Commission for
Communications Regulation

Information Notice

GSM Liberalisation Project: Publication of Interim Licences, 900 MHz and 1800 MHz MOU and non-confidential correspondence provided by respondents (and ComReg written responses to same)

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ANNEX A

Publication of non-confidential correspondence provided by respondents (and ComReg written responses to same) since May 2011.

1. ComReg: Response to H3GI letter of 11 May 2011 "Re: Decision No. D03/11: Response to Consultation and Decision – Inter*im Licences for the 900 M*Hz band" (letter *dated 19 May 2011)*

2. H3GI: Email to ComReg "ComReg – Spectrum" (email *dated 25 May 2011)*

3. ComReg: Reply to H3GI email of 25 May 2011 *(email dated 30 May 2011)*

4. Meteor: Email to ComReg "Spectrum: next steps" *(email dated 22 June 2011)*

5. ComReg: Reply to Meteor email of 22 June 2011 *(email dated 22 June 2011)*

6. Meteor: Reply to ComReg email of 22 June 2011 *(email dated 22 June 2011)*

7. ComReg: Reply to Meteor email of 22 June 2011 *(email dated 23 June 2011)*

8. H3GI: Letter to ComReg " ComReg - 800, 900 and 1800 MHz Consultation Process" (letter dated 5 July 2011)

9. ComReg: Reply to H3GI letter of 5 July 2011 *(letter dated 8 July 2011)*

ANNEX B

Publication of Memorandums of Understanding (MOU) and Interim Licences

1. Non-confidential version of O2's interim licence, as issued in May 2011

2. Non-confidential version of Vodafone's interim licence, as issued in May 2011

3. "Memorandum of Understanding on Frequency Co-ordination between Ireland and the United Kingdom in the frequency bands 890 – 915 MHz and 935 – 960 MHz designated for the Global System for Mobile Communication (GSM)", entered into force 1 January 2001

4. "Memorandum of Understanding on Frequency Co-ordination between Ireland and the United Kingdom in the frequency bands 880 – 890 MHz and 925 – 935 MHz designated for EGSM", entered into force 1 December 2005

5. "Memorandum of Understanding concluded between the administrations of the United Kingdom and Ireland on Co-ordination in the 1710 – 1785 and 1805 – 1880 MHz frequency bands", entered into force 1 December 1999

6. Memorandum of Understanding on frequency Co-ordination between the Republic of Ireland and the United Kingdom in the frequency bands 880 – 915 MHz paired with 925 to 960 MHz And 1710 – 1785 MHz paired with 1805 – 1880 MHz, entered into force 1 May 2011

ANNEX A

1. ComReg: Response to H3GI letter of 11 May 2011 "Re: Decision No. D03/11: Response to Consultation and Decision – Inte*rim Licences for the 900 M*Hz band" (letter *dated 19 May 2011)*

Commission for
Communications Regulation

19 May 2011

Mr Mark Hughes
Head of Regulatory
Hutchison 3G Ireland
1 Clarendon Row
Dublin 2

Dear Mr Hughes,

Re: Decision No. D03/11: Response to Consultation and Decision – Interim Licences for the 900 MHz band

I refer to your letter of 11 May 2011 in which you reiterate Hutchison 3G Ireland's (H3GI) considerable disappointment with the decision by the Commission for Communications Regulation (ComReg) to grant interim GSM 900 MHz licences to Vodafone Ireland Limited and Telefónica Ireland Limited (Decision 03/11) (the "Decision").

ComReg is happy to note that, notwithstanding H3GI's disappointment with the Decision, H3GI has decided not to mount an appeal in relation to it.

In this regard, ComReg also welcomes H3GI's expressed desire to avoid taking any step which could jeopardise or delay release and liberalisation of spectrum as one of the reasons for deciding not to appeal against the Decision.

ComReg further notes your statement that H3GI's decision not to pursue an appeal was made in reliance upon certain statements made in my letter to you of 28 April, and on an expectation that ComReg was committed to taking steps particularised by you in paragraphs 1 to 3, inclusive, on page 2 of your letter.

In this regard, I observe that H3GI's decision not to appeal was, of course, one in which ComReg was not involved, and entirely one for H3GI to evaluate and take on the basis of its best interpretation and analysis of the current and possible future facts and circumstances of relevance.

In this regard also, whilst your letter seeks to relate the steps particularised by you in your letter of 11 May to the contents of my letter of 28 April, ComReg notes generally that these steps contain matters of detail devised by H3GI, as well as refining and taking further certain indicative information provided by me in my letter of 28 April.

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Please note, for the avoidance of doubt in this connection, that in my letter of 28 April I simply sought on behalf of ComReg to give whatever indicative information I could appropriately give to H3GI (and, in publishing the exchange of correspondence, to other interested parties), concerning the questions put in your letter of 21 April.

Whilst my letter set out ComReg's reasonable indications and aspirations in relation to certain matters, it did not include any guarantees, promises or specific representations as to how, when or (as the case may be) whether ComReg would act in relation to those matters. The meaning and effect of my letter should therefore be viewed in this light.

That aside, please be advised that ComReg will note the matters that are of importance to H3GI as reflected in your letter, and will take these matters into account in its decision-making on its broader spectrum proposals.

Finally, I advise that, as usual, ComReg will be publishing this letter in due course in the interests of ensuring the utmost transparency of its consultation process,– subject, as usual, to its *Guidelines on the Treatment of Confidential Information* and to any comments you might wish to make in that regard.

Yours sincerely,

Dr. Samuel Ritchie
Spectrum Operations Manager

2. H3GI: Email to ComReg “ComReg – Spectrum” (email dated 25 May 2011)

From: Mark Hughes
Sent: 25 May 2011 10:53
To: George Merrigan
Cc: Samuel Ritchie; Jim Connolly; David Hennessy
Subject: ComReg - Spectrum

Dear George,

Myself and our CTO, David Hennessy, would like to meet you and discuss our submissions to ComReg in respect of 800, 900 and 1800 MHz and ComReg's recently published draft spectrum strategy statement for 2011 - 2013. Given the importance of these matters to the electronic communications sector and the Irish economy, we would appreciate if you could indicate your availability over the next two weeks.

With kind regards.

Mark.

3. ComReg: Reply to H3GI email of 25 May 2011 (email dated 30 May 2011)

From: Samuel Ritchie
Sent: 30 May 2011 11:09
To: 'Mark Hughes'
Cc: Jim Connolly; David Hennessy; George Merrigan
Subject: RE: ComReg - Spectrum

Dear Mark

Thank you for your e-mail in which you request a meeting to discuss Hutchison 3G Ireland's (H3GI) submissions to the Commission for Communications Regulation (ComReg) in respect of its ongoing consultation relating to the 800 MHz, 900 MHz and 1800 MHz bands, and ComReg's recently published draft spectrum strategy statement for 2011 - 2013.

Please be advised that ComReg is considering these submissions in the respective context in which the submissions were provided.

In relation to ComReg's ongoing 800MHz, 900 MHz and 1800 MHz consultation, and as already advised in previous correspondence to H3GI, ComReg will, in due course, publish a Response to Consultation and Draft Decision on its broader spectrum-release proposals, which will include final draft proposal(s) and will also invite final submissions and information from interested parties. That Response to Consultation and Draft Decision will also include analysis of, and commentary on, H3GI's submissions on the issues raised by H3GI in its various submissions. ComReg will then consider and evaluate all of the material before it prior to making a final decision.

As you would be aware, ComReg's consultation period for its draft spectrum strategy statement for 2011-2013 just closed and ComReg is considering all responses received to it, including those from H3GI. ComReg will publish a final statement in due course.

In these circumstances, whilst ComReg in no way wishes to restrict any party in making effective and full submissions, or in providing relevant information during the course of a consultation process (or processes), it does not appear necessary in this instance to hold bilateral meetings with interested parties in relation to either consultation process. In principle, and in practice, it would appear that all relevant submissions and information can be adduced by way of written material provided to ComReg through the normal mechanisms.

Therefore, ComReg is not currently minded to hold such a meeting.

Regards

Samuel

Dr. Samuel Ritchie
Manager Spectrum Operations

4. Meteor: Email to ComReg “Spectrum: next steps” (email dated 22 June 2011)

From: McCoubrey, William
Sent: 22 June 2011 08:13
To: George Merrigan
Subject: Spectrum: next steps

Hi George,

I would be grateful if you could advise the anticipated publication date of the next consultation in respect of the future licensing of the mobile spectrum bands.

Thanks,
William

William McCoubrey
Head of Regulatory Affairs
Meteor Mobile Communications Ltd

5. ComReg: Reply to Meteor email of 22 June 2011 (email dated 22 June 2011)

From: Samuel Ritchie
Sent: 22 June 2011 12:14
To: McCoubrey, William
Subject: RE: Spectrum: next steps

Dear Mr. McCoubrey

I can advise that at this time we expect to publish a response to consultation (which will include a draft decision and draft RIA) in early to mid July.

Yours Sincerely

Dr. Samuel Ritchie
Manager Spectrum Operations

6. Meteor: Reply to ComReg email of 22 June 2011 (email dated 22 June 2011)

From: McCoubrey, William
Sent: 22 June 2011 12:39
To: Samuel Ritchie
Subject: RE: Spectrum: next steps

Dear Samuel,

Would it be possible to have sight, on a without prejudice basis, of the high level ComReg time plan for progression of the project. i.e. putting more structure around what was previously communicated to H3G (letter dated 28th April 2011, published in ComReg 11/37).

Regards,
William

7. ComReg: Reply to Meteor email of 22 June 2011 (email dated 23 June 2011)

From: Samuel Ritchie
Sent: 23 June 2011 14:01
To: McCoubrey, William
Subject: FW: Spectrum: next steps

Dear Mr. McCoubrey

I refer to our email correspondence below and to your further enquiry as to whether it would be possible for Meteor to have sight, on a without prejudice basis, of ComReg's high-level time-plan for progression of its spectrum liberalisation project.

