



**Auction of spectrum:
2500–2690MHz,
2010–2025MHz
INFORMATION MEMORANDUM**

Publication date:

4 April 2008

IMPORTANT NOTICE

This Information Memorandum ("**Memorandum**") has been prepared by Ofcom in connection with the proposed award of Licences in the 2500–2690MHz and 2010–2025MHz spectrum bands by auction. Terms and expressions used in this Memorandum are as defined in Annex 6 of this Memorandum.

The Award Process will be conducted in accordance with regulations made by Ofcom pursuant to powers under Section 14 of the Wireless Telegraphy Act 2006 (the "WT Act"), pursuant to which the grant of the Licences may be made following a procedure set out in regulations issued by Ofcom.

The regulations to be made in respect of this award are referred to in this Memorandum as "**the Regulations**". A copy of the draft Regulations can be found at Annex 2 of this Memorandum. The Regulations were also issued in draft for statutory consultation on 4 April 2008 and a copy of the Notice of Ofcom's proposals to make regulations, including a copy of the draft Regulations is also available from the Ofcom Website. Recipients of this Memorandum should also note that only the Regulations have statutory effect. Accordingly, in the event of any difference between this Memorandum and the provisions of the Regulations, the Regulations are definitive.

This Memorandum is for information purposes only. It is made available on the express understanding that it will be used for the sole purpose of assisting the recipient of this Memorandum in deciding whether it wishes to proceed with a further investigation of possible participation in the Award Process. This Memorandum is not intended to form any part of the basis of any investment decision or other evaluation or any decision to participate in the Award Process, and should not be considered as a recommendation by Ofcom or its advisers to any recipient of this Memorandum to participate in the Award Process. Each recipient of this Memorandum must make its own independent assessment of the potential value of a Licence after making such investigation as it may deem necessary in order to determine whether to participate in the Award Process. All information contained in this Memorandum is subject to updating and amendment.

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Following issue of this Memorandum, Ofcom may publish further information and guidance. All requests for information will be handled in line with the Freedom of Information Act 2000. Ofcom may publish (including on the Ofcom Website), in whole or in part, questions received from recipients of this Memorandum and the answers provided. The identity of those asking the questions will not be published without the questioner's permission and requests for confidentiality of subject material will be considered in accordance with the need for transparency in the conduct of the Award Process.

Recipients of this Memorandum are encouraged to register their e-mail addresses with Ofcom so as to receive notifications of the publication of further information automatically, but it remains their responsibility to check the Ofcom Website for updates. Registration of address should be made by following the registration procedure at the relevant page on the Ofcom Website at: <http://www.ofcom.org.uk/static/subscribe/radiospectrum.htm>. Shortly before the commencement of the Award Process, the Ofcom Website will carry the detailed information about the Award Process.

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Section 1

Executive Summary

- 1.1 This Memorandum provides information for those parties considering bidding for a licence under the Wireless Telegraphy Act 2006 to establish or use stations for wireless telegraphy or install or use apparatus for wireless telegraphy in one or more of the 2500–2690MHz band (the “**2.6 GHz Band**”) and the 2010–2025 MHz band (the “**2010 MHz Band**”, and together the “**Bands**”) in the United Kingdom (referred to in this Memorandum as a “**Licence**”).
- 1.2 In particular, this Memorandum:
- describes the characteristics of the Bands for which Licences are to be awarded, and the way in which they will be packaged;
 - summarises the principal terms of the Licences that will be issued following completion of the Award Process;
 - summarises the steps which persons need to take in order to qualify and take part in the Award Process; and
 - summarises the rules and timetable applicable to the Award Process.
- 1.3 The following table presents a summary of the packaging of the Bands for the Licences, the rights and obligations under the Licences to be issued, and the rules for the conduct of the Award Process.

Spectrum Packaging	
2.6 GHz Band	<p>There are 38 blocks of 5 MHz available in the 2.6 GHz Band, which will be awarded as paired or unpaired spectrum, or as guard blocks. The spectrum is being made available in blocks of 5 MHz as Paired Lots (2x5 MHz for each Lot, 120 MHz duplex spacing between the lowest frequency of each block of 5 MHz) and Unpaired Lots (5 MHz for each Lot), with the eventual amount of Lots in each of the paired and unpaired categories to be determined in the Auction. There is a limit on the number of Lots available for award in each category a maximum of 14 Paired Lots (14x2x5 MHz with uplink in 2500-2570 MHz and downlink in 2620-2690 MHz) and a minimum of 9 Unpaired Lots (9x5 MHz in 2570-2615 MHz).</p> <p>One guard channel ("Guard Block") will be required at block 24 at the adjacency between paired and unpaired spectrum (when the outcome of the Principal Stage of the Auction means that both Paired and Unpaired Lots are awarded). The Guard Block does not count as a category and is not available as a Lot for the purpose of bidding in the Principal Stage. No Guard Block will be required if the outcome of the Principal Stage of the Auction means that only Unpaired Lots are awarded.</p> <p>The number of Paired and Unpaired Lots to be awarded will be determined in accordance with the Regulations and will be those number of Lots in the Winning Combination of Principal Stage Bids.</p> <p>Each Bidder which is awarded Paired Lots will receive a pair of contiguous ranges of 5 MHz blocks (each range having the same number of 5 MHz blocks and the lowest frequency of each range being separated by 120 MHz).</p> <p>Each Bidder which is awarded Unpaired Lots will receive:</p> <ul style="list-style-type: none"> - a contiguous range of Unpaired Lots if the Winning Principal Stage Bid submitted by that Bidder is a Primary Round Bid or a Basic Supplementary Bid; or - two contiguous ranges of Unpaired Lots, one in the frequency range from 2500 MHz to 2615 MHz (the "Lower Area"), one in the frequency range from 2620 MHz to 2690 MHz (the "Upper Area"), if the Winning Principal Stage Bid submitted by that Bidder is an Additional Supplementary Bid.
2010 MHz Band	The 2010 MHz Band is available as a single 15 MHz lot (the " 2010-2025 MHz Lot ").

<p>Licence conditions</p>	<p>The Licence conditions will be the minimum necessary to:</p> <ul style="list-style-type: none"> • ensure effective use of the licensed frequencies by controlling interference between different authorised uses; and • ensure compliance with international and legal requirements. <p>The technical conditions included in each Licence will comprise a constraint on use defined by reference to spectrum masks. Draft Licences are set out in Annex 1 of this document.</p> <p>Rights to use the licensed frequencies will be on a UK-wide basis within the defined frequency range of each Licence.</p> <p>For the avoidance of doubt the Licences do not guarantee exclusive use of the spectrum. In future Ofcom may grant additional authorisations to allow the use of all, or part, of the Bands. We would develop the conditions of use under such additional authorisations in order to manage the risk of harmful interference and would consult on these conditions.</p>
<p>Usage restrictions</p>	<p>The Licences will:</p> <ul style="list-style-type: none"> • allow uses which respect the defined in-block and out-of-block power limits (EIRP density masks and TRP) where the permitted frequency blocks comprise the Lots won (defined in a Licence as in-block frequency limits); and • not allow any use which exceeds the relevant power limits (in-block EIRP density masks and TRP and out-of-block EIRP density masks) as defined in each Licence.
<p>EC RSC Decision</p>	<p>The Licences and the process for awarding them are consistent with the requirements of the decision of the European Commission that is relevant to the Award Process or the Bands which the Radio Spectrum Committee decided to agree at its meeting on 2 April 2008. The decision will be binding on Member States when it comes into force, which is expected to be in early June 2008.</p>
<p>Wireless Telegraphy Rights & Obligations</p>	

Co-ordination	Networks will need to be operated in compliance with such co-ordination procedures as may be necessary and notified to the Licensees by Ofcom. At present, there are two Memoranda of Understanding agreed with France and Ireland respectively (see Annexes 3 and 4) which define relevant international co-ordination procedures.
Maximum permissible transmitted power	The draft Licence at Annex 1 sets out in-block power limits for Paired Lots, for Standard Unpaired Lots and Restricted Unpaired Lots and for the 2010-2025 MHz Lot.
Permissible Out-of-block emissions	The draft Licence at Annex 1 sets out the out-of-block emissions limits for Paired Lots, for Standard Unpaired Lots and Restricted Unpaired Lots and for the 2010-2025 MHz Lot.
Licence term	Each Licence awarded will have an indefinite duration, but shall be terminable on not less than five years' notice for spectrum management reasons. However, such notice will not be able to take effect during the Initial Term (i.e. 20 years from the date the Licence is issued). In effect, each Licence will have an initial period of 20 years in which Ofcom's revocation powers will be limited to the reasons specified in the Licence.
Licence Fee	The Award Process will determine the fee payable for each Licence, which shall be subject to a reserve price. After the Initial Term, if a Licensee continues to hold the Licence, additional licence fees may be payable in line with Ofcom's policy on spectrum pricing at that time.
Spectrum trading	Each Licence will be tradable (i.e. the rights and obligations arising by virtue of the Licence may be transferred). All types of trade (partial or total, and concurrent or outright) will be permissible.
Liberalisation	Each Licence will contain the minimum necessary technical conditions and will not mandate either the technology to be used or the services that may be offered.
Provision of information to Ofcom and possible publication	Ofcom can require licensees to provide information to Ofcom regarding the characteristics of the equipment they use under their Licence, the location of the equipment and the frequencies used. In order to promote optimal use of the spectrum and to help the market in exploring opportunities for such optimal use, Ofcom may from time to time publish aggregated information regarding the equipment and frequencies used in respect of Licences in the Bands.

Award Mechanism & Rules	
Basic auction format	<p>The Award Process format for the Bands will be a combinatorial clock auction, described in more detail in Section 4. There will be a two-stage approach to determine the identity of the Winning Bidder(s), the number of Lot(s) won, the specific frequencies that will be included in the Winning Bidders' Licence(s) and the fee to be paid for each Licence.</p> <ul style="list-style-type: none"> • The first stage – the Principal Stage – will consist of a multi-round clock auction during which Bidders will bid for the amount of spectrum that they want for each type of generic Lot (Paired Lots in the 2.6 GHz Band, Unpaired Lots in the 2.6 GHz Band and the 2010-2025 MHz Lot), but without specifying the particular frequencies that they would most like to win. During this stage there will be one or more Primary Bid Rounds and a Supplementary Bids Round during which Bidders will be able to submit multiple, mutually exclusive Bids for packages of Lots across categories, subject to constraints created by their Primary Round Bids. During this stage the Winning Combination of Principal Stage Bids, the Winning Bidders and the Base Price for each Winning Bidder will be determined. • The second stage – the Assignment Stage – will consist of a single round sealed bid process during which the Winning Bidders in the 2.6 GHz Band can express any preference they might have for particular frequencies within that Band. This stage involves bidding for available frequencies and determining the final price to be paid by each Winning Bidder. <p>The Award Process will differ if there is only one Bidder at the end of the Qualification Stage.</p>

<p>Eligibility rules</p>	<p>Each Lot in the Auction will have an associated number of Eligibility Points. There are 2 Eligibility Points associated with the 2010-2025 MHz Lot and each Paired Lot and $n-1$ Eligibility Points associated with Unpaired Lots within a Primary or Basic Supplementary Bid, where n is the number of Unpaired Lots in the Primary Bid. If a Bidder submits an Additional Supplementary Bid during the Supplementary Bids Round, there will be $n-2$ Eligibility Points associated with those Lots in that Bid, where n is the number of Unpaired Lots in the Additional Supplementary Bid.</p> <p>The number of Lots in relation to which Bidders can make Bids will be constrained by their Eligibility Limit, which is initially determined by reference to the Bid Deposit and then their bidding activity over the course of the Principal Stage.</p>
<p>Determining the Winning Principal Stage Bids</p>	<p>The Winning Principal Stage Bids will be the Valid Combination of Principal Stage Bids having the highest total value of amounts bid. A Valid Combination of Principal Stage Bids is defined in paragraph 4.149</p> <p>All Valid Principal Stage Bids (Primary Round Bids, Basic Supplementary Bids and Additional Supplementary Bids) from all Bidders are taken into account when identifying the Valid Combination with the highest total value.</p>
<p>Determining the Winning Bidders</p>	<p>The Winning Bidders will be those which submit a Winning Principal Stage Bid.</p>
<p>Pricing rule</p>	<p>Ofcom will determine an amount payable by each Winning Bidder in respect of that Winning Bidder's Winning Principal Stage Bid using a 'second price' rule as described in Section 4. Winning Bidders which submit a Winning Assignment Stage Bid during the Assignment Stage may be required to pay an additional amount as part of their Licence Fee.</p>
<p>Minimum prices</p>	<p>Ofcom has set a reserve price above zero for each individual Lot, as set out in Table 3 of Section 4.</p>
<p>Information release</p>	<p>The identities of all Bidders taking part in the Award Process will be made public. During the Principal Stage, the aggregated level of demand per category of lots will be released to Bidders.</p> <p>Notices concerning the progress of the Award Process, key dates and results of each stage will be published on Ofcom's Website.</p>

<p>Prohibitions on Bidder association and collusion</p>	<p>There will be specific rules to prohibit Bidder association and collusion.</p> <p>An Associate of an Applicant or Bidder may submit an “Member Exclusion Warranty” in which it warrants and undertakes that it has not and will not participate in that Applicant’s or Bidder’s Bidder Group or receive Confidential Information from that Applicant or Bidder. The Applicant or Bidder must also submit an “Exclusion Request Form” signed by two authorised persons in confirmation. Provided Ofcom accepts the Undertakings, the Associate shall then be permitted itself to be an Applicant or a member of another Applicant’s or Bidder’s Bidder Group.</p>
<p>Deposits</p>	<p>Applicants are required to submit an Initial Deposit of £100,000 at the time of application.</p> <p>Prior to the First Primary Bid Round, Ofcom will determine each Bidder’s initial Eligibility Limit by reference to the level of the Bid Deposit that they have paid before the Auction. Each whole £50,000 of deposit equates to 1 Eligibility Point.</p> <p>At various stages during the Auction, Bidders may be required to increase the amount of their Bid Deposits. Failing to meet these requirements may result in exclusion from the Auction and Bidders may forfeit their Bid Deposit.</p> <p>Prior to the end of the Principal Stage, each Winning Bidder will be required to ensure that its Bid Deposit is not less than 100% of the Base Price payable by that Winning Bidder in respect of its Winning Principal Stage Bid.</p> <p>Prior to the end of the Assignment Stage, each Winning Bidder will be required to increase its Bid Deposit to at least 100% of the sum of its Base Price and highest Assignment Stage Bid.</p>
<p>Payment terms</p>	<p>Winning Bidders will be required to pay 100% of the Licence Fee by a time specified by Ofcom and each Licence will only be granted after payment has been received by Ofcom.</p>
<p>Pace of the Auction</p>	<p>The Auction rules give Ofcom flexibility in managing the pace of the Auction.</p>
<p>Limits on acquisition of spectrum</p>	<p>There is a limit to the number of Lots that can be awarded to each Bidder. Bidders are constrained by a maximum Eligibility Limit of 16 Eligibility Points.</p>

Unsold spectrum	Ofcom retains the discretion to grant Licences for any spectrum not awarded through this Award Process, for example as a result of default, after completion of the process, and in a manner to be determined by Ofcom.
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Terminology

- 1.4 For the purposes of this Information Memorandum, we refer to “paired lots” and “unpaired lots” in the 2.6 GHz band, and the “2010-2025 MHz lot”. Interested parties should note that in the Regulations these are referred to respectively as “paired lots” and “individual lots” in the 2.6 GHz band, and the “2010-2025 MHz band”.

Ofcom’s duties and functions

- 1.5 Ofcom has powers under the WT Act to grant licences for wireless telegraphy, and to do so by means of an auction. Ofcom's duties in relation to the award of licences are set out in the WT Act, and are derived from the requirements of European Union legislation.

Section 2

The Spectrum Bands

2.1 The spectrum to be awarded is the 2500 to 2690 MHz and 2010 to 2025 MHz bands (referred to as the “**2.6 GHz Band**” and the “**2010 MHz Band**” respectively).

Spectrum in the 2.6 GHz Band

2.2 The spectrum available for award in the 2.6 GHz Band comprises 190 MHz from 2500 MHz to 2690 MHz.

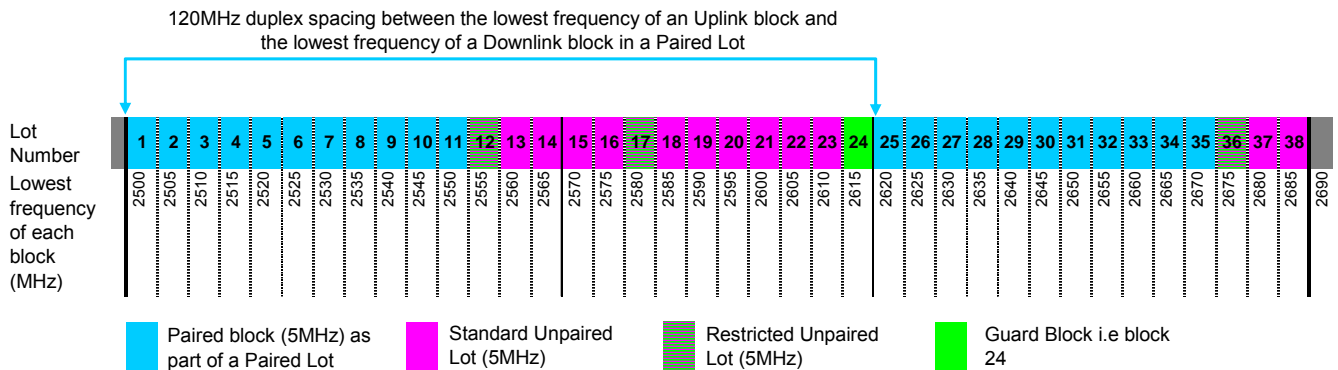
2.3 Table 1 below provides a summary of the spectrum packaging that will apply for the 2.6 GHz Band in the Auction. The Licences are described in more detail in Section 3 and the Auction is described in more detail in Section 4.

Table 1: Summary of spectrum packaging for the 2.6 GHz Band

Type of Lot available in the Principal Stage of the Auction	Spectrum included in Lot	Technical rights
Paired	Two blocks of 5MHz separated by 120MHz (e.g. 2500-2505MHz paired with 2620-2625MHz)	Different rights for each of the two 5MHz blocks in a Lot: Uplink rights (for user stations) for the lower block; Downlink rights (for base stations) for the upper block.
Unpaired (NB: Unpaired lots are identified as individual lots in the Draft Auction regulations – see Annex 2)	One block of 5MHz, which may be in the Lower Area (2500-2615MHz) or in the Upper Area (2620-2690MHz). This can be a Standard Unpaired Lot or a Restricted Unpaired Lot. A Bid for Unpaired Lots can be for: (a) one range of contiguous blocks (Primary Round Bid and Basic Supplementary Bid) which includes one Restricted Unpaired Lot as its lowest 5 MHz block; or (b) two ranges of contiguous blocks (Additional Supplementary Bid) where each range includes one Restricted Unpaired Lot as its lowest 5 MHz block.	Different rights depending on the type of equipment: power limits specific to user stations and power limits specific to base stations. Both type of equipment can be used in any Unpaired Lot. For Restricted Unpaired Lots, different conditions apply for base stations (in particular, lower in-band limits and certain height restrictions).

Type of Lots which may become available in the Assignment Stage only	Spectrum included in Lot and circumstances in which it becomes available	Technical rights
Lot Number 24	5MHz (2615-2620MHz) which become available in the Assignment Stage if the Winning Bids include both Paired and Unpaired Lots. In these circumstances, Lot Number 24 will be awarded to the Winning Bidder which submits a Winning Assignment Stage Bid that includes Lot Number 23.	As for Standard Unpaired Lots.
Lot Number 38	5MHz (2685-2690MHz) which become available in the Assignment Stage if Lot Number 37 (2680-2685MHz) is included in a Winning Bid as part of a Paired Lot and Lot Number 14 is included in a Winning Bid as an Unpaired Lot.	As for a Downlink block of a Paired Lot. In these circumstances, Lot Number 38 will be awarded to the Winning Bidder which submits a Winning Assignment Stage bid that includes Lot Number 37

Figure 1: Identification of Lot Numbers and example of possible band plan



2.4 The number of available Paired and Unpaired Lots will be co-dependent; i.e. the total number of blocks is 38 but the number of Lots in each category will be determined by the Winning Principal Stage Bids and if there are more than 9 Unpaired Lots in the Winning Combination of Principal Stage Bids, then there will necessarily be fewer than 14 Paired Lots in that combination.

2.5 Within the available 190MHz of spectrum there are a maximum of 14 Paired Lots and a minimum number of 9 Unpaired Lots available:

- If there are no Paired Lots in the Winning Combination of Principal Stage Bids, a possible maximum of 38 Unpaired Lots may be awarded.
- If there are Paired Lots in the Winning Combination of Principal Stage Bids, these will form two contiguous ranges, one (which will include Lot Number 1) for Uplink blocks and one (which will include Lot Number 24) for Downlink blocks.

If there are Unpaired Lots in the Winning Combination of Principal Stage Bids, then there will be Unpaired Lots in the Lower Area and there may be Unpaired Lots in the Upper Area. Lot Number 23 will be included in the contiguous range of Unpaired Lots in the Lower Area and, if there are any Unpaired Lots in the Upper Area, Lot Number 38 will be included in that contiguous range of Unpaired Lots. Table 5 in Section 4 sets out the possible combinations of Unpaired and Paired Lots in the 2.6 GHz Band.

UK allocations and uses

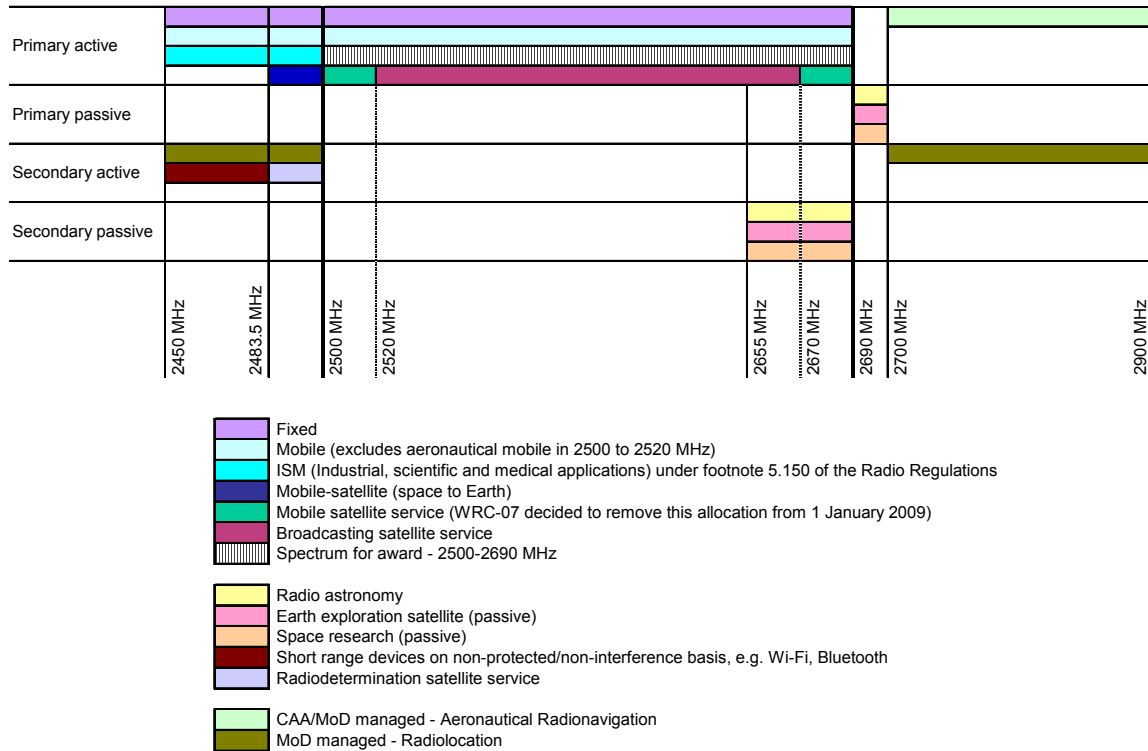
- 2.6 Figure 2 below illustrates the current spectrum allocations within and adjacent to the 2.6 GHz Band which are available for award (this Figure does not include the footnotes 5.403 and 5.420. The illustration is based on the UK Frequency Allocation Table (“**UKFAT**”), the current issue of which is 2007, Issue No. 14.¹ The allocations are identified within the figure in terms of primary and secondary services, the distinction defined in the Radio Regulations (the “**Radio Regulations**”)² of the International Telecommunication Union (the “**ITU**”) being that stations of a secondary service shall not cause harmful interference to stations of primary services nor claim protection from harmful interference from stations of a primary service. However, stations of a secondary service can claim protection from harmful interference from stations of the same or other secondary service(s) that are assigned at a later date. The allocations are also identified within Figure 2 as active or passive services. Stations of passive services do not transmit; stations of active services may transmit and/or receive. Services are defined in Article 1 of the Radio Regulations.
- 2.7 The UKFAT is published by Ofcom on behalf of the National Frequency Planning Group (a sub-committee of the Cabinet Office Official Committee on UK Spectrum Strategy) and provides the framework within which frequency assignments are to be made for all services to be operated in peacetime within the United Kingdom. The UKFAT is updated from time to time in the light of spectrum policy decisions nationally and internationally.
- 2.8 The UKFAT also identifies responsibilities for the management of frequency bands or services, showing whether they are managed by (or on behalf of) Ofcom, the Ministry of Defence, or another Government Department or Agency.

¹ <http://www.ofcom.org.uk/radiocomms/isu/ukfat/ukfat07.pdf>

² an international treaty published by the ITU, an agency of the United Nations - see <http://www.itu.int> and <http://www.itu.int/opb/sector.aspx?lang=en§or=1>.

Figure 2: Service allocations for the 2.6 GHz Band and adjacent spectrum

Based on UK FAT Issue No. 14 (2007)



Primary allocations in the 2.6 GHz Band

2.9 Issue 14 of the UKFAT contains the following allocations in the 2.6 GHz Band:

- Primary fixed service and mobile service allocations in the 2.6 GHz Band, but with aeronautical mobile excluded from 2500 to 2520 MHz. Use of the Band for Programme Making and Special Events ("**PMSE**") falls under these service allocations, with the UKFAT indicating the Band is due to be cleared of existing PMSE users (i.e. their licences will be revoked) so that Ofcom can grant new licences in accordance with the Award Process. The PMSE use includes wireless camera applications, mobile and portable point-to-point video links, and some airborne use. Some geographic and specific power restrictions apply. PMSE licences have been revocable at three months' notice since 1 January 2007. Paragraphs 2.18 to 2.20 cover the authorisation of PMSE use in the 2.6 GHz Band.
- Primary mobile satellite service allocations in the 2500 to 2520 MHz (space to Earth) and 2670 to 2690 MHz (Earth to space) bands in the main frequency allocation table and references to footnotes 5.403 and 5.420 of the Radio Regulations, which allow the 2520 to 2535 MHz and 2655 to 2670 MHz bands to be used for the mobile satellite, except aeronautical mobile satellite service for operation within its national boundaries, subject to agreement under Article 9.21 of the Radio Regulations and with the provisions of Article 9.11A also applying. These footnotes no longer apply in the UK. The ITU World Radiocommunication Conference 2007 (**WRC-07**)³ decided to remove the mobile-satellite service

³ See the Final Acts of the World Radiocommunication Conference 2007 of the ITU (<http://www.itu.int/publ/R-ACT-WRC.8-2007/en>).

allocations and corresponding footnotes for ITU-R Region 1 (Europe, Africa, the Middle East and Mongolia) and Region 2 (the Americas) with effect from 1 January 2009. Ofcom plans to reflect this decision by removing these allocations and footnotes from the next issue of the UKFAT.

- A primary broadcasting satellite service allocation in the 2520 to 2670 MHz band. Footnote 5.416 limits the use of the 2520 to 2670 MHz band by the broadcasting-satellite service to national and regional systems for community reception, subject to agreement obtained under Article 9.21 of the Radio Regulations.

Secondary allocations in the 2.6 GHz Band

- 2.10 The 2655 to 2690 MHz band is allocated in the UK to radio astronomy, Earth exploration satellite service and space research (passive) service on a secondary basis. All of these allocations are for passive services.
- 2.11 Radio astronomy use of the 2655 to 2690 MHz band is assigned the category D protection status within the UKFAT (i.e. no protection can be afforded to the radio astronomy service in this band). The UKFAT lists the Jodrell Bank observatory as using the band for Very Long Baseline Interferometry and pulsar observations.
- 2.12 The band is also allocated to Earth exploration satellite and space research (passive) on a secondary basis. We are not however, aware of any use of the 2655 to 2690MHz band for these services in the UK.

Current authorisation for PMSE use which will be revoked before completion of the Award Process

- 2.13 The 2.6 GHz Band is currently licensed to users for programme making and special events (wireless cameras and point-to-point video links). In 2002 the Radiocommunications Agency notified PMSE users that they would have to vacate the 2.6 GHz Band from 1 January 2007 to allow it to be made available for open award. Annual licences within the 2.6 GHz Band are revocable at three months' notice and provision for PMSE use is made in other frequency bands.
- 2.14 Ofcom has served notice to PMSE users of the 2.6 GHz band that their licences will be revoked. Revocation of their licences will take effect on 31 August 2008.

Primary allocations adjacent to the 2.6 GHz Band

- 2.15 The 2450 to 2500 MHz band is allocated to the fixed and mobile services on a primary basis. There is a primary allocation to the mobile satellite service (space to Earth) between 2483.5 and 2500 MHz which is used for active services. Additionally, footnote UK152 associated with the primary mobile allocation in the 2450 to 2483.5 MHz band indicates that this allocation is used for wide band data transmission systems. This application includes wireless access systems and radio local area networks which operate between 2400 and 2483.5 MHz.
- 2.16 The 2690 to 2700 MHz band has primary allocations to three passive services: Earth exploration-satellite, radio astronomy and space research (passive). The 2700 to 2900 MHz band has a primary allocation to an active service, the aeronautical radionavigation service.
- 2.17 Further primary allocations within the UK adjacent to the 2.6 GHz Band are as follows.

Fixed and mobile services (2450 to 2500 MHz)

- 2.18 The 2450 to 2500 MHz band is used for services for PMSE. The band is managed on behalf of Ofcom by the JFMG Ltd and is available for digital point-to-point video links with an EIRP up to 20 dBW in a maximum bandwidth of 10 MHz. There is also occasional use of analogue point-to-point video links for specific purposes at powers up to 40 dBW EIRP in a maximum bandwidth of 20 MHz. Some geographical restrictions apply. The Interface Requirements for PMSE use within the UK are set out in IR 2038⁴.
- 2.19 The following categories of PMSE applications are authorised to operate in the range 2450 to 2500MHz:
- temporary digital point-to-point video links (coordinated, EIRP up to 20 dBW);
 - legacy analogue point-to-point video links (coordinated, EIRP up to 40 dBW);
 - airborne (air-to-ground) digital point-to-point video links (EIRP nominally 13 dBW but up to 20 dBW); such use is limited within the 2450 to 2490 MHz range;
 - portable/mobile point-to-point video digital links (EIRP nominally 6 dBW); and
 - wireless digital cameras (EIRP nominally 0 dBW).
- 2.20 Further information on the technical frequency assignment criteria and principles employed by JFMG on behalf of Ofcom is provided in:
http://www.ofcom.org.uk/radiocomms/ifi/glines/bas_cg/pmse.

Wide band data transmission systems and short range devices (2400 to 2483.5 MHz)

- 2.21 The 2400 to 2483.5 MHz band is used for licence exempt wide band data transmission systems including Wireless Local Area Network (WLAN) based on the IEEE 802.11 and 802.15 standards (which include WiFi and Bluetooth). The maximum EIRP for wide band data transmission systems is 20 dBm (100mW). The UK Radio Interface Requirements for Wideband Transmission Systems are set out in IR 2005⁵.
- 2.22 Additionally, the 2400 to 2483.5 MHz band is used in the UK for licence exempt short range devices operating to ERC Recommendation T/R 70-03 on a non-protected and non-interference basis. Short range devices can only operate at a limited maximum power, typically 10mW effective radiated power (erp). However higher powers up to 500mW (outdoors) erp and 4W (indoors) erp is permitted within the sub-band 2446 to 2454 MHz for certain classes of short range devices as identified within Annex B of the UKFAT. The UK Radio Interface Requirements for short range devices are set out in IR 2030⁶, which lists the different categories of permitted short range devices and their authorised maximum radiated power levels.

⁴ http://www.ofcom.org.uk/radiocomms/ifi/tech/interface_req/ir2038.pdf

⁵ http://www.ofcom.org.uk/radiocomms/ifi/tech/interface_req/uk2005.pdf

⁶ http://www.ofcom.org.uk/radiocomms/ifi/tech/interface_req/uk2030.pdf

Mobile satellite – Globalstar (2483.5 to 2500 MHz)

- 2.23 The primary allocation to the mobile satellite service in the 2483.5 to 2500 MHz band is used by the Globalstar system, which operates a space to Earth link in that spectrum. Ofcom understands that Globalstar is the only mobile satellite services (“MSS”) system currently operational within the band. It is identified as HIBLEO-4 in the ITU Space Radiocommunication Stations (SRS) database and LEO-D in ITU-R Recommendation M.1184. The Globalstar mobile earth-station terminals are licence-exempt in the UK through Statutory Instrument 2003 No 74⁷, with the minimum performance requirements and technical characteristics specified in ETSI standard 300 733. The UK Radio Interface Requirements for mobile earth-station terminals are set out in IR 2016⁸.
- 2.24 Additionally, Ofcom is aware of a Globalstar proposal raised in CEPT (PT FM44) to consider the introduction of a Complementary Ground Component (CGC) of MSS including the band at 2483.5 to 2500 MHz. The proposal relates to the introduction of base-stations transmissions within that band or a part of that band. The proposal is currently at an initial stage of deliberation in CEPT and technical studies regarding the feasibility of CGC in that spectrum are planned for working group (WGSE) or a project team (PT SE40) of CEPT⁹.

