



Statement on variation of 2100 MHz Third Generation Mobile Wireless Telegraphy Act Licences

Statement

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Section 1

Executive summary

- 1.1 Ofcom published a Notice on 2 February 2011 proposing to make a number of variations to the existing 2100 MHz Third Generation Mobile Wireless Telegraphy Act licences. Ofcom is required to vary the licences in this way as a result of a direction to Ofcom made by the Secretary of State.
- 1.2 This Direction was made on 20 December 2010 and came into force 10 days later.
- 1.3 Ofcom has considered all the responses to the Notice. We have decided to vary the licences in line with our proposal in the Notice subject to some minor changes to the drafting of the licences, which are explained below. If the individual licensees choose to consent to these changes then new licences will be issued to them.

Section 2

Introduction

Notice of the proposed licence variations

- 2.1 The Secretary of State has directed Ofcom in relation to a number of matters relating to mobile spectrum. A draft direction entitled 'The Wireless Telegraphy Act 2006 (Directions to OFCOM) Order 2010' (the "Direction") was laid before Parliament on 27 July 2010.
- 2.2 Both Houses of Parliament approved the draft Direction and it was made by the Secretary of State on 20 December 2010 and came into force ten days later.
- 2.3 Ofcom published on 2 February 2011 a consultation entitled 'Notice of proposed variation of 2100 MHz Third Generation Mobile Wireless Telegraphy Act Licences'¹ (the "Notice") setting out our proposed changes to the licences.
- 2.4 The proposed changes address a number of provisions of the Direction that concern the 3G licences. These are the provisions, subject to licensee consent, to ensure that:
- by 30th June 2013 the licensee must provide an electronic communications network that is capable of providing mobile telecommunications services to an area within which at least 90% of the population of the United Kingdom lives and with a 90% probability that users in outdoor locations within that area can receive the service with a sustained downlink speed of not less than 768kbps in a lightly loaded cell;
 - the licence will continue in force unless or until revoked by OFCOM;
 - OFCOM may revoke the licence either:
 - (i) for spectrum management reasons on not less than 5 years' notice, such notice not to be given before 31st December 2016, or
 - (ii) in accordance with their powers under the Wireless Telegraphy Act 2006; and
 - that the licensee is to pay an annual charge for the licence in respect of periods following 31 December 2021.
- 2.5 A confidential respondent to the above consultation expressed concern over the proposed wording used in paragraph 4(b) of Schedule 1 to the licence template annexed to the Notice. The respondent set out its view that the Government's intention in making Article 5 of the Direction was that the new coverage obligation should be capable of being met using any of the frequencies held by the licensee and not just the frequencies in the 2100 MHz band. Ofcom agreed that this was the Government's intention as set out at paragraph 23 of the Government's statement on

¹ <http://stakeholders.ofcom.org.uk/binaries/consultations/2100-MHz-Third-Generation-Mobile/summary/main.pdf>

the Direction of March 2010². On 2 March 2011, Ofcom published an addendum to the Notice showing the revision to the proposed wording of paragraph 4(b) and its heading of Schedule 1 to the draft licence³.

- 2.6 We asked interested parties to consider the following questions when responding to the Notice.

Do you have any comments on the proposed variations which Ofcom intends to make to the 3G licences in order to implement the Direction?

Do you consent to your 3G licence being varied as proposed?

Do you have any comments on the proposed process to monitor and measure compliance with the coverage obligation requirement?

Responses

- 2.7 We received five responses to the Notice. One response was submitted on a confidential basis. The other four responses are published on the Ofcom website⁴.