At this stage of the ongoing consuItation, I am unable to supply any information beyond that contained in the letter of 28th April 2011 (published in ComReg 11/37) or in my email to you of yesterday's date, other than to add that ComReg would hope to be in a position to have concluded its consultation and to have conducted its spectrum auction by the end of this year. However, while this is ComReg's target time-plan, it is not possible at this time to predict such possible future occurrences as requests for extensions to submit responses (which usually are made following publication of each consultation paper and which will need to be considered) or the quantity and complexity of responses that may be received and which will need to be considered in full and responded to in detail.

Yours sincerely

Dr. Samuel Ritchie
Manager Spectrum Operations

8. H3GI: Letter to ComReg " ComReg - 800, 900 and 1800 MHz Consultation Process" (letter dated 5 July 2011)

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Mr Samuel Ritchie, Manager Spectrum Operations
Commission for Communications Regulation
Abbey Court
Irish Life Centre
Lower Abbey Street
Dublin 1
BY COURIER AND EMAIL: samuel.ritchie@comreg.ie

5 July 2011

Dear Samuel

COMREG – 800, 900 AND 1800 MHZ CONSULTATION PROCESS

I refer to the recently published consultation paper by Ofcom in relation to its upcoming 800 and 2600 MHz award: *Ofcom Consultation on assessment of future mobile competition and proposals for the award of 800 MHz and 2.6 GHz spectrum and related issues (22 March 2011)*("Ofcom's Consultation") and enclose a copy of Hutchison 3G UK Limited's ("H3GUK's") non-confidential response to Ofcom's Consultation.

At page 3 of its consultation, Ofcom identifies the award of 800 and 2600 MHz as *"vital to the UK's economic and social growth"* and states that *"Access to this spectrum is expected to be vital to the future commercial success of existing and prospective new entrant mobile network operators. The proposals set out in this consultation are likely to shape the future competitiveness of the mobile sector for at least the next decade. … Part of this spectrum – the 800 MHz band – is also expected to be key to the economic delivery of next generation mobile broadband services in less densely populated areas"*.

At page 5 of its consultation, Ofcom states and concludes:

"We have carried out a competition assessment as required by the Direction [Government Direction to Ofcom made in December 2010] and as a consequence considered carefully whether it would be appropriate for us to put in place measures in the auction of the 800 MHz and 2.6 GHz bands to promote competition. We consider that there are risks to future competition if bidders could bid for and acquire any amount of spectrum in an open auction and these are sufficient to justify putting in place measures designed to promote competition.

We believe that competition at the national wholesale level is essential to future competition in mobile markets and to maximising consumer and citizen benefits. To be a credible national wholesaler, a competitor is likely to need enough spectrum of the right kind to be able to run a national network of their own or to negotiate a network sharing deal with a national competitor. Our analysis suggests that future competition between credible national wholesalers could be at risk if we do not take action now to promote competition through measures in the award of 800 MHz and 2.6 GHz."

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Ofcom proposes to promote competition at the national wholesale level in two main ways:

1. It proposes to ensure that after the auction, subject to demand, there are at least four holders of a minimum spectrum portfolio that mean they are credibly capable of providing high quality data services in the future. In this it proposes that an operator have at least as much spectrum as one of the following minimum spectrum portfolios:

   a) 2x5 MHz of sub-1 GHz spectrum and 2x20 MHz of 2.6 GHz spectrum; or

   b) 2x5 MHz of sub-1 GHz spectrum and 2x15 MHz of 1800 MHz spectrum; or

   c) 2x10 MHz of sub-1 GHz spectrum and 2x15 MHz of 2.6 GHz spectrum; or

   d) 2x10 MHz of sub-1 GHz spectrum and 2x10 MHz of 1800 MHz spectrum; or

   e) 2x15 MHz of sub-1 GHz spectrum.

   Ofcom proposes to implement this through the use of spectrum 'floors' in the auction. This involves disregarding any potential auction outcome in which a minimum number of licensees do not win at least the minimum amount of spectrum.

2. It proposes to set safeguard spectrum caps. The proposed caps are a maximum of 2x27.5 MHz of sub-1 GHz spectrum and 2x105 MHz of mobile spectrum in total.

Ofcom has considered the potential for market entry. In proposing a minimum of four licensees capable of being credible national wholesalers, Ofcom is not ruling out the potential for some of those licensees to be new national wholesale entrants. Its proposals are neutral as to the identity of the four licensees; they seek to provide all parties with equality of opportunity to bid for sufficient spectrum to be credible national wholesalers in the future.

Ofcom proposes to include a coverage obligation in one licence for the 800 MHz spectrum to deploy an electronic communications network that is capable of providing mobile telecommunications services with a sustained downlink speed of not less than 2Mbps with a 90% probability of indoor reception to an area within which at least 95% of the UK population lives. It believes this should result in coverage of future mobile broadband services that approaches today's 2G coverage by the end of 2017. It considers that such an obligation would be proportionate taking into account the likely costs and benefits.

Ofcom proposes that all types of spectrum trading should be permitted for individual high-power licences, subject to a review of the impact of the proposed trade on competition and that the licences be of indefinite duration, continuing in force until relinquished or revoked.

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For the reasons set out in its response to Ofcom's Consultation, H3GUK supports the broad policy objectives pursued by Ofcom (including the need to maintain four national wholesale operators in the UK market) as well as many of the conclusions it reaches in the consultation. However, it is concerned that in developing its proposals for the combined auction of 800 and 2600 MHz insufficient weight has been placed by Ofcom on the link between the auction and the earlier 900/1800 MHz liberalisation. H3GUK believes that certain modifications and clarifications to the proposals are necessary in order to satisfy Ofcom's legal obligations and to secure its policy objectives, most importantly:

1. Each minimum spectrum portfolio should include spectrum holdings that are equivalent to 2x15 MHz of low frequency spectrum to address the low frequency distortion from liberalisation. If a multi-frequency package is included, it must incorporate at least 2x10 MHz of 800 MHz spectrum.

2. Each minimum spectrum portfolio should also include additional spectrum to address the capacity distortion of liberalisation and to prevent spectrum being a constraint to an operator reaching and maintaining a minimum scale of 20% market revenues.

3. Reserve prices should be set at a modest uniform level with no distinctions drawn between the minimum spectrum portfolio and the open auction.

4. The auction design should ensure that clear information is available on the level of demand and the number of opt-in bidders remaining after each round.

H3GI agrees with Ofcom's approach ie:

1. Given the importance of this spectrum to the economy, society and competition, including reducing or eliminating the Digital Divide, conducting an assessment of the likely future competition in markets for the provision of mobile electronic services after conclusion of the award of the 800 and 2600 MHz bands;

2. The promotion of competition at the national wholesale level to ensure that after the auction, subject to demand, there are at least four holders of a minimum spectrum portfolio that mean they are credibly capable of providing high quality data services in the future by means of spectrum floors and by setting safeguard spectrum caps;

3. Proportionate coverage obligations;

4. Spectrum trading; and

5. Licences of indefinite duration.

H3GI believes that ComReg should apply a similar approach in respect of the award of 800, 900 and 1800 MHz. This spectrum is critical to economic recovery, society and future competition, including reducing or eliminating the Digital Divide. This is acknowledged by ComReg. At page 18 of ComReg Doc. No. 10/105, *"Inclusion of the 1800 MHz Band into the Proposed joint award of 800 MHz and 900 MHz Spectrum"*, ComReg states: *"... It is ... likely to be the case that the outcome of the award process ... will be the most significant determinant of the future structure of the mobile market in Ireland"*. As a result, ComReg

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should conduct an assessment of the likely future competition in markets for the provision of mobile electronic services after conclusion of the award of the 800, 900 and 1800 MHz bands. The promotion of competition at the national wholesale level in Ireland needs to ensure that after the auction, subject to demand, there are at least four holders of a minimum spectrum portfolio that mean they are credibly capable of providing high quality data services in the future ("Credible Future MNO Competition"). As a result, ComReg should impose appropriate spectrum floors and caps. H3GI does not believe that the spectrum cap currently proposed by ComReg is sufficient to ensure Credible Future MNO Competition. This is supported by the response of H3GUK to Ofcom's consultation. In particular, H3GI believes that it is inappropriate for ComReg to proceed on the unproven assumption that the spectrum cap currently proposed by ComReg is sufficient to ensure Credible Future MNO Competition.

Whilst Ofcom was directed by the UK Government to carry out a competition assessment and the UK and Irish positions in respect of 900 MHz are different, the approach adopted by Ofcom is consistent with and required by ComReg's statutory obligation to promote competition under section 12 of the Communications Regulation Act, 2002, as amended and the difference between the UK and Irish positions in respect of 900 MHz is not such as to warrant a different approach.

We look forward to an open-minded discussion of these issues in your forthcoming consultation.

Yours sincerely

MARK HUGHES
Head of Regulatory

Encl.

Copy: Mr Alex Chisholm, Chairperson, ComReg (alex.chisholm@comreg.ie)

9. ComReg: Reply to H3GI letter of 5 July 2011 (letter dated 8 July 2011)

Commission for
Communications Regulation

8 July 2011

Mr Mark Hughes
Head of Regulatory
Hutchison 3G Ireland
1 Clarendon Row
Dublin 2

Dear Mr Hughes

Re: COMREG – 800, 900 AND 1800 MHz Consultation Process

I refer to your letter of 5 July 2011 concerning Ofcom's consultation on the future award of spectrum in the 800 and 2600 MHz bands in the UK. On behalf of ComReg, I respond as set out below.

We note the particular points made by Hutchinson 3G UK Ltd ("H3GUK") in response to that consultation.

We further note your submission that, in respect of the future award of any or all of the 800 MHz, 900 MHz and 1800 MHz spectrum bands in the State, ComReg should apply a similar approach as that proposed by H3GUK.

In that regard, we point out that ComReg is aware of international developments generally, and has also studied and assessed Ofcom's various proposals and the justification for same. However, ComReg has so far noted - as indeed you also pointed out in your letter – that some of the circumstances in the UK are different in Ireland.

You might note that ComReg is in the advanced stages of preparing its response to its various consultations on the release of liberalised spectrum in any or all of the 800 MHz, 900 MHz and 1800 MHz spectrum bands. However, you may rest assured that, in preparing its response and in formulating its final decision, ComReg will duly take into account the points set out in your letter of 5 July.