Earth exploration-satellite service (2690 to 2700 MHz)

- 2.25 The UKFAT indicates that this band is allocated to the Earth exploration-satellite service (EESS) on a primary basis as a passive service. Footnote 5.340 prohibits all emissions in the band (except in certain countries identified within Footnote 5.422). Ofcom understands that there is no current or planned use of the band for EESS in the UK.

Radio astronomy (2690 to 2700 MHz)

- 2.26 The UKFAT indicates that this band is allocated to the radio astronomy service on a primary basis as a passive service with category A protection (i.e. the full protection afforded a primary or exclusive radiocommunication allocation). Footnote 5.340 prohibits all emissions in the band (except in certain countries identified within Footnote 5.422). Radio astronomy observatories are located at Cambridge, Darnhall, Defford, Jodrell Bank, Knockin and Pickmere, and are listed as being used for mapping radio sources, pulsars, and possibly MERLIN (Multi-Element Radio Linked Interferometer Network). Information from the UK radio astronomy community indicates that there is no current use, that the band is not a priority for UK radio astronomy use and that there are no plans for future research projects in that band at UK observatories.

Space research (passive) (2690 to 2700 MHz)

- 2.27 The UKFAT indicates that this band is allocated to the space research (passive) service on a primary basis. Ofcom understands that there is no current or planned use of the band for space research (passive) in the UK.

⁷ <http://www.opsi.gov.uk/si/si2003/20030074.htm>

⁸ http://www.ofcom.org.uk/radiocomms/ifi/tech/interface_req/ir2016.pdf

⁹ See for example ECC document FM44(07)40 (Minutes of the 5th FM PT44 meeting on 6, 7 December 2007) available from <http://www.ero.dk>

Aeronautical radionavigation and radiolocation (2700 to 2900 MHz)

- 2.28 The 2700 to 2900 MHz band has a primary allocation to the aeronautical radionavigation service and a secondary allocation to the radiolocation service. In the UK the band is jointly managed by the Directorate of Airspace Policy of the Civil Aviation Authority (DAP/CAA) and by the Ministry of Defence (MoD). It is extensively used for air traffic control (ATC) by the National Air Traffic Services (NATS), by other organisations that operate airports and by the MoD operating at fixed locations and from designated training areas.
- 2.29 The CAA has notified to Ofcom that it currently operates thirty-six civil radars within this band in the UK. These employ high power pulsed emissions to support air-traffic management functions and are sited mainly at or near airports. There are three main types of amplifier technologies used to generate radar transmissions: magnetron, travelling wave tube (TWT) and solid state devices, all of which have different spectral properties and emission characteristics. Some radars, particularly the older magnetron or TWT types, may have significant out-of-band (OOB) or spurious emissions that can extend for many tens of MHz beyond their operating frequencies. If these operate on frequencies close to the 2700 MHz band edge, their emissions may extend into the top channels of the 2.6 GHz Band.
- 2.30 Information on typical radar RF parameters, the possible unwanted emission characteristics, and the different types of radar usage within the UK can be found in the following documents:
- Study into spectrally efficient radar systems in the L and S Bands. A report by BAE Systems Integrated Systems Technology Limited for the Ofcom Spectrum Efficiency Scheme, May 2006;¹⁰
 - The report of an investigation into the characteristics, operation and protection requirements of civil aeronautical and civil maritime radar systems. A report by Alenia Marconi Systems Limited for the Radiocommunications Agency, August 2001;¹¹
 - ITU-R Recommendation M.1461-1. Procedures for determining the potential for interference between radars operating in the radiodetermination service and systems in other services;
 - ITU-R Recommendation M.1464-1. Characteristics of radiolocation radars, and characteristics and protection criteria for sharing studies for aeronautical radionavigation and meteorological radars in the radiodetermination service operating in the 2700-2900 MHz frequency band;
 - ITU-R SM 1541-2. Unwanted emissions in the out-of-band domain, Annex 8, OOB domain emission limits for primary radar systems; and
 - ITU-R SM 329-10. Unwanted emissions in the spurious domain.
- 2.31 Of the existing civil radars operating within the UK, based on the information supplied by CAA (and not verified by Ofcom), twenty-six stations have frequency assignments in the 2700 to 2790 MHz band. Those include:

¹⁰ <http://www.ofcom.org.uk/research/technology/research/ese/sers/>

¹¹ <http://www.ofcom.org.uk/static/archive/ra/topics/research/topics/s-studies/civil-radio-systems.pdf>

- Twelve magnetron radars operating at peak EIRP power levels up to 92 dBW;
 - Six TWT radars operating at peak EIRP power levels up to 82 dBW;
 - Eight solid state radars operating at peak EIRP power levels up to 80 dBW.
- 2.32 In addition to the civil radars, the MoD has notified to Ofcom that it currently operates ten ground-based military ATC radar within the UK having frequency assignments within the 2700 to 2790 MHz band. These radars provide similar ATC management functions to those of their civilian equivalents. The majority of military ATC radars employ Travelling Wave Tube (TWT) Class-C amplifier technology, operate on multiple frequencies (typically 2, but up to 16 for training purposes) and have a peak EIRP power level of 81 dBW.
- 2.33 The MoD has also provided Ofcom with information on a ground-based tactical radar system that it operates for air defence (AD) functions and has no equivalent civil application. Presently, six radars are part of this AD system. The assigned frequencies for these radars are subject to change according to military operational needs and may well be allocated frequencies within the 2700 to 2790 MHz band. The current tactical AD radars employ solid-state amplifier technology of 89 dBW peak EIRP.
- 2.34 MoD ATC surveillance radars and MoD AD radars may be operated in continuous use at fixed locations in the UK. In addition, the MoD AD radars may also be operated intermittently, depending on operational requirements (usually limited to training and testing) from selected military sites and training areas located throughout the UK. Likely sites and areas¹² used for MoD AD radars in 2700 to 2790 MHz are shown in Annex 5. Some of the MoD AD radar systems may also be deployed outside the UK on an occasional basis which has the resultant impact of reducing the total number of systems that may be resident and operational in the UK at a particular time.
- 2.35 Ofcom is unable to publish detailed information on the characteristics of individual civil or military radar systems (in terms of their location, frequency assignment, type of transmitter technology and other key radio frequency parameters) in the interests of national security.
- 2.36 However Ofcom is providing in this section as much information as possible on radar usage within the 2700 to 2900 MHz band, in order to help interested parties to assess the potential impact that radar OOB emissions might have into the 2.6 GHz Band. As a complement to this information, interested parties are invited to consider conducting their own band occupancy measurement surveys (subject to applicable law, in particular regarding wireless telegraphy) to gain additional information on the likely levels of OOB emissions from radar and other systems falling into the Bands that are the subject of the Award Process.
- 2.37 Annex 5 includes further information on civil and military radars that operate in the range 2700-2790MHz.
- 2.38 The relevant interface requirement, IR 2050¹³, notes that frequency planning assumptions for radars are in accordance with ITU Radio Regulations Appendix 3, Recommendation ITU-R SM. 329-10 (Unwanted emissions in the spurious domain)

¹² These areas are subject to change based on operational requirements.

¹³ http://www.ofcom.org.uk/radiocomms/ifi/tech/interface_req/ir2050.pdf

and Recommendation ITU-R SM.1541-2 (Unwanted emissions in the out-of-band domain). It should also be noted currently there is no regulatory basis for limiting OOB emissions for ground-based military radar systems, the operational requirements of which are subject to change. Recently installed civil radar systems are subject to the requirements of the R&TTE Directive¹⁴ and associated UK implementation instruments.

- 2.39 The MoD and CAA have indicated to Ofcom that they reserve the right to deploy and operate radars within the 2700 to 2900 MHz band as a primary service in accordance with the UKFAT (2007) and footnote 5.337 of the ITU-R Radio Regulations (Edition 2004). As such, there may well be changes in future as new or revised radar assignments are made.
- 2.40 The use that may be made of the 2.6 GHz Band could be affected by possible changes in the way that the neighbouring 2700 to 2900 MHz band is used by the MoD and DAP/CAA for radars. The Government and Ofcom have committed¹⁵ to the wider application of market mechanisms, such as spectrum trading and administered incentive pricing (AIP) to public sector spectrum holdings in order to promote greater spectrum efficiency. It is possible that the application of such mechanisms may lead to the sharing of parts of the 2700 to 2900 MHz band with non-radar systems or some re-planning within the band such that spectrum could be offered for release. At this stage there is no commitment to the change. The MoD is expected to give further details of its plans for spectrum release in a consultation document, due in May 2008.
- 2.41 On 31 January 2008, Ofcom published a statement¹⁶ following an earlier consultation announcing that it intends to enable public sector spectrum holdings to be formalised as tradable Recognised Spectrum Access (RSA) in order to enable and incentivise their release and sharing. We plan to consult on the necessary regulations by the summer, depending on progress by government departments in clarifying their intentions. The selection of frequency bands for the introduction of tradable RSA and the timing will depend on the MoD's plans to release spectrum, on which the MoD has said it will consult by May 2008, and on progress of discussions between the MoD and other departments and public bodies on arrangements to manage bands that they share with each other, with civil aviation or with maritime use.
- 2.42 Ofcom also expects to consult shortly on the application of AIP to aeronautical radar, including in the 2700 to 3100 MHz band.
- 2.43 The nature and extent of any changes that might take place as a result in usage of the 2700 to 3100 MHz band and their potential effect on the 2.6 GHz Band will depend on factors that cannot be predicted with certainty at this time. These include the response of the MoD and civil radar operators to the introduction of market mechanisms and whether the 2700 to 2900 MHz band is to be re-planned. It is not yet possible to know at this stage how much, or when, additional spectrum might become available for non-radar applications at 2700 MHz or to predict the resulting changes to the level of out-of-band emissions from this band into the 2.6 GHz Band.

¹⁴ Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity.

¹⁵ www.spectrumbaudit.org.uk

¹⁶ <http://www.ofcom.org.uk/consult/condocs/sfrps/statement/>

Secondary allocations adjacent to the 2.6 GHz Band

- 2.44 The UKFAT lists a secondary allocation to the radiolocation service in the 2450 to 2500 MHz band and which is assigned to the MoD. However, information from the MoD indicates that they have no current radiolocation assignments in this band. There is also a secondary allocation to the radiodetermination-satellite service (RDSS) space to Earth in the 2483.5 to 2500 MHz band allocated under footnote 5.371 of the Radio Regulations and subject to agreement obtained under Article 9.21. It should be noted there is a primary allocation to the RDSS in Region 2 and in many countries within Regions 1 and 3 listed under footnote 5.400. China has an operational RDSS system which has been notified to the ITU. Agenda item 1.18 of WRC-11 will consider extending the existing primary and secondary allocations to the radiodetermination-satellite service (space-to-Earth) in the 2483.5 to 2500 MHz band in order to make a global primary allocation. Studies in support of this agenda item are invited in Resolution 613 (WRC-07).
- 2.45 The UKFAT indicates a secondary allocation to the radiolocation service in the 2700 to 2900 MHz band. This is assigned to the MoD and footnote UK96 identifies within the UK this allocation is limited to operation of meteorological and military radars. The operation of land based military aeronautical radars under the primary aeronautical radionavigation allocation is addressed within paragraphs 2.28 to 2.43. The MoD operates naval radars above 2700 MHz. Some naval radars fall wholly under the radiolocation allocation, which is on a secondary basis both in the UK and internationally. However, other naval radars have functions within the aeronautical radionavigation service definition and hence fall under the primary aeronautical radionavigation allocation (as addressed within paragraphs 2.28 to 2.40. Naval radars (both MoD and those of other nations Navies) may operate anywhere around the UK coast (within 5km of the coastline) and within Dockyards¹⁷ (Portsmouth, Portland, Rosyth, Faslane, Devonport, Scotstoun and Marchwood). The MoD also has permanent land based sites where naval radars operate – HMS Collingwood, QinetiQ Portsmouth Technology Park, BAE Systems InSyTe (Cowes) and BAE Systems InSyTe (Bushy Hill). Technical details, particularly on out-of-band emissions, are not generally available and it may not be possible to release them if they were made available. We will publish any further information on naval radars which operate above 2700 MHz if it becomes possible to do so, but additional information, if any, is likely to be very limited.
- 2.46 On meteorological radars, the Met Office has indicated to Ofcom that it has no current assignments that make use of the 2700 to 2900 MHz band. However, they have expressed an interest to operate meteorological radars within the 2700 to 2900 MHz band in the future because of the lower attenuation caused by rainfall at these frequencies compared with the C-band (5600 – 5650 MHz) where they operate their existing weather radars. They indicated such proposed future use is to compliment their existing weather radars and will most likely be located near coastal areas.

International allocations and uses of the 2.6 GHz Band

- 2.47 The Radio Regulations (edition of 2004) specify the following allocations in the 2.6 GHz Band:
- primary allocations to the fixed and mobile except aeronautical mobile services in the whole of the 2.6 GHz Band in all three ITU Regions;

¹⁷ Portsmouth- SU627 011; Portland- SY694 746; Rosyth- NT099 817; Faslane – NS246 895; Devonport – SX445 563; Scotstoun-NS521 677; Marchwood – SU407 106.

- primary allocations to the mobile satellite service in the 2500 to 2520 MHz band (space to Earth) and 2670 to 2690 MHz band (Earth to space) in all three ITU Regions, and references in all three ITU Regions to footnotes 5.403 and 5.420, which allow the 2520 to 2535 MHz and 2655 to 2670 MHz bands to be used for the mobile satellite service, subject to agreement under Article 9.21 and coordination under Article 9.11A of the Radio Regulations;
- a primary allocation to the broadcasting-satellite service in the 2520 to 2670 MHz band in all three ITU Regions;
- primary identification to the radiolocation service in France in the 2450 to 2550 MHz band under footnotes 5.397 and 5.405; and
- further allocations applicable in Regions 2 and 3, but not Region 1.

2.48 Additionally, footnote 5.384A identifies the 2.6 GHz Band for use by administrations wishing to implement IMT-2000. The primary allocations listed in paragraph 2.47 are all for active services. There are also secondary allocations in 2670 to 2690 MHz for the Earth exploration-satellite, radio astronomy and space research services, all of which are passive services, in all three ITU Regions.

2.49 WRC-07 made a number of changes relevant to the 2.6 GHz Band. The following changes will come into effect on 1 January 2009:

- removal of the primary allocations to the mobile-satellite service from the Table of Allocations in the 2500 to 2520 MHz and 2670 to 2690 MHz bands from Regions 1 and 2;
- removal from Regions 1 and 2 of the references to footnotes 5.402 and 5.420, covering mobile-satellite service use of the 2520 to 2535 MHz and 2655 to 2670 MHz bands (subject to agreement under Article 9.21 and co-ordination under Article 9.11A), although the footnotes still appear in Region 3; and
- a change to footnote 5.384A so that the IMT-2000 identification becomes an IMT identification.

Additionally, WRC-07 agreed the following changes:

- reduced power flux density (pfd) limits at the Earth's surface from satellite systems that had not been notified to the ITU Radiocommunication Bureau by 14 November 2007 and brought into use by that date;
- identification in Resolution 903 of ten satellite systems operated by China, India, Indonesia and the Middle East that are permitted to operate at higher transmission powers, up to the pfd limits that were in force before WRC-07 (see Table 2);
- new pfd values as co-ordination thresholds for mobile satellite systems of Japan and India applicable in an area of 1000km around their territories; and
- removal of the previous co-ordination thresholds within the Radio Regulations for mobile satellite systems in the band, but with an exception for systems operated by Japan or India where the previous co-ordination thresholds apply if those systems were notified and brought into use by 14 November 2007.

Table 2: Satellite networks listed in Resolution 903 (WRC 07) that may operate up to the pfd limits that were in force before WRC-07

Notifying administration	Name of space station	Orbital position	Coordination request Special Section	Date of receipt of Advance Publication Information
ARS/ARB	ARABSAT 5A-30.5E	30.50 E	CR/C/1626 M2	10.01.05
ARS/ARB	ARABSAT 5B-26E	26.00 E	CR/C/1627 M2	10.01.05
CHN	CHINASAT-MSB4	115.50 E	CR/C/1448 M1 and CR/C/1448 M2	03.11.03
CHN	CHNBSAT-113E	113.20 E	CR/C/1564 M1 and CR/C/1564 M2	18.06.04
CHN	CHNBSAT-119E	119.00 E	CR/C/1565 M1 and CR/C/1565 M2	18.06.04
IND	INSAT-2(74)	74.00 E	CR/C/1311 and CR/C/1311 M1	07.08.85
IND	INSAT-2(83)	83.00 E	CR/C/1312 and CR/C/1312 M1	07.08.85
IND	INSAT-2(93.5)	93.50 E	CR/C/1313 and CR/C/1313 M1	07.08.85
INS	INDOSTAR-107.7E	107.70 E	CR/C/1940	31.07.06
INS	INDOSTAR-118E	118.00 E	CR/C/1941	31.07.06

2.50 Border co-ordination between European administrations is considered in ERC Recommendation 01-01 (revised Helsinki 2007)¹⁸. Amongst its recommendations are that co-ordination shall be based on bilateral or multilateral agreements between administrations. The Recommendation also provides field strength levels as a basis for co-ordination between IMT-2000/UMTS. The Recommendation addresses the co-ordination and protection of multiple UMTS systems and the protection of UMTS

¹⁸ <http://www.ero-docdb.dk/Docs/doc98/official/pdf/REC0101e.PDF>

systems; it makes no recommendations on co-ordination involving the IMT-2000 radio interfaces other than UMTS or other technologies.

- 2.51 Harmonisation work within the ECC has produced the following Decisions relevant to the 2.6 GHz Band:
- ECC/DEC/(02)06 (November 2002) which designates the 2.6 GHz Band to UMTS/IMT-2000 and the 2520 to 2670 MHz portion to terrestrial UMTS/IMT-2000. According to the Decision, the 2500 to 2690 MHz band should be made available for use by UMTS/IMT-2000 systems by 1 January 2008, subject to market demand and national licensing schemes.
 - ECC/DEC/(05)05 (March 2005) which designates the 2.6 GHz Band for terrestrial IMT-2000/UMTS and contains a channel plan for the harmonised utilisation of spectrum in the 2.6 GHz Band for terrestrial IMT-2000/UMTS.
- 2.52 The United Kingdom is not committed to implement the ECC Decisions described in paragraph 2.51.
- 2.53 Further studies on the 2.6 GHz Band took place in the ECC in response to a Mandate¹⁹ from the European Commission to develop least restrictive technical conditions for frequency bands addressed in the context of Wireless Access Policy for Electronic Communication Services (WAPECS). In December 2007, the ECC approved CEPT Report 19²⁰ to the European Commission in response to this Mandate. The Report includes block edge masks for the 2.6 GHz Band, and Ofcom has defined technical conditions for use of the 2.6 GHz band which are consistent with CEPT Report 19 (see Section 3 and the draft Licence at Annex 1). At the Radio Spectrum Committee meeting on 2 April 2008, Member States agreed a Commission decision on the use of the 2.6 GHz Band, based on CEPT Report 19. The provisions set out in the provisions set out in the Information Memorandum regarding the award and use of the 2.6 GHz band are consistent with the Commission decision agreed at the RSC meeting. We expect the Commission decision to come into force in early June. The decision will be binding on Member States, including the United Kingdom.
- 2.54 A related piece of work agreed at the December 2007 meeting of the ECC was for ECC PT1 to develop an ECC Report based on additional sharing studies between personal broadband data systems, as defined in draft ETSI EN 302 544, and UMTS. ECC PT1 has based the content of its draft report on information extracted from previous ITU-R Reports (M.2030 and M.2113) and other interference scenarios where block edge masks are not applied. This draft ECC Report was adopted for public consultation at the ECC plenary meeting on 10-14 March 2008.

France

- 2.55 In France, the 2500 to 2550 MHz band is allocated to the radiolocation service on a primary basis. Such use is subject to agreement with the administrations affected²¹.
- 2.56 The Agence Nationale des Fréquences (ANFR, the French regulator for spectrum management) have confirmed that in France the 2.6 GHz Band is used for tactical

¹⁹

http://ec.europa.eu/information_society/policy/radio_spectrum/docs/current/mandates/ec_to_cept_wapecs_06_06.pdf

²⁰ <http://www.ero.dk/AF8F727A-BCD1-45A9-B454-59BD80A17BD1?frames=no&>

²¹ ITU Radio Regulations Article 4 footnote 5.405

radio relay links and within this range, the 2500 to 2520 MHz band may be used for radiolocation services (radars) in circumstances described in Annex 3. The band will be made progressively available for electronic communication mobile services. The date for the change to electronic communication mobile services is not precisely defined and is subject to discussion concluding between the French regulatory authorities and users of the spectrum, but ANFR advised that this change will take place by summer 2012.

- 2.57 However, France has currently committed to implement ECC Decision (05)05 and the following text appears on the ERO website in relation to this Decision: "The frequency band will be available after 2008 subject to market demand. An ARCEP decision will implement the ECC Decision and the French table of frequency allocation will refer to the ECC Decision in its next version"²².
- 2.58 Further information on the tactical radio links and radars currently operating in France is given in the Memorandum of Understanding concluded between the UK and France for the 2.6 GHz Band. This Memorandum is included at Annex 3.

Ireland

- 2.59 In the Republic of Ireland, the 2500 to 2686 MHz band is used for Multichannel Multipoint Distribution Service (MMDS) services.^{23 24 25 26 27} A MMDS network is currently operated by the company UPC Ireland²⁸. The licences issued to UPC Ireland run to 2014 with options for extension. UPC Ireland operates both analogue and digital MMDS services at present but is currently undertaking a programme to convert the analogue services to digital.
- 2.60 Further information on characteristics of the radio system currently authorised in Ireland are given in the Memorandum of Understanding concluded between the UK and Ireland for the 2.6 GHz Band. This Memorandum is included at Annex 4.

International allocations and uses adjacent to the 2.6 GHz Band

- 2.61 The international allocations that apply to the 2450 to 2500 MHz band in neighbouring countries are identical to those indicated within the UKFAT with the exception of a primary identification to the radiolocation service in France in the 2450 to 2500 MHz band. The international allocations applying to neighbouring countries

²² http://www.eroocdb.dk/doks/implement_doc_adm.aspx?docid=2056

²³ Television Transmission Licensing For Cable and MMDS Systems Report on the Consultation Document No. ODTR 98/63 23 December 1998

²⁴ MMDS TV Licence, Wireless Telegraphy Act, 1926, amended programme services distribution licence issued pursuant to the Wireless Telegraphy Act, 1926, and the Wireless Telegraphy (programme services distribution) Regulations, 1999. ODTR 99/81 July 1999 (effective from 19/04/99)

²⁵ Technical Conditions for the operation of analogue programme services distribution systems in the frequency band 2500-2686MHz. ComReg 98/65R2, 9 June 2004.

²⁶ Technical Conditions for the operation of digital programme services distribution systems in the frequency band 2500-2686MHz. ComReg 98/67R2, 9 June 2004

²⁷ See ComReg document 03/105, Use and Development of Radiocommunications Services in the 2500 - 2690 MHz Bands - Responses to Consultation Document 03/70 (<http://www.comreg.ie/fileupload/publications/ComReg03105.pdf>)

²⁸ Proposed Acquisition by UPC Ireland B.V. of MS Irish Cable Holdings B.V., M/05/024 UGC (Chorus) / NTL, Determination of the (Republic of Ireland) Competition Authority, 4th November 2005

in the 2690 to 2700 MHz and 2700 to 2900 MHz bands are identical to those in the UKFAT. Further information is available in the Radio Regulations and from CEPT²⁹.

Spectrum in the 2010 MHz Band

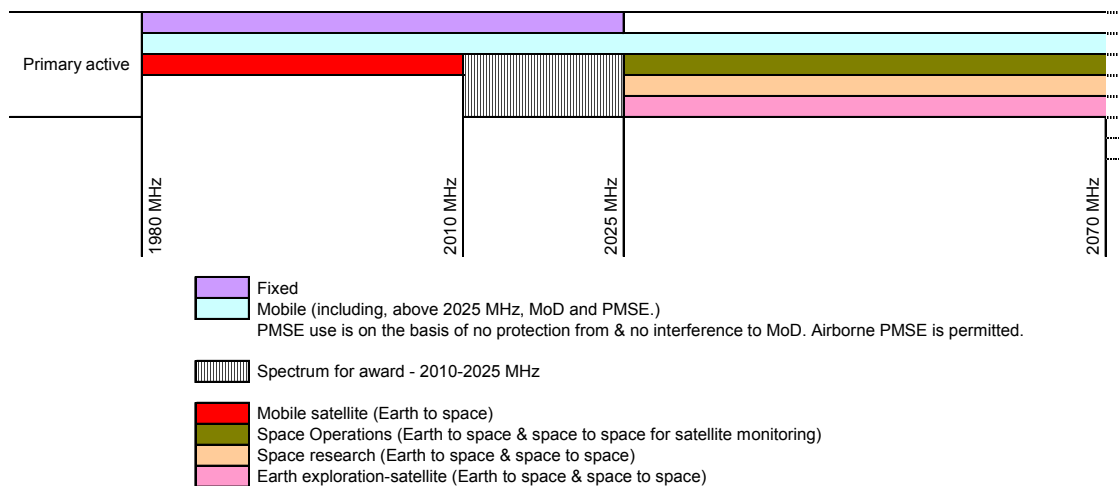
2.62 The spectrum available for award in the 2010 MHz Band comprises 15 MHz from 2010 MHz to 2025 MHz. The spectrum will be offered as a single Lot, with the Licence specifying different rights depending on the type of equipment being used: power limits specific to user stations and power limits specific to base stations, central stations and broadcasting stations. Base station, central station, broadcasting station and user station equipment can be used in the 2010 MHz Band. Section 3 includes the details of the Licence conditions for the 2010 MHz Band.

UK allocations and uses

2.63 Figure 3 below illustrates the current spectrum allocations within, and immediately adjacent to, the 2010 MHz Band and is based on the UKFAT.

Figure 3: Service allocations in the 2010 MHz Band and adjacent spectrum

Based on UK FAT Issue No. 14 (2007)



Primary allocations in the 2010 MHz Band

2.64 The 2010 MHz Band is allocated on a primary basis in the UKFAT to the fixed and mobile services. Both of these are active services. The UKFAT adds a reference to footnote 5.388 in the Radio Regulations, which states that the Band is intended for use, on a worldwide basis, by administrations wishing to implement IMT-2000, but that such use does not preclude the use of this Band by other services to which it is allocated.

2.65 At present, there are no assignments in the UK for the mobile service within the 2010 MHz Band. However, there is one fixed service assignment recorded on our assignment system for a point to point fixed link operating between two off-shore platforms. The fixed link transmitter is located approximately 110km off the East Yorkshire coast. Further details on the licence (in terms of the name of the licence holder and their contact details) are available from the Ofcom Wireless Telegraphy Act Register contained in www.ofcom.org.uk/radiocomms/isu/ukpfa/intro.

²⁹ See for example <http://www.efis.dk/search/general>.

Secondary allocations in the 2010 MHz Band

2.66 There are no secondary allocations in the UK for the 2010 MHz Band.

Uses adjacent to 2010 MHz Band in the UK

Primary allocations adjacent to the 2010 MHz Band

- 2.67 The 1980 to 2010 MHz band is allocated on a primary basis to the fixed, mobile and mobile-satellite (Earth to space) services. All three are active services.
- 2.68 The 2025 to 2110 MHz band is allocated on a primary basis to the space research, space operation and Earth exploration-satellite services, with all three allocations permitted in both the Earth to space and space to space directions. This band is also allocated to the mobile service. All of the allocations are for active services.
- 2.69 The fixed and mobile allocations in the 1980 to 2010 MHz band have no assignments at present. ECC decision (06)09³⁰ and EC Decision 2007/98/EC³¹ designate the 1980 to 2010 and 2170 to 2200 MHz bands to mobile satellite services including those which operate Complementary Ground Components (CGC) as an integral part. An Ofcom consultation published on 15th January 2008³² considers the licensing arrangements in the UK for base stations associated with CGC operating as integral parts of 2 GHz mobile satellite systems. Adjacent band compatibility between UMTS and the satellite component of MSS was studied in CEPT, and ERC Report 65³³ suggests that a 500 kHz guard band is necessary to manage interference to MSS space receivers. This guard band is reflected in ECC Decision (06)01 which specifies that the nearest UMTS carrier to the 2010 MHz Band should be centred on 2013 MHz or above. The UK has not committed to implement this ECC decision. However, the technical conditions for use of the 2010 MHz band defined in Section 3 are in accordance with the principle of a 500kHz guard band between the edge of the lowest carrier in the 2010 MHz band and the boundary at 2010 MHz.
- 2.70 To manage the risk of interference to the potential CGC element of mobile satellite service in the 1980 to 2010 MHz band, the UK has set out-of-block emission limits for the 2010 MHz Band as specified in Section 3 below.
- 2.71 The MoD has one assignment within the 1980 to 2010 MHz band for a system having EIRP in 20dBW in a 1 kHz bandwidth issued on a non-interference basis.

Mobile service in the 2025 to 2110 MHz band

- 2.72 The UKFAT indicates that assignments are made by the MoD for the mobile service in the 2025 to 2070 MHz band. The MoD has indicated to Ofcom that it currently uses this band to support mobile radio-relay links having UK wide assignments operating with up to around 59dBm EIRP (32 dBm mean power into 26.5dBi antenna) in channels up to 8MHz.

³⁰ <http://www.erodocdb.dk/Docs/doc98/official/pdf/ECCDEC0609.PDF>

³¹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:043:0032:0034:EN:PDF>

³² <http://www.ofcom.org.uk/consult/condocs/cgcs/cgcs.pdf>

³³

<http://www.erodocdb.dk/doks/filedownload.aspx?fileid=1914&fileurl=http://www.erodocdb.dk/Docs/doc98/official/pdf/REP065.PDF>

Programme making and special events in the 2025 to 2110 MHz band

- 2.73 Use of this band for PMSE is very similar to that described at paragraph 2.18 and 2.19 above, i.e. the band is available for digital point-to-point video links with an EIRP up to 20 dBW in a maximum bandwidth of 10 MHz, with some geographical restrictions applying. However, no analogue PMSE use is permitted in the band 2025 to 2110 MHz. Ofcom understands that the lower edge of the first 10 MHz PMSE channel starts at 2030 MHz and therefore there is currently a 5 MHz frequency separation between PMSE use and the 2025 MHz adjacency. However, Ofcom also understands that the PMSE community may wish to re-plan the band so that the lower edge of the first PMSE channel starts at 2025 MHz. It should also be noted that airborne PMSE use is currently authorised in the 2025 MHz to 2070 MHz band and is restricted to a maximum EIRP of 13dBW.

Space research in the 2025 to 2110 MHz band

- 2.74 The 2025 to 2110 MHz band is allocated on a primary basis to the space operations, Earth exploration satellite and space research services for Earth to space and space to space communications. Adjacent band compatibility between UMTS and the space science services was studied by CEPT and ERC Report 65 suggests that a 300 kHz guard band is suitable to prevent interference. This guard band is reflected in ECC Decision (06)01 which specifies that the nearest UMTS carrier to 2025 MHz should be centred on 2022.2 MHz or below. The technical conditions for use of the 2010 MHz Band defined in Section 3 are in accordance with the principle of a 300 kHz guard band between the edge of the highest carrier in the 2010 MHz Band and the boundary at 2010 MHz.

Earth exploration-satellite in the 2025 to 2110 MHz band

- 2.75 The band is used in the UK for telecontrol and command of EES satellites. There are currently two licensed earth stations in the UK working in conjunction with two non-geostationary satellites with a total of seven carriers at each earth station operating in the band 2048 to 2063 MHz. The emission codes are either 25K4F1DAN or 20K0F1DAN depending on the satellite and the maximum EIRP density ranges from 11 dBW/Hz to 24 dBW/Hz.

Space Operation in the 2025 to 2110 MHz band

- 2.76 The UKFAT also provides that assignments are made to the MoD for space operations service in 2025 to 2110 MHz. The MoD has indicated to Ofcom that it uses the band to support tele-command and control operation of satellites. It currently operates satellite earth stations at three sites within the UK (Colerne, Menwith Hill and Oakhanger) with transmissions having EIRP of up to 76dBW in 300kHz. Ofcom understands that the MoD currently has no plans to change the operational arrangements for these satellite earth stations. However, the MoD has indicated that it reserves the right to consider and implement changes in future. The nature and extent of any changes that might take place as a result in usage of the 2025 to 2110 MHz band cannot be predicted with certainty at this time.

Secondary allocations adjacent to the 2010 MHz Band

- 2.77 There are no secondary allocations adjacent to the 2010 MHz Band.

International allocations and uses of the 2010 MHz Band

- 2.78 The international allocations in the 2010 MHz Band are identical to those in the UKFAT, i.e. primary allocations to the fixed and mobile services, except for ITU Region 2 where there is also a primary allocation to the mobile satellite (Earth to space) service. Footnote 5.388 in the Radio Regulations states that the 1885 to 2025 MHz band is intended for use, on a worldwide basis, by administrations wishing to implement IMT-2000 but that such use does not preclude the use of these bands by other services to which they are allocated.
- 2.79 As described in paragraph 2.50, cross-border co-ordination between European administrations is considered in ERC Recommendation 01-01 (revised Helsinki 2007). Among its recommendations is that co-ordination shall be based on bilateral or multilateral agreements between administrations. The Recommendation also provides field strength levels as a basis for co-ordination between IMT-2000/UMTS. The Recommendation addresses the co-ordination of multiple UMTS/UMTS systems; it makes no recommendations on co-ordination involving the IMT-2000 radio interfaces (other than UMTS) or other technologies.
- 2.80 Harmonisation work by the ECC has produced Decision ECC/DEC/(06)01, which designates the 1900 to 1980 MHz, 2010 to 2025 MHz and 2110 to 2170 MHz bands for terrestrial IMT-2000/UMTS systems and provides conditions for use of IMT-2000/UMTS in these bands. Under this decision, the 2010 MHz Band may be used either for TDD or for FDD uplink but the decision does not envisage that an administration would implement mixed FDD/TDD use in the 2010 MHz Band. The United Kingdom is not committed to implement Decision ECC/DEC/(06)01.