² <http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-737-government-response-consultation-ofcom-implement-spectrum-modernisation.pdf>

³ <http://stakeholders.ofcom.org.uk/consultations/2100-MHz-Third-Generation-Mobile/>

⁴ <http://stakeholders.ofcom.org.uk/consultations/2100-MHz-Third-Generation-Mobile/?showResponses=true>

Section 3

Assessment of the responses to the Notice

3.1 In this section we review the responses we received to our Notice and set out our response in each case.

Licence fees

- 3.2 Everything Everywhere asked whether the licence fees payable after 31 December 2021 will be calculated in the same manner as administered incentive pricing fees payable on other mobile spectrum or not.
- 3.3 After 31 December 2021 Ofcom will charge fees pursuant to sections 12 and 13 of the Wireless Telegraphy Act 2006. The nature of such fees, including their method of calculation will depend on Ofcom's policy for setting fees at the time, in light of its statutory duties.
- 3.4 Everything Everywhere noted that in the new clause 7 in the main body of the licence template the text 'on or before such dates as shall be notified in writing to the licensee' would appear to give Ofcom the power to amend the initial fee payment date and that it should be clear that no payment is required prior to 1 January 2022. Three suggested that paragraph 7 in the main body of the licence template should be clarified to indicate that an annual fee will only be payable from 31 December 2021.
- 3.5 In the licence template annexed to the Notice there is text sited above paragraph 1 in the main body which shows that the fee payment date is 1 January (annually) and that this is from 1 January 2022. We do not therefore consider that further amendments are required to clarify that no fees will be payable before 1 January 2022.

Technical issues

- 3.6 Everything Everywhere suggested that in section 7 of schedule 1 to the licence template the 'ITU Emission Code' should include provision for bandwidths greater than 5 MHz.
- 3.7 Everything Everywhere suggested that paragraphs 6(c) and 8(c) of schedule 1 to the licence template contain old text relating to TDD use within the base receive or base transmit frequency bands (FDD bands) and this text should be removed.
- 3.8 Everything Everywhere suggested Section 8(b) of schedule 1 to the licence template may require additional text to ensure that the 1900-1920 MHz band can be used efficiently.
- 3.9 Ofcom has considered the above suggestions from Everything Everywhere but is of the view that they fall outside the scope of this consultation. Accordingly, Ofcom will contact licensees to take this matter forward separately.

- 3.10 Everything Everywhere also felt that operators should have the explicit right to implement carrier deployment not aligned to 5 MHz offsets from block edge provided permissible out of block limits are met.
- 3.11 The licence does not preclude the use of alternative frequency offsets from block edges therefore Ofcom does not consider that a change is necessary.

LTE

- 3.12 Everything Everywhere asked whether the 2100 MHz licences will be updated in future to allow the use of Long Term Evolution (LTE) technology.
- 3.13 In our consultation document of 22 March 2011⁵ entitled 'Consultation on assessment of future mobile competition and proposals for the award of 800 MHz and 2.6 GHz spectrum and related issues' we advised that we propose to make further variations to allow the use of LTE and WiMax in the 2100 MHz band (and the 900 and 1800 MHz bands) as soon as technical conditions have been agreed within Europe. Discussion on technology neutral conditions that would allow the use of LTE and WiMax in the 2100 MHz band are still ongoing within the European Committee ECC PT1.

Coverage obligation

- 3.14 The Welsh Assembly Government strongly disagreed with the coverage obligation and strongly believed that it does not go far enough to address the coverage issues that currently affect users in rural (and some urban) parts of Wales.
- 3.15 The extent of the coverage obligation to be included in the licences was not a matter on which we were consulting. The extent of the coverage obligation to be included in the licences was specified by the Secretary of State in the Direction (paragraph 5(3)(a)). We do not therefore intend to amend the coverage obligation as drafted. We recognise however that mobile coverage and mobile not-spots are a concern to stakeholders, and we are therefore separately taking forward a number of pieces of work in this regard.
- 3.16 The Welsh Assembly asked for clarity on the circumstances under which Ofcom would seek to revoke licences, noting that the revocation criteria did not appear to include a provision to penalise licensees who 'hoard' spectrum without fulfilling their coverage obligations.
- 3.17 The coverage obligation required in accordance with paragraph 5(3)(a) of the Direction is set out in paragraph 4(b) of Schedule 1 to the Licence (please see annex 5 of the Notice). Paragraph 4(b), above, sets out that section 43A of the Wireless Telegraphy Act 2006 will apply to licensees who contravene the coverage obligation. Section 43A provides for Ofcom to impose a penalty for contravention of a term of a Wireless Telegraphy Act licence.