Finally, I advise that ComReg will publish this letter and your letter of 5 July in due course, in accordance with its standard process in any consultation. Publication shall as usual be subject to its *Guidelines on the Treatment of Confidential Information* and to any comments you might wish to make in that regard.

Yours sincerely

Dr. Samuel Ritchie
Spectrum Operations Manager

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ANNEX B

Publication of Memorandums of Understanding (MOU) and Interim Licences

1. Non-confidential version of O2's interim licence, as issued in May 2011

Schedule 4

Commitments made by the Licensee prior to the Grant of the Original Licence.

Part 1

Licence Commencement Date

The Licence Commencement Date is the 16th day of May 2011.

Schedule 4

Part 2

The Licensed Mobile Services

1. The Licensed Mobile Services

1.1 The Licensed Mobile Services are GSM Mobile and Personal Communications Services having the characteristic of a pan-European, cellular, digital, land based, mobile telephony service;

(a) Compatible with the GSM Standard, provided in the 900MHz band; and

(b) With the international roaming capability as referred to in Part 5 of this Schedule.

2. Additional services

2.1. The Licensee shall be required to provide the following Services;

(a) Fax and Data,

(b) Short Message Service,

(c) Voicemail,

(d) Call Diversion,

(e) Call waiting and Hold,

(f) Call Barring; and

(g) Itemised Billing.

Schedule 4

Part 3

Access to the Emergency Services

1. General

The Licensee shall provide ready access for customers through the Licensed Mobile Service to the emergency services (within the meaning of this Part 3 of the Schedule).

2. Calls to an Emergency Service

In this Part an "emergency services" means the Gardá Siochana, the fire brigade services, the ambulance services, the boat and coastal rescue services, (including the rescue services provided by the Air Corps) or the mountain and cave rescue services.

3. Directions by the Commission

The Commission may give directions in writing to the Licensee in relation to the handling of calls to and from customers relating to an emergency service ("emergency calls"), and the Licensee shall comply with any such directions.

4. Acceptance of Emergency Calls

Emergency access codes 999 and 112 shall be open to all GSM terminal equipment equipped with a valid SIM Card, where technically necessary, and any other codes subsequently designated for use as emergency access codes, exclusively for calls to the emergency services.

5. Routeing of Emergency Calls

The Licensee shall ensure that an emergency call is routed at the expense of the Licensee, to a collection centre for emergency calls. The Licensee shall provide not less than two routes with physical diversity between each mobile switching centre and a collection centre as described.

6. Emergency Calls Free of Charge

(a) The Licensee shall not impose a charge on the customer in respect of an emergency call; and

(b) The Licensee shall not list on a customer's itemised bill any emergency call.

7. Identification of Emergency Calls

When an emergency call is made to an emergency service from terminal equipment of a customer, the Licensee shall, where technically possible, transmit the customer's number to a collection centre for emergency calls in the form of a calling line identification message.

Schedule 4

Part 4

Service Quality, Performance Standards and Obligations

1. General Obligations

1.1. For the purposes of carrying out service quality surveys, the Licensee shall provide, on request, to the Commission the following;

(a) Maps showing coverage for in the case of the GSM900 service, 2 Watt terminals; and

(b) An up to date list of the locations of the base transceiver stations;

(c) A mechanism for identifying the base station that is handling a call at any given time; and

(d) An adequate number of test numbers.

Furthermore, where requested to do so, the Licensee shall provide to members of the public, maps of the other GSM operators with whom it has roaming agreements showing the coverage provided by them,

2. Coverage

2.1. **"Coverage"** means the extent to which the strength of the radio signal is sufficient to provide an adequate service for a 2 Watt, GSM900 terminal operating outdoors.

An adequate service is achieved outdoors if the average field strength measured outdoors is at least 46dBμV/m for GSM 900 at a height of 1.5 metres above ground level.

Coverage is expressed as a percentage of geographical area, and as a percentage of the population, of the State.

2.2 Measurement Guidelines for coverage

The appropriate figures contained in the latest population census published by the Central Statistics Office will be used for calculating the base figure when calculating national population coverage.

Measurements to determine coverage shall be carried out using; a 2 Watt, GSM900 terminal operating outdoors.

Signal strength measuring equipment may also be used.

2.3 Mandatory Service Standards

The Licensee shall ensure that the national population coverage shall not fall below that given in the Original Licence and in any case the Licensee shall ensure that national geographic coverage shall not fall below 90%.

2.4 Other Obligations

The Licensee shall publish up to date maps showing coverage for 2 Watt, GSM900 terminals operating outdoors.

3. Service Unavailability

3.1. **"Service unavailability"** means the average number of minutes per terminal per year for which the Licensed Mobile Service as defined in the Original Licence, is not available due to a network disturbance, failure or scheduled unavailability.

3.2 Measurement Guidelines for Service Unavailability

The calculation of service unavailability is subject to the following weighting factors which take account of traffic load variations

Service Unavailability, Weighting Factors **(divide duration of each network event by weighting factor)**			
	Monday to Friday	Saturday	Sunday
For periods between 07.00 and 24.00	1	2	4
For periods between 00.00 and 07.00	4	8	16

3.3. Mandatory Service Standard

In any case the Licensee shall ensure that service unavailability is less than 60 minutes.

3.4. Other Obligations

(a) The Licensee shall keep a log (the “network log") for the purposes of recording and tracking all periods of system unavailability. The Licensee shall maintain this network log in a manner that will demonstrate, to the satisfaction of the Commission that such a network log is an adequate means of assessing whether the Licensee is complying with its system availability obligations under this licence.

(b) The network log, or as may be appropriate, part thereof, shall be made available on request to the Commission.

(c) The Licensee shall calculate the service unavailability for the Licensed Mobile Services for any period specified by the Commission from the information recorded in the network log, and shall upon request and within such time, as may be specified by the Commission, provide the Commission with the results of the calculation.

4. Grade of Service

4.1 Blocking Rates

(a) **Definitions**:

"Blocking rate" means the percentage of total call attempts made for the traffic case concerned, for the Licensed Mobile Service as defined in the Original Licence, during the time consistent busy hour and within coverage, which are unsuccessful; and

"Time consistent busy hour" means the period of one hour starting at the same time each day for which the average traffic of the Licensee's Mobile and Personal Communications System concerned is greatest over the days under consideration. The time consistent busy hour shall be determined from an analysis of traffic data obtained from the service as defined in the Original Licence and shall be subject to the approval of the Commission.

(b) Mandatory Service Standards

The Licensee shall ensure that the blocking rate shall not exceed the percentages in respect of each of the traffic cases specified in the following Table;

Maximum Permissible Blocking Rates		
Traffic Case	**Blocking rate**	
	Average	Worst Case
Terminal equipment (connected to the Licensee's Mobile and Personal Communications System) to Terminal equipment (connected to the Licensee's Mobile and Personal Communications System)	3%	10%
Terminal equipment (connected to the Licensee's Mobile and Personal Communications System) to Terminal equipment (connected to the Mobile and Personal Communications System of an Other Licensed Operator)	3%	10%
Terminal equipment (connected to the Licensee's Mobile and Personal Communications System) to Terminal equipment (connected to the Telecommunications Network of an Other Licensed Operator)	3%	8%

4.2 Dropped Calls

(a) **"Dropped call rate"** means the percentage of total established calls during any measurement period, for the Licensed Mobile Service as defined in the Original Licence, which are prematurely released by the Licensee's Mobile and Personal Communications System within three minutes.

(b) **Measurement Guidelines**

Measurements will be made in the case of the GSM900 service, with a 2 Watt, GSM900 terminal operating within claimed coverage areas;

(c) **Mandatory Service Standards**

The Licensee shall ensure that the dropped call rate shall not exceed the percentage in respect of each of the traffic cases specified in the following Table;

Maximum Permissible Dropped Call Rates		
Traffic Case	**Dropped Call Rate**	
	Average	Worst Case
Terminal equipment (connected to the Licensee's Mobile and Personal Communications System) to **Terminal equipment (connected to the Licensee's Mobile and Personal Communications System)**	2%	4%
Terminal equipment (connected to the Licensee's Mobile and Personal Communications System) to **Terminal equipment (connected to the Mobile and Personal Communications System of an Other Licensed Operator)**	2%	4%
Terminal equipment (connected to the Licensee's Mobile and Personal Communications System) to **Terminal equipment (connected to the Telecommunications Network of an Other Licensed Operator)**	1.5%	3%

4.3 Transmission Quality

The Licensee shall ensure that the speech transmission quality complies with the GSM Technical Specifications of ETSI and in particular, the Licensee shall ensure that appropriate echo treatment equipment is used in the provision of the Licensed Mobile Services and that it is properly configured.

4.4 Other Obligations

The Licensee shall provide to the Commission, on request, such grade of service measurement information as the Commission considers necessary to determine performance against mandatory service standards and specifies to the Licensee.

5. Customer Service Centres Response Times

"Response time" means in relation to a customer service centre, is, the time taken for a call to the centre to be answered.

5.1 Mandatory Service Standards

The Licensee shall ensure that the response time shall accord with the appropriate time specified in the following Table;

Service Period	Response Times
08.00 to 20.00 hours, Monday to Friday, and 09.00 to 17.00 hours, Saturday, Sunday and Public Holidays	less than 15 seconds for 90% of calls, and less than 45 seconds for all calls
00.00 to 08.00 hours and 20.00 to 24.00 hours, Monday to Friday, and 00.00 to 09.00 hours and 17.00 to 24.00 hours, Saturday, Sunday and Public Holidays	less than 20 seconds for 90% of calls, and less than 60 seconds for all calls

6. Billing

6.1 Mandatory Service Standards

In relation to billing, the Licensee shall, unless agreed otherwise with individual customers, comply with the appropriate standard requirements specified in the following Table;

Billing Aspects	Standard Requirements	Options and Alternatives
Billing Frequency	Monthly	Alternative frequency or flexible frequency subject to agreement with customer
Billing Itemisation	All billable calls and services	Customised bill layouts with or without summary itemisation subject to agreement with customer
Billing Medium	Paper	Delivery of bills on computer media or on-line subject to agreement with customer
Billing Method	Per Second Billing	At commencement of the service, calls shall attract minimum thirty second charge and charges shall increment in ten second intervals thereafter

An itemised bill shall contain, at least, the following information in respect of each billable call;

(a) the date of the call,
(b) the start time of the call,
(c) the number called,
(d) the duration of the call; and
(e) the price of the call.