France

- 2.81 In France, the 2010 MHz Band is designated for mobile electronic communication / IMT systems. ANFR has indicated that no radiocommunication networks are operating in the band at present. Its use is under study and may be subject to a public consultation in 2008.

Ireland

- 2.82 In Ireland the 2010 MHz Band is designated on a non-exclusive basis for IMT2000 services, according to the Radio Frequency plan published by ComReg. ComReg has not yet set a date for the introduction of services in this band.

International allocations and uses adjacent to the 2010 MHz Band

- 2.83 The international allocations in the 1980 to 2010 MHz band applicable to neighbouring countries are identical to those in the UKFAT. In the 2025 to 2110 MHz band there is a primary fixed service allocation in all three regions in the Radio Regulations that does not appear in the UKFAT.

Other emissions in the band

Ultra-wideband

- 2.84 In order to implement changes required by Commission Decision 2007/131/EC³⁴ on allowing the use of the radio spectrum for equipment using ultra-wideband

³⁴ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:055:0033:0036:EN:PDF>

technology in a harmonised manner in the Community, in July 2007 Ofcom made the Wireless Telegraphy (Ultra-Wideband Equipment) (Exemption) Regulations 2007 (No. 2084) to exempt the use of spectrum by equipment using ultra-wide band (UWB) technologies. UWB is a generic term for technologies typically characterised by the emission of very low power radiation spread over a very large radio bandwidth.

2.85 In summary, the provisions in the regulations described in paragraph 2.84 applicable to the 2010 MHz and 2.6 GHz Bands are as follows:

- i) the UWB equipment only radiates transmissions at frequencies up to and including 3.4 GHz or at frequencies above 4.8 GHz. The emissions limit for frequencies between 1.6 GHz and up to and including 3.4 GHz when measured in any direction is:
 - a maximum mean EIRP density no greater than -85.0 dBm/MHz; and
 - a maximum peak EIRP no greater than -45.0 dBm or the equivalent transmission level; and
- ii) the UWB equipment shall:
 - be used indoors or, where it is not used indoors, not be attached to any infrastructure, installation or outdoor antenna that is fixed or to any motor vehicle or railway vehicle;
 - not cause harmful interference to any wireless telegraphy.

2.86 In addition to the current regulations and limits mentioned above in paras 2.84 and 2.85 for the use of UWB devices there are ongoing discussion within the EU related to the possibility of additional EC Spectrum Decision(s) with different limits applying to application specific uses of UWB. The limits and mitigation techniques chosen by the EC for inclusion in any forthcoming EC Decisions for application specific uses of UWB are likely to be similar to those already published in ECC Decisions ECC/DEC/(07)01³⁵ and ECC/DEC/(06)08³⁶. These decisions are separate decisions that cover the recommended limits that should be applied to the use of Building Material Analysis (BMA), Ground and Wall Probing Radars (GPR/WPR).

2.87 Ground and Wall Probing Radar use is currently licensed in the UK to operate between 150 MHz to 4 GHz. The technical limits applied to their use are shown in the PFAT and the Radio Equipment must comply with the technical requirements stated in Annex b – Table 3 of the UK frequency allocation Table 2004, issue No.13. See below for the basic technical limits:

- Maximum Total radiated power: = 250 microwatts

³⁵ <http://www.erodocdb.dk/Docs/doc98/official/pdf/ECCDEC0701.PDF>

³⁶ <http://www.erodocdb.dk/Docs/doc98/official/pdf/ECCDEC0608.PDF>

- Maximum radiated spectral line power: = 100 nanowatts
- Maximum leakage power from antenna shield: = 10 nanowatts

Further information on the rules and regulations applied in licensing of GPR/WPR devices can be seen at the following web pages:

<http://www.ofcom.org.uk/radiocomms/ifi/licensing/classes/rfans/gprlicences/>

<http://www.ofcom.org.uk/radiocomms/isu/ukfat/>

Radiation from RF Heating Apparatus

- 2.88 The UKFAT (in footnote UK6) identifies the 2400 to 2500 MHz band for use of industrial, scientific and medical (ISM) applications. The Wireless Telegraphy (Control of Interference from Electro-Medical Apparatus) Regulations 1963 and the Wireless Telegraphy (Control of Interference from Radio Frequency Heating Apparatus) Regulations 1971 specify the limits of levels of emissions permitted for ISM applications. Annex A of the UKFAT provides further information on the regulation of ISM equipment in the UK. The requirements of the European Directive 2004/108/EC³⁷ and its transposition into UK law (see the EMC Regulations 2006, SI 2006/3418) may also be relevant to emissions from ISM applications.

³⁷ Directive 2004/108/EC of the European Parliament and of the Council, of 15 December 2004, on the approximation of the Laws of Member States relating to electromagnetic compatibility.

Section 3

The Licences

- 3.1 The Licences provide the Licensees with the right to establish, install and use radio transmitting and receiving stations and/or radio apparatus described in the Licences subject to the terms of the Licences. For the avoidance of doubt they do not guarantee exclusive use of the spectrum. In the future Ofcom may grant additional authorisations to allow the use of all, or part, of the Bands. We would develop the conditions of use under any such additional authorisations in order to manage the risk of harmful interference and would consult on these conditions. The Licences will not specify particular categories of permitted use; they will contain only those technology and usage restrictions that are in Ofcom's view proportionate and necessary for spectrum management reasons to manage the risk of harmful interference and to ensure compliance with Ofcom's statutory duties and international obligations. Bidders should note, however, that the services that a Licensee intends to offer may be constrained by regulation of downstream services (at retail or wholesale level) such as the Conditions of Entitlement under the Communications Act 2003, and other legislation and Bidders should seek their own advice in this regard.

Frequency ranges

- 3.2 Each Licence will entitle the Licensee to use the frequencies that are awarded to it as Paired Lots, Unpaired Lots (Standard Unpaired Lots or Restricted Unpaired Lots), the 2010-2025 MHz Lot or a combination of some or all of the three, in accordance with the Award Process (see Section 4).

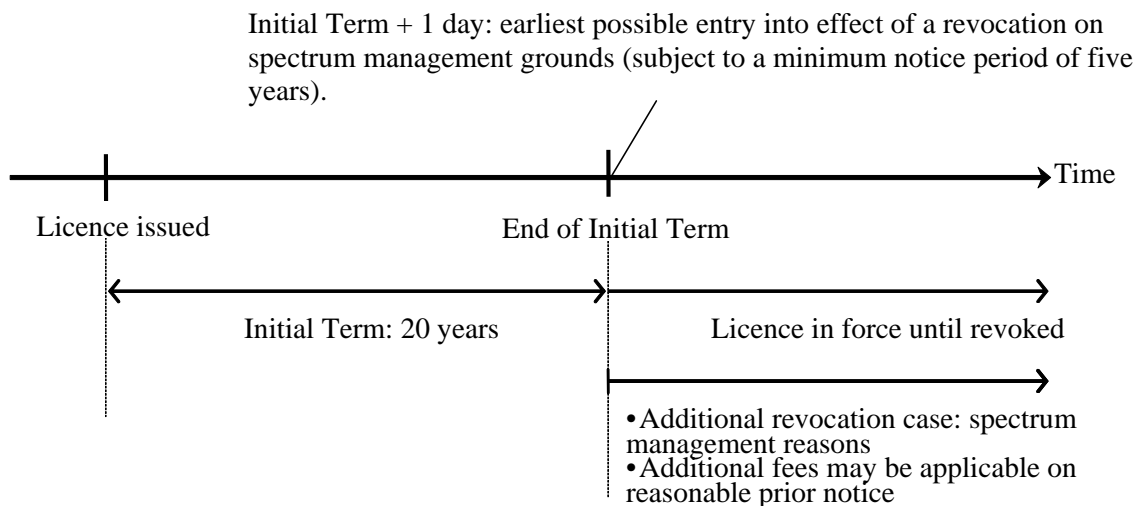
Term, revocation and variation

- 3.3 Each Licence will have an indefinite duration, but can be revoked on five years' notice for spectrum management reasons. This notice will not be able to take effect during the initial term of 20 years ("Initial Term"). In effect, each Licence therefore has an initial period of 20 years in which Ofcom's revocation powers do not include revocation for spectrum management reasons. The Licence continues indefinitely after the Initial Term, unless it is revoked or surrendered and from the end of the initial term Ofcom can revoke the Licence for spectrum management reasons.
- 3.4 Paragraph 3 of the template Licence in Annex 1 lists the following circumstances in which a Licence may be varied or revoked by Ofcom at any time, including prior to the end of the Initial Term:
- i) at the request of, or with the consent of, the Licensee;
 - ii) for non-payment or late payment of the relevant Licence Fee;
 - iii) if there has been a breach of any of the terms of the Licence;
 - iv) if the Licensee has not complied with any requirement of any relevant Trading Regulations;
 - v) if the Licensee has not complied with certain requirements of the Regulations under which the Licence was awarded;

- vi) in accordance with section 8(5) of Schedule 1 of the WT Act, which section provides that notwithstanding any terms or provisions in a licence which restrict the exercise by Ofcom of its power to revoke licences, Ofcom may at any time, by notice in writing, revoke or vary licence terms if it appears to be requisite or necessary or expedient to do so in the interests of national security, or for the purposes of complying with an international obligation of the United Kingdom;
- vii) if it appears requisite or necessary or expedient to do so for the purpose of complying with a direction by the Secretary of State to Ofcom under section 5 of the Communications Act 2003 or Section 5 of the WT Act; or
- viii) on five years' notice, not to expire before the end of the Initial Term, for spectrum management reasons.

3.5 Figure 4 below is a graphical illustration of the Licence term.

Figure 4: Licence term



3.6 Where Ofcom proposes to vary or revoke a Wireless Telegraphy Licence, it must follow the procedure in both the relevant Licence and under Section 7 of Schedule 1 of the WT Act. Ofcom must state in a notice to the Licensee concerned, the reasons for the proposed variation or revocation and specify a period during which the Licensee may make representations, or where the notice relates to a failure to observe licence conditions, meet those licence conditions. Ofcom must then give notice to the Licensee of its decision taking account of any representations received.

Ability to assign a Licence

3.7 A Licence is not assignable, but rights and obligations arising under the Licences will be capable of being transferred under the spectrum trading regime.

Spectrum trading

- 3.8 Ofcom started the implementation of spectrum trading for selected licence classes in 2004, through the Wireless Telegraphy (Spectrum Trading) Regulations 2004.³⁸ The changes, described in Ofcom's Spectrum Trading Statement, published in August 2004 (the "Trading Statement"), introduced the possibility for Wireless Telegraphy Licensees in specific classes to carry out:
- i) outright total transfers;
 - ii) concurrent total transfers;
 - iii) outright partial transfers; or
 - iv) concurrent partial transfers,
- of the rights and obligations under a licence.
- 3.9 Under an outright total transfer, the rights and obligations being transferred are transferred in their entirety from one party to another. Thus the original licensee (that traded the spectrum) no longer has any rights to use the traded spectrum.
- 3.10 Under a concurrent total transfer, all of the rights and obligations being transferred are transferred under a licence to a third party resulting in a concurrent holding of those rights and obligations by the transferor and the transferee(s).
- 3.11 Under an outright partial transfer, one party transfers some of the rights and obligations arising under a licence to a third party.
- 3.12 Under a concurrent partial transfer, one party transfers some of the rights and obligations arising under a licence to a third party which results in a concurrent holding of those partial rights and obligations by the transferor and the transferee(s).
- 3.13 We are proposing to amend the Wireless Telegraphy (Spectrum Trading) Regulations 2004 to allow all these types of transfer in respect of the Licences. The draft amendments are set out in a notice of our proposal to make regulations in connection with the award of this spectrum that is available on Ofcom's Website.
- 3.14 To be clear the Licensee can not assign the Licence itself to another party, but it will be capable of transferring the rights and obligations in the Licences under the spectrum trading regime.

Licence Fees

- 3.15 In respect of each Licence, the Licence Fee for the Initial Term (i.e. the first 20 years) will be determined through the Award Process. We will deduct the Licence Fee from that Licensee's Bid Deposit (unless the Licence Fee exceeds that Licensee's Bid Deposit in which case the relevant Winning Bidder shall be required to pay us the shortfall before we grant the Licence), in accordance with the Regulations.
- 3.16 After the end of the Initial Term, we may apply annual fees under sections 12 and 13 of the WT Act. The nature of any such fees will depend on the application of our

³⁸ Statutory Instrument 2004 No. 3154

statutory duties in these particular circumstances, our general approach to applying fees for the use of spectrum at that time and how that general approach relates to the Licences. Such fees could be set at a level to recover a share of the costs of regulation; they may alternatively be based on Administered Incentive Pricing (AIP, as defined in Ofcom's statement of 10 January 2007³⁹ on spectrum pricing). AIP presently plays an important role in incentivising efficient spectrum use, and we have stated that we expect to continue applying AIP after introducing spectrum trading in order to promote efficient use of the spectrum.⁴⁰

Radio Equipment: Technical conditions

- 3.17 Licences will contain the minimum necessary restrictions on the permitted use of the Bands to manage the risk of harmful interference and to ensure compliance with Ofcom's statutory duties and international obligations. Technical conditions will cover the in-block EIRP density masks, TRP limits and out-of-block EIRP density masks. There will be no restriction on the technology that may be used.
- 3.18 It should be noted that the technical licence conditions outlined below are fully consistent with the Commission Decision agreed by Member States at the RSC meeting on 2 April 2008.
- 3.19 The R&TTE Directive requires manufacturers to make declarations regarding the conformity of their radio and telecommunications terminal equipment with respect to the essential requirements of that Directive, implemented in the UK by the Radio Equipment and Telecommunications Terminal Equipment Regulations 2000⁴¹.
- 3.20 In February 2008 Ofcom notified to the European Commission the Interface Requirements (IRs) for each of the Bands.⁴²

Permitted Frequency Bands

- 3.21 Subject to the permitted out-of-block emissions, the Radio Equipment must only transmit on the frequency ranges awarded to the relevant Licensee within the following Bands:
- i) 2500–2690MHz; and
 - ii) 2010–2025MHz.
- 3.22 The Radio Equipment can be established and installed for terrestrial use. Use for transmission between terrestrial stations and aeronautical stations is not permitted in the Bands.

Power limits and Permissible Out-of-block emissions

- 3.23 For the 2.6 GHz Band, the maximum mean permissible transmitted power in the Permitted Frequency Blocks (as defined in Annex 1) shall not exceed:

³⁹ <http://www.ofcom.org.uk/consult/condocs/pricing06/statement/>

⁴⁰ See for instance Ofcom's Spectrum Trading Statement (available at: http://www.ofcom.org.uk/consult/condocs/spec_trad/), in particular paragraphs 7.1 to 7.13. See also the SFR:IP Interim Statement (available at <http://www.ofcom.org.uk/consult/condocs/sfrip/statement/>), at paragraphs 3.46 to 3.52.

⁴¹ SI 2000/730

⁴² For further details interested parties should see http://www.ofcom.org.uk/radiocomms/ifi/tech/interface_req/draft_ir/.

(a) paired frequencies

paired uplink frequencies	31 dBm/(5MHz) TRP
paired downlink frequencies	61 dBm/5MHz EIRP

(b) unpaired frequencies

uplink use of unpaired frequencies	31 dBm/(5MHz) TRP
downlink use of restricted unpaired frequencies	25 dBm/(5MHz) EIRP
downlink use of standard unpaired frequencies	61 dBm/(5MHz) EIRP

- 3.24 In cases where terminal stations or user stations are permanently installed at a fixed location an alternative maximum mean power of 35 dBm/(5 MHz) for uplink use of both paired and unpaired frequencies applies.
- 3.25 The permissible out-of-block emission limit for downlink use of frequencies in the 2.6 GHz Band is built up from two components:
- a baseline requirement; and
 - a requirement relative to Permitted Frequency Blocks.
- 3.26 For any particular frequency outside the Permitted Frequency Blocks the higher value of the baseline and relative requirement will apply (as shown in the Draft Licence at Annex 1).
- 3.27 For the 2010 MHz Band, the maximum mean power transmitted in the Permitted Frequency Block 2010 – 2025 MHz shall not exceed:
- | | |
|---------------------------------|------------------|
| for uplink use of frequencies | 31 dBm/5MHz TRP |
| for downlink use of frequencies | 61 dBm/5MHz EIRP |
- 3.28 In cases where terminal stations or user stations are permanently installed at a fixed location an alternative maximum mean power of 35 dBm/(5 MHz) for uplink use of frequencies applies.
- 3.29 The in-block power limits above apply only within the range 2010.5 – 2024.7 MHz. Outside this range the permissible out-of-block emissions requirement will apply (as shown in the draft Licence at Annex 1).
- 3.30 It should be noted that the out-of-block emission requirement below 2010 MHz (-45 dBm/MHz EIRP) contained in the draft licence at Annex 1 may be subject to further analysis at the European level. The outcome of this analysis may result in binding requirements on the UK under European law under which we may need to amend the limits set out in Annex 1.
- 3.31 Where technologies are deployed that actively transmit in bursts (e.g. TDD technologies) then the above limits shall be applied to the active part of the transmission.
- 3.32 In cases where the inputs to different antennas are not correlated, the maximum mean EIRP transmitted in the Permitted Frequency Blocks referred to above is calculated from the sum of the EIRP for each separate antenna.

Note: this applies for MIMO, transmit diversity and “antenna combining” (where different transmitter channels are fed to different branches of a diversity antenna system).

- 3.33 In cases where the inputs to different antennas or antenna elements are correlated, the maximum mean EIRP transmitted in the Permitted Frequency Blocks referred to above is calculated as follows:

$$\text{EIRP}_{\text{effective}} = \Sigma P_{\text{nom}} \text{ (dBm)} + 10 \log 180/\theta + 10 \log 360/\phi$$

Where:

ΣP_{nom} is the sum of the nominal maximum powers of the transmitter outputs feeding each element, measured at the antenna port;

θ is the -3dB beamwidth of the antenna array in the vertical plane (if this beamwidth can vary, the minimum value should be used); and

ϕ is the angle in the horizontal plane for which the antenna system is intended to provide service (e.g. for an antenna system that is intended to provide 360° coverage with four arrays, this angle would be 90°).

Note: this applies to adaptive or beam forming antenna arrays where, averaged over time, the power radiated by the antenna system is spread evenly over its angle of operation.

Access and inspection

- 3.34 Licensees will be required to permit any person that we authorise to have access to and to examine and test the Radio Equipment specified in the Licence at all reasonable times, to ensure that the Radio Equipment is being used in accordance with the conditions of the Licence. The Licensee must also permit access at any time to the Radio Equipment specified in the Licence to any person that we authorise when an urgent situation arises.

Provision of information to Ofcom and possible publication

- 3.35 Ofcom can require licensees to provide information to Ofcom regarding the characteristics of the equipment they use under their Licence, the location of the equipment and the frequencies used. In order to promote optimal use of the spectrum and to help the market in exploring opportunities for such optimal use, Ofcom may from time to time publish aggregated information regarding the equipment and frequencies used in respect of Licences in the Bands. This is without prejudice to any information which Ofcom is required by law to publish or disclose in any event.

Modification, restriction and closedown

- 3.36 Ofcom may require the Radio Equipment (or any part of it) to be modified or restricted in use, or temporarily or permanently closed down if:
- i) a Licensee has breached the terms of its Licence; and/or
 - ii) use of Radio Equipment is or may be causing or contributing interference to the operation of other authorised Radio Equipment; and/or
 - iii) there is a local or national state of emergency.

International Co-ordination for terrestrial services in the 2.6 GHz and 2010 MHz Bands

- 3.37 The Licensee must ensure that the Radio Equipment is operated in compliance with such cross-border co-ordination and sharing procedures as may be notified to the Licensee by Ofcom. There are currently agreements between the UK and each of France and the Republic of Ireland. These are provided at Annexes 3 and 4.

Geographical boundaries of the Licences

- 3.38 The Licences authorise use of the Bands within the United Kingdom.

Section 4

The Award Process

Licence Award Regulations

- 4.1 The Award Process will be conducted in accordance with the Regulations which set out the Auction procedure in detail. A copy of the proposed Regulations in the draft form published by Notice for comment on 4 April 2008 is provided at Annex 2 of this Memorandum. Anyone wishing to comment on the draft should review the Notice of Ofcom's proposal to make regulations in connection with the award of the 2.6 GHz and 2010 MHz Bands. The final form of the Regulations will be placed on the Ofcom Website once they are made and they will be published by Her Majesty's Stationery Office and made available at www.opsi.gov.uk. Anyone making or considering making an application in accordance with the procedure described below should read and understand the rules of the Award Process as set out in the Regulations. If there is any discrepancy between the description of the Regulations contained in this Memorandum and the Regulations, the Regulations will prevail. Ofcom will consider all representations made in response to the Notice and, if necessary, change its proposals and the content of the proposed Regulations. The Regulations as enacted may, therefore, differ from the draft provided at Annex 2 and described below.

Introduction

- 4.2 This Section explains the various stages in the Award Process and the effect of the proposed Regulations. In summary, the Award Process comprises:
- an application stage during which applications for Licences will be made to Ofcom in accordance with the procedures described in the Regulations;
 - a qualification stage during which Ofcom will determine whether applicants are qualified to bid in the Award Process;
 - a two stage Auction consisting of:
 - the Principal Stage with one or more Primary Bid Rounds and a Supplementary Bids Round;
 - the Assignment Stage during which Winning Bidders in the 2.6 GHz Band will be able to bid for particular frequencies, in the 2.6 GHz Band, to be included in a Licence;
 - the Grant Stage during which Ofcom will grant Licences to the Winning Bidder or Bidders for the frequencies assigned to them in accordance with the Assignment Stage.

If there is no more than one Bidder at the end of the qualification stage, an alternative frequency assignment process will be used.

- 4.3 For the Award Process, Ofcom will use an Electronic Auction System, which is described in paragraphs 4.202-4.212.

- 4.4 Table 3 below describes each Band, the number of Paired Lots and Unpaired Lots available in the 2.6 GHz Band, a description of those Lots, the Eligibility Points associated with each Lot, the First Round Price per Lot and the minimum number of Lots that can be comprised in a Bid in respect of each type of Lot. Please note that Unpaired Lots are identified as individual Lots in the draft Auction regulations; see Annex 2.

Table 3: Description of available lots

Band	Number of Lots	Bandwidth of Lot	Eligibility Points per Lot	First Round Price per Lot	Minimum bid size (in Lots)
2010-2025 MHz	1	1x15 MHz	2	£100,000	1
2.6 GHz	0-14 Paired Lots	2x5 MHz	2	£100,000	1
2.6 GHz	9-38 Individual (Unpaired) Lots	1x5 MHz	For n contiguous Unpaired Lots, eligibility is $n-1$ points For n Unpaired Lots split across 2 contiguous ranges of frequency blocks, eligibility is $n-2$ points	£ 50,000	2

Usage rights in the 2.6 GHz Band

- 4.5 In total, there are 38 frequency blocks of 5MHz each available in the 2.6 GHz Band as shown in Table 4 below. The Principal Stage will determine how many Paired Lots and Unpaired Lots will be awarded. However, the number of Paired Lots and Unpaired Lots that can be awarded is constrained in the following way: a maximum of 14 Paired Lots and a minimum of 9 Unpaired Lots are available for award.

Table 4: Frequencies available in the 2.6 GHz Band

<u>Lot Number</u>	<u>Frequencies</u>
Lot 1	2500–2505 MHz

Lot 2	2505–2510 MHz
Lot 3	2510–2515 MHz
Lot 4	2515–2520 MHz
Lot 5	2520–2525 MHz
Lot 6	2525–2530 MHz
Lot 7	2530–2535 MHz
Lot 8	2535–2540 MHz
Lot 9	2540–2545 MHz
Lot 10	2545–2550 MHz
Lot 11	2550–2555 MHz
Lot 12	2555–2560 MHz
Lot 13	2560–2565 MHz
Lot 14	2565–2570 MHz
Lot 15	2570–2575 MHz
Lot 16	2575–2580 MHz
Lot 17	2580–2585 MHz
Lot 18	2585–2590 MHz
Lot 19	2590–2595 MHz
Lot 20	2595–2600 MHz
Lot 21	2600–2605 MHz
Lot 22	2605–2610 MHz
Lot 23	2610–2615 MHz
Lot 24	2615–2620 MHz
Lot 25	2620–2525 MHz
Lot 26	2625–2630 MHz
Lot 27	2630–2635 MHz
Lot 28	2635–2640 MHz
Lot 29	2640–2645 MHz
Lot 30	2645–2650 MHz
Lot 31	2650–2655 MHz
Lot 32	2655–2660 MHz
Lot 33	2660–2665 MHz
Lot 34	2665–2670 MHz
Lot 35	2670–2675 MHz
Lot 36	2675–2680 MHz
Lot 37	2680–2685 MHz
Lot 38	2685–2690 MHz

4.6 Table 5 shows the possible combinations of Paired Lots and Unpaired Lots in the 2.6 GHz Band, assuming that the maximum number of Lot is awarded in each case. There are other potential outcomes when there are unsold Lots.

Table 5: Possible combinations of Unpaired and Paired Lots in the 2.6 GHz Band

Outcome	Unpaired Lots (1x5 MHz)					Paired Lots (2x5 MHz)		
	Total no. of Lots	Lower area		Upper area		Total no. of Lots	Uplink (MHz)	Downlink (MHz)
		No. of Lots	Frequencies (MHz)	No. of Lots	Frequencies (MHz)			
1	9	9	2570-2615	0	-	14	2500-2570	2620-2690
2	10	10	2565-2615	0	-	13	2500-2565	2620-2685
3	13	11	2560-2615	2	2680-2690	12	2500-2560	2620-2680
4	15	12	2555-2615	3	2675-2690	11	2500-2555	2620-2675
5	17	13	2550-2615	4	2670-2690	10	2500-2550	2620-2670
6	19	14	2545-2615	5	2665-2690	9	2500-2545	2620-2665
7	21	15	2540-2615	6	2660-2690	8	2500-2540	2620-2660
8	23	16	2535-2615	7	2655-2690	7	2500-2535	2620-2655
9	25	17	2530-2615	8	2650-2690	6	2500-2530	2620-2650
10	27	18	2525-2615	9	2645-2690	5	2500-2525	2620-2645
11	29	19	2520-2615	10	2640-2690	4	2500-2520	2620-2640
12	31	20	2515-2615	11	2635-2690	3	2500-2515	2620-2635
13	33	21	2510-2615	12	2630-2690	2	2500-2510	2620-2630
14	35	22	2505-2615	13	2625-2690	1	2500-2505	2620-2625
15	38	2500-2690				0	-	-

4.7 Figure 5 illustrates selected outcomes from Table 5.

Figure 5: Illustration of examples of outcomes from Table 5

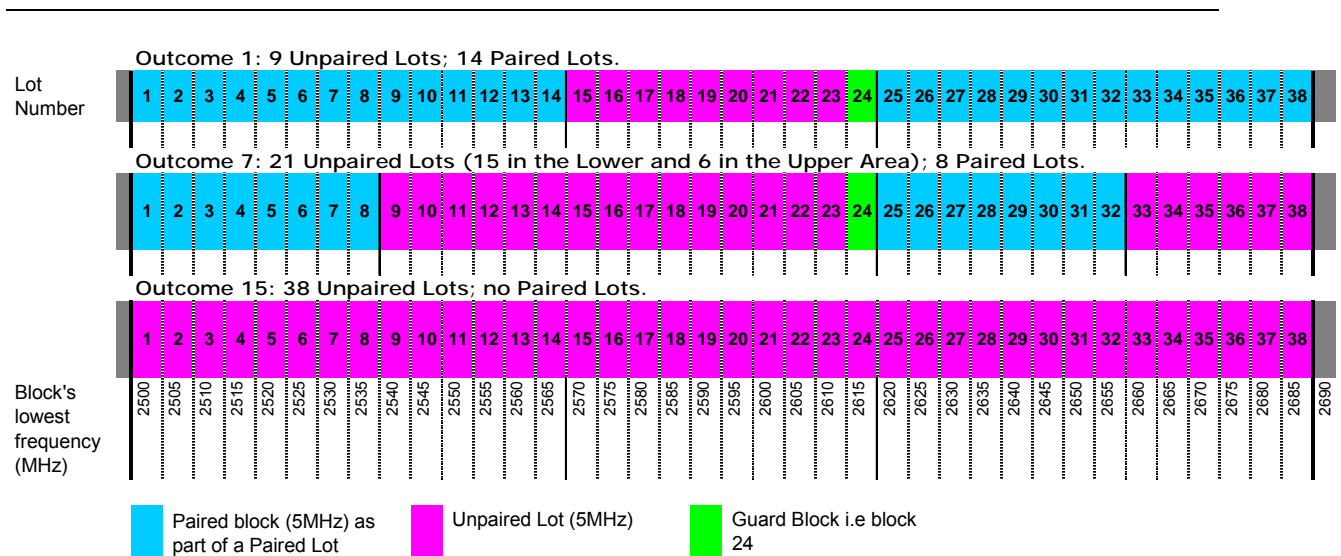
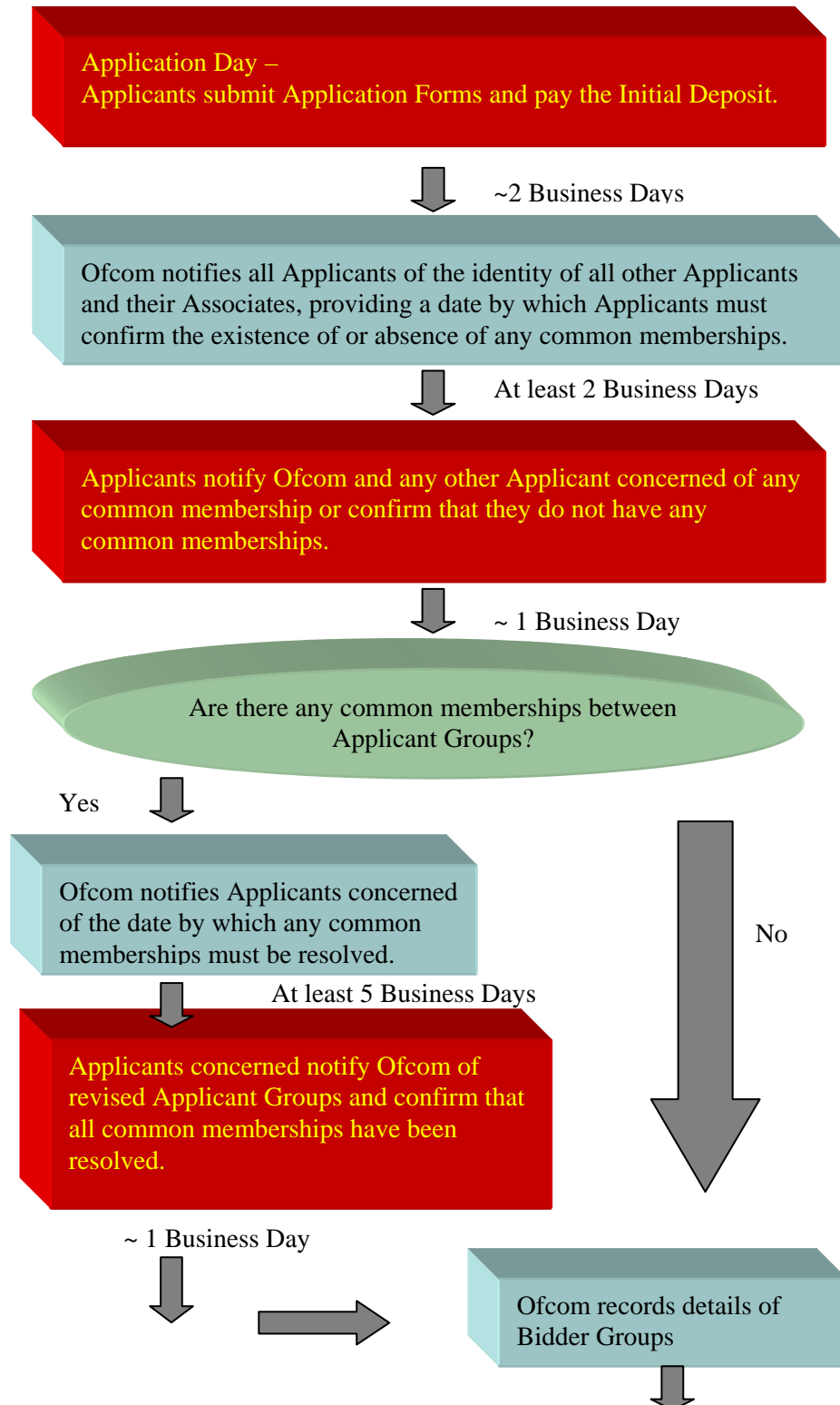