Coverage obligation verification

- 3.18 A number of respondents to the consultation commented on aspects of verification of the coverage obligation.

⁵ <http://stakeholders.ofcom.org.uk/consultations/combined-award/>

- 3.19 A confidential response was concerned that insufficient detail was available on the mechanics of the process to give them comfort that the results would yield an accurate reflection of the population coverage.
- 3.20 A confidential response was concerned that the calculation method used by Ofcom appeared to be overly complex and had many unclear elements. They had concerns relating to population data with particular reservations relating to Ofcom's proposal to use a population weighted centroid approach for each census Output Area to assess coverage. They also had concerns regarding the proposed calculation method which did not appear to consider that operators have deployed multiple carriers in many areas of the country. Additionally, they were concerned that the proposed methodology did not mention two key parameters which they believed are necessary for calculating coverage; the received noise figure (or related parameter such as receiver sensitivity) and terminal antenna efficiency.
- 3.21 One confidential response and one partly confidential response noted that Ofcom has omitted any value(s) for SINR.
- 3.22 A confidential response suggested that if equipment other than specified third generation UMTS equipment is used to meet the coverage obligation then potentially the coverage validation methodology proposed by Ofcom could be invalid. They also suggested that there needs to be an unambiguous definition of loading in the surrounding cells
- 3.23 O2 said in their response that MNOs will need to better understand how compliance will be evaluated (including applicable bands and technologies) to determine whether it is appropriate to apply for a licence variation in the form proposed.
- 3.24 O2 and Three noted that in para 4.9 of the Notice, bullet one of the overview would need to be adjusted to allow operators to submit site data for any licensed frequencies using any technology capable of delivering the required service level.
- 3.25 Three suggested that it might be preferable to use a methodology based on signal strength and pilot E_c/I_0 measurements rather than SINR.
- 3.26 In relation to the verification of the coverage obligation, Ofcom has initiated a working group with the operators where we intend to address the comments raised above. We expect this group to work over the next few months and it is hoped that this group can reach a consensus on the approach to verification. Ofcom will publish a further statement on this matter in due course.
- 3.27 Everything Everywhere expressed concerns that data supplied to Ofcom may be subject to release under the Environmental Information Regulations 2004.
- 3.28 The Environmental Information Regulations 2004 give rights of access to environmental information held by public authorities. Ofcom has a duty under the above regulations to make environmental information it holds available on request, unless an exception (or other relevant circumstance) as set out in the above regulations applies.

Remote disablement requirement for indoor repeaters

- 3.29 The definition of 'smart/intelligent low power repeater' (in paragraph 11 of schedule 1 to the licence template) requires the licensee to have the ultimate control of the repeater (i.e. the licensee must be able to remotely disable such repeaters). Three

enquired whether this was necessary as there was a low risk of interference from repeater equipment and the condition could increase the cost of each indoor repeater and lower levels of deployment.

- 3.30 Ofcom is of the view that the definition of smart/intelligent low power repeaters falls outside the scope of this consultation. Accordingly, Ofcom will contact licensees to take this matter forward separately.