6.2. Billing Accuracy and Fraud Detection

The Licensee shall incorporate in its billing system;

(a) measures to ensure that each call record is an accurate record of the actual call and that the correct accumulated call records are applied to generate each customer's bill; and

(b) measures to detect cases of possible fraud, including measures to identify rapidly abnormal calling patterns.

Schedule 4

Part 5

Roaming

1. The Licensee shall not act on foot of any agreement providing for a national roaming capability made between the Licensee and any other provider of a GSM mobile telephony service in the State unless and until the Commission has approved the terms of the agreement.
2. The Licensee shall establish and maintain as part of the Licensed Mobile Services an international roaming capability for its Users that is as wide and comprehensive as is practicable.
3. The Licensee may impose charges in respect of Users roaming on GSM mobile telephony networks in other countries (being outward-roaming Users) and in respect of Users of GSM mobile telephony services in other countries roaming on the Licensee's Mobile and Personal Communications System (being inward-roaming Users) at rates not exceeding those specified in the table below:-

Roaming Services	**Licensee's charges**	
	Outward-roaming User	**Inward-roaming User**
Roaming Service Fee	No charge	No charge
Outgoing calls from roaming customer	Other operator's tariff for roaming customers plus administration surcharge not exceeding 15% of that tariff	Licensee's call tariff for roaming customers charged to the other operator and no administration surcharge

Schedule 4

Part 6

Other Conditions

Charges to Customers

1. The Licensee shall endeavour to reduce, in each of its financial years, the amounts of the charges to its customers so that those amounts are, after allowance is made for changes in the value of money in each such year after the first, lower than those obtaining in the previous such year, and shall endeavour to maintain those charges at or below the appropriate international comparators specified from time to time by the Commission.

2. The following supplementary features shall be provided as constituent parts of the service to any customer, on request, without the addition of any amount in respect thereof to the amount of the connection fee or monthly rental specified, that is to say;
   (a) voice mail,
   (b) call diversion,
   (c) call waiting,
   (d) itemised billing,
   (e) short message service; and
   (f) GSM data and fax.

Customer Service Centre

The Licensee shall maintain at least one centre (a "customer service centre") to which access by telephone free of charge is provided to customers and members of the public at all times.

A customer service centre shall make available at all times a facility to receive reports in relation to difficulty in the use of the Licensed Mobile Services of a fault or breakdown in the provision of the Licensed Mobile Services.

2. Non-confidential version of Vodafone's interim licence, as issued in May 2011

Schedule 4

Commitments made by the Licensee prior to the Grant of the Original Licence.

Part 1

Licence Commencement Date

The Licence Commencement Date is the 16th day of May 2011.

Schedule 4

Part 2

The Licensed Mobile Services

1. **The Licensed Mobile Services**

1.1. The Licensed Mobile Services are GSM Mobile and Personal Communications Services having the characteristic of a pan-European, cellular, digital, land based, mobile telephony service;

(a) Compatible with the GSM Standard, provided in the 900MHz band ("GSM900 Service"); and

(b) With the international roaming capability referred to in Part 5 of this Schedule.

2 Additional services

2.1 The Licensee shall be required to provide the following services;

(a) Fax and data,

(b) Short message service,

(c) Voicemail,

(d) Call diversion,

(e) Call waiting,

(f) Itemised billing.

Schedule 4

Part 3

Access to The Emergency Services

1. **General**

The Licensee shall provide ready access for customers through the Licensed Mobile Services to the emergency services (within the meaning this of Part 3 of the Schedule).

2. **Calls to an Emergency Service**

In this Part an "emergency service" means the Gardá Siochana, the fire brigade services, the ambulance services, the boat and coastal rescue services (including the rescue services provided by the Air Corps) or the mountain and cave rescue services.

3. **Directions by the Commission**

The Commission may give directions in writing to the Licensee in relation to the handling of calls to and from customers relating to an emergency service ("emergency calls"), and the Licensee shall comply with any such directions.

4. **Acceptance of Emergency Calls**

Emergency access codes 999 and 112, and any other codes subsequently designated for use as emergency access codes, shall be open to all GSM terminal equipment equipped with a valid SIM Card, where technically necessary.

5. **Routeing of Emergency Calls**

The Licensee shall ensure that an emergency call is routed at the expense of the Licensee, to a collection centre for emergency calls. The Licensee shall provide not less than two routes with physical diversity between each mobile switching centre and a collection centre as described.

6. **Emergency Calls Free of Charge**

(a) The Licensee shall not impose a charge on the customer in respect of an emergency call; and

(b) The Licensee shall not list on a customer's itemised bill any emergency call.

7. **Identification of Emergency Calls**

When an emergency call is made from terminal equipment of a customer of the Licensee, the Licensee shall, where technically possible, transmit the customer's number to a collection centre for emergency calls in the form of a calling line identification message.

Schedule 4

Part 4

Service Quality, Performance Standards and Obligations

1. General Obligations

For the purposes of carrying out service quality surveys, the Licensee shall provide, on request, to the Commission;

(a) Maps showing coverage for, in the case of the GSM900 service, 2 Watt terminals,

(b) An up to date list of the locations of the base transceiver stations,

(c) A mechanism for identifying the base station that is handling a call at any given time; and

(d) An adequate number of test numbers.

Furthermore, where requested to do so, the Licensee shall provide to members of the public, maps of the other GSM operators with whom it has roaming agreements showing the coverage provided by them.

2. **Coverage**

2.1. "**Coverage**" means the extent to which the strength of the radio signal is sufficient to provide an adequate service for a 2 Watt, GSM900 terminal.

An adequate service is achieved outdoors if the average field strength measured outdoors is at least 46dBuV/m for the GSM900 service at a height of 1.5 metres above ground level.

Coverage is expressed as a percentage of geographical area, or as a percentage of population, of the State.

2.2. **Measurement Guidelines for coverage**

The appropriate figures contained in the latest population census published by the Central Statistics Office will be used for calculating the base figure when calculating national population coverage.

Measurements to determine coverage shall be carried out using; a 2 Watt, GSM900 terminal;

Signal strength measuring equipment may also be used.

2.3. **Mandatory Service Standards**

The Licensee shall ensure that the national outdoor population coverage shall not fall below that given in the Original Licence and in any case the Licensee shall ensure that national geographic coverage shall not fall below 92%.

2.4. **Other Obligations**

The Licensee shall publish up to date maps showing coverage for 2 Watt, GSM900 mobile terminals operating outdoors.

3 **Service Unavailability**

3.1. "**Service unavailability**" means the average number of minutes per terminal for any six month period for which the service as defined in the Original Licence, is not available due to a network disturbance, failure or scheduled unavailability.

3.2. **Measurement Guidelines for service unavailability**

The calculation of service unavailability is subject to the following weighting factors which take account of traffic load variations.

Service Unavailability, Weighting Factors (divide duration of each network event by weighting factor)			
	Monday to Friday	**Saturday**	**Sunday**
For periods between 07.00 and 24.00	1	2	4
For periods between 00.00 and 07.00	4	8	16

3.3. **Mandatory Service Standard**

The Licensee shall ensure that service unavailability is less than 45 minutes

3.4. **Other Obligations**

(a) The Licensee shall keep a log (the “network log”) for the purposes of recording and tracking all periods of system unavailability. The

Licensee shall maintain this network log in a manner that will demonstrate, to the satisfaction of the Commission, that such a network log is an adequate means of assessing whether the Licensee is complying with its system availability obligations under this Licence.

(b) The network log or, as may be appropriate, part thereof shall be made available on request to the Commission.

(c) The Licensee shall calculate the service unavailability for the Licensed Mobile Services for any period specified by the Commission from the information recorded in the network log, and shall upon request and within such time as may be specified by the Commission, provide the Commission with the results of the calculation.

4. Grade of Service

4.1. Blocking Rates

(a) **Definitions**:

"**Blocking rate**" means the percentage of total call attempts made for the traffic case concerned, for the Licensed Mobile Service as defined in the Original Licence, during the time consistent busy hour and within coverage, which are unsuccessful.

"**Time consistent busy hour**" means the period of one hour starting at the same time each day for which the average traffic of the Licensee's Mobile and Personal Communications System concerned is greatest over the days under consideration. The time consistent busy hour shall be determined from an analysis of traffic data obtained from the Licensed Mobile Service as defined in the Original Licence and shall be subject to the approval of the Commission.

(b) **Mandatory Service Standards**

The Licensee shall ensure that the blocking rate shall not exceed the percentages in respect of each of the traffic cases specified in the following Table;

Maximum Permissible Blocking Rates		
Traffic Case	**Blocking rate**	
	Average	Worst Case
Terminal equipment (connected to the Licensee's Mobile and Personal Communications System) to **Terminal equipment (connected to the Licensee's Mobile and Personal Communications System)**	3.47%	10%
Terminal equipment (connected to the Licensee's Mobile and Personal Communications System) to **Terminal equipment (connected to the Mobile and Personal Communications System of an Other Licensed Operator)**	4%	10%
Terminal equipment (connected to the Licensee's Mobile and Personal Communications System) to **Terminal equipment (connected to the Telecommunications Network of an Other Licensed Operator)**	2%	8%

4.2. **Dropped Calls**

(a) **"Dropped call rate":** the percentage of total established calls during any measurement period, for the Licensed Mobile Service as defined in the Original Licence, which are prematurely released by the Licensee's Mobile and Personal Communications System within three minutes.

(b) **Measurement Guidelines**

Measurements will be made in the case of the GSM900 service, with a 2 Watt terminal operating within claimed coverage areas.

(c) **Mandatory Service Standards**

The Licensee shall ensure that the dropped call rate shall not exceed 3% on average or 6% worst case.

4.3. **Transmission Quality**

The Licensee shall ensure that the speech transmission quality complies with the GSM Technical Specifications of ETSI and in particular, the Licensee shall ensure that appropriate echo treatment equipment is used in the provision of the Licensed Mobile Services and that it is properly configured.