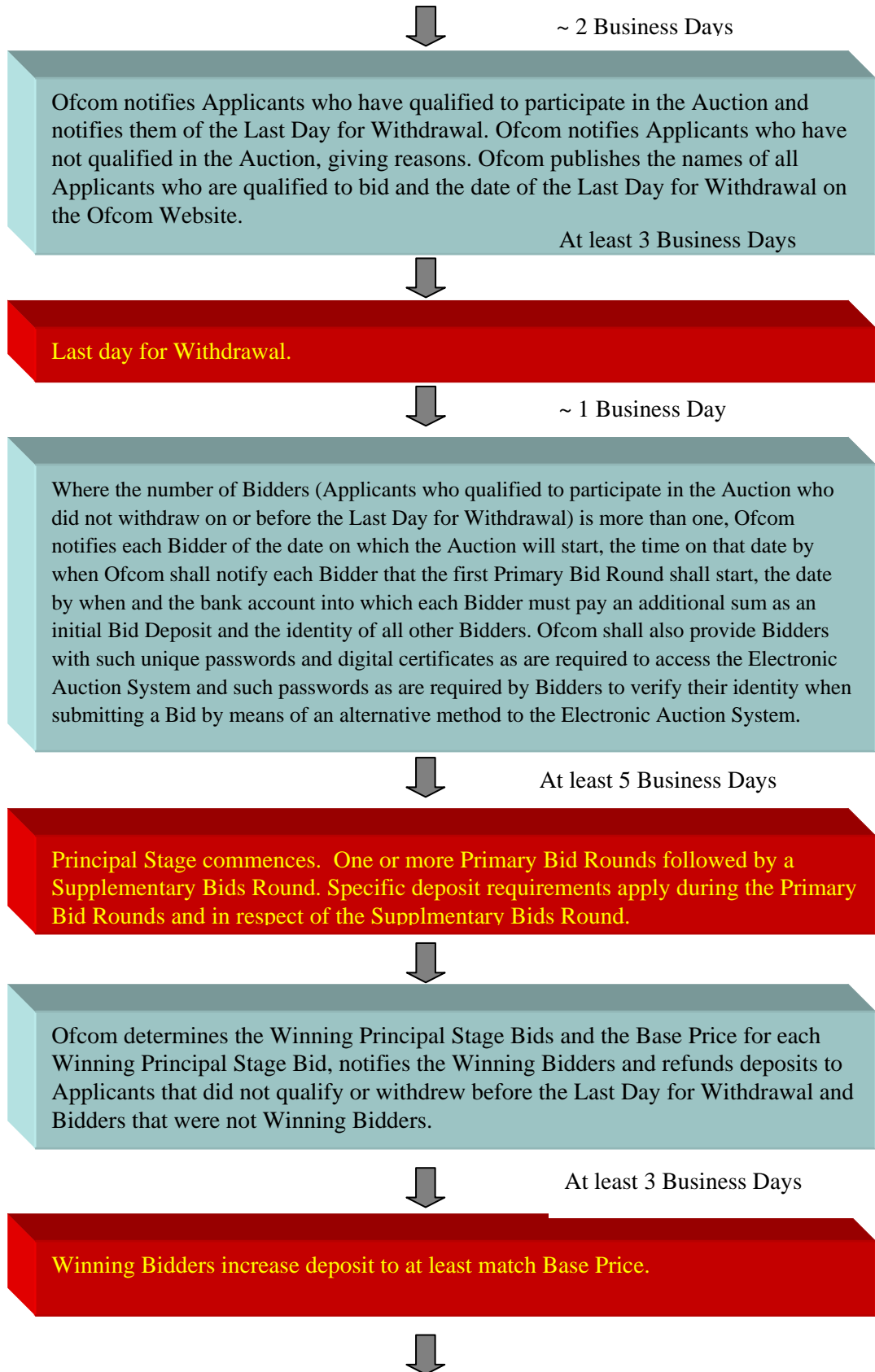
Illustration of Award Process Timeline

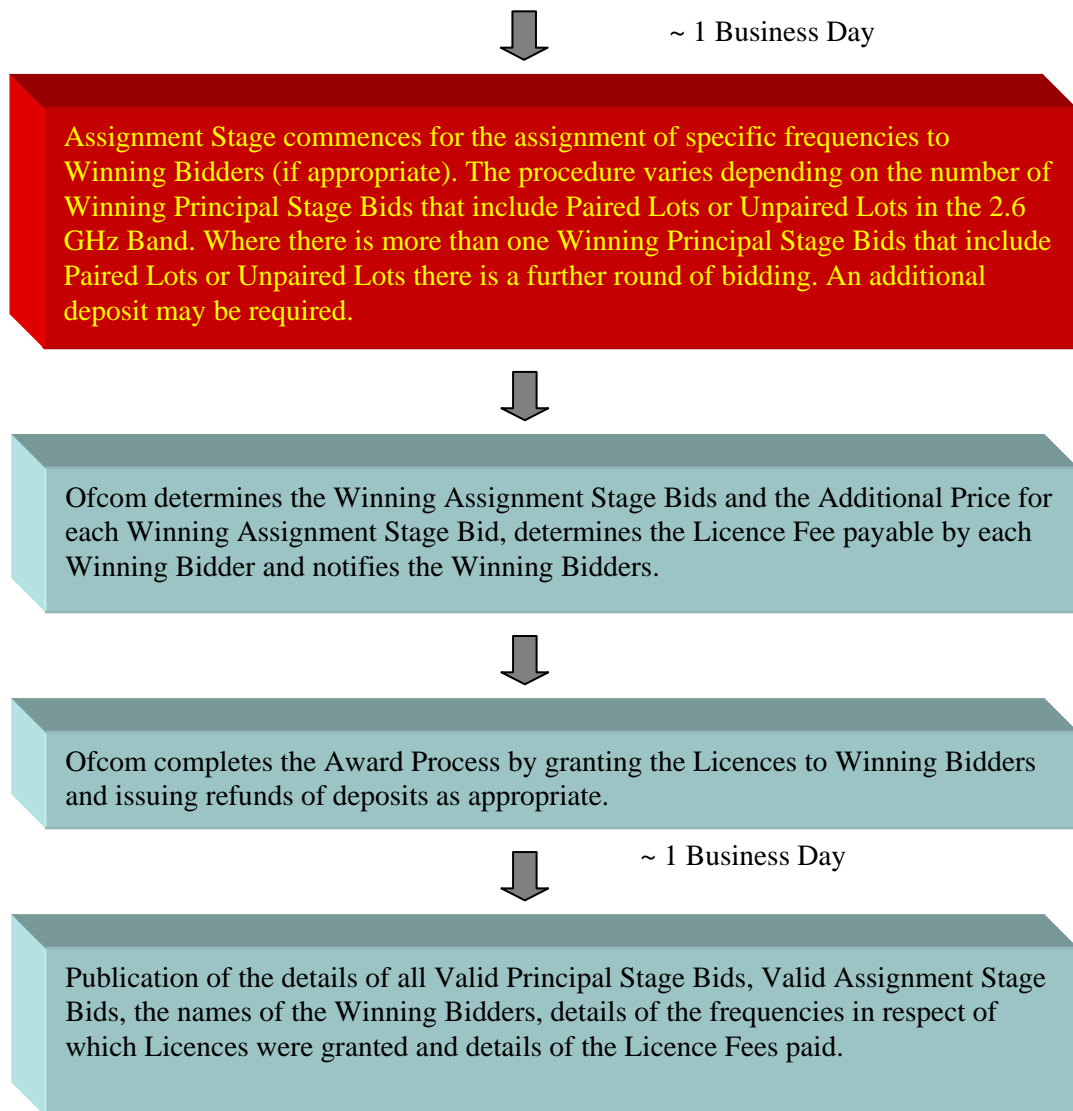
4.8 There is no pre-set timetable for the Award Process but Ofcom has provided guidance as to the likely time periods that Ofcom expects to apply to the various stages of the Award Process. The flowchart provided at Figure 6 below provides a simplified graphical illustration of the Award Process. It assumes that Ofcom proceeds with the Auction under Part 5 of the Regulations because there is more than one Bidder.

4.9 Stages which require action by Applicants or Bidders are highlighted in red, whilst those requiring action by Ofcom are in blue.

Figure 6: Indicative timeline for the Award Process







Start of the Award Process

- 4.10 The Award Process may only begin after the Regulations have come into force. The Regulations will state the date when they will come into force, which is likely to be around one month after the date the Regulations are made.
- 4.11 Ofcom will publish notice of the Application Day on the Ofcom Website and there will be at least two weeks between the publication of the notice and the Application Day.

Questions and Answers before the Application Day

- 4.12 Any party interested in participating in the Award Process may submit questions in writing to Ofcom in relation to any aspect of the Award Process. Questions should be submitted at least five Business Days before the Application Day and Ofcom will aim to respond to all questions at least two Business Days before the Application Day.

- 4.13 Ofcom's normal manner of responding to a question will be to respond to the person who asked the question by email. Ofcom will then consider whether to publish a copy of the question and any response, in whole or in part, on the Ofcom Website. However, in doing so, Ofcom will not normally identify the person who has asked the question without their consent. Any person not wishing any part of its question to be published, should clearly mark the relevant part(s) "Confidential" and Ofcom will take this into account in deciding whether and what to publish.

Application Stage

- 4.14 The application stage is set out at Part 2 of the Regulations. Applicants are not required to pass a technical test, or to provide details of the services they intend to offer. Only bodies corporate may apply but they need not be incorporated in the UK.
- 4.15 Application Forms must be submitted to Ofcom at Riverside House, 2a Southwark Bridge Road, London, SE1 9HA in a sealed envelope on the Application Day during the period specified for receipt of Application Forms by Ofcom on the Ofcom Website. Ofcom will publish on its spectrum awards section of the Ofcom Website⁴³ the details of the application procedures, including the day and time for delivery of Application Forms.
- 4.16 Each Applicant must also pay an Initial Deposit of £100,000 into Ofcom's bank account in accordance with paragraph 4.216. Ofcom will publish on its spectrum awards section of the Ofcom Website the deadline for and guidance on the payment arrangements for the Initial Deposit.
- 4.17 In exceptional circumstances, Ofcom may be required to change the day, time or place for delivery of Application Forms or the payment of the Initial Deposit. Ofcom will take all reasonable steps to inform interested parties of a change.
- 4.18 The information to be contained in the Application Form is set out at Schedule 2 of the Regulations and must include details of and a specimen signature of the Applicant's authorised persons (which must number at least three but no more than five), the name and job title of its directors (or members of its managing body), its Associates together with their material interest in the Applicant and all other members of the Applicant's Applicant Group (see paragraph 4.20 below) and information relating to its qualification to bid. It must be accompanied by the Application Warranty (set out at section 7 of Schedule 2 of the Regulations) containing certain representations and warranties and an Additional Member Warranty (set out at Schedule 3 of the Regulations) for each member of its Applicant Group who is not an Associate. Ofcom intends to make pro forma copies of all documents relating to the Award Process available for downloading from the Ofcom Website. (Application Form, Application Warranty and Additional Member Warranty are not terms used in the Regulations but are used in this Memorandum for convenience.)
- 4.19 The Application Form, the Application Warranty and, where applicable, the Additional Member Warranty must be signed by at least two individuals who are authorised to bind the Applicant for all purposes in relation to the Award Process and who are listed as authorised persons on the Application Form. The Additional Member Warranty must also be signed by or on behalf of the relevant person becoming a member of the Applicant Group. Applicants (and relevant members of their Applicant Groups) should note that they are making legally enforceable representations and warranties to Ofcom in these documents.

⁴³ <http://www.ofcom.org.uk/radiocomms/spectrumawards/>

4.20 A member of an Applicant Group may not be a member of another Applicant Group. An Applicant Group is defined in the Regulations as the Applicant, each Associate of the Applicant and each other person named by the Applicant and in respect of whom the Applicant has submitted an Additional Member Warranty.

4.21 An Associate is defined as any person who has a Material Interest in the Applicant or Bidder. In summary, this includes any person who (whether directly or indirectly):

- holds shares carrying more than 25% of the votes entitled to be cast at a general meeting of the Applicant or Bidder;
- holds shares in the Applicant and whose consent is required for the conduct of any business of the Applicant or Bidder; or
- has the right to appoint or remove a majority of the board of directors of the Applicant or Bidder.

Interested parties must refer to the Regulations for the actual definitions of Associate and Material Interest.

4.22 The Application Warranty requires the Applicant to represent and warrant that:

- its authorised persons have read and understood the Regulations, the terms of the Licences and the WT Act;
- it is legally capable of both bidding in the Award Process and having a Licence issued to it (including having all consents, permissions and internal approvals in place);
- the information provided in its Application Form is to the best of its knowledge and belief true, accurate and complete in all material respects; and
- it is aware of the provisions in the Regulations relating to disclosing and obtaining Confidential Information (see further the Activity Rules described at paragraphs 4.197 to 4.201 below).

4.23 The Additional Member Warranty requires the Applicant to represent and warrant that the person becoming a member of its Applicant or Bidder Group (who is not an Associate of the Applicant) is not also a member of any other Applicant or Bidder Group. The Applicant must also notify Ofcom immediately if it becomes aware that the person has ever been or becomes a member of any other Applicant or Bidder Group or a subsidiary of any member of any other Applicant or Bidder Group or the person has ever obtained or obtains Confidential Information relating to another Applicant or Bidder.

4.24 On the same form, the person becoming the member of the Applicant or Bidder Group must represent and warrant that it consents to be a member of the Applicant or Bidder Group, that it is not a member of any other Applicant or Bidder Group and that it is aware of the provisions concerning disclosing and obtaining Confidential Information (see further the Activity Rules described at paragraphs 4.197 to 4.201 below). It must also notify Ofcom and the relevant Applicant immediately if it has ever been or becomes a member of any other Applicant or Bidder Group or a subsidiary of any member of any other Applicant or Bidder Group or if it has ever obtained or obtains Confidential Information relating to another Applicant or Bidder.

- 4.25 Under the provisions in the Regulations relating to disclosing and obtaining Confidential Information, if a member of the Bidder Group, or any other person to whom its Confidential Information has been disclosed, discloses Confidential Information outside the Bidder Group (other than to Ofcom, to a financier of its bid or to someone who is considering participating in the Bidder Group), this may lead to an Applicant not being qualified to bid and forfeiting its deposit, or to a qualified Bidder being excluded from the Award Process and forfeiting its deposit. In connection with this, each Applicant is also required to give Ofcom details on its Application Form of all such disclosures of Confidential Information outside its Applicant or Bidder Group. An Applicant or Bidder may wish to consider making any intended recipient of its Confidential Information a member of its Applicant or Bidder Group by submitting an Additional Member Warranty in respect of that recipient, before disclosing the Confidential Information. Any disclosure to that recipient would then be to a person within its Applicant or Bidder Group.
- 4.26 Ofcom retains a discretion whether an Applicant should qualify to bid, and whether a Bidder should be excluded or forfeit its deposit. Potential Applicants, Applicants and Bidders should, therefore, take considerable care in relation to commercial discussions with parties outside their respective Applicant or Bidder Groups. Depending on the content and character of the commercial discussions, it is possible that they could involve the exchange of Confidential Information, and that this could lead to a failure to qualify, or to forfeiture of deposits and possibly also exclusion from the Award Process. Potential Applicants, Applicants and Bidders will need to take their own advice in this regard. In exercising its discretion, Ofcom will be particularly concerned with whether the disclosure of Confidential Information is part of collusive behaviour, or would materially affect the outcome of the Award Process.
- 4.27 The Activity Rules contained at Part 6 of the Regulations and described at paragraphs 4.197 to 4.201 below apply to Applicants determined by Ofcom as qualified to bid and to Bidders.
- 4.28 Subject to the Activity Rules, an Applicant may add or remove one or more Associates to or from its Bidder Group at any time after the recording by Ofcom of the members of each Applicant Group as a Bidder Group by sending a revised Application Form and Application Warranty to Ofcom. It may also add a person who is not an Associate to its Bidder Group by sending an Additional Member Warranty to Ofcom. Applicants should note that the Regulations, in particular the Activity Rules, have the effect of prohibiting any member of one Bidder Group from also being a member of another Bidder Group.
- 4.29 Ofcom will return Initial Deposits (without any interest having accrued) to Applicants who do not qualify to bid in the Award Process on completion of the Principal Stage of the Award Process, unless the Initial Deposit has been forfeited in accordance with the Regulations (for example for breach of the Activity Rules).

Qualification Stage

- 4.30 The qualification stage is described in detail at Part 3 of the Regulations. An Applicant may not qualify to bid in the Auction if a member of its Applicant Group is also a member of another Applicant Group. Following the Application Day, Ofcom will notify each Applicant of the names and Associates of each other Applicant. Ofcom expects to do this within two Business Days after the Application Day. Accordingly, this notification will also set a deadline by when Applicants must notify Ofcom whether or not any members of their Applicant Group are also Associates of another Applicant. In such cases, Applicants must also notify the other Applicant(s)

- concerned. Ofcom expect that Applicants will have two Business Days to complete this exercise.
- 4.31 In parallel with this exercise, Ofcom will also consider whether any members of one Bidder Group are also members of another Bidder Group.
- 4.32 Where Ofcom has determined that a common membership exists, Ofcom will notify the Applicants concerned and specify a deadline by when all the common memberships must be resolved (i.e. by when a common Associate must have disposed of or otherwise removed its Material Interest in one or both of the Applicants concerned, or by when one of the Applicants concerned must have withdrawn from the Award Process).
- 4.33 Ofcom expects that Applicants will have five Business Days to resolve any common memberships.
- 4.34 Prior to the date on which Ofcom notifies each Applicant whether or not they have qualified as Bidders, an Applicant may submit a request to Ofcom for an Associate of that Applicant to be removed from that Applicant's Applicant Group. It is therefore recommended that any exclusion applications should be made as early as possible in the application process, and preferably at the same time as Applications to participate in the Award Process are made. Associates and Applicants should be aware that Ofcom will disclose to other Applicants the identity of entities who have applied to be excluded from Bidder Groups.
- 4.35 An Associate of an Applicant may apply to be excluded from that Applicant's Applicant or Bidder Group provided that the Associate does not:
- hold shares which carry equal to or more than 50% of the votes entitled to be cast at a general meeting of the Applicant; or
 - have the right to appoint or remove a majority of the board of directors of the Applicant.
- 4.36 In order to apply to be excluded from an Applicant or Bidder Group, the Associate must deliver to Ofcom a document in the form set out in the Regulations (the "**Member Exclusion Warranty**"), completed by the Associate and signed on its behalf by two authorised persons. In the Member Exclusion Warranty, the Associate will give an undertaking that:
- it will not seek or accept Confidential Information relating to the Applicant or any member of the Applicant or Bidder Group prior to the completion of the Award Process;
 - no director, employee or person seconded to the Associate has taken or will take part in any discussion or activity which relates in any way to any potential or actual bid by the Applicant;
 - any person who is a director or employee of, or seconded to the Associate who is also a director of the Applicant will be excluded from any meeting (or part of the meeting) of the board of directors of the Applicant at which any aspect of the Applicant's participation in the Award Process is or is to be discussed;
 - any person who is a director or employee of, or person seconded to the Applicant who is also a director of the Associate will not take part in any meeting

or any part of any meeting of the board of directors of the Associate at which any aspect of the Associate's participation in the Award Process is or is to be discussed;

- it has not taken and will not take actions which could influence in any way the behaviour of the Applicant or any member of the Applicant's Applicant or Bidder Group, in relation to any aspect of their participation in the Award Process; and
- all employees and directors of, and persons seconded to the Associate who in the usual course of their employment may come into contact with any employee or director of, or person seconded to the Applicant or any member of the Applicant's Applicant or Bidder Group, will be made fully aware of the undertakings given by the Associate in the Member Exclusion Warranty.

4.37 The Applicant must deliver to Ofcom a document in the form set out in the Regulations (the "**Exclusion Request Form**"), completed by the Applicant and signed on its behalf by two authorised persons. In the Exclusion Request Form, the Applicant will give equivalent undertakings to those made in the Member Exclusion Warranty, that:

- it has not sought or accepted Confidential Information relating to the Associate or any other Applicant or Bidder, and will not do so prior to the completion of the Award Process;
- no director, employee or person seconded to the Applicant has taken or will take part in any discussion or activity which relates in any way to any potential or actual bid by the Associate or any Applicant or Bidder Group to which the Associate belongs;
- any person who is a director or employee of, or seconded to the Associate who is also a director of the Applicant will be excluded from any meeting (or part of the meeting) of the board of directors of the Applicant at which any aspect of the Applicant's participation in the Award Process is or is to be discussed;
- any person who is a director or employee of, or person seconded to the Applicant who is also a director of the Associate will not take part in any meeting or any part of any meeting of the board of directors of the Associate at which any aspect of the Associate's participation in the Award Process is or is to be discussed;
- it has not taken and will not take actions which could influence in any way the behaviour of the Associate or any member of any Applicant or Bidder Group of which the Associate is or becomes a member, in relation to any aspect of their participation in the Award Process;
- all employees and directors of, and persons seconded to the Applicant who in the usual course of their employment may come into contact with any employee or director of, or person seconded to the Associate or any member of any Applicant or Bidder Group of which the Associate is or becomes a member, will be made fully aware of the undertakings given by the Applicant in the Exclusion Request Form.

(Exclusion Request Form and Member Exclusion Warranty are not terms used in the Regulations but are used in this Memorandum for convenience).

- 4.38 An application to exclude an Associate from an Applicant or Bidder Group is subject to approval by Ofcom, based on an assessment of the merits of the specific case. The following paragraphs provide some guidance regarding how Ofcom expects to assess applications to exclude an Associate, and examples of some of the factors which we will take into account, but this guidance does not purport to be a comprehensive list of all such relevant factors.
- 4.39 The exclusion application procedure is intended to apply primarily to cases of shareholdings which pre-exist the Award Process, and is not intended to enable potential Bidders to increase their bidding options by, for example, setting up before the Auction bidding vehicles through which to make multiple bids.
- 4.40 This underlying intention will inform Ofcom's decision-making when assessing exclusion applications. In particular, Ofcom will have regard to:
- a) the length of time the Associate applying to be excluded has held its material interest in the Applicant(s), and whether there are any indications that the material interest has been gained primarily with a view to increasing bidding options in the auction;
 - b) any information which the Associate or Applicant provide to Ofcom in the Member Exclusion Declarations (including any information as to why they are unable to give the representations, warranties and undertakings set out in those documents);
 - c) any indication that any information provided to Ofcom in relation to the exclusion application is false or misleading;
 - d) any indication that granting the request is likely to distort the outcome of the Award Process.
- 4.41 If Ofcom approves an exclusion application, Ofcom will notify the Associate and the Applicant in writing of its decision. Where an Associate of an Applicant is authorised to be excluded from that Applicant's Bidder Group in accordance with the procedures in paragraphs 4.34 to 4.37 it shall be permitted to be a member of another Applicant's Bidder Group.
- 4.42 Ofcom expects that it will record the details of the Bidder Groups of each Applicant Group (for the purposes of determining which Applicants have qualified) as soon as reasonably practicable after expiry of the five Business Day period given in accordance with paragraph 4.33.
- 4.43 The next step in the qualification process is for Ofcom to determine which Applicants qualify to bid in the Auction.
- 4.44 If a common membership has not been resolved, neither Applicant may qualify.
- 4.45 In addition, in making its determination of whether an Applicant should qualify to bid in the Auction, Ofcom will take into account whether:
- the grant of a Licence to that Applicant would be prejudicial to the interests of national security;

- the Applicant is a fit and proper person to hold a Licence having regard to the probity of the Applicant, each member of the Applicant's Bidder Group and each director of each member of the Applicant's Bidder Group;
- the Applicant has submitted false or misleading information to Ofcom;
- the Applicant or any member of its Bidder Group has colluded or attempted to collude or is colluding or attempting to collude with any other person to distort the outcome of the Award Process, or has acted or is acting in a way which is likely to distort the outcome of the Award Process;
- the Applicant or any member of its Bidder Group, or any person to whom Confidential Information has been disclosed, has disclosed, or is disclosing or attempting to disclose or has incited or is inciting another person to disclose Confidential Information to anyone other than to a member of its Bidder Group, Ofcom, a provider of finance (where the disclosure was for the purpose of raising finance for the application), or a person considering whether to join the Bidder Group of the Applicant;
- the Applicant or any member of its Bidder Group has received or is obtaining or attempting to obtain Confidential Information relating to another Applicant;
- the Applicant or any member of its Bidder Group is receiving or attempting to receive services in relation to the Award Process from anyone who has provided or is providing services to Ofcom in relation to the Award Process (for these purposes the advisers are Allen & Overy LLP, DotEcon Ltd, Prof. Peter Cramton of the University of Maryland and Dr Ian Jewitt of Nuffield College); or
- any member, or director or employee of a member of the Applicant's Bidder Group who is also a director or employee or a member of another Applicant's Bidder Group is taking part in the preparation of both Bidder Groups for participation in the Award Process or receiving Confidential Information relating to both Bidder Groups.

Applicants should note in particular paragraphs 4.25 and 4.36 in relation to the disclosure of Confidential Information.

- 4.46 During the qualification stage, Ofcom may also request an Applicant to provide additional information or documentation by a specified deadline. In making its determination, Ofcom will take into account any failure by the Applicant to provide the additional information by the relevant deadline.
- 4.47 Ofcom expect to determine which Applicants have qualified to bid in the Award Process within two Business Days after recording details of the Bidder Groups as described at paragraph 4.42 above. Ofcom will notify each Applicant of whether it has qualified to bid in the Award Process (including the reasons where an Applicant has not qualified), the names of all other Applicants who have qualified to bid and the Last Day for Withdrawal (the last day on which Applicants who have qualified to bid in the Auction may withdraw their application without forfeiting their Initial Deposit for that reason). Ofcom expects the Last Day for Withdrawal to be at least three Business Days after notification to Applicants that they are qualified to bid. Ofcom will also publish on the Ofcom Website the names of those Applicants who have qualified to bid in the Auction and the Last Day for Withdrawal.

- 4.48 If an Applicant who has qualified to bid wishes to withdraw from the Award Process, it must send Ofcom a notice to this effect (signed by at least two of its authorised persons). That Applicant will be excluded from the Award Process (and will not be re-admitted) and Ofcom will notify each other Applicant of that fact. On the next Business Day after the Last Day for Withdrawal, Ofcom expects to publish the names of all Bidders (i.e. Applicants qualified to participate in the Award Process who have not withdrawn) on the Ofcom Website and announce the procedure it will follow for award of the Licences (depending on the number of Bidders).

If there are no Bidders

- 4.49 If there are no Bidders, there will be no Auction and Ofcom will consider an alternative award process. Ofcom will refund Applicants which were not qualified or withdrew in accordance with paragraph 4.47 the Initial Deposits (where they have not been forfeited) but not any interest which has accrued on the Initial Deposits.

Award process where there is only one Bidder

- 4.50 If there is only one Bidder, there will be no Auction and Ofcom will follow the procedure set out in Part 4 of the Regulations.
- 4.51 The Bidder will be required to select, on the Frequency Range Selection Menu, no more than one of the frequency ranges listed on the Frequency Range Selection Menu in respect of each of:
- the 2010 MHz Band;
 - the frequency ranges available for Paired Lots in the 2.6 GHz Band; and
 - the frequency ranges available for Unpaired Lots in the 2.6 GHz Band,
- so that the total number of Eligibility Points associated with that selection is no more than 16 (see paragraphs 4.77 to 4.82).
- 4.52 If the Bidder selects one of the frequency ranges for Paired Lots, it will be awarded the contiguous frequencies immediately above 2500 MHz (uplink) and 2620 MHz (downlink) corresponding to the frequency range listed on the Frequency Range Selection Menu that it selects. If the Bidder selects a frequency range for between two and eleven Unpaired Lots, it will be awarded the contiguous frequencies immediately below 2620 MHz corresponding to the frequency range listed on the Frequency Range Selection Menu that it selects.
- 4.53 If the Bidder selects a frequency range for more than eleven Unpaired Lots, it will receive a split award consisting of one contiguous range of frequencies immediately below 2620 MHz and one contiguous range immediately below 2690 MHz, corresponding to the frequency range listed on the Frequency Range Selection Menu that it selects.
- 4.54 The Licence Fee will be the sum of the prices specified on the Frequency Range Selection Menu for the selected frequency ranges.
- 4.55 Ofcom will notify the Bidder of the respective deadlines by when the Bidder must:

- return a completed Frequency Range Selection Menu, signed on its behalf by two of its authorised persons, to Ofcom at Riverside House, 2a Southwark Bridge Road, London SE1 9HA; and
- pay into Ofcom's bank account by a same day electronic transfer with accompanying information which identifies the Bidder, a sum which shall be an amount equal to the Licence Fee less its Initial Deposit (subject to any deposit forfeits).

Ofcom expects that the Bidder will have three Business Days to make its choice from the date it is sent a Frequency Range Selection Menu by Ofcom.

- 4.56 After Ofcom receives the completed Frequency Range Selection Menu and relevant Licence Fee from the Bidder, it will grant the Bidder a Licence for the frequency ranges selected.
- 4.57 A Bidder who fails to return a completed Frequency Range Selection Menu to Ofcom or pay the relevant Licence Fee, in each case by the relevant deadline, will forfeit its Initial Deposit (to the extent it has not already been forfeited) and will not be entitled to the grant of a Licence.
- 4.58 After Ofcom grants the Licence to the Bidder, it will complete the Award Process by:
- publishing on the Ofcom Website details of the name of the Bidder, the frequency ranges selected and the Licence Fee paid; and
 - refunding to Applicants which were not qualified, or withdrew in accordance with paragraph 4.47, their respective Initial Deposits (subject to any deposit forfeits) but without any accrued interest .

Award process where there is more than one Bidder

- 4.59 Where there is more than one Bidder, the Award Process will be in three stages. The first stage of the Auction (the "**Principal Stage**") will consist of one or more rounds for the submission of Primary Bids ("**Primary Bid Rounds**") and a further single round for the submission of Supplementary Bids ("**Supplementary Bids Round**"). A Bid made during the Principal Stage shall be a bid for the 2010-2025 MHz Lot, a number of Paired Lots and/or a number of Unpaired Lots. Bids for Paired Lots and/or Unpaired Lots must not make reference to the frequencies or to the specific Lot Numbers attaching to those frequencies which are specified and set out in Table 4. The maximum numbers of Lots available are set out in Table 3 above.
- 4.60 The Principal Stage determines the Winning Bidders, the number of Lots of each type to be allocated to the Winning Bidders and the Base Price for each Winning Bidder. It is followed by the "**Assignment Stage**", during which the Winning Bidders may bid for particular frequency ranges compatible with the number and type of Lots comprised in their Winning Principal Stage Bids. Winning Assignment Stage Bids determine the Lot Numbers to be included in the Licences granted to the Winning Bidders and any Additional Price each Winning Bidder may have to pay in respect of the Assignment Stage. Following completion of the Principal Stage and the Assignment Stage, there will be a Grant Stage during which Ofcom will grant Licences to the Winning Bidders.
- 4.61 Both the Principal Stage and the Assignment Stage will be conducted using the Electronic Auction System described in more detail in paragraphs 4.202-4.212 below.

Where a Bidder is unable to submit a Bid Form using the Electronic Auction System because of technical failure or an event or circumstance with similar effect on that Bidder's ability to use the Electronic Auction System, it may seek Ofcom's permission to submit the Bid Form using an alternative method, such as email or fax ("**Alternative Method**"). This alternative is described, as it applies in each stage, in more detail below in paragraphs 4.96, 4.136 and 4.172.

Start of the Principal Stage

4.62 At least three Business Days before the start of the first Primary Bid Round, Ofcom will:

- notify each Bidder of the Bidder training arrangements (which will be likely to take place over two Business Days following the Last Day for Withdrawal.
- notify each Bidder of the date and the time on that date on and by which Ofcom will notify it of the first Primary Bid Round;
- notify each Bidder of passwords and deliver to each Bidder digital certificates required to access and use the Electronic Auction System and verify its identity;
- send each Bidder a user manual for the Electronic Auction System;
- notify each Bidder of passwords required to verify that Bidder's identity where Ofcom have agreed under Regulations 33, 40 or 59 (as the case may be) of the Regulations that the Bidder may submit its Bids by means of an Alternative Method to the Electronic Auction System; and
- notify each Bidder of the deadline by when and the bank account into which Bidders may pay their initial Bid Deposits. Ofcom expects this deadline to be 23.59 on the Business Day preceding the date of the first Primary Bid Round.

Bid Deposit (before the first Primary Bid Round)

4.63 Before the start of the first Primary Bid Round, Ofcom will notify all Bidders of a deadline by when they may pay an additional sum into Ofcom's bank account which, when added to the Initial Deposit, will constitute the initial "**Bid Deposit**". As explained in paragraph 4.78, the level of a Bidder's initial Bid Deposit will determine the Eligibility Limit of that Bidder for the first Primary Bid Round. Any further sum payable by a Bidder to constitute its Bid Deposit must be paid into Ofcom's bank account in accordance with the relevant Regulations as described in paragraph 4.216.

Primary Bid Rounds

4.64 The Primary Bid Rounds follow a clock auction format. The Auction proceeds in discrete rounds, with all Bidders making Bids within the same fixed time window. In any given Primary Bid Round, each Bidder may make a single Bid for a single combination of Lots at the prevailing Round Prices. The procedure for making Primary Bids is explained in more detail in paragraphs 4.87 to 4.92.

4.65 Before each Primary Bid Round Ofcom will give each Bidder at least 15 minutes' prior notice of the date on which and the times on that date within which Bidders may make Primary Bids by making an announcement via the Electronic Auction System. The duration of each Primary Bid Round will be decided by Ofcom in its sole

discretion although Ofcom does not anticipate holding Primary Bid Rounds of less than fifteen minutes or longer than sixty minutes in duration.

- 4.66 Ofcom will only schedule Primary Bid Rounds to take place between 10 am and 5 pm on Business Days. There is no limit on the number of Primary Bid Rounds that may be held on a Business Day. It may decide not to hold any Primary Bid Rounds on a Business Day. Ofcom will give further guidance on the scheduling of rounds before the start of the Primary Bid Rounds.
- 4.67 At the same time that Ofcom notifies Bidders of a Primary Bid Round, it will also notify each Bidder of:
- its Eligibility Limit for that Primary Bid Round so the Bidder can ensure that its Primary Bid in that Primary Bid Round is valid;
 - the number of remaining Extensions available to the Bidder; and
 - the Round Price for each Lot in that Primary Bid Round.