General comments on the licence template

- 3.31 Everything Everywhere suggested that in paragraph 3(c) of the main body of the licence template the text should read '5 years' notice', and that the word 'the' should be omitted before 31 December 2016. We agree and have made these changes in the annexed licence template.
- 3.32 In paragraph 4 of the main body of the licence template Everything Everywhere suggested that the original text could be deleted leaving only the new text with the word 'however' omitted. We disagree. The primary position is that, assuming we maintain our proposals for mobile spectrum trading following our recent consultation, the licence will not be transferable, with the exception being that a transfer may be authorised in accordance with relevant trading regulations. We do not therefore intend to effect the change proposed above.
- 3.33 Everything Everywhere noted that, in paragraph 6 of the main body of the licence template, the name of the company which paid the fee in respect of the licence following the auction in 2000 may not necessarily be the same name as the current licensee. However, we do not believe that this requires any amendment to the licence template.
- 3.34 Three noted the addendum published by Ofcom on 2 March showing the revision to the proposed wording of paragraph 4(b) of Schedule 1 of the licence template and the heading to this section (please see paragraph 2.5 above). Three advised that they did not object to this amendment but suggested that it afforded a further advantage to other Mobile Network Operators apart from themselves. They expected that Ofcom should take account of this advantage in its competition assessment ahead of the proposed 800 MHz/2.6 GHz auction.
- 3.35 Ofcom published a consultation document entitled 'Consultation on assessment of future mobile competition and proposals for the award of 800 MHz and 2.6 GHz spectrum and related issues on 22 March 2011⁶ and which closed on 31 May 2011. Ofcom will consider Three's comments in its consideration of this consultation.
- 3.36 A confidential response suggested that in paragraph 4(a) of schedule 1 of the licence template, the text '*enable the provision of, by no later than 31 December and to*' together with the following word '*thereafter*' are redundant and therefore, should be deleted. As our intention is to effect the minimum number of changes necessary to implement the Direction, we do not propose to make this change.
- 3.37 In paragraph 4(a) of schedule 1 of the licence template, O2 suggested that the cross reference to paragraph 10 of Schedule 1 should read paragraph 9 of Schedule 1. We agree and have made this correction in the annexed licence template.

⁶ <http://stakeholders.ofcom.org.uk/consultations/combined-award/>

- 3.38 Three asked if the expressions 'interference ' and 'undue interference' used in the main body and schedule 1 of the licence template would have the same meanings as under Section 115 of the Wireless Telegraphy Act 2006. We confirm that we would interpret the above expressions in accordance with Section 115 of the Wireless Telegraphy Act 2006.

Section 4

Next steps

- 4.1 A new licence template incorporating the originally proposed variations and changes detailed in section 3 is set out in annex 1 to this statement. We will issue this varied licence to the existing 2100 MHz 3G licensees upon receipt of their respective written consents to the varied licence.

Annex 1

Licence template

Office of Communications (Ofcom)
Wireless Telegraphy Act 2006

THIRD GENERATION MOBILE LICENCE

This Licence replaces the licence issued by Ofcom on [DATE] to [COMPANY NAME].

Licence no: **XXXXXX**

Date of issue: **[DATE]**

Fee payment date **1 January (annually)**
(from 1 January 2022)

1. This Licence authorises **[COMPANY NAME]**
("The Licensee")
of **XXXX**
XXXX
XXXX
XXXX

to establish, install and use radio transmitting and receiving stations and/or radio apparatus as described in Schedule 1 of this Licence (hereinafter together called "the Radio Equipment") subject to the terms set out below.

Licence Term

2. This Licence shall continue in force until revoked by Ofcom or surrendered by the Licensee.

Licence Variation and Revocation

3. (1) Pursuant to Schedule 1(8) of the Wireless Telegraphy Act 2006 ("the 2006 Act"), Ofcom may not revoke this Licence under Schedule 1(6) of the 2006 Act save at the request or with the consent of the Licensee except:

- (a) in accordance with clause 7 of this Licence;
- (b) in accordance with Schedule 1 paragraph 8(5) of the 2006 Act;
- (c) for reasons related to the management of the radio spectrum, provided that in such a case the power to revoke may only be exercised after five years' notice is given in writing and after Ofcom has considered any pertinent factors (such notice not to be given before 31 December 2016);