4.4. **Other Obligations**

The Licensee shall provide to the Commission, on request, such grade of service measurement information as the Commission considers necessary to determine performance against mandatory service standards as specified to the Licensee.

5. **Billing**

5.1. **Mandatory Service Standards**

In relation to billing, the Licensee shall, unless agreed otherwise with individual customers, comply with the appropriate standard requirements specified in the following Table:-

Billing Aspects	Standard Requirements	Options and Alternatives
Billing Frequency	Monthly	Alternative frequency or flexible frequency subject to agreement with customer
Billing Itemisation	All billable calls and services	Customised bill layouts with or without summary itemisation subject to agreement with customer
Billing Medium	Paper	Delivery of bills on computer media or on-line subject to agreement with customer
Billing Method	Per Second Billing	

An itemised bill shall contain, at least, the following information in respect of each billable call;-

(a) the date of the call,

(b) the start time of the call,

(c) the number called,

(d) the duration of the call; and

(e) the price of the call.

5.2. **Billing Accuracy and Fraud Detection**

The Licensee shall incorporate where possible in its billing system and otherwise shall adopt:

(a) measures to ensure that each call record is an accurate record of the actual call and that the correct accumulated call records are applied to generate each customer's bill, and

(b) measures to detect cases of possible fraud including measures to identify rapidly abnormal calling patterns.

Schedule 4

Part 5

Roaming

1. The Licensee shall not act on foot of any agreement providing for a national roaming capability made between the Licensee and any other provider of a GSM mobile telephony service in the State unless and until the Commission has approved the terms of the agreement.

2. The Licensee shall establish and maintain as part of the Licensed Mobile Services an international roaming capability for its customers that is as wide and comprehensive as is practicable.

3. “Memorandum of Understanding on Frequency Co-ordination between Ireland and the United Kingdom in the frequency bands 890 – 915 MHz and 935 – 960 MHz designated for the Global System for Mobile Communication (GSM)”, entered into force 1 January 2001

MEMORANDUM OF UNDERSTANDING ON FREQUENCY CO-ORDINATION BETWEEN

IRELAND AND THE UNITED KINGDOM

IN THE FREQUENCY BANDS 890- 915 MHz and 935- 960 MHz DESIGNATED FOR THE GLOBAL SYSTEM FOR MOBILE COMMUNICATION (GSM)

1 - INTRODUCTION

1.1 – Frequencies in the bands 890-915 MHz (mobile transmit) and 935-960 MHz (base transmit) are designated for the pan-European public digital land mobile system "Global System for Mobile Communications" (GSM), consistent with CEPT Recommendation (T/R 75-02; Athens, 1990) and EC Directive (87/372/EEC).

1.2 - It is necessary to establish agreements for regulatory and technical procedures for frequency co-ordination, in order to minimise interference problems between systems operating in neighbouring countries. These agreements should be designed to reduce the administrative burden and permit a rapid deployment of GSM in the countries concerned.

1.3 - Within their respective territories, the administrations of Ireland and the United Kingdom have licensed analogue cellular mobile telephone systems in parts of the band specified above. Transition arrangements are necessary to ensure mutual protection between GSM and these existing analogue systems, until the analogue systems are withdrawn.

1.4 - This agreement is based on the principles established in CEPT Recommendation T/R 20-08 E (Lecce 1989).

2 - AGREEMENT

The Administrations of Ireland and the United Kingdom agree to operate the co-ordination procedure described below.

3 - ESTABLISHMENT OF BASE-STATIONS

3.1 - Preferred frequencies

The rules allowing establishment of base stations without co-ordination shall be based on the concepts outlined in sections 3.3 and 3.4. The bands 890 -915 MHz and 935-960 MHz shall be divided into groups of frequencies which shall be assigned equally between the networks of Ireland and the United Kingdom as "preferred frequencies".

3.2 - Field strength prediction

The field strength shall be predicted by the method of CEPT T/R 20-08. Annex A provides a summary of the method, together with some additional text to resolve ambiguities in the CEPT document. In special cases, multiple interference from analogue transmitters could fall within the bandwidth of a GSM channel. In such scenarios, field strength shall be calculated by power summation, taking account of the GSM receiver filter characteristic by using the "Analogue to GSM curve" of Table A2-1, given in CEPT Recommendation T/R 20-08 (Lecce 1989 (CR)).

3.3 - Use of the preferred bands

A base station may be established without co-ordination, in a preferred band allocated to a network, provided that the predicted field strength at all points along a line 15km inside the neighbouring country does not exceed 19dBμV/m.

3.4 - Use of the non-preferred bands

A base station may be established without co-ordination, to operate at a frequency outside the preferred bands on condition that the predicted field strength, at all points on the border or the territory, does not exceed 19dBμV/m. No base station may be established within 10km of the border in the non-preferred band without co-ordination (as detailed in paragraph 3.6) since the method of propagation prediction does not apply at distances of less than 10km.

3.5 - Exchange of information between operators

At the request of a mobile operator, operators from the neighbouring country shall make details of existing base stations available. Where interference is believed to arise between operators, they should exchange information, with a view to resolving the difficulty. A copy of the interference details shall also be sent to both administrations.

The Administrations of Ireland and the United Kingdom agree to facilitate this exchange of information between operators and to intervene should operators not be able to resolve cases of interference by mutual agreement.

3.6 - Co-ordination procedure

The Administration of Ireland and the United Kingdom are committed to ensuring that the operators of their GSM networks, covered by this Memorandum of Understanding, respect the limits for establishment of base stations without co-ordination, given in 3.3 and 3.4 above. However, there might be an occasional need to establish stations such that the field strength at the border will exceed these limits. In such cases, each administration may seek co-ordination according to the procedure described in Paragraph 4 of CEPT Recommendation T/R 20-08 (LECCE 1989 (CR)) and in line with the format given in CEPT T/R 25-08 (LECCE 1989 (CR)).

4 - PREFERRED BANDS

The preferred bands are shown at Annex B.

5 - EXISTING STATIONS

Existing stations will comply with the agreed limit values or be co-ordinated using the procedure given in Section 3.6 by June 1st 2001.

6 - TERMINATION OF THE PREVIOUS MEMORANDUM OF UNDERSTANDING

The Memorandum of Understanding between Ireland and the United Kingdom for frequency co-ordination in the 890 – 915 MHz and 935 – 960 MHz frequency bands designated for the GSM system which entered into force on 1st September 1999 shall be terminated on the date when this MoU comes into force.

7 - REVIEW ARRANGEMENTS

The terms of this Memorandum of Understanding may be modified by mutual agreement of both administrations.

8 - TERMINATION OF THE MEMORANDUM OF UNDERSTANDING

Either Administration may withdraw from this Memorandum of Understanding subject to six months notice.

9 - DATE OF ENTRY INTO FORCE

This Memorandum of Understanding shall enter into force on 1st January 2001.

1 For the UNITED KINGDOM administration

Robert Cooper 22/11/00

R. COOPER

2 For IRELAND administration

J. A. Connolly 19 December 2000

J. CONNOLLY

Originals of this Memorandum of Understanding for Frequency Co-ordination will be laid down with the Radiocommunications Agency in London and the Office of the Director of Telecommunications Regulation in Dublin.

Annex A - Propagation Prediction Method

The method of field strength prediction shall be based upon the curves given in Annex 1 of CEPT Recommendation T/R 20-08 (Lecce 1989 (CR)), on pages 3 and 5 and the correction factors given on page 4. The following paragraphs fully define the method.

A.1 Correction Factors

The following correction factors are added to the values derived from the curves referred to above:

A general correction factor of -2dB for the 900MHz band
A correction factor to allow for the height of the mobile antenna of:
-10 dB over sea paths
-10 dB over land paths at distances of <50km
-3dB over land paths at distances >100km
Linear interpolation in dB used for distances between 50 and 100km

The overall effect of these correction factors is illustrated in figure A.1 below

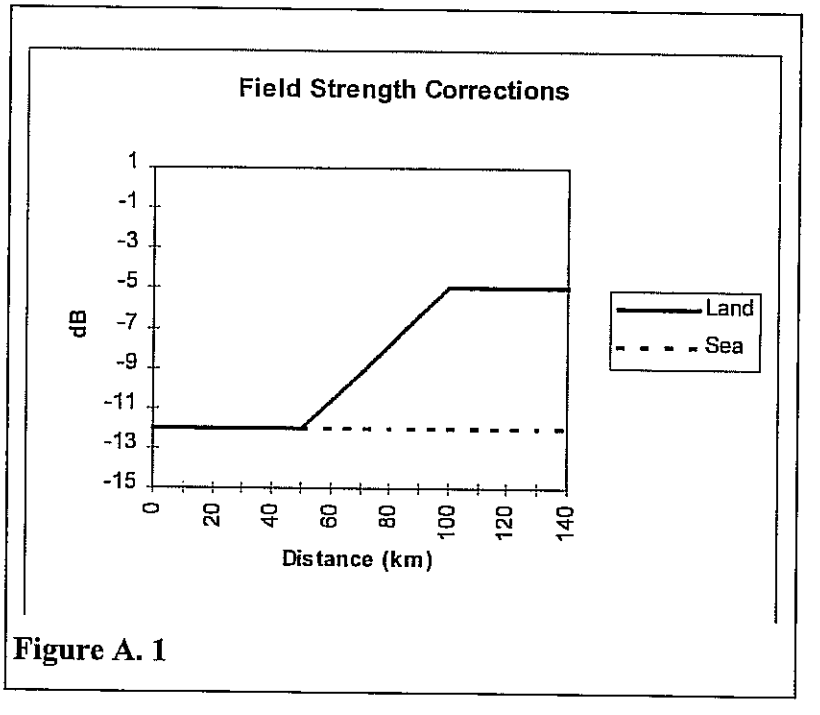


Figure A. 1

A.1 - Effective Antenna Height

Following the principles from ITU-R P370 (on which the T/R 20-08 propagation curves are based) the effective antenna height shall be defined as: The antenna height above the average ground level between distances of 3km and 15km from the transmitter, in the direction of the receiver. For prediction at distances of less than 15km and more than 10km from the transmitter, the effective antenna height shall be defined as the antenna height above the

average ground level between the receiver location and a point 3km from the transmitter, in the direction of the receiver.