Round Prices

- 4.68 There is a separate price per Lot in each round (the “**Round Price**”). In the First Primary Bid Round, the Round Prices will be equal to the First Round Prices (set out in Table 3 in paragraph 4.4 above). In subsequent Primary Bid Rounds:
- the Round Price for Unpaired Lots remains the same unless there is both Excess Demand for the 2.6 GHz Band as a whole **and** the total number of Unpaired Lots selected in Valid Primary Bids is more than nine, in which case the Round Price for Unpaired Lots in the next Primary Bid Round shall be equal to an amount that is half the amount of the Round Price for Paired Lots as determined below for the same Primary Bid Round;
 - the Round Price for Paired Lots remains the same unless there is Excess Demand for the 2.6 GHz Band as a whole **or** there is Excess Demand for Paired Lots in which case the Round Price will be increased to an amount that is no more than twice the amount of the previous Round Price for that Lot;
 - the Round Price for the 2010-2025 MHz Lot remains the same unless there is Excess Demand for that Lot in which case the Round Price will be increased to an amount that is no more than twice the amount of the previous Round Price for that Lot.
- 4.69 For the 2.6 GHz Band as a whole, “**Excess Demand**” means that it would not be possible for Ofcom to assign:
- to each Bidder submitting a Valid Primary Bid containing Paired Lots, a contiguous range of Paired Lots such that the number of Paired Lots contained within that range is equal to the number it has selected; and
 - to each Bidder submitting a Valid Primary Bid containing Unpaired Lots, a contiguous range of Unpaired Lots such that the number of Unpaired Lots contained within that range is equal to the number of Unpaired Lots it has selected,

such that Lot Number 24 is not assigned and each other Lot is assigned only once.

- 4.70 For Paired Lots, Excess Demand means where the total number of Paired Lots selected in Valid Primary Bids is greater than fourteen.
- 4.71 Where no Valid Primary Bid contains Paired Lots, "**Excess Demand**" for the 2.6 GHz band as a whole means that the total number of Unpaired Lots contained in all Valid Primary Bids exceeds 38.
- 4.72 For the 2010 MHz Band, "**Excess Demand**" means where the 2010-2025 MHz Lot has been selected in more than one Valid Primary Bid.
- 4.73 Subject to paragraph 4.75 the amount by which Round Prices increase from round to round will be at Ofcom's discretion. Regulation 23(7) of the Regulations imposes a maximum increase of 100% of the previous Round Price for each of the 2010-2025 MHz Lot and the Paired Lots.
- 4.74 Bidders should note that the increase in Round Price for Unpaired Lots could, if necessary, exceed 100% of the previous Round Price for Unpaired Lots (in cases where in one or more successive Primary Bid Rounds, the total number of Unpaired Lots selected in Valid Primary Bids is equal to or less than nine and in the subsequent Primary Bid Round, that total number is greater than nine).
- 4.75 When determining the amount by which the Round Price for a type of lot will be increased, Ofcom will take account of the level of Excess Demand for Lots of that type; where there is a high level of Excess Demand as a proportion of the number of Lots available the amount by which the Round Price for that Band will be increased is likely to be greater than where there is a lower level of Excess Demand.
- 4.76 The Round Price for a Lot will never decrease.

Determination of Eligibility

- 4.77 Each Lot has a number of Eligibility Points associated with it, specified in Table 3 above. A Bidder's activity in a Primary Bid Round is constrained by its Eligibility Limit such that the total number of Eligibility Points associated with the each Lot included in the Bid Selection comprised in a Primary Bid which it makes cannot exceed that Bidder's Eligibility Limit for that Primary Bid Round.
- 4.78 In the first Primary Bid Round, a Bidder's Eligibility Limit is calculated by dividing the total amount of the Bidder's initial Bid Deposit by fifty thousand, subject to a limit of sixteen. Where the number is not a whole number it will be rounded down to the nearest whole number. Where a Bidder's Eligibility Limit is less than two, the Bidder will be excluded from the Award Process and will forfeit its Initial Deposit and any other deposit.
- 4.79 For example, if a Bidder does not increase its Initial Deposit of £100,000 before the start of the Principal Stage, it will have an Eligibility Limit of two which would allow a Bidder to submit a Primary Bid for either the 2010-2025 MHz Lot, one Paired Lot or up to three Unpaired Lots (one of which would necessarily be a Restricted Unpaired Lot).
- 4.80 In subsequent Primary Bid Rounds, a Bidder's Eligibility Limit is determined by the level of its activity in the previous Primary Bid Round. For example, if a Bidder makes a Primary Bid (as described in paragraphs 4.87 to 4.92) with 15 Eligibility Points attributable to it, its Eligibility Limit for the next Primary Bid Round is 15; and that Bidder cannot make a Primary Bid in any subsequent Primary Bid Round for a Bid

Selection that has more than 15 Eligibility Points associated with it (calculated by reference to the number of Eligibility Points associated with its Primary Bid in the previous Primary Bid Round). The number of Eligibility Points associated with a Valid Primary Bid shall be a number equal to the total of the Eligibility Points associated with each Lot included in the Bid Selection specified in that Valid Primary Bid.

- 4.81 Accordingly, over successive Primary Bid Rounds, a Bidder's Eligibility Limit can stay the same or fall, but can never increase. Given that Eligibility Points are not attached to a specific category of Lots, it is possible that a Bidder's activity in one or two categories may increase, provided that the Bidder's activity in other categories is sufficiently reduced.
- 4.82 If a Bidder fails to submit a Valid Primary Bid in a Primary Bid Round, its Eligibility Limit in subsequent Primary Bid Rounds will be zero.

Extensions to Primary Bid Rounds

- 4.83 If a Bidder fails to submit a completed Primary Bid Form within the round time for that Primary Bid Round, that Bidder will have a further period of time in which to submit its completed Primary Bid Form (a "**Primary Bid Round Extension**"). This Primary Bid Round Extension will end thirty minutes after the notified round end time for the Primary Bid Round. Subject to paragraph 4.84, a Bidder may have a Primary Bid Round Extension in respect of no more than two Primary Bid Rounds.
- 4.84 Ofcom may grant an additional Primary Bid Round Extension to a Bidder where it is satisfied that the Bidder's use of a Primary Bid Round Extension had been due to circumstances beyond the Bidder's control. This may include a fundamental failure of the communications systems that enable the Bidder to use the Electronic Auction System that is beyond the Bidder's control.
- 4.85 Where a Bidder uses a Primary Bid Round Extension in relation to a Primary Bid Round, Ofcom will inform the remaining Bidders:
- that the Primary Bid Round has been extended; and
 - when the extended Primary Bid Round has concluded.
- 4.86 Where, in relation to a Primary Bid Round, circumstances prevent a number of Bidders from accessing or using the Electronic Auction System to submit Primary Bid Forms, Ofcom may notify all Bidders that it has decided to re-schedule or re-run that Primary Bid Round.

Making Primary Bids

- 4.87 A Bidder must complete and submit a Primary Bid Form to Ofcom to make a Primary Bid. It must specify the Lot or Lots it wishes to include in a Licence at the prevailing Round Price for the relevant Lot or Lots.
- 4.88 A Bidder cannot submit more than one Primary Bid in any Primary Bid Round. A Primary Bid for Unpaired Lots must include at least two such Lots.
- 4.89 A Bidder that does not submit a Valid Primary Bid (described in paragraphs 4.93 to 4.95 below) in the first Primary Bid Round will be excluded from the Award Process and will not receive a refund of its Bid Deposit. In subsequent Primary Bid Rounds, if

a Bidder does not submit a Valid Primary Bid that Bidder's Eligibility Limit for subsequent Primary Bid Rounds will be zero.

- 4.90 Each Bid must specify the total amount in thousands of whole pounds that a Bidder is willing to pay for a Licence for the Lots it has selected. This amount must be equal to the total of the prevailing Round Prices for the selected Lots.
- 4.91 In relation to each Primary Bid Round, except as provided for in paragraph 4.96, each Bidder must submit its Primary Bid Form via the Electronic Auction System. The Electronic Auction System will allow each Bidder to select the Lots in each Band that it wishes to include in a Primary Bid Form using list boxes. Once a Bidder has completed a Primary Bid Form, it must input the form for checking by the Electronic Auction System. The Electronic Auction System will not allow a Bidder to submit a Primary Bid which exceeds that Bidder's Eligibility Limit for that Primary Bid Round. The Electronic Auction System will also alert a Bidder if its Primary Bid will result in that Bidder having a lower Eligibility Limit in any subsequent Primary Bid Round. Once a Bidder's Primary Bid Form has been checked by the Electronic Auction System, that Bidder may either revise its Primary Bid Form (in which case the Bidder would need to input the form for checking by the Electronic Auction System once again) or formally submit the Primary Bid Form.
- 4.92 Primary Bid Forms must be received by Ofcom by the date and time specified, subject to the rules on extensions described above in paragraphs 4.83-4.86.

Valid Primary Bids

- 4.93 Only Valid Primary Bids will be taken into consideration for determining whether the conditions set out in Regulation 21(2) of the Regulations (as described in paragraph 4.68) are met, the Winning Combination of Principal Stage Bids as described in paragraph 4.149 and the Base Price payable by a Winning Bidder as described in paragraph 4.151. A "**Valid Primary Bid**" is a Primary Bid by a Bidder that:
- is completed and submitted in the manner described in paragraphs 4.87, 4.88 and 4.90-4.92; and
 - does not result in that Bidder's Eligibility Limit being exceeded in accordance with paragraphs 4.77-4.82.

At the end of each Primary Bid Round, Ofcom will notify a Bidder who submits a Primary Bid that is not a Valid Primary Bid during that Primary Bid Round and will give reasons why the Primary Bid is not a Valid Primary Bid.

- 4.94 At the end of each Primary Bid Round and before the start of the next Primary Bid Round (or the Supplementary Bids Round if there are no more Primary Bid Rounds), Ofcom will notify Bidders of the total number of (a) selections of the 2010 – 2025 MHz Lot; (b) Paired Lots; and (c) Unpaired Lots included in Valid Primary Bids.
- 4.95 Ofcom may, from time to time, publish on the Ofcom Website the total number of (a) selections of the 2010 – 2025 MHz Lot; (b) Paired Lots; and (c) Unpaired Lots included in Valid Primary Bids submitted in the most recently completed Primary Bid Round.

Submission of Primary Bids in exceptional circumstances

- 4.96 Where a Bidder is unable to submit a Primary Bid Form using the Electronic Auction System because of technical failure (or an event or circumstance with similar effect on that Bidder's ability to use the Electronic Auction System), it may seek Ofcom's permission to submit the Primary Bid Form using an alternative method in respect of either a specific Primary Bid Round, all Primary Bid Rounds to be held on a Business Day or for a specified period of time. The Bidder may seek the permission before the start of a Primary Bid Round, during a Primary Bid Round or during a Primary Bid Round Extension. If Ofcom gives it permission, the Bidder must submit the Primary Bid Form to Ofcom using the prescribed alternative method and any Primary Bids submitted by that Bidder via the Electronic Auction system after Ofcom has granted permission to use the prescribed alternative method will not be accepted by Ofcom unless Ofcom agrees otherwise with the Bidder. In these circumstances, Primary Bid Forms must be received by Ofcom by the date and time specified, subject to the rules on extensions described above in paragraphs 4.83-4.86.
- 4.97 Any Primary Bid Form submitted using an alternative method must comply with any requirements relating to the authentication of communications made by means of the prescribed alternative method that are notified to that Bidder by Ofcom.
- 4.98 Regulation 34 of the Regulations sets out the process Ofcom will follow where, due to the manner of completion, a Primary Bid Form is incomplete or defective but Ofcom believes that it can ascertain the relevant Bidder's intention in relation to the making of the Primary Bid.

Additional deposit for Primary Bid Rounds

- 4.99 Where a Bidder submits a Primary Bid for an amount greater than twice the amount of that Bidder's Bid Deposit, Ofcom may subsequently, having regard to the desirability of securing an efficient outcome to the Principal Stage, give notice requiring the Bidder to increase its Bid Deposit by a specified deadline so that the Bid Deposit is at most half the amount of the highest Valid Primary Bid made by that Bidder before Ofcom gave notice to the Bidder.
- 4.100 If Ofcom issues a notice to a Bidder pursuant to paragraph 4.99 before 2pm on a Business Day, the deadline by when that Bidder must increase its Bid Deposit by paying an additional amount into Ofcom's bank account will be no earlier than 23.59 on the following Business Day (e.g. if a Bidder receives a notice from Ofcom at 1pm on Tuesday, the deadline for increasing its Bid Deposit will be no earlier than 23.59 on Wednesday). If Ofcom issues a notice to a Bidder after 2pm on a Business Day, the deadline by when that Bidder must increase its Bid Deposit will be no earlier than 23.59 on the next Business Day after the following Business Day (e.g. if a Bidder receives a notice from Ofcom at 3pm on Thursday, the deadline for increasing its Bid Deposit will be no earlier than 23.59 on Monday).
- 4.101 Where a Bidder does not comply with the provisions of paragraph 4.100, Ofcom will notify the Bidder and that Bidder's Eligibility Limit for any Primary Bid Rounds following notification that the Bidder has failed to comply with the provisions will be zero, thereby preventing that Bidder from being able to submit any further Primary Bids. The Bidder will, however, be able to participate in the Supplementary Bids Round provided that the Bidder complies with paragraphs 4.130 and 4.139.

Progress of Primary Bid Rounds

- 4.102 At the end of each Primary Bid Round, Ofcom will determine whether there is Excess Demand with respect to any or all of the 2010 MHz Band, Paired Lots and for the 2.6 GHz Band as a whole and the total number of selected Unpaired Lots is more than nine.
- 4.103 Where there is Excess Demand with respect to at least one of the 2010 MHz Band, the Paired Lots and the 2.6 GHz Band as a whole then, subject to paragraph 4.104, there will be another Primary Bid Round.
- 4.104 Ofcom can decide that there will be no further Primary Bid Rounds at the conclusion of any Primary Bid Round notwithstanding that Excess Demand exists as described in paragraphs 4.69 to 4.72 above, if Ofcom is satisfied that it is unlikely that the information that would be available to Bidders if there were any further Primary Bid Rounds would affect the determination of the Winning Combination of Principal Stage Bids and the Base Prices.
- 4.105 Where there are no more Primary Bid Rounds the Auction will proceed to the Supplementary Bids Round.
- 4.106 All Bidders that submitted a Valid Primary Bid in the first Primary Bid Round will be entitled to participate in the Supplementary Bids Round, provided they have not been excluded from the Award Process.

Supplementary Bids Round

- 4.107 Supplementary Bids, like Primary Bids, are Bids for a selection of Lots. This provides an opportunity for Bidders to bid for selections of Lots that they did not bid for in the Primary Bid Rounds or to raise their Primary Round Bids where this is possible. It also provides an opportunity for Bidders to make Bids for the same selections of Lots contingent on any Unpaired Lots being divided into two Divisions in specific configurations. All Valid Principal Stage Bids received from Bidders in both the Primary Bid Rounds and the "**Supplementary Bids Round**" are considered together to determine the Winning Bidders.
- 4.108 Bidders may submit:
- Basic Supplementary Bids; or
 - Additional Supplementary Bids.
- 4.109 A "**Basic Supplementary Bid**" is a Bid at an amount in thousands of whole pounds for either a Bid Selection containing only Paired Lots or a Bid Selection containing only Paired Lots and the 2010 – 2025 MHz Lot or a Bid Selection containing Unpaired Lots where that Bid is conditional on those Unpaired Lots being in one contiguous range. An "**Additional Supplemental Bid**" is a Bid at an amount in thousands of whole pounds for a Bid Selection containing Unpaired Lots where those Unpaired Lots are divided into two contiguous ranges of Unpaired Lots and one such range is in the Lower Area and the other such range is in the Upper Area, irrespective of whether or not the Bid includes Paired Lots or the 2010 – 2025 MHz Lot.
- 4.110 Ofcom will give each Bidder prior notice of:

- the date on which and the times on that date within which the Supplementary Bids Round will take place;
- the deadline by when Bidders must increase their Bid Deposits in accordance with paragraph 4.130; and
- if applicable, the proportion referred to in paragraph 4.130.

4.111 There will be at least one clear Business Day between the conclusion of the final Primary Bid Round and the start of the Supplementary Bids Round. Ofcom anticipates that the Supplementary Bids Round will take place between 10am and 5pm on a single Business Day and last for at least two hours but no more than seven hours.

Making Basic Supplementary Bids

4.112 A Bidder is not required to submit a Basic Supplementary Bid. If it wishes to, it must do so on a Supplementary Bids Form and specify the total number of Paired Lots and Unpaired Lots in the 2.6 GHz Band it wishes to include in a Licence and whether it also wishes to include the 2010-2025 MHz Lot in that Licence. It must also specify the amount in thousands of whole pounds that it is willing to pay for the Licence.

4.113 A Basic Supplementary Bid for Unpaired Lots must include at least two Unpaired Lots.

4.114 Bidders may make Basic Supplementary Bids for Bid Selections that are the same as or different from the Bid Selections comprised in their Primary Bids.

4.115 Bidders must choose the amount of any Basic Supplementary Bids they make (unlike in the Primary Bid Rounds, where Ofcom sets the Round Prices) in accordance with paragraphs 4.116 to 4.119 below.

4.116 The amount of a Basic Supplementary Bid must not be less than the total amount of the Round Prices in the first Primary Bid Round for the Lots included in the Bid Selection specified in that Bid.

4.117 Where the Basic Supplementary Bid is for a Bid Selection in respect of which the Bidder has also made a Primary Round Bid, the amount of the Basic Supplementary Bid must be greater than the amount of the highest Primary Round Bid made by the Bidder for that Bid Selection.

4.118 Where a Bidder did not make a Valid Primary Bid in the final Primary Bid Round, or the total number of Eligibility Points associated with the Basic Supplementary Bid is greater than the total number of Eligibility Points associated with the Bidder's Valid Primary Bid made in the final Primary Bid Round, the amount of the Basic Supplementary Bid must not be greater than the total amount of the Round Prices for the Lots included in the Bid Selection specified in the Basic Supplementary Bid in the latest Primary Bid Round in which the Bidder had a sufficient Eligibility Limit to bid for that Bid Selection (see paragraphs 4.77 to 4.82 above for an explanation of how Eligibility Limits are determined).

4.119 The amount which a Bidder can bid in a Basic Supplementary Bid will not be limited where the Bidder made a Valid Primary Bid in the final Primary Bid Round and the total number of Eligibility Points associated with the selection of Lots comprised in the Basic Supplementary Bid is equal to or less than the total number of Eligibility Points

associated with the Bidder's Valid Primary Bid made in the final Primary Bid Round. For example, if a Bidder in the final Primary Bid Round makes a Valid Primary Bid that has 12 Eligibility Points associated with it, that Bidder may make an unlimited Basic Supplementary Bid provided that the Basic Supplementary Bid does not have more than 12 Eligibility Points associated with it (on the basis of the Lots included in the Bid). If the same Bidder makes a Basic Supplementary Bid that has 13 Eligibility Points associated with it (i.e. more than 12), the value of that Basic Supplementary Bid must not exceed the total amount it could have bid in the Primary Bid Round in which it last had sufficient Eligibility Points to make a Primary Bid for a selection of Lots with 13 Eligibility Points associated with it. This also applies where a Bidder did not make a Valid Primary Bid in the final Primary Bid Round and makes a Basic Supplementary Bid that has 13 Eligibility Points associated with it.

- 4.120 Bidders may submit any number of Basic Supplementary Bids provided they do not submit more than one Basic Supplementary Bid for each particular Bid Selection.

Making Additional Supplementary Bids

- 4.121 Only a Bidder that has made either:

- a Valid Primary Bid for a Bid Selection including three or more Unpaired Lots; or
- a Valid Basic Supplementary Bid for a Bid Selection including three or more Unpaired Lots,

(each being an "**Eligible Bid**") may make an Additional Supplementary Bid.

- 4.122 A Bidder is not required to submit an Additional Supplementary Bid. If it wishes to, it must specify on a Supplementary Bids Form the total number of Paired Lots and Unpaired Lots in the 2.6 GHz Band it wishes to include in a Licence and whether it also wishes to include the 2010-2025 MHz Lot in that Licence. It must also specify the amount in thousands of whole pounds that it is willing to pay for the Licence and, in respect of the Unpaired Lots, that those Unpaired Lots are to be divided into two Divisions. Bidders must specify how the total number of Unpaired Lots contained in their Additional Supplementary Bid is to be split numerically between the two Divisions although each Division must contain at least two Unpaired Lots. Bidders may not however specify which Division is to be in the Lower Area and which in the Upper Area.

- 4.123 Each Additional Supplementary Bid made by a Bidder must be for a Bid Selection containing:

- the 2010-2025 MHz Lot (if the Eligible Bid made by that Bidder in accordance with paragraph 4.121 contained the 2010 – 2025 MHz Lot);
- the same number of Paired Lots as the Eligible Bid made by that Bidder in accordance with paragraph 4.121 ;
- one Unpaired Lot in addition to the number of Unpaired Lots in the Eligible Bid made by that Bidder in accordance with paragraph 4.127 (i.e. if there were four Unpaired Lots in an Eligible Bid made by a Bidder, each Additional Supplementary Bid made by the Bidder must be for a Bid Selection containing five Unpaired Lots).

- 4.124 By way of example, a Bidder that submitted an Eligible Bid containing seven Unpaired Lots could submit the following Additional Supplementary Bids:
- four Unpaired Lots in one Division and four Unpaired Lots in the other Division;
 - five Unpaired Lots in one Division and three Unpaired Lots in the other Division; and/or
 - six Unpaired Lots in one Division and two Unpaired Lots in the other Division.
- 4.125 Bidders must choose the amount of any Additional Supplementary Bids they make (unlike in the Primary Bid Rounds, where Ofcom sets the Round Prices) in accordance with paragraphs 4.126 to 4.128 below.
- 4.126 The amount of an Additional Supplementary Bid must not be less than the total amount of the Round Prices in the first Primary Bid Round for the Lots included in the Bid Selection specified in that Bid.
- 4.127 Where a Bidder has made a Valid Primary Bid that is an Eligible Bid and not a Valid Basic Supplementary Bid that is an Eligible Bid for the same Bid Selection and the Additional Supplementary Bid satisfies the conditions set out in 4.123 with respect to the Valid Primary Bid, the amount of the Additional Supplementary Bid must not be greater than the amount of the highest Valid Primary Bid made by that Bidder for that Bid Selection.
- 4.128 Where a Bidder has made a Valid Basic Supplementary Bid that is an Eligible Bid and the Additional Supplementary Bid satisfies the conditions set out in 4.123 with respect to the Valid Basic Supplementary Bid, the amount of the Additional Supplementary Bid must not be greater than the amount of that Valid Basic Supplementary Bid.
- 4.129 Bidders may submit any number of Additional Supplementary Bids provided that a Bidder may not submit more than one Additional Supplementary Bid for each particular selection and Division of Unpaired Lots meeting the requirements described in paragraph 4.123 above.

Increase to Bid Deposit in Supplementary Bids Round

- 4.130 By the deadline notified to Bidders by Ofcom in accordance with paragraph 4.110, , each Bidder must pay, an additional sum which, when added to the Bidder's Bid Deposit (less any sum forfeited) is not less than:
- where a Bidder has always satisfied the requirements with respect to further deposits during Primary Bid Rounds set out in paragraph 4.100 in respect of every notice it has received in accordance with paragraph 4.99, the greater of a proportion specified by Ofcom in the notice submitted to Bidders prior to the Supplementary Bids Round in accordance with paragraph 4.117 of that Bidder's highest Valid Primary Bid and the same proportion of its highest Valid Supplementary Bid, where that proportion shall be at most one half; and
 - where a Bidder has at least once failed to satisfy those requirements set out in paragraph 4.100 in respect of every notice it has received in accordance with paragraph 4.99, the greater of the amount of that Bidder's highest Valid Primary Bid and its highest Valid Supplementary Bid.

Any further sum payable by a Bidder in order to increase its Bid Deposit shall be paid into Ofcom's bank account in accordance with paragraph 4.216.

- 4.131 If a Bidder does not pay this further deposit, Ofcom will notify the Bidder and that Bidder will be excluded from the Award Process. In addition, Ofcom will not refund that Bidder's Deposit, which will be forfeited and all of that Bidder's Primary Bids and Supplementary Bids (if any) will be deemed invalid and will not be taken into consideration for the purposes of determining the Winning Combination of Principal Stage Bids and the Base Price payable by a Winning Bidder.

Use of Electronic Auction System in the Supplementary Bids Round

- 4.132 Each Bidder must submit its Supplementary Bids Form via the Electronic Auction System and this must be received by Ofcom by the date and time notified to them in accordance with paragraph 4.110, except as provided for in paragraph 4.136.
- 4.133 The Electronic Auction System includes a tool that allows each Bidder to maintain and revise a list of provisional Supplementary Bids throughout the Primary and Supplementary Bid Rounds. This tool also provides information about all Primary Bids submitted by that Bidder and the constraints on any Supplementary Bids the Bidder may make which derive from these Primary Bids. Bidders should note that this tool is provided for their convenience and that no provisional Supplementary Bids entered into the Electronic Auction System will be visible to Ofcom or to any other Bidder.
- 4.134 Any provisional Supplementary Bids entered into the Electronic Auction System by a Bidder, together with all Primary Bids submitted by that Bidder in the Primary Bid Rounds, will be made available to the Bidder on the Electronic Auction System as a starting point for compiling a list of Supplementary Bids. A Bidder may add, revise or delete Supplementary Bids from this list. The Electronic Auction System will provide each Bidder with details of any constraints, deriving from its Primary Round Bids, on the maximum amount of Supplementary Bids it may submit for particular combinations of Lots.
- 4.135 Once a Bidder has finalised its list of Supplementary Bids and included them on a Supplementary Bids Form it must enter the form for checking by the Electronic Auction System. The Electronic Auction System will reject the entire Supplementary Bids Form if any of the Supplementary Bids comprised in the Supplementary Bids Form are not Valid Supplementary Bids, as described in paragraph 4.139. In this case a Bidder will be able to revise its Supplementary Bids Form and re-enter it for checking again. Once a Bidder's Supplementary Bids Form has been checked by the Electronic Auction System and has been confirmed by the Electronic Auction System as Valid Supplementary Bids, that Bidder may either revise its Supplementary Bids Form (in which case the Bidder would need to input the form for checking by the Electronic Auction System once again) or formally submit the Supplementary Bids Form.

Submission of Supplementary Bids in exceptional circumstances

- 4.136 Where a Bidder is unable to submit a Supplementary Bids Form using the Electronic Auction System because of a technical failure (or an event or circumstance with similar effect on the Bidder's ability to use the Electronic Auction System), it may seek Ofcom's permission to submit the Supplementary Bids Form using an alternative method. If Ofcom gives it permission, the Bidder must submit the Supplementary Bids Form to Ofcom using the prescribed alternative method and any

Supplementary Bids submitted by that Bidder via the Electronic Auction System will not be accepted by Ofcom unless Ofcom agrees otherwise with the Bidder. Any Supplementary Bids Form submitted using an alternative method must comply with any requirements relating to the authentication of communications made by means of the prescribed alternative method that are notified to that Bidder by Ofcom.

Extension to Supplementary Bids Round

- 4.137 If a Bidder fails to submit a completed Supplementary Bids Form to Ofcom as described in paragraph 4.132 and Ofcom is satisfied that this was due to circumstances beyond the Bidder's control that Bidder will have a further sixty minutes in which to submit its completed Supplementary Bids Form to Ofcom.
- 4.138 Regulation 42 of the Regulations sets out the process Ofcom will follow where, due to the manner of completion, a Supplementary Bids Form is incomplete or defective but Ofcom considers it can ascertain the relevant Bidder's intention in relation to the making of the Supplementary Bid or Bids.

Valid Supplementary Bids

- 4.139 Only Valid Basic Supplementary Bids will be taken into consideration for determining the Winning Combination of Principal Stage Bids as described in paragraph 4.149 and the Base Price payable by a Winning Bidder as described in paragraph 4.151. A Valid Basic Supplementary Bid is a Basic Supplementary Bid that:
- i) is completed and submitted in the manner described in paragraphs 4.112, 4.114, 4.115 and 4.132;
 - ii) is for an amount that complies with the requirement described in paragraph 4.116 to 4.119; and
 - iii) complies with paragraphs 4.113 and 4.120.
- 4.140 Only Valid Additional Supplementary Bids will be taken into consideration for determining the Winning Combination of Principal Stage Bids as described in paragraph 4.149 and the Base Price payable by a Winning Bidder as described in paragraph 4.151. A Valid Additional Supplementary Bid is an Additional Supplementary Bid that:
- is completed and submitted in the manner described in paragraphs 4.112 and 4.132;
 - is for an amount that complies with the restrictions set out in paragraph 4.126 to 4.128; and
 - complies with the restrictions described in paragraph 4.129 and with the requirements set out in paragraph 4.123.
- 4.141 Ofcom will notify a Bidder who submits a Supplementary Bid that is not a Valid Supplementary Bid and will give reasons why it is invalid.

Illustration of submitting a Valid Supplementary Bid

- 4.142 The following example shows how the Primary Bids made by a Bidder dictate the Supplementary Bids it can make. The information contained in this example is provided for illustrative purposes only.

- 4.143 Suppose that in Primary Bid Round 8, the Round Price per Unpaired Lot was £150,000, the Round Price per Paired Lot was £300,000, and the Round Price for the 2010-2025 MHz Lot was £250,000. Suppose that a Bidder submitted a Primary Bid comprising a Bid Selection of six Unpaired Lots and two Paired Lots. Thus, the total Eligibility Points associated with that Bidder's Primary Bid in Bid Round 8 was 9.
- 4.144 Now suppose that in Primary Bid Round 9, the Round Price per Unpaired Lot is increased to £160,000, the Round Price per Paired Lot is increased to £320,000 but the Round Price for the 2010-2025 MHz Lot remains unchanged at £250,000. Then consider two cases according to the Primary Bids made from Primary Bid Round 9 onwards:
- i) The Bidder continues to bid on six Unpaired Lots and two Paired Lots until the end of the Primary Bid Rounds;
 - ii) The Bidder reduces its demand to four Unpaired Lots and two Paired Lots in Primary Bid Round 9.
- 4.145 In the first case, the number of Eligibility Points associated with the Bidder's Primary Bids in each Primary Bid Round stays at nine, so there is no limit on the amount of a Basic Supplementary Bid that the Bidder could make for packages of Lots with associated Eligibility Points less than or equal to nine points.
- 4.146 In the second case, the number of Eligibility Points associated with the Bidder's Primary Bids declined from nine points to seven points in Primary Bid Round 9, so the Bidder's Eligibility Limit from Round 10 onwards was reduced to seven Eligibility Points. Any Basic Supplementary Bids comprising Bid Selections with aggregate Eligibility Points of nine or eight would be capped according to the Round Prices in Primary Bid Round 9, as this is the last Primary Bid Round when the Bidder was eligible to submit Bid Selections with these Eligibility Limits. For example, the Bidder could submit Basic Supplementary Bids for packages such as:
- Ten Unpaired Lots at a price not exceeding £1,600,000 (10 x £160,000);
 - Four Unpaired Lots, two Paired Lots and the 2010-2025 MHz Lot at a price not exceeding £1,530,000 (4 x £160,000 + 2 x £320,000 + £250,000);
 - Nine Unpaired Lots at a price not exceeding £1,440,000 (9 x £160,000); and
 - Eight Unpaired Lots and the 2010-2025 MHz Lot at a price not exceeding £1,530,000 (8 x £160,000 + £250,000).

Determining the Winning Principal Stage Bids and the Winning Combination of Principal Stage Bids

- 4.147 Following the end of the Supplementary Bids Round, Ofcom will determine the Winning Principal Stage Bids and the identity of the Winning Bidders.
- 4.148 The Winning Principal Stage Bids will be the Valid Principal Stage Bids that comprise the Winning Combination of Principal Stage Bids.
- 4.149 The Winning Combination of Principal Stage Bids will be the Valid Combination of Principal Stage Bids having the highest total value of amounts bid. A "**Valid Combination of Principal Stage Bids**" is any combination of Valid Principal Stage Bids within which:

- a) there is at most one Valid Principal Stage Bid from any one Bidder;
- b) the 2010-2025 MHz Lot is included in at most one of the Bids;
- c) subject to subparagraphs (d) and (e), in respect of the 2.6 GHz Band, Ofcom could assign:
 - a contiguous range of Paired Lots to a Bidder equal to the number of Paired Lots which that Bidder has selected; and
 - a contiguous range of Unpaired Lots to a Bidder equal to the number of Unpaired Lots which that Bidder has selected,

such that Lot Number 24 is not assigned and each other Lot is assigned no more than once;

- d) where a combination of Valid Principal Stage Bids includes at least one Additional Supplementary Bid, Ofcom could assign:
 - in respect of each Valid Principal Stage Bid containing Paired Lot, a contiguous range of Paired Lots to a Bidder equal to the number of Paired Lots which that Bidder has selected;
 - in respect of each Valid Principal Stage Bid containing Unpaired Lots, that is not an Additional Supplementary Bid, a contiguous range of Unpaired Lots to that Bidder equal to the number of Unpaired Lots which that Bidder has selected; and
 - in respect of each Valid Principal Stage Bid containing Unpaired Lots, that is an Additional Supplementary Bid, two contiguous ranges of Unpaired Lots to that Bidder where:
 - the number of Unpaired Lots within one range corresponds to the number of Unpaired Lots within one of the Divisions which that Bidder has specified; and
 - the number of Unpaired Lots within the other range corresponds to the number of Unpaired Lots within the other Division which that Bidder has specified,

such that Lot Number 24 is not assigned and each other Lot is assigned no more than once;

- e) where a combination of Valid Principal Stage Bids includes no Bids for Paired Lots, Ofcom could assign contiguous ranges of Unpaired Lots in respect of each Valid Principal Stage Bid such that there is no overlap between those ranges.