- (d) if, in connection with the transfer or proposed transfer of rights and obligations arising by virtue of the Licence, there has been a breach of any provision of Regulations made by Ofcom under the powers conferred by section 30(1) and (3) of the 2006 Act¹;
- (e) If there has been a material breach of any of the terms of this Licence or the schedules(s) hereto;

(2) In the period before 31 December 2021, pursuant to Schedule 1 paragraph 8(1) of the 2006 Act, Ofcom may not vary this Licence under Schedule 1 paragraph 6 of the 2006 Act save at the request or with the consent of the Licensee except:

- (a) in the circumstances specified in paragraphs (b), (c) and (d) of sub-paragraph (1) of the paragraph; or
- (b) in relation only to paragraphs 7 and 8 of Schedule 1, if Ofcom has reasonable grounds for concluding that use of the Radio Equipment in accordance with either or both of these paragraphs is causing, or is likely to cause, undue interference to other authorised radio equipment.

(3) After 31 December 2021, Ofcom may only vary this Licence by notification in writing to the Licensee and in accordance with paragraphs 6 and 7 of Schedule 1 of the 2006 Act.

Changes

- 4. This Licence may not be transferred. The transfer of rights and obligations arising by virtue of this Licence may however be authorised in accordance with regulations made by Ofcom under powers conferred by section 30 of the 2006 Act².
- 5. The Licensee shall give prior or immediate notice to Ofcom in writing of any changes to the details of the Licensee and/or address as recorded in paragraph 1 of this Licence.
- 6. If the Licence is surrendered or revoked no refund of the fee which was paid by [COMPANY NAME] whether in whole or in part, will be made except at the absolute discretion of the Secretary of State in accordance with regulation 5 of the Wireless Telegraphy (Third Generation Licences) Regulations 1999.

Fees

- 7. The Licensee shall each year pay Ofcom the relevant fee as provided in section 12 of the 2006 Act and the regulations made thereunder on or before the fee payment date shown above, or on or before such dates as shall be notified in writing to the Licensee, failing which Ofcom may revoke this Licence.

¹ These are regulations on spectrum trading.

² See Ofcom's website for the latest position on spectrum trading and the types of trade which are permitted.

8. The Licensee shall also pay interest to Ofcom on any amount which is due under the terms of this Licence or provided for in any Regulations made by Ofcom under sections 12 and 13(2) of the 2006 Act from the date such amount falls due until the date of payment, calculated with reference to the Bank of England base rate from time to time. In accordance with section 15 of the 2006 Act any such amount and any such interest is recoverable by Ofcom.

9. If the Licence is surrendered or revoked, no refund, whether in whole or in part of any amount which is due under the terms of this Licence or provided for in any Regulations made by Ofcom under sections 12 and 13(2) of the 2006 Act will be made, except at the absolute discretion of Ofcom.

Penalty

10. Ofcom may impose a penalty on the Licensee in accordance with section 43A of the 2006 Act if the Licensee is or has been in contravention of the provisions specified in Schedule 1 paragraph 4(b) of this Licence.

Radio Equipment Use

11. The Licensee shall ensure that the Radio Equipment is constructed and used only in accordance with the provisions specified in Schedule 1 of this Licence. Any proposal to amend any detail specified in Schedule 1 of this Licence must be agreed with Ofcom in advance and implemented only after this Licence has been varied or reissued accordingly.

12. The Licensee shall ensure that the Radio Equipment is operated in compliance with the terms of this Licence and is used only by persons who have been authorised in writing by the Licensee to do so and that such persons are made aware of, and of the requirement to comply with, the terms of this Licence.

Access and Inspection

13. The Licensee shall permit a person authorised by Ofcom:

- (a) to have access to the Radio Equipment; and
- (b) to inspect this Licence and the Radio Equipment,

at any and all reasonable times or, when in the opinion of that person an urgent situation exists, at any time to ensure the Radio Equipment is being used in accordance with the terms of this Licence.