A.2 - Interpolation Between Curves for Different Antenna Heights

When the effective antenna height falls between the values for which curves are given, the field strength in dBμV/m shall be found by linear interpolation between the appropriate pair of curves. If the effective antenna height falls outside the range of heights for which curves are given, the value from the nearest available curve shall be used.

A.3 - Interpolation for Mixed Land-Sea Paths

In the case of mixed land-sea paths, the field strength in dBμV/m shall be found by linear interpolation between the values determined for land and sea paths, according to the relative proportions of land and sea along the path, as follows:

$$E = (d_{sea}/d_{total}) \times E(sea, d) + (d_{land}/d_{total}) \times E(land, d)$$

d_{sea}	is the length of the sea path
d_{land}	is the length of the land path
$d_{total} = d_{sea} + d_{land}$	is the total path length
$E(land, d)$	is the field strength value in dBμV/m given by the curves of T/R 20-08 applicable to land propagation for a path length (d), plus the appropriate correction factor for a path length (d).
$E(sea, d)$	is the field strength value in dBμV/m given by the curves of T/R 20-08 applicable to sea propagation for a path length (d), plus the appropriate correction factor.

A.4 - Use of Base Station Antenna Patterns

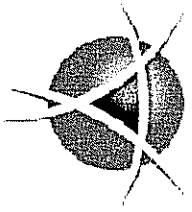
Calculation of predicted field strengths should take into account the radiation pattern of the base station antenna in azimuth and elevation. In the case of predictions to receiver locations along an obstructed path, the vertical angle to the visible horizon rather than to the receiver shall be used. Simplified calculations may be used which ignore the vertical radiation pattern of the antenna. In this case, the gain at the peak of the vertical pattern shall be used, in order to achieve a worst-case prediction.

Annex B - Preferred Bands

The preferred frequencies for the United Kingdom and Ireland are shown in the table below:

GSM Channel number	Preferred	Non-preferred
1 - 12	United Kingdom	Ireland
13 - 36	Ireland	United Kingdom
37 - 55	United Kingdom	Ireland
56 – 74	Ireland	United Kingdom
75 – 93	United Kingdom	Ireland
94 – 111	Ireland	United Kingdom
112 – 124	United Kingdom	Ireland

4. “Memorandum of Understanding on Frequency Co-ordination between Ireland and the United Kingdom in the frequency bands 880 – 890 MHz and 925 – 935 MHz designated for EGSM”, entered into force 1 December 2005



Commission for
Communications Regulation

Ofcom
OFFICE OF COMMUNICATIONS

MEMORANDUM OF UNDERSTANDING ON FREQUENCY CO-ORDINATION BETWEEN IRELAND AND THE UNITED KINGDOM IN THE FREQUENCY BANDS 880 - 890 MHz and 925- 935 MHz DESIGNATED FOR EGSM

1 - INTRODUCTION

1.1 Within Ireland and the United Kingdom, the frequency bands 880 - 890 MHz and 925 – 935 MHz are designated to be used for EGSM [1].

1.3 It is necessary to establish agreements for regulatory and technical procedures for frequency co-ordination, in order to minimise interference problems between systems operating in neighbouring countries. These agreements should be designed to reduce the administrative burden and permit a deployment of GSM in the countries concerned.

1.4 This MOU is based on the principles established in CEPT Recommendation T/R 20-08 [3]

2 - AGREEMENT

The Administrations of Ireland and the United Kingdom agree to operate the co-ordination procedure described below.

3 - ESTABLISHMENT OF BASE-STATIONS

3.1 - Preferred frequencies

The rules allowing establishment of base stations without co-ordination shall be based on the concepts outlined in sections 3.3 and 3.4. The bands 880 -890 MHz and 925-935 MHz shall be divided into groups of frequencies which shall be assigned equally between the networks of Ireland and the United Kingdom as "preferred frequencies".

3.2 - Field strength prediction

The field strength shall be predicted by the method of CEPT T/R 20-08 [3]. Annex A provides a summary of the method, together with some additional text to resolve ambiguities in the CEPT document.

3.3 - Use of the preferred bands

A base station may be established without co-ordination, in a preferred band allocated to a network, provided that the predicted field strength at all points along a line 15km inside the neighbouring country does not exceed 19dBμV/m.

3.4 - Use of the non-preferred bands

A base station may be established without co-ordination, to operate at a frequency outside the preferred bands on condition that the predicted field strength, at all points on the border or the territory, does not exceed 19dBμV/m. No base station may be established within 10km of the border in the non-preferred band without co-ordination (as detailed in paragraph 3.6) since the method of propagation prediction does not apply at distances of less than 10km.

3.5 - Exchange of information between operators

An MoU between the administrations of Ireland and the United Kingdom which enables co-ordination between operators, subject to agreement of the Administrations, was signed on the 13th October 1999 [5].

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[1] ERC Decision (97) 02 of 21 March 1997 on the extended frequency bands to be used for the GSM Digital Pan-European Communications System.

[3] The European Conference of Postal and Telecommunications Administrations, Recommendation T/R 20-08 E (Lecce 1989 CR), Frequency planning and frequency coordination for the GSM system.

[5] Agreement between the administrations of the United Kingdom and Ireland concerning the approval of planning arrangements between operators of mobile radiocommunications network 13 October

At the request of a mobile operator, operators from the neighbouring country shall make details of existing base stations available. Where interference is believed to arise between operators, they should exchange information, with a view to resolving the difficulty. A copy of the interference details shall also be sent to both administrations.

The Administrations of Ireland and the United Kingdom agree to facilitate this exchange of information between operators and to intervene should operators not be able to resolve cases of interference by mutual agreement.

3.6 - Co-ordination procedure

The Administration of Ireland and the United Kingdom are committed to ensuring that the operators of their GSM networks, covered by this Memorandum of Understanding, respect the limits for establishment of base stations without co-ordination, given in 3.3 and 3.4 above. However, there might be an occasional need to establish stations such that the field strength at the border will exceed these limits. In such cases, each administration may seek co-ordination according to the procedure described in Paragraph 4 of CEPT Recommendation T/R 20-08 [3] and in line with the format given in CEPT T/R 25-08 [6].

[6] The European Conference of Postal and Telecommunications Administrations, Recommendation T/R 25-08 (Lecce 1989, revised in Vienna 1999) Planning criteria and coordination of frequencies in the land mobile service in the range 29.7-960 MHz

4 - PREFERRED BANDS

The allocation of preferred bands between the United Kingdom and Ireland shall be:

EGSM ARFCN	Preferred	Non preferred
975-982	Ireland	United Kingdom
983-990	United Kingdom	Ireland
990-994	Ireland	United Kingdom
995-998	United Kingdom	Ireland
999-1002	Ireland	United Kingdom
1003-1006	United Kingdom	Ireland
1007-1014	Ireland	United Kingdom
1015-1022	United Kingdom	Ireland
1023-0		Ireland and United Kingdom

Annex B gives a channel by channel list of the operator assignments.

5 - REVIEW ARRANGEMENTS

The terms of this Memorandum of Understanding may be modified by mutual agreement of both administrations.

6 - TERMINATION OF THE MEMORANDUM OF UNDERSTANDING

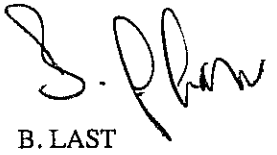
Either Administration may withdraw from this Memorandum of Understanding subject to six months notice.

7- DATE OF ENTRY INTO FORCE

This memorandum of Understanding shall enter into force on December 1st 2005.

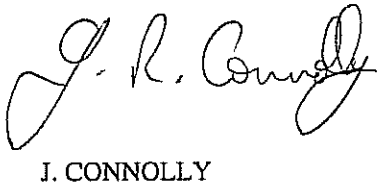
Done at London on November 4th 2005.

For the UNITED KINGDOM administration



B. LAST

For the administration of IRELAND



J. CONNOLLY

Originals of this Memorandum of Understanding for Frequency Co-ordination will be laid down with the Office of Communications (Ofcom) in London and the Commission for Communications Regulation (Comreg) in Dublin.

Annex A - Propagation Prediction Method

The method of field strength prediction shall be based upon the curves given in Annex 1 of CEPT Recommendation T/R 20-08 ([3]), on pages 3 and 5 and the correction factors given on page 4. The following paragraphs fully define the method.

A.1 Correction Factors

The following correction factors are added to the values derived from the curves referred to above:

A general correction factor of -2dB for the 900MHz band
A correction factor to allow for the height of the mobile antenna of:
-10 dB over sea paths
-10 dB over land paths at distances of <50km
-3dB over land paths at distances >100km
Linear interpolation in dB used for distances between 50 and 100km

The overall effect of these correction factors is illustrated in figure A.1 below

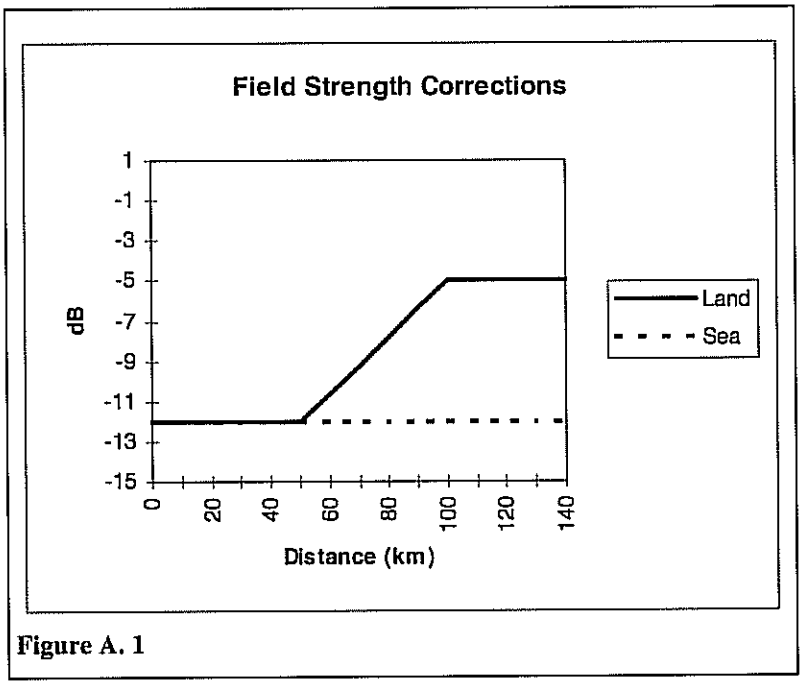


Figure A. 1

A.1 - Effective Antenna Height

Following the principles from ITU-R P370 (on which the T/R 20-08 propagation curves are based) the effective antenna height shall be defined as: The antenna height above the average ground level between distances of 3km and 15km from the transmitter, in the direction of the receiver. For prediction at distances of less than 15km and more than 10km from the transmitter, the effective antenna height shall be defined as the antenna height above the average ground level between the receiver location and a point 3km from the transmitter, in the direction of the receiver.

