provisions in the Arrangements shall not result in an impairment of the authorised use of radio frequencies by third parties not involved in the Arrangements.

In order to facilitate Arrangements between operators, each Administration will provide names and point of contact information for the relevant licensees, subject to the agreement of the licensees.

6. HARMFUL INTERFERENCE

If an operator suffers from harmful interference and/or notices a degradation of the quality of service on its network - due to the rise of the field strength coming from a neighbouring Administration for example - it should immediately inform its Administration, which will contact its counterparts. A list of contact points for each Administration, including the operators shall be exchanged regularly.

7. REVIEW AND FOLLOW UP OF THE MOU

Any signatory Administration may request a review of this MoU. Any part of this MoU may be revised in the light of future developments, i.e. introduction of new technologies and experience in the operation of the networks covered by the MoU.

8. TERMINATION OF THE MOU

Any signatory Administration may withdraw from this MoU subject to 6 months notice.

9. Date of entry into force

This MoU will enter into force on 16th October 2023.

For the Administration of United Kingdom

David Willis



For the Administration of France

Keite DYVRANDE