Modification, Restriction and Closedown

14. A person authorised by Ofcom may require the Radio Equipment or any part thereof, to be modified or restricted in use, or temporarily or permanently closed down immediately if in the opinion of the person authorised by Ofcom:

- (a) a material breach of this Licence has occurred; and/or
- (b) the use of the Radio Equipment is, or may be, causing or contributing to undue interference to the use of other authorised radio equipment.

15. Ofcom may in the event of a national or local state of emergency being declared require the Radio Equipment to be modified or restricted in use, or temporarily or permanently closed down either immediately or on the expiry of such period as Ofcom may specify. Ofcom shall exercise this power by a written notice served on the Licensee or by a general notice applicable to holders of this class of Licence.

Geographical Boundaries

16. This Licence does not authorise the establishment and use of the Radio Equipment on the Isle of Man or any of the Channel Islands.

Interpretation

17. In this Licence:
- (a) the establishment, installation and use of the Radio Equipment shall be interpreted as establishment and use of stations and installation and use of apparatus for Wireless Telegraphy as specified in section 8(1) of the 2006 Act;
 - (b) the expression "interference" shall have the same meaning that it has under the 2006 Act (Section 115);
 - (c) the expression "inspect" includes examine and test;
 - (d) the schedules and Annex form part of this Licence together with any subsequent schedule(s) which Ofcom may issue as a variation to this Licence at a later date; and
 - (e) the Interpretation Act 1978 shall apply to the Licence as it applies to an Act of Parliament.

Issued by Ofcom.

[COMPANY NAME]- 3G Cellular Licence
Issued: [DATE] – Revision: [X] Licence Number: [XXXXXX]
SCHEDULE 1 TO LICENCE NUMBER: XXXXXX

Licence Class: **Third Generation Mobile**

Schedule date: [DATE]

This schedule forms part of Licence no. XXXXXX, issued to [COMPANY NAME] (“the Licensee”) on [DATE].

1. **Description of Radio Equipment Licensed**

In this Licence, the Radio Equipment means the base transceiver stations or repeater stations forming part of the Network (as defined in paragraph 2 below).

2. **Purpose of the Radio Equipment**

The Radio Equipment shall form part of a radio telecommunications network ("the Network"), in which approved user stations communicate by radio with the Radio Equipment to provide a telecommunications service.

3. **Approved Standards for the Radio Equipment**

The Radio Equipment covered by this Licence shall comply with the appropriate Interface Requirement (IR 2019 – Third Generation Mobile) or for equipment placed on the market before 8 April 2000, is required to be type approved in accordance with a recognised technical performance standard relating to the service licensed.

4. **Special Conditions**

(a) The Licensee shall install, maintain and use Radio Equipment (as specified in paragraph 9 of Schedule 1) in such a way as to enable the provision of, by no later than 31 December 2007, and to maintain thereafter, a telecommunications service by means of the Radio Equipment to an area where at least 80% of the population of the UK live.

(b) The Licensee shall by no later than 30 June 2013 provide and thereafter maintain an electronic communications network that is capable of providing mobile telecommunications services to an area within which at least 90% of the population of the United Kingdom lives and with a 90% probability that users in outdoor locations within that area can receive the service with a sustained downlink speed of not less than 768kbps in a lightly loaded cell. Section 43A of the 2006 Act shall apply to any contravention of this provision.

(c) During the period that this Licence remains in force and for 6 months thereafter, the Licensee shall compile and maintain accurate records of:

(i) The following details relating to the Radio Equipment:

(a) postal address;

- (b) National Grid Reference (to 100 metres resolution);
 - (c) antenna height and type;
 - (d) radio frequencies in operation during the Licence term;
- (ii) a statement of the number of customers using the Network; and

without prejudice to this paragraph (c), the Licensee shall furnish to Ofcom in such a manner and at such times as reasonably requested, information in the form of documents, accounts, estimates, returns and any other information, which may be reasonably required for the purposes of verifying compliance with this Licence and for statistical purposes.