A.2 - Interpolation between Curves for Different Antenna Heights

When the effective antenna height falls between the values for which curves are given, the field strength in dBμV/m shall be found by linear interpolation between the appropriate pair of curves. If the effective antenna height falls outside the range of heights for which curves are given, the value from the nearest available curve shall be used.

A.3 - Interpolation for Mixed Land-Sea Paths

In the case of mixed land-sea paths, the field strength in dBμV/m shall be found by linear interpolation between the values determined for land and sea paths, according to the relative proportions of land and sea along the path, as follows:

$$E = (d_{sea} / d_{total}) \times E(sea, d) + (d_{land} / d_{total}) \times E(land, d)$$

d_{sea}	is the length of the sea path
d_{land}	is the length of the land path
$d_{total} = d_{sea} + d_{land}$	is the total path length
$E(land, d)$	is the field strength value in dBμV/m given by the curves of T/R 20-08 applicable to land propagation for a path length (d), plus the appropriate correction factor for a path length (d).
$E(sea, d)$	is the field strength value in dBμV/m given by the curves of T/R 20-08 applicable to sea propagation for a path length (d), plus the appropriate correction factor.

A.4 - Use of Base Station Antenna Patterns

Calculation of predicted field strengths should take into account the radiation pattern of the base station antenna in azimuth and elevation. In the case of predictions to receiver locations along an obstructed path, the vertical angle to the visible horizon rather than to the receiver shall be used. Simplified calculations may be used which ignore the vertical radiation pattern of the antenna. In this case, the gain at the peak of the vertical pattern shall be used, in order to achieve a worst-case prediction.

Annex B Operator channel assignments

				Frequencies MHz					
.Ch. N	National Preferential Administration	UK Operator	Ireland Operator	Mobile to Base			Base to Mobile		
975	Ireland	Vodafone	A	880.1	to	880.3	925.1	to	925.3
976	Ireland	Vodafone	A	880.3	to	880.5	925.3	to	925.5
977	Ireland	Vodafone	A	880.5	to	880.7	925.5	to	925.7
978	Ireland	Vodafone	A	880.7	to	880.9	925.7	to	925.9
979	Ireland	Vodafone	A	880.9	to	881.1	925.9	to	926.1
980	Ireland	Vodafone	A	881.1	to	881.3	926.1	to	926.3
981	Ireland	Vodafone	A	881.3	to	881.5	926.3	to	926.5
982	Ireland	Vodafone	A	881.5	to	881.7	926.5	to	926.7
983	UK	Vodafone	A	881.7	to	881.9	926.7	to	926.9
984	UK	Vodafone	A	881.9	to	882.1	926.9	to	927.1
985	UK	Vodafone	A	882.1	to	882.3	927.1	to	927.3
986	UK	Vodafone	A	882.3	to	882.5	927.3	to	927.5
987	UK	Vodafone	A	882.5	to	882.7	927.5	to	927.7
988	UK	Vodafone	A	882.7	to	882.9	927.7	to	927.9
989	UK	Vodafone	A	882.9	to	883.1	927.9	to	928.1
990	UK	Vodafone	A	883.1	to	883.3	928.1	to	928.3
991	Ireland	Vodafone	B	883.3	to	883.5	928.3	to	928.5
992	Ireland	Vodafone	B	883.5	to	883.7	928.5	to	928.7
993	Ireland	Vodafone	B	883.7	to	883.9	928.7	to	928.9
994	Ireland	Vodafone	B	883.9	to	884.1	928.9	to	929.1
995	UK	Vodafone	B	884.1	to	884.3	929.1	to	929.3
996	UK	Vodafone	B	884.3	to	884.5	929.3	to	929.5
997	UK	Vodafone	B	884.5	to	884.7	929.5	to	929.7
998	UK	Vodafone	B	884.7	to	884.9	929.7	to	929.9
999	Ireland	Vodafone	B	884.9	to	885.1	929.9	to	930.1
1000	Ireland	02	B	885.1	to	885.3	930.1	to	930.3
1001	Ireland	02	B	885.3	to	885.5	930.3	to	930.5

1002	Ireland	02	B	885.5	to	885.7	930.5	to	930.7
1003	UK	02	B	885.7	to	885.9	930.7	to	930.9
1004	UK	02	B	885.9	to	886.1	930.9	to	931.1
1005	UK	02	B	886.1	to	886.3	931.1	to	931.3
1006	UK	02	B	886.3	to	886.5	931.3	to	931.5
1007	Ireland	02	C	886.5	to	886.7	931.5	to	931.7
1008	Ireland	02	C	886.7	to	886.9	931.7	to	931.9
1009	Ireland	02	C	886.9	to	887.1	931.9	to	932.1
1010	Ireland	02	C	887.1	to	887.3	932.1	to	932.3
1011	Ireland	02	C	887.3	to	887.5	932.3	to	932.5
1012	Ireland	02	C	887.5	to	887.7	932.5	to	932.7
1013	Ireland	02	C	887.7	to	887.9	932.7	to	932.9
1014	Ireland	02	C	887.9	to	888.1	932.9	to	933.1
1015	UK	02	C	888.1	to	888.3	933.1	to	933.3
1016	UK	02	C	888.3	to	888.5	933.3	to	933.5
1017	UK	02	C	888.5	to	888.7	933.5	to	933.7
1018	UK	02	C	888.7	to	888.9	933.7	to	933.9
1019	UK	02	C	888.9	to	889.1	933.9	to	934.1
1020	UK	02	C	889.1	to	889.3	934.1	to	934.3
1021	UK	02	C	889.3	to	889.5	934.3	to	934.5
1022	UK	02	C	889.5	to	889.7	934.5	to	934.7
1023	non pref (1)	02		889.7	to	889.9	934.7	to	934.9
0	non pref (1)	02		889.9	to	890.1	934.9	to	935.1
(1) Non preferential channel for both administrations									

5. “Memorandum of Understanding concluded between the administrations of the United Kingdom and Ireland on Co-ordination in the 1710 – 1785 and 1805 – 1880 MHz frequency bands”, entered into force 1 December 1999

MEMORANDUM OF UNDERSTANDING CONCLUDED BETWEEN THE ADMINISTRATIONS OF

THE UNITED KINGDOM AND IRELAND

ON COORDINATION IN THE 1710-1785 AND 1805-1880 MHz FREQUENCY BANDS

1 - INTRODUCTION

Frequencies in the bands 1710 - 1785 MHz (mobile transmit) and 1805 - 1880 MHz (base transmit) are designated for pan-European digital land mobile services "Digital Communications System" (DCS) 1800, consistent with ERC/DEC/(95)03 and CEPT T/R 22-07 (MONTREUX, 1993).

Accordingly, the Administrations of the United Kingdom and Ireland have agreed the following coordination procedures.

2 - PROCEDURE FOR FREQUENCY COORDINATION

The coordination procedure is based on the concept of preferential frequencies, in line with CEPT Recommendation T/R 22-07 (Montreux, 1993). The 1710-1785 MHz and 1805-1880 MHz frequency bands will be apportioned as groups of frequencies, which can be assigned in an equitable manner by both countries as "preferential bands".

In the case of a preferential band allocated to one country, a base station may be established without prior coordination if the predicted field strength, at all points 15km inside the neighbouring country, does not exceed the trigger value specified in paragraph 2.1.1.

In the instance of a non-preferential band assigned to one country, a base station may be established without prior coordination if the predicted field strength, at all points on the border or the territory, does not exceed the trigger value specified in paragraph 2.1.2.

2.1 - Technical characteristics

2.1.1 - Preferential bands

In a preferential band, the field strength shall not exceed the trigger value of 25 dBμV/m at 3 metres above ground level at all points 15 km inside the neighbouring country.

2.1.2 - Non-preferential bands

In a non-preferential band, the field strength shall not exceed the trigger value of 25 dBμV/m at 3 metres above ground level at all points on the border or the territory of the neighbouring country.

2.1.3 – Additional interference sources.

Where multiple interference sources are present, the simplified algorithm given in Annex 2 of CEPT Recommendation T/R 22-07 shall be applied.

2.2 - Allocation of preferential channels

The division of preferential channels between the two countries shall be in accordance with Annex 1.

3 - EXCHANGE OF INFORMATION

At the request of a mobile operator, operators from the neighbouring country shall make details of existing base stations available. Where interference is believed to arise between operators, they should exchange information, with a view to resolving the difficulty. A copy of the interference details shall also be sent to both administrations.

The Administrations of Ireland and the United Kingdom agree to facilitate this exchange of information between operators and to intervene should operators not be able to resolve cases of interference by mutual agreement.

All exchanges of information shall be made in accordance with the format specified in CEPT T/R 25-08 (LECCE 1989 (CR)).

4 - CO-ORDINATION PROCEDURE

The Administrations of Ireland and the United Kingdom are committed to ensuring that operators covered by this Memorandum of Understanding, respect the limits for establishment of base stations given in 2.1.1 and 2.1.2 above. However, there might be an occasional need to establish stations such that the field strength at the border will exceed these limits. In such cases, each administration may seek co-ordination according to the procedure described in Paragraph 4 of CEPT Recommendation T/R 20-08 (LECCE 1989 (CR)) and in line with the format given in CEPT T/R 25-08 (LECCE 1989 (CR)).

5 - EXISTING STATIONS

Existing stations will comply with the agreed limit values or be co-ordinated using the procedure given in Section 4.0 by January 1st 2000.