4.150 If there is more than one Valid combination of Principal Stage Bids for which the total value is equal highest, the Winning Combination of Principal Stage Bids will be that Valid Combination of Principal Stage Bids which has the highest total number of Eligibility Points associated with it. If there is more than one Valid Combination of Principal Stage Bids for which the total value is equal highest and the associated number of Eligibility Points is equal highest, the Winning Combination of Principal Stage Bids will be that Valid Combination of Principal Stage Bids which includes the lowest number of Additional Supplementary Bids. If there is more than one such Valid Combination of Principal Stage Bids (equal highest total value, equal highest total

number of Eligibility Points and equal lowest number of Additional Supplementary Bids), Ofcom will determine the Winning Combination of Principal Stage Bids by employing a method of random selection from among those combinations.

Determination of Base Price of Winning Principal Stage Bids

4.151 Ofcom will determine an amount payable by each Winning Bidder in respect of that Winning Bidder's Winning Principal Stage Bid (a "**Base Price**") according to a second price rule. The key features of the rule for this award are that:

- the Base Price for a Winning Principal Stage Bid will be no greater than the amount of the Winning Principal Stage Bid;
- the Base Price for a Winning Principal Stage Bid will be no less than the total of the First Round Prices for the Lots comprised in the Winning Principal Stage Bid;
- the total amount of the Base Prices for all Winning Principal Stage Bids will be minimised;
- no losing Bidder or combination of Bidders (including combinations of losing and winning Bidders), on the basis of their Bids, would be prepared to pay more than the Base Prices; and
- where there is more than one set of prices that satisfy the foregoing conditions, the Base Prices will be those prices with an opportunity cost variance lower than any other such prices.

Schedule 8 of the Regulations sets out in detail how Ofcom will determine the Base Prices.

Notification of results of Principal Stage and refund of deposits

4.152 Once Ofcom has determined the Winning Principal Stage Bids, the Winning Combination of Principal Stage Bids and the Base Price for each Winning Principal Stage Bid, Ofcom will:

- notify each Winning Bidder of:
 - the Bid Selection included in their Winning Principal Stage Bid and the Base Price for that Winning Principal Stage Bid;
 - the further sum (if any) that it is required to pay to increase its Bid Deposit, as set out in paragraphs 4.153 to 4.154 below;
- notify all other Bidders that they have not made a Winning Principal Stage Bid; and
- refund Deposits (less any sum forfeited and excluding any interest which has accrued on the Deposits) to Applicants which were not qualified or which withdrew prior to the Last Day for Withdrawal and to Bidders that are not Winning Bidders.

Final Increase to Bid Deposit in Principal Stage

- 4.153 Each Winning Bidder must pay into Ofcom's bank account by a deadline notified by Ofcom a further amount (the "**Final Principal Stage Deposit**") that results in the Winning Bidder's total Bid Deposit being not less than the amount of that Winning Bidder's Base Price. Ofcom will give at least three Business Days notice of this deadline.
- 4.154 If a Bidder fails to make this further payment, Ofcom will notify the Bidder and the Bidder will be excluded from the Award Process and will not receive a refund of its Initial Deposit or any sum paid as a Bid Deposit, which shall be forfeited.

Publication of results of Principal Stage

- 4.155 After the deadline for payment of the Final Principal Stage Deposit set out in paragraph 4.153, Ofcom will publish on the Ofcom Website:
- the name of each Winning Bidder that has complied with the deposit requirements in paragraph 4.153;
 - in respect of each of those Winning Bidders:
 - the Bid Selection or Bid Selection and Division of Unpaired Lots (as the case may be) comprised in its Winning Principal Stage Bid; and
 - the Base Price for its Winning Principal Stage Bid;
 - the name of each Winning Bidder that has not complied with the deposit requirements in paragraph 4.153 and has been excluded from the Award Process in accordance with paragraph 4.154;
 - in respect of each of those Winning Bidders:
 - the Bid Selection or Bid Selection and Division of Unpaired Lots (as the case may be) comprised in the Bid which would have constituted its Winning Principal Stage Bid; and
 - the Base Price for what would have applied to its Winning Principal Stage Bid.

Assignment Stage

- 4.156 The purpose of the Assignment Stage is to determine how the available frequencies in the 2.6 GHz Band are distributed among the Winning Bidders from the Principal Stage, and the final price to be paid by each Winning Bidder for those frequencies. The Principal Stage will have already determined the amount and type (i.e. Paired Lots or Unpaired Lots) of spectrum Winning Bidders will receive in the 2.6 GHz Band, but not the specific frequencies within that Band. As there is only one Lot in the 2010 MHz Band, Ofcom will assign the frequencies between 2010 MHz and 2025 MHz to the Winning Bidder that submitted the Winning Principal Stage Bid for that Lot.
- 4.157 The exact procedure for assigning frequencies in the 2.6 GHz Band will vary depending on whether one or more Winning Principal Stage Bids include Paired Lots or Unpaired Lots.

Where a single Winning Principal Stage Bid includes Paired Lots or Unpaired Lots

- 4.158 For the 2.6 GHz Band, where Paired Lots were selected in only one Winning Principal Stage Bid, Ofcom will assign to the Bidder that submitted the Winning Principal Stage Bid a contiguous range of Paired Lots such that:
- the number of Paired Lots contained within that range is equal to the number of Paired Lots selected in that Winning Principal Stage Bid; and
 - Lot Number one is contained within that range.
- 4.159 Subject to paragraph 4.160, where Unpaired Lots were selected in only one Winning Principal Stage Bid, Ofcom will assign to the Bidder a contiguous range of Unpaired Lots in the Lower Area such that:
- the number of Unpaired Lots contained within that range is equal to the number of Unpaired Lots which the Bidder selected; and
 - Lot Number twenty-three is contained within that range.
- 4.160 Where:
- Unpaired Lots were selected in only one Winning Principal Stage Bid; and
 - that Winning Principal Stage Bid was an Additional Supplementary Bid,
- Ofcom will assign to the Bidder two contiguous ranges of Unpaired Lots such that:
- one contiguous range of Unpaired Lots is assigned in the Lower Area such that:
 - the number of Unpaired Lots within that range is equal to the number of Unpaired Lots in the Division containing the larger number of Unpaired Lots which the Bidder specified; and
 - Lot Number twenty-three is contained within that range; and
 - one contiguous range of Unpaired Lots is assigned in the Upper Area such that:
 - the number of Unpaired Lots within that range is equal to the number of Unpaired Lots in the Division containing the smaller number of Unpaired Lots which the Bidder specified; and
 - Lot Number thirty-eight is contained within that range.

Assignment Stage Round procedure for the 2.6 GHz Band where more than one Winning Principal Stage Bid includes Paired Lots or Unpaired Lots

- 4.161 If more than one Winning Principal Stage Bid includes Paired Lots or Unpaired Lots, the Auction will proceed to the Assignment Stage Round to determine which frequencies will be assigned to each Winning Bidder.
- 4.162 Where the Assignment Stage Round relates to Paired Lots, only Bidders that submitted a Winning Principal Stage Bid which included Paired Lots can participate in that part of the Assignment Stage Round. Similarly, where the Assignment Stage

Round relates to Unpaired Lots, only Bidders that submitted a Winning Principal Stage Bid which included Unpaired Lots can participate in that part of the Assignment Stage Round. Those Winning Bidders may only submit a Bid in the Assignment Stage Round (an "**Assignment Bid**"):

- in the case of Paired Lots, for the contiguous range of Paired Lots;
- in the case of Unpaired Lots where the Winning Principal Stage Bid was not an Additional Supplementary Bid, for the contiguous range of Unpaired Lots; and
- in the case of Unpaired Lots where the Winning Principal Stage Bid was an Additional Supplementary Bid, for the combination of two contiguous ranges of Unpaired Lots where one range is in the Lower Area and the other range is in the Upper Area,

that Ofcom determines are available to the Winning Bidder in accordance with paragraph 4.164 (the "**Assignment Stage Options**"). A Bidder cannot submit more than one Assignment Stage Bid for each of the Assignment Stage Options so determined by Ofcom.

4.163 Bidders are not required to submit an Assignment Stage Bid for an Assignment Stage Option. A Bidder which wishes to make an Assignment Stage Bid for an Assignment Stage Option must do so on the Assignment Stage Bid Form and specify an amount in whole pounds that it is willing to pay for a Licence that includes:

- the contiguous range of Unpaired Lots;
- the combination of two contiguous ranges of Unpaired Lots; or
- the contiguous range of Paired Lots (as the case may be),

in addition to the Base Price for that Bidder's Winning Principal Stage Bid.

4.164 In Ofcom's determination of the Assignment Stage Options that are available to a Bidder in the Assignment Stage Round, the following conditions must be satisfied:

4.164.1 in respect of Paired Lots, the Assignment Stage Options shall be the contiguous ranges of Paired Lots which satisfy the following conditions:

- a) the number of Paired Lots contained in that contiguous range of Paired Lots is the same as the number of Paired Lots included in that Bidder's Winning Principal Stage Bid; and
- b) the lowest Lot of a Paired Lot included in that range is such that the following conditions could be satisfied:
 - each Winning Bidder that included Paired Lots in its Winning Principal Stage Bid is assigned a contiguous range of Paired Lots that, in respect of that Bidder's Winning Principal Stage Bid, satisfies the condition in paragraph (a) above;
 - there is no overlap between the frequencies assigned;
 - the combination of all of the contiguous ranges of Paired Lots assigned is a single contiguous range of Paired Lots; and

- Lot Number one is included in that contiguous range of Paired Lots.
- 4.164.2 in respect of Unpaired Lots, the Assignment Stage Options that are available shall be the contiguous ranges, or combinations of two contiguous ranges of Unpaired Lots (as the case may be) that satisfy the following conditions:
- a) where the Bidder's Winning Principal Stage Bid was not an Additional Supplementary Bid, the contiguous ranges of Unpaired Lots shall be such that the number of Unpaired Lots contained in each such contiguous range is the same as the number of Unpaired Lots included in the Bidder's Winning Principal Stage Bid;
 - b) where the Bidder's Winning Principal Stage Bid was an Additional Supplementary Bid, the combinations of two contiguous ranges of Unpaired Lots shall be such that:
 - the number of Unpaired Lots contained in one of those contiguous ranges is the same as the number of Unpaired Lots within one of the two Divisions specified in that Bidder's Winning Principal Stage Bid; and
 - the number of Unpaired Lots contained in the other of those contiguous ranges of Unpaired Lots is the same as the number of Unpaired Lots within the other of the two Divisions specified in that Bidder's Winning Principal Stage Bid;
 - c) the lowest Unpaired Lot included in each contiguous range of Unpaired Lots is such that the following conditions could be satisfied:
 - each Winning Bidder that included Unpaired Lots in its Winning Principal Stage Bid is assigned a contiguous range of Unpaired Lots, or in the case of a Winning Principal Stage Bid that was an Additional Supplementary Bid, a combination of two contiguous ranges of Unpaired Lots that, in respect of that Bidder's Winning Principal Stage Bid, satisfies the condition set out in paragraph (a) or the conditions set out in paragraph (b), as the case may be;
 - there is no overlap between the frequencies assigned;
 - the combination of all contiguous ranges of Unpaired Lots assigned in the Lower Area (if any) is a contiguous range of Unpaired Lots which includes Lot Number 23 and all Lot Numbers less than Lot Number 23 but does not include Lot X (or any Lot Numbers less than Lot X), where X is equal to the total number of Paired Lots selected in Winning Principal Stage Bids;
 - the combination of all contiguous ranges of Unpaired Lots assigned in the Upper Area (if any) is a contiguous range of Unpaired Lots which includes Lot Number 38 and all Lot Numbers less than Lot Number 38 but does not include Lot Y (or any Lot Numbers less than Lot Y), where Y is equal to the sum of 24 and the total number of Paired Lots selected in Winning Principal Stage Bids;
 - d) where no Valid Principal Stage Bids contained Paired Lots:

- all Unpaired Lots awarded are awarded in one contiguous range of Unpaired Lots;
- each Winning Bidder is awarded a contiguous range of Unpaired Lots; and
- there is no overlap between the contiguous ranges of Unpaired Lots awarded to Winning Bidders.

Scheduling the Assignment Bid Round

4.165 Ofcom will notify each relevant Winning Bidder that is entitled to make an Assignment Stage Bid of the Assignment Stage Options that are available to that Bidder and the date on which and the times on that date within which the Assignment Stage Round will take place. There will be at least one clear Business Day between the conclusion of the Supplementary Bids Round and the start of the Assignment Stage Round. Ofcom anticipates that the Assignment Stage Round will take place between 10am and 5pm on a single Business Day and last for at least two hours but no more than seven hours.

Increase to Bid Deposit at Assignment Stage

- 4.166 Each Winning Bidder that makes an Assignment Stage Bid must, by the deadline specified by Ofcom, increase its Bid Deposit. The additional amount must, when added to that Winning Bidder's existing Bid Deposit (less any sum forfeited) be not less than the amount calculated in accordance with the formula set out in Regulation 55 of the Regulations.
- 4.167 If a Winning Bidder fails to comply with paragraph 4.166 all of that Winning Bidder's Assignment Stage Bids will be invalid and for the purpose of determining the Winning Combination of Assignment Stage Bids and the Additional Price (described in paragraph 4.185) payable by a Winning Bidder that Winning Bidder will be deemed to have made Assignment Stage Bids of zero for each Assignment Stage Option available to the Bidder for that purpose.

Making Assignment Stage Bids

- 4.168 A Winning Bidder which is entitled to submit an Assignment Stage Bid and decides to submit such a Bid should note that there is no restriction on the minimum or maximum amount that may be Bid.
- 4.169 If a Winning Bidder submits a completed Assignment Stage Bid Form to Ofcom it must, except as provided for in paragraph 4.172, do so via the Electronic Auction System. Once a Winning Bidder's Assignment Stage Bid Form has been checked by the Electronic Auction System, that Bidder may either revise its Assignment Stage Bid Form (in which case the Winning Bidder would need to input the form for checking by the Electronic Auction System once again) or formally submit the Assignment Stage Bid Form.

Valid Assignment Stage Bids

- 4.170 An Assignment Stage Bid will only be taken into consideration for the purposes of determining the Winning Combination of Assignment Stage Bids and the Additional Price payable by a Winning Bidder if it is a Valid Assignment Stage Bid.

- 4.171 A Valid Assignment Stage Bid is a Bid submitted in accordance with the restrictions set out in paragraphs 4.162, which is made on an Assignment Stage Bid Form that has been completed in accordance with paragraph 4.163 and submitted to Ofcom in accordance with paragraph 4.169 and is received by Ofcom by the end of the Assignment Stage Round (as notified by Ofcom in accordance with paragraph 4.165) (the "**Assignment Stage Bid Deadline**").

Submission of Assignment Stage Bids in exceptional circumstances

- 4.172 Where a Winning Bidder is unable to submit an Assignment Stage Bid Form using the Electronic Auction System because of a technical failure (or an event or circumstance with similar effect on the Winning Bidder's ability to use the Electronic Auction System), it may seek Ofcom's permission to submit the Assignment Stage Bid Form using an alternative method. If Ofcom gives it permission, the Winning Bidder must submit the Assignment Stage Bid Form to Ofcom using the prescribed alternative method and any Assignment Stage Bids submitted by that Winning Bidder via the Electronic Auction System will not be accepted by Ofcom unless Ofcom agrees otherwise with the Winning Bidder. Any Assignment Stage Bid Form submitted by a Winning Bidder using an alternative method must comply with any requirements relating to the authentication of communications made by means of the prescribed alternative method that are notified to the Winning Bidder by Ofcom.
- 4.173 Regulation 61 of the Regulations sets out the process Ofcom will follow where, due to the manner of completion, an Assignment Stage Bid Form is incomplete or defective but Ofcom considers that it can ascertain the relevant Bidder's intention in relation to the making of the Assignment Stage Bid.

Extension to Assignment Bid Round

- 4.174 If Ofcom has not received a completed Assignment Stage Bid Form from a Winning Bidder by the deadline notified to Winning Bidders in accordance with paragraph 4.165 and Ofcom is satisfied that this was due to circumstances beyond the Bidder's control so that the Bidder could not submit the Assignment Stage Bid Form so that it was received by the specified deadline, that Winning Bidder will have a further thirty minutes after the Assignment Stage Bid Deadline to submit a completed Assignment Stage Bid Form to Ofcom.

Notification that Assignment Stage Bid is not valid

- 4.175 Where a Bidder submits an Assignment Stage Bid that is not a Valid Assignment Stage Bid, Ofcom will, after the end of the Assignment Stage Round, notify the Bidder of that fact and will give the reasons why the Bid is not a Valid Assignment Stage Bid.

Procedure where there is no Valid Assignment Stage Bid

- 4.176 In respect of each Assignment Stage Option available to a Bidder, where the Bidder does not make a Valid Assignment Stage Bid for that option, it will be deemed to have made a Valid Assignment Stage Bid of zero for that option for the purposes of determining:
- the Winning Combination of Assignment Stage Bids in accordance with paragraph 4.180;

- the Additional Price payable by a Winning Bidder in accordance with paragraph 4.185.

Determination of Winning Assignment Stage Bids

- 4.177 Ofcom will determine separately the Winning Assignment Stage Bids for Paired Lots and Unpaired Lots, in accordance with paragraphs 4.178 to 4.180
- 4.178 In respect of Paired Lots, the Winning Assignment Stage Bids will be those Valid Assignment Stage Bids with respect to Paired Lots that comprise the Winning Combination of Assignment Stage Bids.
- 4.179 In respect of Unpaired Lots, the Winning Assignment Stage Bids will be those Valid Assignment Stage Bids with respect to Unpaired Lots that comprise the Winning Combination of Assignment Stage Bids.
- 4.180 Subject to paragraph 4.182, the Winning Combination of Assignment Stage Bids will be the Valid Combination of Assignment Stage Bids having the highest total value of amounts bid.
- 4.181 For Paired Lots and Unpaired Lots respectively, a Valid Combination of Assignment Stage Bids is any combination of Valid Assignment Stage Bids with respect to Paired Lots and Unpaired Lots respectively within which:
- there is one Valid Assignment Stage Bid from each Winning Bidder that specified Paired Lots or Unpaired Lots or both Paired Lots and Unpaired Lots in its Winning Principal Stage Bid;
 - there is no overlap between the contiguous ranges of Unpaired Lots or Paired Lots comprised in those Valid Assignment Stage Bids;
 - in the case of Paired Lots:
 - the combination of all of the contiguous ranges of Paired Lots comprised in those Valid Assignment Stage Bids is a contiguous range of Paired Lots; and
 - that contiguous range of Paired Lots includes Lot Number one;
 - in the case of Unpaired Lots where at least one Winning Principal Stage Bid contains Paired Lots:
 - the combination of all contiguous ranges of Unpaired Lots in the Lower Area comprised in those Valid Assignment Stage Bids (if any) is a contiguous range of Unpaired Lots which includes Lot Number 23 and all Lot Numbers less than Lot Number 23 but does not include Lot X (or any Lot Numbers less than Lot X), where X is equal to the number of Paired Lots selected in Winning Principal Stage Bids;
 - the combination of all contiguous ranges of Unpaired Lots in the Upper Area comprised in those Valid Assignment Stage Bids (if any) is a contiguous range of Unpaired Lots which includes Lot Number 38 and all Lot Numbers less than Lot Number 38 but does not include Lot Y (or any Lot Numbers less than Lot Y), where Y is equal to the sum of 24 and the total number of Paired Lots selected in Winning Principal Stage Bids;

- in the case of Unpaired Lots where none of the Winning Principal Stage Bids contains Paired Lots:
 - all Unpaired Lots are assigned in one contiguous range of Unpaired Lots;
 - any Unpaired Lots which are not included in Valid Assignment Stage Bids themselves form a contiguous range of Unpaired Lots which will not be assigned to any Bidder.

4.182 Where there is more than one Valid Combination of Assignment Stage Bids for which the total value is highest, Ofcom will determine the Winning Combination of Assignment Stage Bids by employing a method of random selection from amongst those Valid Combinations of Assignment Stage Bids.

Assignment of Lot Number 24 and Lot Number 38 in specific circumstances

4.183 Where a Valid Combination of Assignment Stage Bids includes both Paired Lots and Unpaired Lots and Lot Number 23 is assigned as an Unpaired Lot, Lot Number 24 shall be added to the assignment of frequencies for the Winning Bid which includes Lot Number 23.

4.184 Where a Valid Combination of Assignment Stage Bids includes both Paired Lots and Unpaired Lots, Lot Number 13 and Lot Number 37 are assigned as a Paired Lot and Lot 14 is assigned as an Unpaired Lot, Lot Number 38 shall be added to the assignment of frequencies for the Winning Bid which includes Lot Number 37.

Determination of the Additional Price payable for a Winning Assignment Stage Bid

4.185 In respect of each Winning Assignment Stage Bid, Ofcom will determine an amount in whole pounds in accordance with Schedule 9 of the Regulations (the “**Additional Price**”) which will be payable by the relevant Winning Bidder. This amount will be calculated according to a second price rule and will be payable as part of the Winning Bidder's Licence Fee. The key features of the rule for the determination of this Additional Price are the same as those set out in paragraph 4.151 in relation to determination of the Base Price for a Winning Principal Stage Bid.

Notification of results of the Assignment Stage

4.186 Once Ofcom has determined the Winning Assignment Stage Bids, the Winning Combinations of Assignment Stage Bids, and the Additional Price for each Winning Assignment Stage Bid, Ofcom will notify each Winning Bidder of:

- the frequencies in respect of which the Winning Bidder made Winning Assignment Stage Bids; and
- the Additional Price for each Winning Assignment Stage Bid made by that Winning Bidder.

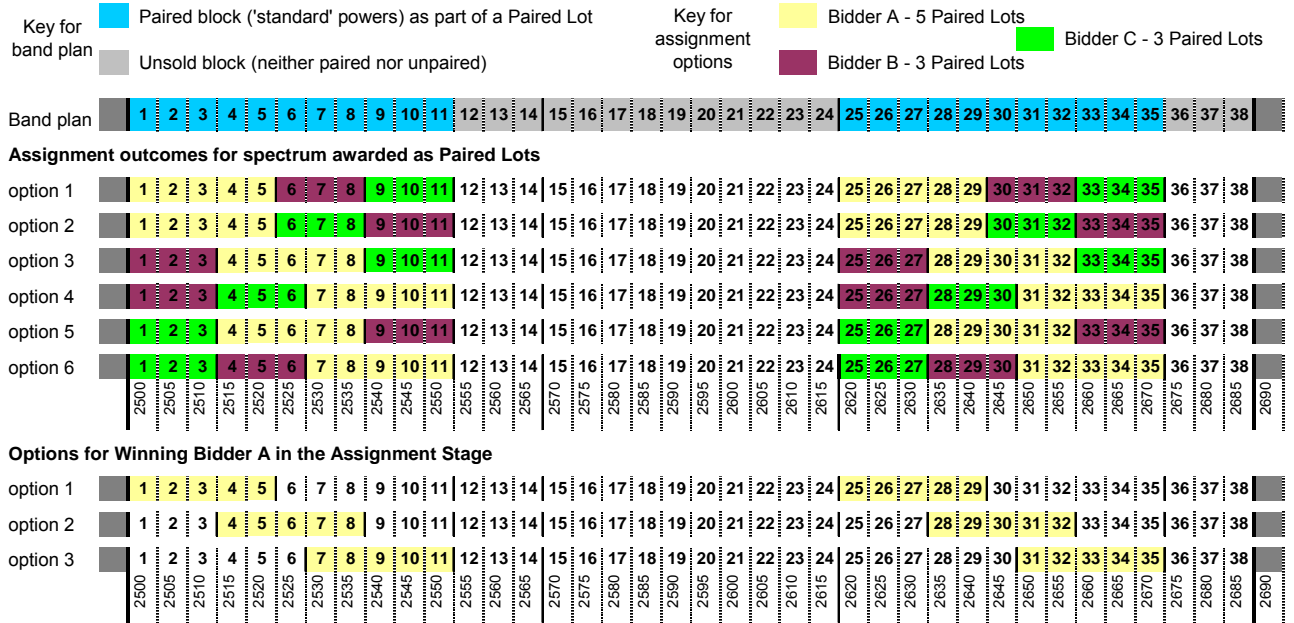
Illustration of possible outcomes of the Assignment Stage

4.187 Figure 7 below illustrates possible outcomes of the Assignment Stage in circumstances where the Winning Combination of Principal Stage Bids only includes Paired Lots. In this example there are three Winning Bidders and six possible permutations for assigning the available frequencies to these Bidders. Winning

Bidders B and C each have four Assignment Stage Options and Winning Bidder A has three Assignment Stage Options.

Figure 7: Illustrations of the possible outcomes of the Assignment Stage where the Winning Combination of Principal Stage Bids includes Paired Lots only

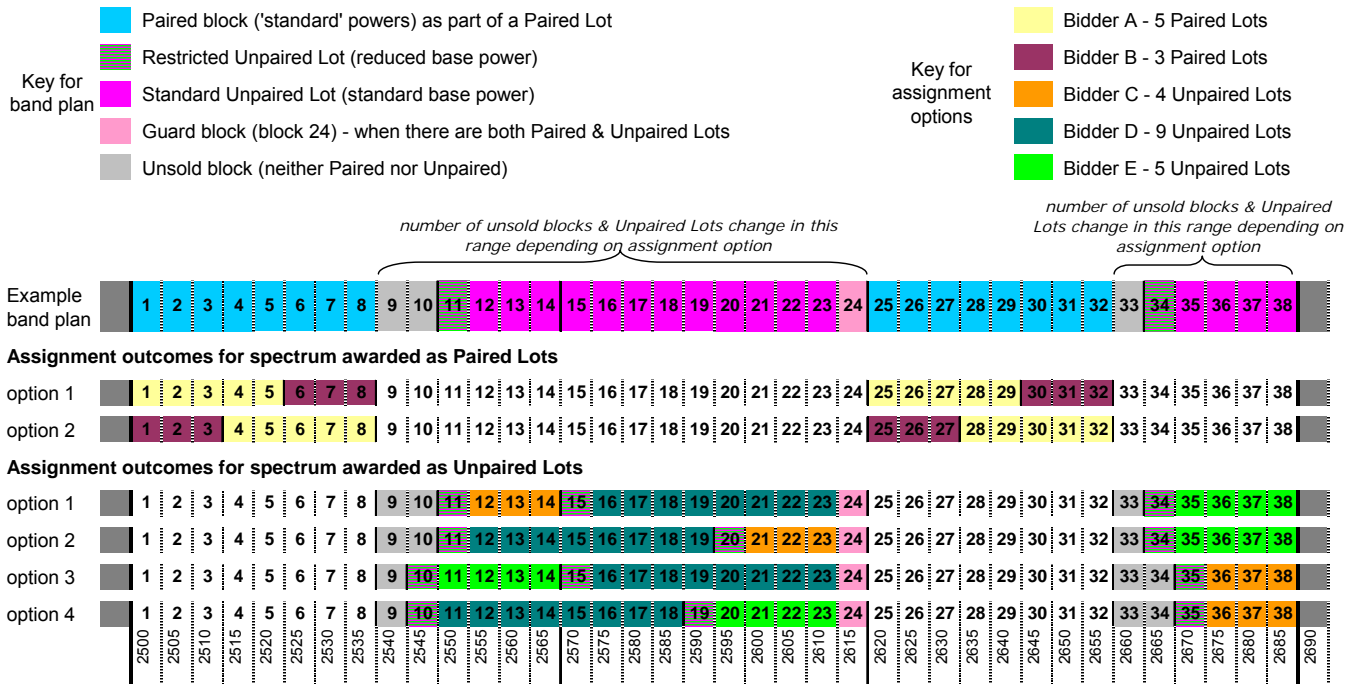
Example in which there is some unsold spectrum (2x3 blocks of 5MHz each) over and above the minimum unpaired amount (Lots 15 to 24 are necessarily unsold if there are only Paired Lots in the Winning Combination of Principal Stage Bids). Assume 3 Winning Bidders of Paired Lots.



4.188 Figure 8 below illustrates possible outcomes of the Assignment Stage in circumstances where the Winning Combination of Principal Bids includes both Paired Lots and Unpaired Lots. In this example, in respect of the Paired Lots, there are two Winning Bidders and two possible permutations for assigning the available frequencies (Winning Bidders A and B each have two Assignment Stage Options). In respect of the Unpaired Lots, there are four possible permutations for assigning the available frequencies and Winning Bidders C, D and E each have three Assignment Stage Options.

Figure 8: Illustration of the possible outcomes of the Assignment Stage where the Winning Combination of Principal Stage Bids includes both Paired and Unpaired Lots

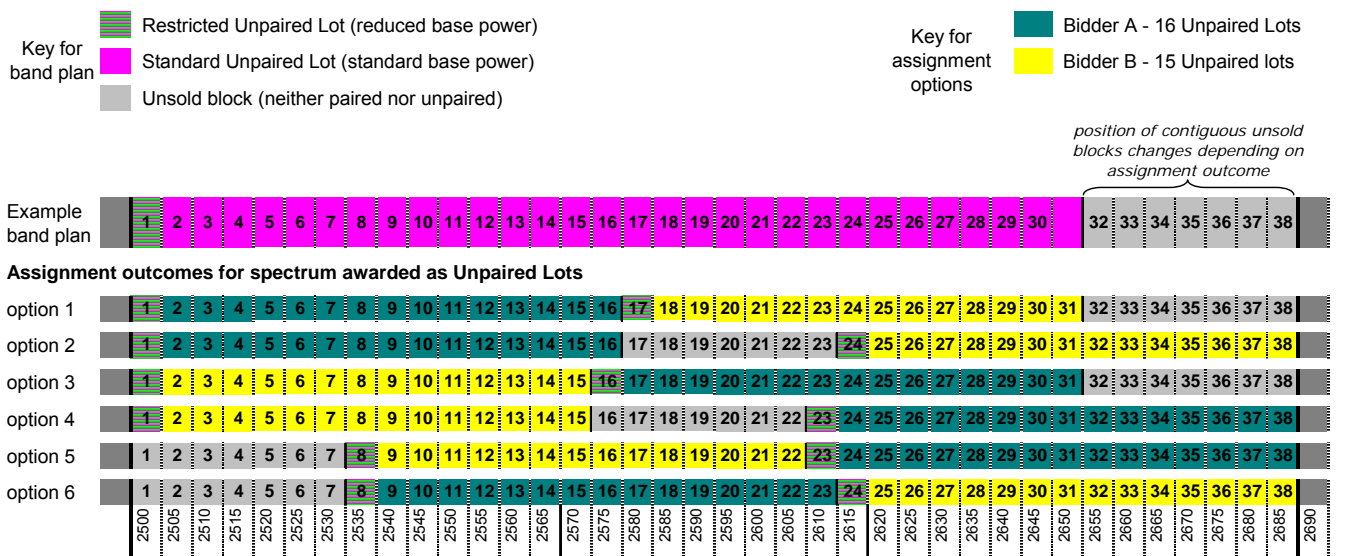
Example with some unsold spectrum (3 blocks), 8 Paired Lots and 18 Unpaired Lots (no split bid) + block 24. Assume 2 Winning Bidders of Paired Lots and 3 Winning Bidders of Unpaired Lots.



4.189 Figure 9 below illustrates possible outcomes of the Assignment Stage in circumstances where the Winning Combination of Principal Stage Bids only includes Unpaired Lots. In this example there are two Winning Bidders (each with four Assignment Stage Options) and six possible permutations for assigning the available frequencies.

Figure 9: Illustration of the possible outcomes of the Assignment Stage where the Winning Combination of Principal Stage Bids includes Unpaired Lots only

Example with some unsold spectrum (7 blocks of 5MHz each) and 31 Unpaired Lots (no split bid). Assume 2 Winning Bidders of Unpaired Lots.



Grant Stage

Determination of the Licence Fee

4.190 The Licence Fee payable by a Winning Bidder will be an amount equal to the total of:

- the Base Price determined by Ofcom under paragraph 4.151; and
- for each Winning Assignment Stage Bid made by that Bidder, the Additional Price for that Winning Assignment Stage Bid as determined by Ofcom under paragraph 4.185.

Procedure where a Winning Bidder's Deposit is less than the Licence Fee

4.191 Where, after completion of the Assignment Stage, the amount of a Winning Bidder's Bid Deposit (less any sum forfeited) is an amount that is less than its Licence Fee, Ofcom will notify the Winning Bidder of the deadline by when the Bidder must pay into Ofcom's bank account an additional sum which is no less than the shortfall. Ofcom expects that deadline to be 23.59 on the Business Day following the day on which Ofcom gives the Bidder the relevant notification.

4.192 Provided that the Winning Bidder complies with paragraph 4.191, Ofcom will grant the Winning Bidder a Licence for the relevant frequencies assigned to that Winning Bidder. If a Winning Bidder does not comply with paragraph 4.191, the Winning Bidder will not be entitled to the grant of a Licence and will not receive a refund of its Bid Deposit, which will (where not already forfeited) be forfeited. The frequencies awarded to the Winning Bidder shall be subject to the technical restrictions set out in the Licence which apply depending on whether the frequencies are awarded as Paired Lots or Unpaired Lots.

Procedure where a Bidder's Deposit is greater than or equal to the Licence Fee

4.193 Where, after completion of the Assignment Stage, the amount of a Winning Bidder's Bid Deposit (less any sum forfeited) is greater than or equal to its Licence Fee, Ofcom will:

- grant the Winning Bidder a Licence for the relevant frequencies assigned to that Winning Bidder; and
- refund to the Winning Bidder the difference (if any) between the amount of that Winning Bidder's Bid Deposit (less any sum forfeited) and the Licence Fee.