(d) In respect of femtocell equipment and smart/intelligent low power repeater equipment, the conditions relating to the keeping of records contained in sub-paragraphs 4(c)(i)(a), 4(c)(i)(b) and 4(c)(i)(c) shall not apply.

(e) The Licensee shall inform Ofcom of the address of the premises at which this Licence and the information detailed at sub-paragraph (c) above shall be kept.

(f) The Licensee shall submit to Ofcom copies of the records detailed in sub-paragraph (c) above at such intervals as Ofcom shall notify to the Licensee.

(g) The Licensee shall, upon request, supply Ofcom or any person authorised on their behalf with the name and address of any subscribing customers of the Network, or require its agents to provide such information on its behalf.

TECHNICAL REQUIREMENTS

The Licensee shall ensure that the Radio Equipment performs in accordance with the following technical requirements.

5. Frequency Band(s) of Operation

The Radio Equipment is authorised to operate in the following frequency bands:

[Frequency range] XXXX – XXXX MHz: Base Receive

[Frequency range] XXXX – XXXX MHz: Base Transmit

[Frequency range] XXXX – XXXX MHz Base Transmit/Receive in Time Division Duplex

6. Maximum Permissible EIRP

- (a) Frequency Division Duplex (FDD)

The Radio Equipment in Frequency Division Duplex (FDD) mode, is required to conform with the following EIRP limits:

Maximum EIRP per carrier	Maximum EIRP per MHz
65 dBm	61 dBm/MHz

(b) Time Division Duplex (TDD)

The Radio Equipment in Time Division Duplex (TDD) mode is required to conform with the following EIRP limits:

Maximum EIRP per carrier	Maximum EIRP per MHz
62 dBm	58 dBm/MHz

(c) Time Division Duplex (TDD) operated in the base receive or base transmit frequency bands

If the Licensee chooses to operate Radio Equipment in Time Division Duplex (TDD) mode in either the base receive or the base transmit frequency band of operation, the EIRP limits for TDD defined in Section 6(b) also apply as a minimum. In addition to this, the Licensee may be required to take additional measures to ensure that deployment of TDD Radio Equipment in the base receive or base transmit frequency band does not cause undue interference to FDD Radio Equipment operated by a neighbouring licensee.

7. **ITU Emission Code**

5M00G7W

8. **Permissible Out of Block Emissions**

(a) Frequency Division Duplex (FDD)

Out of block emissions from the Radio Equipment in Frequency Division Duplex (FDD) mode must not exceed the following:

Offset from edge of block	Maximum permitted level	Measurement bandwidth
0 to 0.2 MHz	- 14 dBm	30 kHz
0.2 to 1.0 MHz	-14 -15($\Delta f^*-0.2$) dBm	30 kHz
Beyond 1.0 MHz	-13 dBm	1.0 MHz

*Note: Δf is the offset from the edge of the frequency block in MHz.

(b) Time Division Duplex (TDD)

Out of block emissions from the Radio Equipment in Time Division Duplex (TDD) mode must not exceed the following:

Offset from edge of block	Maximum permitted level	Measurement bandwidth
0 to 5 MHz	-23 dBm	1.0 MHz
Beyond 5 MHz	-30 dBm	1.0 MHz

(c) Time Division Duplex (TDD) operated in the base receive or base transmit frequency bands.

If the Licensee chooses to operate Radio Equipment in Time Division Duplex (TDD) mode in either the base receive or the base transmit frequency bands of operation, the limits for TDD defined in Section 8(b) also apply as a minimum. In addition to this, the Licensee may be required to take additional measures to ensure that deployment of TDD Radio Equipment in the base receive or base transmit frequency band does not cause undue interference to FDD Radio Equipment operated by a neighbouring licensee.