6 - REVIEW ARRANGEMENTS

The terms of this Memorandum of Understanding may be modified by mutual agreement of both administrations.

7 - TERMINATION OF THE MEMORANDUM OF UNDERSTANDING

Either Administration may withdraw from this Memorandum of Understanding subject to six months notice.

8 - DATE OF ENTRY INTO FORCE

This Memorandum of Understanding shall enter into force on 1st September 1999.

1 For the UNITED KINGDOM administration

R. COOPER

2 For the IRELAND administration

A. RYAN

Originals of this Memorandum of Understanding for Frequency Co-ordination will be laid down with the Radiocommunications Agency in London and the Office of the Director of Telecommunications Regulation in Dublin.

ANNEX 1

ALLOCATION OF PREFERENTIAL CHANNELS

Allocation of preferential channels between the UK and IRELAND

DCS 1800 CHANNEL	COUNTRY
512 – 525	IRELAND
526 – 547	UK
548 – 561	IRELAND
562 – 593	UK
594 – 618	IRELAND
619 – 624	UK
625 – 639	IRELAND
640 – 668	UK
669 – 693	IRELAND
694 – 699	UK
700 – 711	IRELAND
712 – 744	UK
745 – 768	IRELAND
769 – 774	UK
775 – 788	IRELAND
789 – 817	UK
818 – 843	IRELAND
844 – 849	UK
850 – 861	IRELAND
862 – 874	UK
875 – 877	IRELAND
878 – 882	UK
883 – 885	IRELAND

6. Memorandum of Understanding on frequency Co-ordination between the Republic of Ireland and the United Kingdom in the frequency bands 880 – 915 MHz paired with 925 to 960 MHz And 1710 – 1785 MHz paired with 1805 – 1880 MHz, entered into force 1 May 2011

Commission for
Communications Regulation

Ofcom
OFFICE OF COMMUNICATIONS

MEMORANDUM OF UNDERSTANDING ON FREQUENCY CO-ORDINATION BETWEEN THE REPUBLIC OF IRELAND AND THE UNITED KINGDOM IN THE FREQUENCY BANDS 880 – 915 MHz PAIRED WITH 925 to 960 MHz AND 1710-1785 MHz PAIRED WITH 1805 – 1880 MHz

1. INTRODUCTION

1.1. This Memorandum of Understanding (MoU) describes the procedures for the co-ordination of civil radio services between the Republic of Ireland (RoI) and the United Kingdom (UK) in the frequency bands 880 – 915 MHz paired with 925 to 960 MHz and 1710-1785 MHz paired with 1805 – 1880 MHz.

1.2. In Ireland and the UK the frequency bands 880 – 915 MHz, 925 MHz to 960 MHz, 1710-1785 MHz and 1805 – 1880 MHz are currently allocated to GSM. They will in due course be liberalised in line with the Commission Decision (as amended from time to time) on the liberalisation of frequencies in the 900MHz and 1800MHz bands to allow them to be used for different mobile telephony technologies [2].

1.3. Ofcom is the Administration of the United Kingdom responsible for all relations with the RoI concerning this MoU.

1.4. The Commission for Communications Regulation (ComReg) is the Administration of the RoI responsible for all relations with the UK concerning this MoU.

1.5. Accordingly, the Administrations of the UK and the RoI have agreed the co-ordination procedures in this MoU.

1.6. This MoU applies in the territories of The Republic of Ireland and the United Kingdom.

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

1.8. Coordination of IMT/UMTS (FDD) services is based on the protection requirements for non preferential frequency blocks given in Par 2.2 of annex 2 (08)02 [1]

2. COMMITMENT OF THE ADMINISTRATIONS

The Administrations of the ROI and the UK are committed to ensuring that the radio-communication stations operating in the frequency band covered by this MoU, respect the limits for establishment of base stations without co-ordination given at paragraph 3, unless the stations are specifically exempt from the co-ordination procedure in accordance with paragraph 4.

RM

[1] ECC Recommendation (08)02 Frequency Planning and Frequency Co-ordination for the GSM 900 (Including E-GSM) /UMTS 900, GSM 1800/UMTS 1800 Land Mobile Systems

3. CRITERIA FOR CO-ORDINATION

3.1. Stations using the GSM technology will be coordinated according to [2, 3, 4]

3.2. Stations using technologies from the IMT family will be coordinated according to par 3.3 and 3.4 in line with paragraph 2.2 of ECC recommendation (08)02.

3.3. Stations using IMT/UMTS (FDD) technologies may be used without coordination with a neighbouring country if the mean field strength of each carrier produced by the base station does not exceed a value of:

a. In the frequency band 925-960 MHz: 59 dBµV/m/5MHz at a height of 3m above ground at the border line between two countries and 31 dBµV/m/5MHz at a height of 3 m above ground at a distance of 6 km inside the neighbouring country.

Or

b. In the frequency band 1805-1880 MHz:65 dBµV/m/5MHz at a height of 3m above ground at the border line between two countries and 37 dBµV/m/5MHz at a height of 3 m above ground at a distance of 6 km inside the neighbouring country.

3.4. Radiocommunication stations for which the predicted field strength exceeds the values given in par 3.3 must be co-ordinated in accordance with paragraph 7, except where stations are listed in paragraph 6 or an arrangement exists between operators as described in paragraph 4.

3.5. To establish the predicted field strength produced by a station, the methodology set out at paragraph 5 shall be employed.

3.6. In the case of non-continuous transmission, the interference power shall be the power emitted, during the active part of the signal, in the stated bandwidth.

4. ARRANGEMENTS BETWEEN OPERATORS

4.1. To facilitate reasonable and timely development of their systems, licensees are encouraged to develop Bilateral and Multilateral Arrangements.

4.2. Licensees holding rights, in each of the neighbouring countries, to use the frequencies of operation of a Radiocommunication station may mutually agree conditions in which that station can exceed the predicted field strengths set out at paragraph 3.3.

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[2] Memorandum of understanding on frequency co-ordination between Ireland and the United Kingdom in the frequency bands 880-890 MHz and 925-925 MHz designated for EGSM. In force 1 December 2005.
[3] Memorandum of understanding on frequency co-ordination between Ireland and the United Kingdom in the frequency bands 890-915 MHz and 935-960 MHz designated for the global system for mobile communication (GSM) in force 1 January 2001
[4] Memorandum of understanding concluded between the administrations of the United Kingdom and Ireland on co-ordination in the 1710-1785 and 1805-1880 MHz frequency bands in force 1 September 1999

4.3. Where licensees have reached such a mutual agreement, co-ordination of the corresponding station in accordance with paragraph 7 is not required, subject to the terms of the agreement between the licensees and subject to the agreement being lawful. It is the responsibility of the licensees to ensure that the agreement is lawful . It is also the responsibility of the licensees to ensure that an appropriate agreement is reached with all licensees in the neighbour country authorised to use frequencies at which the predicted field strength may exceed the thresholds set out at paragraph3.3.

4.4. In order to facilitate operator co-ordination, each Administration will provide names and point of contact information for the relevant licensees, subject to the agreement of the licensees.

5. PREDICTION OF PROPAGATION

The field prediction method shall be according to the latest version of Recommendation ITU-R P. 1546 5:

- 10% of the time
- 50% of locations
- Height of the receiver antenna 3m

Taking account of:

- Terrain profile for the base station in all main directions
- Type of terrain (e.g. land, sea, mixed path)
- Effective radiated field strength
- Antenna tilt and azimuth

Including model components:

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

And standard value: DeltaN = 40 (N0m-N1000m)

[5] Recommendation ITU-R P.1546, Method for point-to-area predictions for terrestrial services in the Frequency range 30 MHz to 3 000 MHz

6. CO-ORDINATED STATIONS

The stations listed below have been agreed by both Administrations to be coordinated. Any subsequent change in the parameters given in the table shall void any acceptance of co-ordination for the corresponding station or stations.

	Name	Individual Channel bandwidth	Modulation	Centre Frequency	Lat	Long	East	North	Ground H AMSL (m)	H AGL (m)	EIRP dBm	Antenna Manufacturer reference	Pol	3dB BW Degs	Az Degs E of N.

7. CO-ORDINATION PROCEDURE

7.1. Exchanges of information for co-ordination/notification purposes shall be in the format set out in the HCM agreement Annex 2A (revised at Vilnius 2005) [6]

7.2. In the event of interference between authorised users of the frequency bands 925 MHz to 960 MHz, and 1805 – 1880 MHz in the ROI and the UK, the affected users shall exchange information between themselves with a view to resolving the interference by mutual agreement. A report of the interference and the details of the information exchanged shall be sent to both Administrations. The Administrations of the ROI and the UK agree to facilitate the exchange of information between authorised users of the band.

7.3. Co-ordination request should be sent by the licensee through the administration responsible for its authorisation.

8. REVIEW OF MoU

8.1. The co-ordination threshold and prediction methods defined in this MoU may be reviewed in the light of new technologies, experience of operation of networks in both countries and future prediction developments.

8.2. This MoU explicitly covers co-ordination of GSM and IMT(FDD) services between the UK and the RoI, and may need to be reviewed if other technologies are to be considered.

9. TERMINATION OF THE MEMORANDUM OF UNDERSTANDING

Either Administration may withdraw from this Memorandum of Understanding subject to 6 months notice.

[6] Agreement between the Administrations of … on the Co-ordination of frequencies between 29.7 MHz and 39.5 GHz for fixed service and land mobile service (HCM Agreement) Vilnius, 2005 http://hcm.bundesnetzagentur.de/http/englisch/verwaltung/index_europakarte.htm

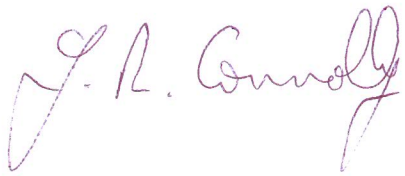
10. DATE OF ENTRY INTO FORCE

This Memorandum of Understanding shall enter into force on 1 May 2011.

Signed on .

JIM CONNOLLY

For the administration of The Republic of Ireland



Signed on 5 April 2011 .

RAY MCCONNELL

For the UNITED KINGDOM administration