The frequencies awarded to the Winning Bidder shall be subject to the technical restrictions set out in the Licence which apply depending on whether the frequencies are awarded as Paired Lots or Unpaired Lots.

Completion of the Award Process

4.194 After the grant of Licences and the payment of refunds to Winning Bidders, Ofcom will complete the Award Process by publishing on the Ofcom Website details of all Valid Principal Stage Bids and all Valid Assignment Stage Bids made by each Bidder, the names of all Licensees, the details of the frequencies comprised in the Licences awarded and the Licence Fees paid. Ofcom will also publish the names of any Winning Bidders that did not comply with the deposit requirements in paragraph 4.191 and have been excluded from the Award Process in accordance with

paragraph 4.192 and, in respect of those Bidders, details of the frequencies that would have been assigned to them and the Licence Fees that would have been payable by them.

- 4.195 Ofcom expects that the Award Process will be completed within five Business Days following the conclusion of the Assignment Stage.
- 4.196 If one or more Lots are not awarded as part of the Award Process, Ofcom retains the discretion to award the remaining Lots through a separate award process.

Activity Rules

- 4.197 The Activity Rules which apply to all Applicants and Bidders are set out in Part 6 of the Regulations. Any breach of the Activity Rules which would materially affect the outcome of the Award Process will result in a Bidder or Applicant which is qualified to bid forfeiting their Initial Deposit (or Bid Deposit where one has been paid) and may also result in that Bidder or Applicant being excluded from the Award Process by Ofcom giving that Bidder or Applicant written notice.
- 4.198 If a Bidder is excluded from the Award Process during the Principal Stage, any Principal Stage Bids submitted by the Bidder will be deemed to be invalid and will not be taken into consideration for the purposes of determining the Winning Combination of Principal Stage Bids or the Base Price payable by the Winning Bidders.
- 4.199 If a Bidder is excluded from the Award Process during the Assignment Stage, all of the Assignment Stage Bids it has submitted (including any Bids which the Bidder is deemed to have submitted under paragraph 4.176 will be deemed to be invalid and will not be taken into consideration for the purposes of determining the Winning Combination of Assignment Stage Bids or the Additional Prices payable by the Winning Bidders.
- 4.200 The Activity Rules apply to all Bidders and all Applicants who have qualified to bid and they continue to apply until the Licences have been awarded pursuant to the Award Process. If a Bidder has been issued a Licence and is later found to have breached the Activity Rules, the Licence may be revoked under the terms of the Licence itself.
- 4.201 Regulation 74 of the Regulations sets out the details of the events which may lead to exclusion from the Award Process and/or to an Initial Deposit or Bid Deposit being forfeited. These include, where:
- an Applicant or Bidder has submitted false or misleading information to Ofcom;
 - an Applicant or Bidder or any member of its Bidder Group is colluding or attempting to collude with any other person to distort the outcome of the Award Process, or is acting in a way which is likely to distort the outcome of the Award Process;
 - the Applicant or Bidder or any member of its Bidder Group, or any person to whom Confidential Information has been disclosed, is disclosing, attempting to disclose or inciting another person to disclose Confidential Information to anyone other than to a member of its Bidder Group, Ofcom, a provider of finance (where the disclosure was for the purpose of raising finance for the bid) or to a person considering whether to join the Bidder Group of the Applicant or Bidder;

- the Applicant or Bidder or any member of its Bidder Group is obtaining or attempting to obtain Confidential Information in relation to any other Applicant or Bidder;
- the Applicant or Bidder or any member of its Bidder Group is receiving or attempting to receive services in relation to the Award Process from any person who has provided or is providing services to Ofcom in relation to the Award Process (for these purposes the advisers are Allen & Overy LLP, DotEcon Ltd and Prof. Peter Cramton of the University of Maryland and Dr Ian Jewitt of Nuffield College);
- any member, director or employee of a member of the Applicant's or Bidder's Bidder Group, who is also a director or employee of a member of another Bidder Group, is taking part in the preparation of both Bidder Groups for participation in the Award Process or is receiving Confidential Information relating to both Bidder Groups;
- a member of an Applicant's or Bidder's Bidder Group is or becomes a member of another Bidder Group; and
- a change occurring in the membership of an Applicant's or Bidder's Bidder Group subsequent to the Application Day except where a person ceases to be a member of the Bidder Group, a person has been added to the Bidder Group in accordance with the Regulations, or where a person becomes an Associate through merger and acquisition activity provided that such activity is not for a purpose related to the Award Process (and provided that the addition will not result in a member of one Applicant or Bidder's Bidder Group also being a member of another Bidder Group).

Electronic Bidding System

- 4.202 Both the Principal Stage and the Assignment Stage will be conducted using the Electronic Auction System. Bidders will be able to access the system over the public Internet using a standard web-browser. The minimum requirements in terms of hardware and software will be described in a user manual that will be distributed to Bidders prior to the Auction. However, these requirements will not be onerous – a typical PC running Windows and using Internet Explorer or Firefox or an Apple Mac using Safari or Firefox should usually be sufficient. Java will need to be installed on the Bidder's computer to access the Electronic Auction System (if not already available, this can be downloaded from www.java.com and easily installed).
- 4.203 Bidders will need to have a reliable Internet connection (128Kbit/s download speed or better, so a typical ADSL or E1/T1 connection will suffice). Ofcom recommends that Bidders have a backup computer and backup Internet connection in place for the duration of the Auction.
- 4.204 Internet addresses for primary and backup Auction servers will be communicated to Bidders by Ofcom prior to the Auction. In order to access these servers, Bidders will need to install the digital certificates provided by Ofcom in accordance with paragraph 4.62 on the computers they intend to use to access the Electronic Auction System. This is a simple process and instructions will be given to Bidders in the user manual provided to Bidders by Ofcom in accordance with paragraph 4.62. Digital certificates will be distributed to Bidders by Ofcom and are specific to each Bidder. A password will be required to install the certificates, which will be distributed to Bidders separately.

- 4.205 Bidders will be able to log in to the Electronic Auction System only from computers on which they have installed the necessary digital certificates. A further login username and password are required to access the Electronic Auction System, which will be communicated to Bidders by Ofcom prior to the Auction in accordance with paragraph 4.62.
- 4.206 Bidders will be identified by the Electronic Auction System through their digital certificates and their username and login password. Bidders will need to ensure that these are not disclosed to third parties. In the event of any actual or suspected breach of security, Bidders should contact Ofcom at the earliest opportunity.
- 4.207 The Electronic Auction System only allows a Bidder to be logged in from one computer at any one time. However, should there be a failure of the Bidder's computer or network connection, the Electronic Auction System will automatically log out the Bidder, who can then log in from a different (backup) computer on which the necessary digital certificates are installed. The Bidder will be able to continue using the Electronic Auction System from the point it left off.
- 4.208 The Electronic Auction System allows Bidders to enter Bids and to observe the progress of the Auction. It provides a display of the key aspects of the Auction state, such as the number of completed Primary Bid Rounds, whether a round is currently running and a countdown timer for submitting decisions when deadlines are in force. It also displays a clock synchronised with the Auction server to aid Bidders in submitting Bids. However, Bidders should note that deadlines apply according to the time that Bids are received at the server, not the time that they are sent from the Bidder's computer. Therefore, it is prudent for Bids to be submitted in good time prior to the end of each round to allow for network delays. Bids are not processed by the Electronic Auction System and results are not released until after the end of each round, so there is no strategic advantage to Bidders from delaying submission of their bids.
- 4.209 Submitting a Bid into the Electronic Auction System involves a two-step checking and confirmation process (regardless of whether the Bid is a Primary Bid, Supplementary Bid or Assignment Stage Bid). Bidders will first need to enter their Bid (or Bids) for checking by the Electronic Auction System. The system will check that the Bid (or Bids) is consistent with the relevant Regulations. If not, the Bidder will be given an explanation of the problem and be returned to the relevant screen to allow further editing of the Bid (or Bids). If the Bid (or Bids) is consistent with the relevant Regulations, the Electronic Auction System will return a summary of the Bid (or Bids), which can then be submitted. Only Bids that have been submitted will be considered to be valid Bids. If a Bidder checks a Bid but then fails to submit it, no Bid will have been made.
- 4.210 Throughout the Primary Bid Rounds, Bidders will be able to use the Electronic Auction System to store and update a list of Supplementary Bids on a provisional basis. This list of provisional Supplementary Bids can then be edited, checked and submitted during the Supplementary Bids Round. The facility to check and submit Supplementary Bids will be disabled until the start of the Supplementary Bids Round.
- 4.211 The Electronic Auction System will provide summaries of each Bidder's own Bids and also a history of Round Prices and excess demand. Downloadable files of own Bids and the Auction history will be provided for transferring data to other applications. These will be available in comma separated value (.CSV) and tab delimited (.TXT) formats. Either format can be easily read into programs such as Microsoft Excel.

4.212 The Electronic Auction System provides a one-way messaging system that allows Ofcom to send notices to Bidders. Ofcom envisages this being the primary means of communicating with Bidders about Round schedules, deposit increase deadlines and other aspects of the Award Process. If Bidders need to contact Ofcom, they will need to use the means described below in paragraph 4.214.

Ofcom events related to the Award Process

4.213 Ofcom is planning to hold a number of events that will allow interested parties to familiarise themselves with the Auction design and procedures and the Electronic Auction System. These will include a seminar explaining the Auction rules before the Regulations are made and a demonstration of the Electronic Auction System. After the Qualification Stage Ofcom will also hold test auctions for Bidders. These events will be arranged to assist potential Applicants and Bidders in making decisions as to whether to participate in the Award Process and in making preparations for participation in the Auction. Ofcom will publish further details of such events on the spectrum awards section of the Ofcom Website <http://www.ofcom.org.uk/radiocomms/spectrumawards/>.

Contacts with Ofcom

4.214 If an Applicant or Bidder needs to notify Ofcom of any fact or circumstance it must do so by notice in writing by one of the following means:

- electronic mail to an electronic mail address dedicated to the Award Process which is published by Ofcom on the Ofcom Website; or
- personal delivery to Riverside House, 2a Southwark Bridge Road, London, SE1A 9HA; or
- fax to a number dedicated to the Award Process which will be published by Ofcom on its internet Website.

4.215 Where Ofcom has agreed that a Bidder may submit a Bid Form using an Alternative Method to the Electronic Auction System, Ofcom will provide the Bidder with the appropriate contact details.

Ofcom's Bank Account

4.216 Any sum payable by an Applicant or Bidder to Ofcom must be made by a same day electronic transfer into the bank account specified by Ofcom, with accompanying information which identifies that Applicant or Bidder. Ofcom will publish on the spectrum award section of the Ofcom Website (<http://www.ofcom.org.uk/radiocomms/spectrumawards/>) details of the bank account into which Initial Deposits must be paid. It will provide further details to Bidders of payment arrangements for Deposits.

Changes to the Award Process

4.217 Part 7 of the Regulations includes a general power for Ofcom to alter the date, time, or place of delivery of any documents or the completion of any action in relation to the Award Process where it would otherwise be impractical for delivery or action to take place at the relevant date, time or place, as the case may be.

- 4.218 Where Ofcom determine that it is impracticable for any reason, where a time for the start of a Round has been notified to Bidders, to start the Round at that time, Ofcom will take all reasonable steps to notify Bidders of a revised time for the start of the Round.
- 4.219 Where Ofcom determine that it is impracticable for any reason, where a time for the end of a Round has been notified to Bidders, for the Round to end at that time, Ofcom will take all reasonable steps to notify Bidders of a revised time for the end of the Round.
- 4.220 Where Ofcom determine that it is impracticable for any reason to use the Electronic Auction System, Ofcom will take all reasonable steps to notify Bidders of an alternative method of participating in the Award Process and any requirements relating to the authentication of communications made by means of the alternative method.
- 4.221 Where a Round of the Auction is in progress and Ofcom determine that it is not possible to continue the Round because of a technical failure (or an event or circumstance with equivalent effect on the continuation of the Round), Ofcom will:
- take all reasonable steps to notify Bidders of its determination;
 - disregard the Bids made in that Round; and
 - resume the Award Process from the end of the previous Round of the Auction (or, if there was no previous Round, rerun the Award Process from the start of the First Primary Bid Round).
- 4.222 If Ofcom determines that it is not possible to continue the Auction because of a technical failure (or an event with equivalent effect on the continuation of the Auction), Ofcom will:
- i) determine the Rounds for which Bids made in those Rounds should be disregarded in order to have a fair and efficient outcome to the Award Process;
 - ii) take all reasonable steps to notify Bidders of its determinations; and
 - iii) resume the Award Process from the end of the latest Round for which Bids are not disregarded, or, where all Bids are to be disregarded, rerun the Award Process from the start of the First Primary Bid Round.

Section 5

Associated Policy Issues

- 5.1 This section provides some summary information on related policy issues and relevant regulations related to the award of spectrum that is the subject of this Memorandum. It is the responsibility of interested parties to determine how legislation and regulatory provisions apply to their specific circumstances, whether in relation to spectrum use, provision of downstream electronic communications services or any other aspect any future business related to use of the Bands. In doing so, interested parties should be aware of the on-going process lead by the European Commission to reform the legislative framework that applies to electronic communications in Europe. Any resulting changes to regulatory provisions in the European Community are likely to be applicable in the UK. Further information is available from the European Commission's website at http://ec.europa.eu/information_society/policy/ecomm/tomorrow/index_en.htm.

Ofcom's approach to the regulation of the radio spectrum

- 5.2 Ofcom licences use of most of the civil radio spectrum in the UK, with the aim of securing the optimal use of spectrum and meeting Ofcom's other statutory duties. Ofcom also represents the UK internationally on spectrum matters. Ofcom administers spectrum use in the UK by licensing or by exemption from the requirement to hold a licence under section 8 of the WT Act. Ofcom's general approach to spectrum management has been set out in a number of documents published by Ofcom over the past few years, including:
- the Spectrum Framework Review consultation document published in November 2004 and Statement published in June 2005⁴⁴;
 - the Spectrum Trading consultation document published in November 2003 and the Trading Statement published in August 2004⁴⁵;and
 - the Spectrum Liberalisation consultation document published in September 2004 and Statement published in January 2005.⁴⁶
- 5.3 The approach is also summarised in the SFR:IP consultation document (section 3), and in the SFR:IP Interim Statement of 28 July 2005⁴⁷. In relation to cellular services, a further consultation on the liberalisation of 2G and 3G spectrum and the implementation of the Radio Spectrum Committee Decision on 900MHz and 1800MHz was published on 20 September 2007⁴⁸.
- 5.4 The award of the Licences outlined in this Memorandum forms part of a wider programme of awards which was proposed in the SFR:IP. Specifically, paragraphs 6.18 to 6.94 of the SFR:IP were concerned with the award of the Bands. Ofcom's general approach to the awards in this programme is outlined in the SFR:IP (see section 4 in particular) and the Interim Statement on the SFR:IP published on 28 July

⁴⁴ <http://www.ofcom.org.uk/consult/condocs/sfr/>

⁴⁵ http://www.ofcom.org.uk/consult/condocs/spec_trad/

⁴⁶ <http://www.ofcom.org.uk/consult/condocs/liberalisation2/>

⁴⁷ <http://www.ofcom.org.uk/consult/condocs/sfr:ip/>

⁴⁸ <http://www.ofcom.org.uk/consult/condocs/liberalisation/>

2005 (see section 4 in particular). The Ofcom Spectrum Awards website⁴⁹ contains information and updates on the programme of awards.

Exemption from the need of a licence for user terminals

- 5.5 The draft Licence at Annex 1 contains technical provisions for both network (base, central, broadcasting) stations and terminal or user stations. Use of terminal or user stations in the Bands is not covered by the existing statutory instruments which exempt equipment from the requirement to be licensed. The current exemption regulations are the Wireless Telegraphy (Exemption) Regulations 2003 (Statutory Instrument 2003 No. 74⁵⁰ as amended) (the “**Exemption Regulations**”).
- 5.6 For Licensees that request it after completion of the Award Process, Ofcom will consult on amending the Exemption Regulations to exempt from licensing terminal and user stations that comply with the requirements of the Licence in respect of the frequencies covered by their Licence.
- 5.7 Licensees are invited to submit their request for licence-exemption for terminal and user stations operating under their Licence as soon as possible after completion of the Award Process. Subject to receiving any such request, Ofcom plans to consult on the corresponding amendments to the Exemption Regulations after the completion of the Award Process. Ofcom has consulted⁵¹ on the policy of licence exemption for terminals in the 2.6 GHz and 2010 MHz Bands and has decided⁵² to allow this (where terminal and user stations comply with the technical conditions in the Licences) where Licensees request it. The statutory consultation on amendments to the Exemption Regulations concerns the way that this policy is put into effect by the draft statutory instrument. Resulting changes to the Exemption Regulations would likely come into force approximately a few months following publication of that consultation.

Other spectrum awards

- 5.8 The latest information on Ofcom's programme of spectrum awards is given on our Website⁵³. The programme is subject to change from time to time, as are other aspects of spectrum policy and regulations.
- 5.9 Four awards have been completed to date, including in February 2008 an award for use of spectrum at 10, 28, 32 and 40GHz.⁵⁴ Several other spectrum awards are in preparation including L-Band (1452-1492MHz) for which an Information Memorandum⁵⁵ was published on 7 December 2007.

⁴⁹ <http://www.ofcom.org.uk/radiocomms/spectrumawards/>

⁵⁰ <http://www.opsi.gov.uk/si/si2003/20030074.htm>

⁵¹ See section 6 in the discussion document published in August 2007

<http://www.ofcom.org.uk/consult/condocs/2ghzdiscuss/main.pdf>.

⁵² See section 8 in the statement published in April 2008 (a link to the statement is available on the spectrum awards section of the Ofcom website at

<http://www.ofcom.org.uk/radiocomms/spectrumawards/>).

⁵³ <http://www.ofcom.org.uk/radiocomms/spectrumawards/>

⁵⁴ <http://www.ofcom.org.uk/radiocomms/spectrumawards/liveawards/1040award/>

⁵⁵ http://www.ofcom.org.uk/radiocomms/spectrumawards/awardspending/award_1452/1452im/

DDR

- 5.10 We consulted on our plans to award spectrum between 470-862 MHz as part of the Digital Dividend Review⁵⁶ (DDR). This project is looking at awarding three sorts of spectrum in this band:
- spectrum that will be cleared as a result of digital switchover, and that will be available UK-wide for new uses. This will be 112MHz comprising 14 channels of 8MHz;
 - two other blocks of spectrum that are used for other things, but have the potential to be cleared. These are channel 36 and channel 69; and
 - interleaved spectrum. This is capacity that will be available within the frequencies that will be used to carry the six DTT multiplexes. It is effectively 'white space' that exists geographically between the transmitters needed for those six multiplexes.
- 5.11 We published our policy statement⁵⁷ on the DDR on 13 December 2007, including in particular further information on the status of clearance, early use and award of Channel 36. Ofcom plans to auction most of the digital dividend spectrum in 2009. Ofcom plans to offer licences that allow users to decide the technology and service, and that can be traded after award. However, the timetable is subject to factors outside our control, particularly developments in the EU, and may change during the course of the DDR.
- 5.12 In relation to cleared spectrum and interleaved channels 61 and 62, we plan to publish the information memorandum and auction rules by the end of 2008. The auction itself could take place in the first half of 2009.
- 5.13 In relation to interleaved spectrum, we expect to auction geographic packages in Border, Granada, West Country and Wales by the end of 2008. We expect to award the package with PMSE obligations (including channel 69) by beauty contest to the same timetable. Auctions of the remaining geographic packages will follow in 2009.

Mobile Satellite Services

- 5.14 Following the adoption of EC decision 2007/98/EC⁵⁸ and a public consultation⁵⁹, the EC published on 22 August 2007 a proposal for a "Decision of the European Parliament and of the Council on the selection and authorisation of systems providing mobile satellite services (MSS)". These services will be authorised for operation in the spectrum bands 1980 – 2010 MHz and 2170-2200 MHz⁶⁰.

⁵⁶ <http://www.ofcom.org.uk/radiocomms/ddr/>

⁵⁷ <http://www.ofcom.org.uk/consult/condocs/ddr/statement/>

⁵⁸ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32007D0098:EN:NOT>

⁵⁹ Public Consultation on the Selection and Authorisation of Systems Providing Mobile Satellite Services (MSS), 30 March 2007:

http://ec.europa.eu/information_society/policy/radio_spectrum/ongoing_consult/2ghz_mss_30march07_30may07/index_en.htm

⁶⁰

http://ec.europa.eu/information_society/policy/radio_spectrum/docs/ref_docs/com/com_2007_480_en_fin.pdf

- 5.15 The Decision will require agreement under co-decision procedures⁶¹ by the European Parliament and the Council. The Treaty does not set any time limit for the European Parliament to give its opinion. In practice, this phase lasts for eight months on average. It may, however, be much longer, depending on the technical or political complexity of the dossiers.
- 5.16 It is anticipated that the draft Decision will be adopted by April 2008 and that following this, the EC will issue a call for applications which would be considered in accordance with a pre-defined set of evaluation criteria. The conclusions of the selection process are expected to be made known by March or April 2009 depending on whether spectrum scarcity arises during the first phase of the evaluation process.
- 5.17 This Decision will also be binding on all EU Member States, however Member States have discretion in accordance with their national procedures as to how to implement the requirement to authorise complementary ground component (CGC) systems operating as part of the mobile satellite system.
- 5.18 On 17 September 2007, Ofcom held a stakeholder workshop⁶² to discuss its intention to consult on the authorisation of CGC systems. This consultation was published on 15 January 2008⁶³ and responses are due by 25 March 2008.

Sitefinder

- 5.19 Sitefinder⁶⁴ is the Government's public access database of base stations. It is operated by Ofcom on behalf of the Government, and is developed in co-operation with industry. The database provides information on operational base stations in England, Scotland, Wales and Northern Ireland, and was established following the recommendations of the Stewart Report. All holders of licences using technologies Global System for Mobile communications (GSM), International Mobile Telecommunications (IMT) or Terrestrial Trunked Radio (TETRA) and similar technologies, will be requested to provide the information specified in the Sitefinder database in relation to their networks, on a voluntary basis.

Follow up to the Independent Audit of Spectrum Holdings

- 5.20 The Independent Audit of Spectrum Holdings⁶⁵, led by Professor Martin Cave, recommended wide ranging changes to the management of public sector, aeronautical and maritime spectrum. The audit, which focussed on spectrum below 15 GHz, also identified a number of opportunities where increases in efficiency of spectrum use could be achieved, potentially resulting in the release of spectrum for commercial use. The Government's response⁶⁶, published in March 2006, accepted the recommendations of the audit and outlined a plan for implementing them. A progress statement was published in December 2006. The Government published its first "Forward Look", setting out its strategy for managing major public sector spectrum holdings, in March 2007⁶⁷.

⁶¹ http://ec.europa.eu/codecision/stepbystep/text/index_en.htm

⁶² http://www.ofcom.org.uk/radiocomms/ifi/licensing/classes/satellite/procedure_manuals/CGC.pdf

⁶³ <http://www.ofcom.org.uk/consult/condocs/cgcs/>

⁶⁴ <http://www.sitefinder.ofcom.org.uk/>

⁶⁵ <http://www.spectrumbauidit.org.uk/pdf/20051118%20Final%20Formatted%20v9.pdf>

⁶⁶ <http://www.spectrumbauidit.org.uk/pdf/governmentresponse.pdf>

⁶⁷ http://www.spectrumbauidit.org.uk/pdf/Forward_Look_2007.pdf

- 5.21 In July 2007, we published a consultation document - Spectrum Framework Review; the Public Sector⁶⁸ - which sets out proposals to make public sector spectrum holdings tradable with a view to facilitating, and providing incentives for, their release for commercial use in line with the recommendations of the Independent Audit and the Forward Look. The consultation closed on 4 October 2007 and we published a statement⁶⁹ describing our conclusions on 31 January 2008.
- 5.22 In the consultation, we indicated frequency bands below approximately 15 GHz that might in future be made tradable. However, the Ministry of Defence (MoD) and other public sector bodies concerned have not yet decided how much spectrum to release or in which frequency bands. The October 2007 Pre-Budget Report⁷⁰ committed the MoD, which has the largest public sector spectrum holdings, to release a "significant proportion" beginning in 2008. The MoD is conducting a detailed audit of its future spectrum requirements and has said that it intends to consult by May 2008 on its plans for releasing spectrum.

London 2012 Olympic Games and Paralympic Games and Glasgow 2014 Commonwealth Games

- 5.23 On 6 July 2005, London was chosen to host the games of the XXX Olympiad (the "**Games**"), which will take place between 27 July and 9 September 2012. The Olympic Park will be built on a 500-acre site in the Lower Lea Valley, while Wembley Stadium, the All England Lawn Tennis and Croquet Club, Lord's Cricket Ground, Greenwich Park, Regent's Park, Hyde Park and Horse Guards Parade will also host events in London. The Eton College Rowing Centre at Dorney Lake, Weymouth Bay and Portland Harbour and five other football grounds – Hampden Park, the Millennium Stadium, Old Trafford, St. James' Park and Villa Park – currently make up the remaining venues.
- 5.24 As well as the Games themselves, test events will take place at Weymouth and Portland in 2010 and at these and other venues during 2011 and into 2012.
- 5.25 Guarantee 15.8 of London's bid for the Games stated that:
- "By early planning and understanding all the frequency requirements (including broadcasters, teams, organisers, policy, security and emergency services etc.), Ofcom will organise a full frequency plan for the Games and will arrange all the spectrum licences in good time in support of the plan. This will guarantee access to spectrum for all the licensees. . . The Secretary of State for Trade and Industry has guaranteed on behalf of the UK Government the allocation of the frequencies required for the organisation of the Games."
- 5.26 We are working closely with the Government and the London Organising Committee of the Olympic Games and Paralympic Games ("LOCOG") to take forward this spectrum plan. Interested parties may wish to know that on 30 November 2007 we published a discussion document that addresses issues that we must consider in planning spectrum use for the Games.⁷¹
- 5.27 Guarantee 15.9 of the bid stated that:

⁶⁸ <http://www.ofcom.org.uk/consult/condocs/sfrps/>

⁶⁹ http://www.ofcom.org.uk/media/news/2008/01/nr_20080131

⁷⁰ http://www.hm-treasury.gov.uk/pbr_csr/pbr_csr07_index.cfm

⁷¹ <http://www.ofcom.org.uk/consult/condocs/spectrum2012/condoc.pdf>

The Secretary of State for the Department of Trade and Industry has guaranteed on behalf of the UK Government to the waiving of fees payable for the allocated frequencies required for the Games.

- 5.28 The Secretary of State clarified in a letter to the President of the International Olympic Committee ("**IOC**") that this guarantee applied in respect of the following constituent groups:
- i) athletes;
 - ii) the IOC;
 - iii) LOCOG;
 - iv) national Olympic committees;
 - v) international federations of sport;
 - vi) the media;
 - vii) rights-holding broadcasters; and
 - viii) Olympic partners (i.e. sponsors).
- 5.29 Ofcom and the Government have considered the relevance of these guarantees to the Bands being awarded under this Award Process. We have decided that no condition should be included in the Licences for use of the Bands to be awarded under this Award Process.
- 5.30 Section 5 of the Communications Act provides that the Secretary of State may direct Ofcom in relation to its functions relating to the management of the radio spectrum. The Secretary of State's power extends to issuing directions to us for the purpose of securing compliance with international obligations of the United Kingdom. Under Section 8 of Schedule 1 to the Wireless Telegraphy Act 2006, we may ourselves at any time revoke a licence or vary its terms, provisions or limitations if it appears to us to be necessary or expedient to do so for the purpose of securing compliance with an international obligation of the United Kingdom. The Government has advised us that the guarantees given to the IOC constitute international obligations of the United Kingdom.
- 5.31 It is not possible for the Secretary of State or Ofcom to fetter their discretion about the exercise of their respective powers as described in paragraph 5.25. However, neither the Government nor Ofcom expect to exercise their powers, without the consent of the Licensee, to vary or revoke the Licences being awarded under this Award Process for the purpose of meeting international obligations of the United Kingdom relating to the Games.
- 5.32 Potential bidders should be aware that the Government has given similar guarantees on spectrum for the Glasgow 2014 Commonwealth Games. As with the London Games, although it is not possible for the Secretary of State or Ofcom to fetter their discretion, neither expects to exercise its power, without the consent of the Licensee, to vary or revoke the Licences being awarded under this Award Process for the purpose of meeting international obligations of the United Kingdom relating to the Glasgow Games.

Other Ofcom consultations

5.33 We published a consultation document on 12 April 2007 entitled 'Licence-Exemption Framework Review'.⁷² This addressed a range of issues related to the assignment and management of spectrum used by licence-exempt devices. The consultation closed on 21 June 2007 and a Statement⁷³ was issued on 4 December 2007.

5.34 It is recommended that a generic power spectral density lower bound for the licensing of radio devices is considered by Ofcom. This would mean that only those devices above that level would require licensing. The proposal is that the level:

(a) is equal to the ultra-wideband (UWB) limits on power spectral density for frequencies below 10.6 GHz;

(b) is equal to $-85 + 20 \log(f_{\text{GHz}}/10.6)$ dBm/MHz (mean EIRP density), or
 $-45 + 20 \log(f_{\text{GHz}}/10.6)$ dBm/50MHz (peak EIRP density),

for frequencies above 10.6 GHz which are subject to ITU-R Radio Regulations Footnote 5.340, or which support sensitive services such as radio astronomy and earth exploration satellites; and

(c) is equal to $-65 + 20 \log(f_{\text{GHz}}/10.6)$ dBm/MHz (mean EIRP density), or
 $-25 + 20 \log(f_{\text{GHz}}/10.6)$ dBm/50MHz (peak EIRP density),

for all other frequencies above 10.6 GHz,

where f_{GHz} represents frequency in units of GHz. Transmissions below the specified limits may be exempt from licensing, subject to compliance with all UWB operational restrictions⁷⁴ (other than minimum bandwidth) as specified in EC Decision 2007/131/EC. The proposed mean EIRP spectral density limits are illustrated in Figure 10 below with labels corresponding to the above recommendations.

5.35 It should be emphasized that the masks proposed above 10.6 GHz serve as guidelines only. The limits eventually adopted would depend on the specific bands and the interference resilience of incumbent services, but would broadly allow greater radiation levels at higher frequencies.

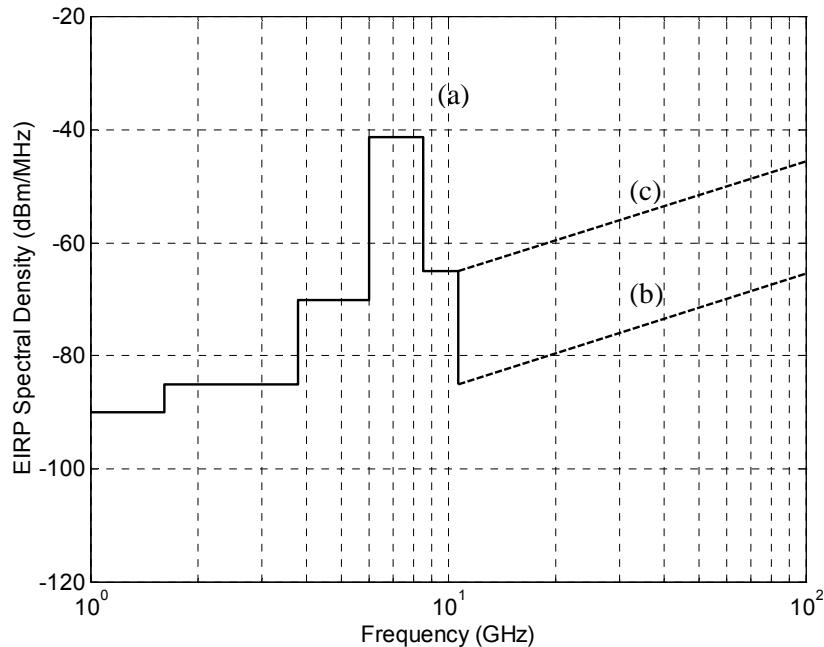
⁷² <http://www.ofcom.org.uk/consult/condocs/lefr/lefr.pdf>

⁷³ http://www.ofcom.org.uk/consult/condocs/lefr/lefr_statement/lefr_statement.pdf

⁷⁴ Such operational restrictions include the requirement that an UWB device is either used indoors (and will cease transmission within 10 seconds unless it receives an acknowledgement from an associated receiver that its transmission is being received) or, if it is used outdoors, it is not attached to a fixed installation, a fixed infrastructure, a fixed outdoor antenna, or an automotive or railway vehicle.

- 5.36 Any future authorisations of licence-exempt use by Ofcom will generally be subject to specific consultations with associated impact assessments, as appropriate, for the concerned bands.

Figure 10: Proposed power spectral density lower bounds for the licensing of radio devices.



Competition from other services

- 5.37 Any party considering participating in this Award Process must make its own independent assessment of the competition that its services using the Bands will face from existing and future services, and the implications of this competition for the potential value of a Licence.
- 5.38 It should be noted that other authorisations of spectrum use may permit the provision of services that could compete with those that may be offered using the Bands. Ofcom is not, as a function of this Award Process, placing any limitation on its scope for authorising others to use spectrum to offer such services. Such authorisation may occur, for example, by way of the grant of new licences, decisions as to the variation of existing licences, or decisions as to exemptions from licensing. As set out in the SFR and elsewhere, Ofcom's general policy is to move towards authorising the use of spectrum on a technology and application neutral basis that provides much greater flexibility for the use of spectrum to respond to demand and to be economically efficient.