9. **Relevant Performance Standards**

The Radio Equipment is required either to comply with the relevant performance standards applicable at the time of installation or with other requirements in any applicable Interface Requirements, as referred to in article 4.1 of the "Radio Equipment and Telecommunications Terminal Equipment Directive" and issued to the Licensee.

The current relevant performance standards are:

- (a) UK Radio Licence Interface Requirement 2019- Third Generation Mobile;
- (b) ETSI TS 125.104: UTRA (BS) FDD; Radio Transmission and Reception;
- (c) ETSI TS 125.105: UTRA (BS) TDD; Radio Transmission and Reception.

10. **Co-ordination**

The Radio Equipment shall be operated in compliance with such co-ordination procedures as are required by any Memorandum of Understanding with another neighbouring administration (including the administrations of the Isle of Man and the Channel Islands) as notified by Ofcom.

11. **Interpretation**

In this Schedule:

- (a) "Maximum EIRP per carrier". The EIRP (effective isotropic radiated power) is the product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna. The maximum EIRP in any direction from the base-station should be below this limit for any transmitted carrier. Power for this limit is defined as the mean modulated carrier power time averaged over any

suitable time period in which the transmitter is continuously transmitting at its maximum operational power level;

- (b) “Maximum EIRP per MHz”. The EIRP per MHz is defined as the sum of the EIRP radiated by all transmitted carriers in any given direction within any contiguous 5 MHz block within an operator’s spectrum allocation, divided by 5;
- (c) The EIRP per carrier and the EIRP per MHz limits are to be considered separately for any deployment and the more stringent is to be complied with;
- (d) “Frequency block” means the frequency band of operation of the licensee defined in Section 6 of this Schedule;
- (e) “Out of block emissions” are defined as Radio Frequency (RF) emissions generated by the system operated by the licensee but radiated into the spectrum adjacent to the licensee’s frequency block;
- (f) “Maximum permitted level” (of out of block emissions) is the maximum power, integrated over the corresponding measurement bandwidth, that may be supplied by the transmitter to the antenna feeder line. Power is defined as the mean RF power time averaged over any suitable time period during which the transmitter is continuously transmitting at its maximum rated power;
- (g) “Frequency Division Duplex (FDD)” operation is defined as bi-directional communication in which one radio frequency carrier is used for transmission and a separate radio frequency carrier is used for reception;
- (h) “Time Division Duplex (TDD)” operation is defined as bi-directional communication using a single radio frequency carrier for transmit and receive, with transmission/reception taking place using discrete time slots;
- (i) “dBm” is an abbreviation for the power ratio in decibels (dB) of the measured power referenced to one milliwatt (mW);
- (j) A “femtocell” is a base station of the Network which operates at a power not exceeding 20dBm E.I.R.P. per carrier which may be established by customers of the Network but which is or will be used only by and under the control of the Network, following the establishment of a telecommunications link between the femtocell and the Network;
- (k) A “smart/intelligent low power repeater” is a repeater of the Network which operates with power not exceeding 24dBm E.I.R.P. per carrier, which may be established by customers of the Network who have written agreements with the Licensee and:
 - The Licensee has ultimate control of the repeater, i.e. each individual repeater can be disabled remotely by the Licensee;

- The repeater operates only on the Licensee’s frequencies and with their valid Public Land Mobile Network Identifier;
- Must not cause undue interference to other spectrum users; and
- The repeater only transmits on the Licensee’s Base Receive frequencies when actively carrying a call (voice, video or data) signalling from serviced handsets.

(1) “User Station” means any vehicle mounted or hands portable mobile station designed for mobile use and/or any station designed or adapted to be established and used from static locations which meet the appropriate technical performance requirements as set out in the Wireless Telegraphy (Exemption) Regulation in force from time to time and either complies with the appropriate Interface Regulation listed in paragraph 3, or for equipment placed on the market before 8 April 2000, is type approved in accordance with a recognised technical standard relating to the service licensed.

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