International frequency allocation and harmonisation

- 5.39 Section 2 includes information regarding existing ECC decisions that are relevant to the 2.6 GHz and 2010 MHz Bands (ECC/DEC/(02)06, ECC/DEC/(05)05, ECC/DEC/(06)01), which the UK is not committed to implement.

- 5.40 In response to a mandate from the European Commission⁷⁵, CEPT also produced a report on “least restrictive technical conditions” for use of several spectrum bands, including the 2.6 GHz Band. CEPT Report 19 (available at: <http://www.erodocdb.dk/doks/doccategory.aspx?doccatid=16>) provides the Committee’s views on technical conditions designed to allow coexistence of different types of wireless networks within the 2.6 GHz Band, in the form of in-block and out-of-block power limits for base stations and user stations.
- 5.41 At the RSC meeting on 2 April 2008, Member States agreed a Commission decision on use of the 2.6 GHz band, based on CEPT Report 19. It will, once in force, be binding on the UK. Ofcom has developed the conditions set out in Section 3 and contained in the Draft Licence at Annex 1 in a way that is consistent with the Commission decision adopted on 2 April. The decision is expected to come into force in early June 2008.
- 5.42 EC Decision 2007/131/EC sets out conditions for allowing the use of the radio spectrum for equipment using ultra-wideband technology. The conditions discussed in Section 2 regarding use of the band for ultra-wideband are derived from the EC decisions.
- 5.43 The EU’s Communications Committee⁷⁶ (COCOM) has also been considering a recommendation on the non-technical conditions attached to the rights of use for radio frequencies under the regulatory framework for electronic communications. This recommendation covers the spectrum bands identified in relation to WAPECS⁷⁷, including the band, 2500-2690 MHz.
- 5.44 The main points included in the recommendation relate to-
- a) the promotion of service neutrality and spectrum trading where appropriate;
 - b) use of market mechanisms to achieve efficient use of spectrum;
 - c) where roll-out obligations are included in authorisations, specifying the provisions that will apply in case of non-compliance; and
 - d) suitable durations of licences in a context where spectrum trading is allowed.
- 5.45 At its meeting on 20 February 2008, COCOM agreed to start an accelerated written procedure (under Article 19 of the Framework Directive 2002/21/EC) for the adoption of the recommendation. This was launched on 6 March 2008, closing on 13 March 2008, and agreement was reached. Once formally adopted, Ofcom is under a duty to take utmost account of such Commission recommendations. We believe that the Licences described in Section 3 and included in draft at Annex 1 are consistent with the recommendation.
- 5.46 In future, the EC may take initiatives to update or repeal existing decisions, or to introduce new decisions that could affect use of the 2.6 GHz or 2010 MHz Bands.

⁷⁵ See the mandate dated 5 July 2006 available at http://ec.europa.eu/information_society/policy/radio_spectrum/activities/rsc_work/mandates/index_en.htm.

⁷⁶ http://ec.europa.eu/information_society/policy/ecomms/implementation_enforcement/comm_committee/index_en.htm

⁷⁷ 470-862 MHz; 880-915 MHz; 925-960 MHz; 1710-1785 MHz; 1805-1880 MHz; 1900-1980 MHz; 2010-2025 MHz; 2110-2170 MHz; 2500-2690 MHz; 3.4-3.8 GHz.

The corresponding measures may be binding on the UK and on any authorised user of the 2.6 GHz or 2010 MHz Bands in the UK. If the EC adopted such binding decisions, Ofcom would implement them as necessary and this may result in changes to the conditions of use of the 2.6 GHz and 2010 MHz Bands.

Non-operational licences

5.47 Ofcom issues two classes of short-term non-operational wireless telegraphy licences:

- non-operational temporary use – licensed for up to 6 months; and
- non-operational development – licensed for 12 months.

5.48 These licences enable activities such as the trialling of services and the testing and development of equipment in a range of frequency bands. These licences may, for example, be for systems that are designed for export markets as well as UK markets. Such licences are issued through a co-ordination and clearance procedure involving other licensed users of the frequency bands in question and under the condition that they cannot claim protection from interference from other licensees nor are they allowed to cause interference to other licensees. Non-operational licences have no right of renewal at the end of their term. At the time of award, there may be a number of non-operational licences in force in the Bands being awarded.

5.49 Interested parties should note that we may issue further non-operational licences in the Bands following the completion of the Award Process.

R&TTE Directive

5.50 The R&TTE Directive requires manufacturers to make declarations that their radio and telecommunications terminal equipment conforms to the essential requirements of the Directive; all products within the scope of the R&TTE Directive and the Low Voltage Directive which are placed on the UK market must show "CE" marks. The European Commission's "Blue Guide" (Guide to the Implementation of Directives Based on the New Approach and Global Approach) lists other Directives which require CE marking of products and equipment. It is available from the Commission's website⁷⁸.

Electronic Communications Code

5.51 The Electronic Communications Code (the "**Code**") is set out at schedule 2 to the Telecommunications Act 1984 as amended by schedule 3 to the Communications Act 2003. The Code sets out various rights of Code operators and these include the ability to install their infrastructure on public highways without needing a specific licence to do so under the New Road and Street Works Act 1991 (Local Authorities will be permitted to establish permit schemes to better manage access to public highways under Part 3 of the Traffic Management Act 2004 and the Traffic Management Permit Schemes (England) Regulations 2007; the latter which come into force on 1 April 2008) and it also exempts them from certain aspects of the Town and Country Planning regime in the form of Permitted Development.

5.52 Ofcom is permitted to grant Code powers under section 106 of the Communications Act 2003 to any applicant for the purposes of the provision by them of an electronic

⁷⁸ <http://ec.europa.eu/enterprise/newapproach/legislation/guide/index.htm>

communications network or for the purposes of the provision by them of a system of conduits which would be made available for use by providers of electronic communications networks. Applicants seeking Code powers are required to provide Ofcom with details in relation to their application and these are set out in the statement entitled: “The Granting of the Electronic Communications Code” (see http://www.ofcom.org.uk/telecoms/ioi/e_c_c/ecc.pdf).

Other regulation of the provision of electronic communication services and networks

5.53 It is the responsibility of interested parties who are considering using the Bands to provide electronic communications services to familiarise themselves with any relevant regulation. The same is also true of all other aspects of regulation, such as broadcasting regulation and competition law. It should be noted that all aspects of regulation are subject to change from time to time, including (without limitation) the relevant legislative framework, and the nature of regulation within any given legislative framework. In particular and by way of example, interested parties should note:

- that there are General Conditions of Entitlement with which they may need to comply with as described in more detail below;
- the existence of regulation in relation to the provision of voice call termination on each network operated by a mobile network operator⁷⁹; and
- that if Licensees wish to purchase access and interconnection from operators of existing networks for services in markets where those operators do not have Significant Market Power, our expectation is that these services should be negotiated commercially.

General Conditions of entitlement

5.54 All providers of Electronic Communications Services (ECS) and Electronic Communications Networks (ECN) in the UK are covered by the General Conditions of Entitlement. Out of 22 conditions, some apply to particular categories of ECS or ECN providers, mainly depending on whether they provide public services or networks and whether they provide publicly available telephone services or public telephone networks.

5.55 It is the responsibility of any undertaking involved in the provision of ECS or ECN to identify which conditions apply to them and to ensure that it complies with them. Further information can be found at http://www.ofcom.org.uk/telecoms/ioi/g_a_regime/gce/gcoe/?a=87101 and a copy of the consolidated General Conditions can be found at: http://www.ofcom.org.uk/telecoms/ioi/g_a_regime/gce/. This is usually updated quarterly.

5.56 It should be noted that from time to time Ofcom consults on changing the General Conditions of Entitlement and such proposals can usually be found on the Ofcom Website. Recent consultations concerning General Conditions include:

- Consumer protection test for telephone number allocation⁸⁰;

⁷⁹ See for example http://www.ofcom.org.uk/consult/condocs/mobile_call_term/

- Metering & Billing⁸¹.
- 5.57 We have also published recent statements setting out policies which we will implement in the following areas:
- Telephone numbering;⁸²
 - NTS,⁸³
 - Arrangements for porting numbers when customers switch supplier;⁸⁴
 - Regulation of VoIP services.⁸⁵
- 5.58 In addition, the Ofcom Annual Plan⁸⁶ and the updated programme of work contains details of work that we are carrying out, or are planning to undertake that relates to this area and the European Commission is carrying out a review of the Directives that may also affect the General Conditions⁸⁷.

Administered Incentive Pricing

- 5.59 The Award Process will determine subject to a reserve price, the fee payable in respect of the Initial Term for each Licence. After the Initial Term, if a Licensee continues to hold the Licence, additional licence fees may be payable in line with Ofcom's policy on spectrum pricing at that time.
- 5.60 The current spectrum pricing provisions are based on legal powers in the Wireless Telegraphy Act 2006 and the Communications Act 2003. Ofcom's general approach to Wireless Telegraphy Act charges was set out in its Spectrum Pricing consultation in September 2004⁸⁸ and subsequent statement published in February 2005⁸⁹.
- 5.61 In 2006, we consulted⁹⁰ on variations to the current Wireless Telegraphy (Licence Charges) Regulations 2005⁹¹ and subsequent to that consultation, Ofcom has twice made Regulations amending licence charges, relating to PMSE, Community Radio and other minor changes to various licence classes⁹² and relating to Satellite Services licences.⁹³

Tax

- 5.62 Any party considering participation in the Award Process must take its own advice on the tax consequences of being awarded a Licence.

⁸⁰ <http://www.ofcom.org.uk/consult/condocs/numberingcpt/>

⁸¹ http://www.ofcom.org.uk/consult/condocs/metering_billing/

⁸² <http://www.ofcom.org.uk/consult/condocs/numberingreview/statement/> and

<http://www.ofcom.org.uk/consult/condocs/numbering03/statement/>

⁸³ http://www.ofcom.org.uk/consult/condocs/nts_forward/statement/

⁸⁴ <http://www.ofcom.org.uk/consult/condocs/gc18review/statement>

⁸⁵ <http://www.ofcom.org.uk/consult/condocs/voip>

⁸⁶ http://www.ofcom.org.uk/about/accoun/reports_plans/annual_plan0708/

⁸⁷ http://ec.europa.eu/information_society/policy/ecommm/tomorrow/index_en.htm

⁸⁸ http://www.ofcom.org.uk/consult/condocs/spec_pricing/

⁸⁹ http://www.ofcom.org.uk/consult/condocs/spec_pricing/statement/statement.pdf

⁹⁰ <http://www.ofcom.org.uk/consult/condocs/pricing06/>

⁹¹ <http://www.opsi.gov.uk/si/si2005/20051378.htm>

⁹² <http://www.ofcom.org.uk/consult/condocs/licencecharges/>

⁹³ <http://www.ofcom.org.uk/consult/condocs/wt/statement/>

- 5.63 Payments for Wireless Telegraphy licence fees are not subject to VAT. The question of whether VAT should be payable in the case of the 3G mobile telephone Wireless Telegraphy Act licences auctioned in 2000 was heard by the European Court of Justice, which delivered its judgement on the matter on 26 June 2007⁹⁴. The Court held that in the case of these licences, the Government issued them in a regulatory capacity which was not an economic activity and consequently their issue was outside the scope of VAT.
- 5.64 The Court's judgement confirms the United Kingdom's interpretation of VAT legislation, namely that where a Wireless Telegraphy Act licence is issued by a public authority pursuant to public law and in order to regulate the use of the radio frequencies, that activity is outside the scope of VAT.
- 5.65 If and to the extent that a Wireless Telegraphy licence is held to be issued in the circumstance which might make it subject to VAT, such VAT will be payable in addition to the licence fee (whether determined under an award process or under spectrum pricing where applicable).

⁹⁴ <http://curia.europa.eu/jurisp/cgi-bin/form.pl?lang=en&Submit=Rechercher&alldocs=alldocs&docj=docj&docop=docop&docor=docor&docjo=docjo&numaff=C-284/04&datefs=&datefe=&nomusuel=&domaine=&mots=&resmax=100>, and <http://curia.europa.eu/jurisp/cgi-bin/form.pl?lang=en&Submit=Rechercher&alldocs=alldocs&docj=docj&docop=docop&docor=docor&docjo=docjo&numaff=C-369/04&datefs=&datefe=&nomusuel=&domaine=&mots=&resmax=100>

Section 6

Application Instructions

Application Procedure

- 6.1 The procedure for making an application for a Licence is set out in the Wireless Telegraphy (Licence Award) (No.2) Regulations 2008, a draft of which is set out in Annex 2. As explained in Section 4, when we have made the final regulations, we will announce details of the relevant time and date for interested parties to make an application.

Contacts and Further Information

Contacts for enquiries

- 6.2 Any further enquiries relating to this Memorandum and the Award Process should be addressed in writing and sent by email directly to Ofcom at spectrumawards@ofcom.org.uk. These should be marked for the attention of: Brice Le Cannu and also marked: Spectrum Auction Question – Award of 2500–2690MHz and 2010–2025MHz.

Further Information

- 6.3 Annex 2 contains the draft Regulations. These can also be found on the Ofcom Website.

Disclosure of further information

- 6.4 Following issue of this Memorandum, Ofcom has the discretion to publish further information and to publish questions and the answers provided. Ofcom may, however, exercise its discretion not to publish a particular question and answer, in whole or in part. Ofcom also reserves the right not to respond to such a question, and to publish relevant guidance arising from an answer to such a question. The identity of questioners will not be published without their permission. Applicants should note the provisions of the Regulations in relation to questions on Applications.

Annex 1

Draft Licence

Wireless Telegraphy Act 2006

Office of Communications (Ofcom)

SPECTRUM ACCESS LICENCE [BAND]

Licence no. **xxxxxx**

Date of issue: **xx xxxxx 2008**

1. The Office of Communications (Ofcom) grants this licence to

Company Name
Company Reg No: xxxxxx
("the Licensee")
Addressxxxxxx
xxxxxxxxxxxxxxxx
xxxxxxxxxxxxxxxx
xxxxxxxxxx
xxxxxxxxxx

to establish, install and use wireless telegraphy stations and/or wireless telegraphy apparatus as described in the schedule(s) ("the Radio Equipment") subject to the terms set out below.

Licence Term

2. This Licence shall continue in force until revoked by Ofcom in accordance with paragraph 3 below or surrendered by the Licensee.

Licence Variation and Revocation

3. Pursuant to Schedule 1, paragraph 8 of the Wireless Telegraphy Act 2006 ("the Act") Ofcom may not revoke or vary this Licence under Schedule 1, paragraph 6 of the Act except:
 - (a) at the request of, or with the consent of, the Licensee;
 - (b) in accordance with paragraph 8 of this Licence;

- (c) if there has been a breach of any of the terms of this Licence;
 - (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 section 30(3) of the Act⁹⁵;
 - (e) if the Licensee has been found to the reasonable satisfaction of Ofcom to have been involved in any act, or omission of any act, constituting a breach of the Wireless Telegraphy (Licence Award)(No. 2) Regulations 2008 (the "Regulations");
 - (f) in accordance with Schedule 1, paragraph 8(5) of the Act;
 - (g) if it appears to Ofcom to be necessary or expedient to revoke or vary the Licence for the purposes of complying with a direction by the Secretary of State given to Ofcom under section 5 of the Act or section 5 of the Communications Act 2003; or
 - (h) for reasons related to the management of the radio spectrum, provided that in such case:
 - (i) this power to revoke may only be exercised after at least five (5) year's notice is given in writing to the Licensee; and
 - (ii) such notice must expire after twenty (20) years from the date of issue of this Licence.
4. Ofcom may only revoke or vary this Licence by notification in writing to the Licensee and in accordance with Schedule 1 Paragraphs 6 and 7 of the Act.

Changes

5. This Licence is not transferable. 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(1) and section 30 (3) of the Act⁹⁶.
6. The Licensee must give prior notice to Ofcom in writing of any proposed change to the Licensee's name and address from that recorded in the Licence.

Fees

7. The Licence Fee in respect of this Licence is [£xxxxxxxx] which for the avoidance of doubt is exclusive of any VAT which may ultimately be payable.

⁹⁵ These are regulations on spectrum trading.

⁹⁶ <http://www.ofcom.org.uk/radiocomms/ifi/trading/>

8. On or after the expiry of twenty (20) years from the date of issue of this Licence the Licensee shall pay to Ofcom such sum(s) as may be provided for in regulations made by Ofcom under sections 12 and 13(2) of the Act, failing which Ofcom may revoke this Licence.
9. 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 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 Act any such amount and any such interest is recoverable by Ofcom.
10. 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 Act will be made, except at the absolute discretion of Ofcom in accordance with regulation [XX] of the Regulations, or any regulation made under those sections of the Act (as the case may be).

Radio Equipment Use

11. The Licensee must ensure that the Radio Equipment is established, installed and used only in accordance with the provisions specified in Schedule(s) of this Licence. Any proposal to amend any detail specified in Schedule(s) 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 must 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 to inspect, examine and test 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 any of the wireless telegraphy stations or wireless telegraphy apparatus that comprise the Radio Equipment 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 breach of a term of the Licence has occurred; and/or
 - (b) the use of the Radio Equipment is causing or contributing to interference to the use of other authorised radio equipment.
15. Ofcom may require any of the wireless telegraphy stations or wireless telegraphy apparatus that comprise the Radio Equipment to be modified or restricted in use, or temporarily closed down either immediately or on the expiry of such period as may be specified in the event of a national or local state of emergency being declared. Ofcom may only exercise this power after a written notice is served on the Licensee or a general notice applicable to holders of a named class of Licence is published.

Geographical Boundaries

16. This Licence authorises the Licensee to establish, install and use the Radio Equipment only in the United Kingdom.

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 Act;
 - (b) the expression "interference" shall have the meaning given by section 115 of the Act;
 - (c) the expressions "wireless telegraphy apparatus" and "wireless telegraphy station" shall have the meanings given by section 117 of the Act.
18. The schedule(s) to this Licence form(s) part of this Licence together with any subsequent schedule(s) which Ofcom may issue as a variation to this Licence at a later date.
19. The Interpretation Act 1978 shall apply to the Licence as it applies to an Act of Parliament.

Issued by Ofcom

Signed by

For the Office of Communications

Draft Schedule for 2500-2690MHz

THIS DRAFT SCHEDULE PROVIDES AN EXAMPLE OF A LICENCE SCHEDULE IN RESPECT OF BOTH PAIRED AND SINGLE LOTS IN THE 2.6 GHZ BAND AND ILLUSTRATIVE ASSOCIATED FREQUENCIES.

SCHEDULE [] TO LICENCE NUMBER: xxxxxx

Schedule Date: **xx xxxxx 2008**

Licence Category: **SPECTRUM ACCESS [XXXX]**

1. Description of Radio Equipment Licensed

In this Licence, the Radio Equipment means any wireless telegraphy station or wireless telegraphy apparatus that transmits in accordance with the requirements of paragraphs 6 – 9 of this schedule.

2. Interface Requirements for the Radio Equipment use

Use of the Radio Equipment shall be in accordance with the following Interface Requirement:

IRxxxx⁹⁷ "Spectrum Access xxxxxxxxxxxx"

3. Special Conditions relating to the Operation of the Radio Equipment

- (a) During the period that this Licence remains in force, unless consent has otherwise been given by Ofcom, the Licensee shall compile and maintain accurate written records of:
- (i) the following details relating to the base stations, central stations and broadcasting stations:
 - a) postal address (including post code);
 - b) National Grid Reference (to 100 metres resolution);
 - c) antenna height (above ground level) and type, bearing east of true north;
 - d) radio frequencies which the Radio Equipment is able to use and radio frequencies which the Radio Equipment uses;
 - e) the technical characteristics of the Radio Equipment both in terms of transmission and reception of wireless telegraphy;
 - (ii) a statement of the number of subscribing customers;

⁹⁷ [Link to IR]

and the Licensee must produce these records if requested by a person authorised by Ofcom.

- (b) The Licensee shall inform Ofcom of the address of the premises at which this Licence and the information detailed at sub-paragraph 3(a) above shall be kept.
- (c) The Licensee must submit to Ofcom copies of such parts of the records detailed in sub-paragraph 3(a) above at such intervals as Ofcom shall notify to the Licensee. Without prejudice to any information which Ofcom is required by law to publish or disclose, Ofcom may, from time to time, publish such extracts of this information as it sees fit, regarding-
 - (i) the total number of base stations, central stations and broadcasting stations of the Radio Equipment which are operational;
 - (ii) the locations, aggregated by outward postcode, of those base stations, central stations and broadcasting stations;
 - (iii) the frequencies used by the Radio Equipment.
- (d) The Licensee must also submit to Ofcom in such manner and at such times, all information relating to the establishment, installation or use of the Radio Equipment, whether stored in hard copy or electronic form, as reasonably requested for the purposes of verifying compliance with this Licence, for statistical purposes and more generally for the purpose of ensuring that Ofcom can perform its spectrum management functions.

4. **National Co-ordination (e.g. at Frequency and Geographical Boundaries)**

The Radio Equipment shall be operated in compliance with such co-ordination procedures as may be necessary and notified to the Licensee by Ofcom.

5. **International Cross-border Co-ordination**

The Licensee must ensure that the Radio Equipment is operated in compliance with such cross-border co-ordination and sharing procedures as may be notified to the Licensee by Ofcom.

6. **Permitted Frequency Blocks**

Subject to the out-of-block emissions permitted under paragraph 8, the Radio Equipment must only transmit on the following frequency bands (the “Permitted Frequency Blocks”):

(a) paired frequencies

Paired frequencies (uplink)	[2500 – 2520] MHz;
Paired frequencies (downlink)	[2620 – 2640] MHz

and

(b) unpaired frequencies

Restricted unpaired frequencies (uplink and downlink)	[2570 – 2575] MHz
Standard unpaired frequencies (uplink and downlink)	[2575 – 2605] MHz

7. **Maximum Permissible Transmitted Power**

The maximum mean power transmitted in the Permitted Frequency Blocks shall not exceed:

(a) paired frequencies

Paired frequencies (uplink)	31 dBm/(5MHz) TRP
Paired frequencies (downlink)	61 dBm/(5MHz) EIRP

and

(b) unpaired frequencies

Standard unpaired frequencies (uplink use)	31 dBm/(5MHz) TRP
Standard unpaired frequencies (downlink use)	61 dBm/(5MHz) EIRP
Restricted unpaired frequencies (uplink use)	31 dBm/(5 MHz) TRP
Restricted unpaired frequencies (downlink)	25 dBm/(5MHz) EIRP

In cases where terminal stations or user stations are permanently installed at a fixed location an alternative maximum mean power of 35 dBm/(5 MHz) EIRP for uplink use of both paired and unpaired frequencies applies.

Where technologies are deployed that actively transmit in bursts then the above limits shall be applied to the active part of the transmission.

8. **Permissible Out-of-block Emissions**

Downlink use of frequencies

The permissible out-of-block emission limit for downlink use of frequencies is built up from two components:

- A baseline requirement; and
- A requirement relative to Permitted Frequency Blocks.

For any particular frequency outside the Permitted Frequency Blocks the higher value out of the baseline and relative requirement will apply.

Baseline requirement

A1.1	Frequency range	A1.2	Maximum mean EIRP (integrated over a 1 MHz bandwidth) for out-of-block emissions
A1.3	[2470 – 2615] MHz	A1.4	–45 dBm/MHz
A1.5	[2615 – 2675] MHz	A1.6	+4 dBm/MHz
A1.7	[2675 – 2720] MHz	A1.8	–45 dBm/MHz

Requirement relative to Permitted Frequency Blocks

(a) for paired frequencies (downlink)

Offset from relevant block edge	Maximum mean EIRP for out-of-block emissions
2470 to –5.0MHz (lower block edge)	Baseline requirement level
–5.0 to –1.0MHz (lower block edge)	+4dBm/MHz
–1.0 to –0.2MHz (lower block edge)	+3 + 15(Δ_F + 0.2) dBm/30kHz
–0.2 to 0.0MHz (lower block edge)	+3dBm/30kHz
0.0 to +0.2MHz (upper block edge)	+3dBm/30kHz
+0.2 to +1.0MHz (upper block edge)	+3 – 15(Δ_F – 0.2) dBm/30kHz
+1.0 to +5.0MHz (upper block edge)	+4dBm/MHz
+5.0MHz (upper block edge) to 2720 MHz	Baseline requirement level

Where: Δ_F is the frequency offset from the relevant block edge (in MHz);
the lower block edge is at [2620] MHz; and
the upper block edge is at [2640] MHz

(b) for unpaired frequencies (downlink use)

Offset from relevant block edge	Maximum mean EIRP for out-of-block emissions
2470 to 0.0MHz (lower block edge)	Baseline requirement level
0.0 to +0.2MHz (upper block edge)	+3dBm/30kHz
+0.2 to +1.0MHz (upper block edge)	+3 – 15(Δ_F – 0.2) dBm/30kHz
+1.0 to +5.0MHz (upper block edge)	+4dBm/MHz
+5.0MHz (upper block edge) to 2720 MHz	Baseline requirement level

Where: Δ_F is the frequency offset from the relevant block edge (in MHz);
the lower block edge is at [2570] MHz; and
the upper block edge is at [2605] MHz

- (c) for downlink use of frequencies (paired or unpaired) where specific antenna restrictions are applied and where the maximum mean power transmitted within the Permitted Frequency Blocks does not exceed 25 dBm/(5MHz) EIRP.

In cases where antennas are either:

- (i) placed indoors and are at a height no greater than 10 metres above ground level; or
- (ii) placed outdoors and are at a height no greater than 4 metres above ground level,

the following alternative out-of-block emissions requirements apply for paired frequencies (downlink) and unpaired frequencies (downlink use).

Offset from relevant block edge	Maximum mean EIRP for out-of-block emissions
2470 to -5.0MHz (lower block edge)	-22dBm/MHz
-5.0 to -1.0MHz (lower block edge)	-18dBm/MHz
-1.0 to -0.2MHz (lower block edge)	$-19 + 15(\Delta_F + 0.2)$ dBm/30kHz
-0.2 to 0.0MHz (lower block edge)	-19dBm/30kHz
0.0 to +0.2MHz (upper block edge)	-19dBm/30kHz
+0.2 to +1.0MHz (upper block edge)	$-19 - 15(\Delta_F - 0.2)$ dBm/30kHz
+1.0 to +5.0MHz (upper block edge)	-18dBm/MHz
+5.0MHz (upper block edge) to 2700MHz	-22dBm/MHz
2700 MHz to 2720MHz	-45dBm/MHz

Where: Δ_F is the frequency offset from the relevant block edge (in MHz);
the lower block edge is at [2620] MHz for paired frequencies (downlink) and [2570] MHz for unpaired frequencies; and
the upper block edge is at [2640] MHz for paired frequencies (downlink) and [2605] for unpaired frequencies.

Uplink use of paired frequencies and unpaired frequencies

The permissible out-of-block emission limit for uplink use of frequencies (paired or unpaired) is:

Offset from relevant block edge	Maximum mean EIRP for out-of-block emissions
2470 to -6MHz (lower block edge)	-19dBm/MHz
-6.0 to -5.0MHz (lower block edge)	-13dBm/MHz
-5.0 to -1.0MHz (lower block edge)	-10dBm/MHz
-1.0 to 0.0MHz (lower block edge)	-15dBm/30kHz
0.0 to +1.0MHz (upper block edge)	-15dBm/30MHz
+1.0 to +5.0MHz (upper block edge)	-10dBm/MHz
+5.0 to +6.0MHz (upper block edge)	-13dBm/MHz
+6.0MHz (upper block edge) to 2720 MHz	-19dBm/MHz

Where: Δ_F is the frequency offset from the relevant block edge (in MHz);
the lower block edge is at [2500] MHz for paired frequencies (uplink) and [2570] MHz for unpaired frequencies ; and
the upper block edge is at [2520] MHz for paired frequencies (uplink) and [2605] MHz for unpaired frequencies

9. Application of the Maximum Permissible Transmitted Power to base stations with multiple transmit antennas

- (a) In cases where the inputs to different antennas are not correlated, the maximum mean EIRP transmitted in the Permitted Licence Blocks referred to in section 7 above is calculated from the sum of the EIRP for each separate antenna

Note: this applies for MIMO, transmit diversity and “antenna combining” (where different transmitter channels are fed to different branches of a diversity antenna system).

- (b) In cases where the inputs to different antennas or antenna elements are correlated, the maximum mean EIRP transmitted in the Permitted Licence Blocks referred to in section 7 above is calculated as follows:

$$\text{EIRP}_{\text{effective}} = \Sigma P_{\text{nom}} \text{ (dBm)} + 10 \log 180/\theta + 10 \log 360/\phi$$

Where:

ΣP_{nom} is the sum of the nominal maximum powers of the transmitter outputs feeding each element, measured at the antenna port;

θ is the -3dB beamwidth of the antenna array in the vertical plane (if this beamwidth can vary, the minimum value should be used); and

ϕ is the angle in the horizontal plane for which the antenna system is intended to provide service (e.g. for an antenna system that is

intended to provide 360° coverage with four arrays, this angle would be 90°).

Note: this applies to adaptive or beam forming antenna arrays where, averaged over time, the power radiated by the antenna system is spread evenly over its angle of operation (where this is not the case the calculation method in (a) above applies)

10. Interpretation of terms in this Schedule

In this Schedule:

- (a) "EIRP" means the equivalent isotropically radiated power. This is the product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain);
- (b) "TRP" means the total radiated power. This is the integral of the power transmitted in different directions over the entire radiation sphere;
- (c) "dBm" means the power level in decibels (logarithmic scale) referenced against 1milli-Watt (i.e. a value of 0 dBm is 1 milli-Watt);
- (d) "out-of-block emissions" means radio frequency emissions generated by the Radio Equipment and radiated into the frequency bands adjacent (in terms of frequency) to the licensee's Permitted Frequency Blocks;
- (e) "uplink" refers to transmissions from terminal stations or user stations to a base station, central station or broadcasting station;
- (f) "downlink" refers to transmissions from a base station, central station or broadcasting station to:
 - (i) a terminal station or user station; or
 - (ii) another base station, central station or broadcasting station;
- (g) "base station", "central station" or "broadcasting station" means any station that is providing communications services to associated terminal stations or user stations and forms part of an electronic communications network;
- (h) "terminal station", or "user station" means any station that, in relation to an electronic communications network, provides services directly to the user;

Draft Schedule for 2010-2025MHz

THIS DRAFT SCHEDULE PROVIDES AN EXAMPLE OF A LICENCE SCHEDULE IN RESPECT OF THE 2010-2025MHZ BAND.

SCHEDULE [] TO LICENCE NUMBER: xxxxxx

Schedule Date: **xx xxxxx 2008**

Licence Category: **SPECTRUM ACCESS [XXXX]**

1. Description of Radio Equipment Licensed

In this Licence, the Radio Equipment means any wireless telegraphy station or wireless telegraphy apparatus that transmits in accordance with the requirements of paragraphs 6 – 9 of this schedule.

2. Interface Requirements for the Radio Equipment use

Use of the Radio Equipment shall be in accordance with the following Interface Requirement:

IRxxxx⁹⁸ "Spectrum Access xxxxxxxxxxxx"

3. Special Conditions relating to the Operation of the Radio Equipment

- (a) During the period that this Licence remains in force, unless consent has otherwise been given by Ofcom, the Licensee shall compile and maintain accurate written records of:
- (i) the following details relating to the base stations, central stations or broadcasting stations:
 - a) postal address (including post code);
 - b) National Grid Reference, (to 100 metres resolution);
 - c) antenna height (above ground level) and type, bearing east of true north;
 - d) radio frequencies which the Radio Equipment is able to use and radio frequencies which the Radio Equipment uses;
 - e) the technical characteristics of the Radio Equipment both in terms of transmission and reception of wireless telegraphy;
 - (ii) a statement of the number of subscribing customers;

⁹⁸ [Link to IR]

and the Licensee must produce these records if requested by a person authorised by Ofcom.

- (b) The Licensee shall inform Ofcom of the address of the premises at which this Licence and the information detailed at sub-paragraph 3(a) above shall be kept.
 - a. The Licensee must submit to Ofcom copies of such parts of the records detailed in sub-paragraph 3(a) above at such intervals as Ofcom shall notify to the Licensee. Without prejudice to any information which Ofcom is required by law to publish or disclose, Ofcom may, from time to time, publish such extracts of this information as it sees fit, regarding-
 - i. the total number of base stations, central stations and broadcasting stations of the Radio Equipment which are operational;
 - ii. the locations, aggregated by outward postcode, of those base stations, central stations and broadcasting stations;
 - iii. the frequencies used by the Radio Equipment.
- (c) The Licensee must also submit to Ofcom in such manner and at such times, all information relating to the establishment, installation or use of the Radio Equipment, whether stored in hard copy or electronic form, as reasonably requested for the purposes of verifying compliance with this Licence, for statistical purposes and more generally for the purpose of ensuring that Ofcom can perform its spectrum management functions.

4. National Co-ordination (e.g. at Frequency and Geographical Boundaries)

The Radio Equipment shall be operated in compliance with such co-ordination procedures as may be necessary and notified to the Licensee by Ofcom.

5. International Cross-border Co-ordination

The Licensee must ensure that the Radio Equipment is operated in compliance with such cross-border co-ordination and sharing procedures as may be notified to the Licensee by Ofcom.

6. Permitted Frequency Blocks

Subject to the out-of-block emissions permitted under paragraph 8, the Radio Equipment must only transmit on the following frequency band (the “Permitted Frequency Block”):

Permitted Frequency Block	2010 – 2025 MHz
---------------------------	-----------------

7. Maximum Permissible Transmitted Power

The maximum mean power transmitted in the Permitted Frequency Block shall not exceed:

For uplink use of frequencies	31 dBm/(5MHz) TRP
For downlink use of frequencies	61 dBm/(5MHz) EIRP

The in-block power limits above apply only within the frequency range 2010.5 – 2024.7 MHz. Outside this range the permissible out-of-block emissions requirement will apply (see below).

In cases where terminal stations or user stations are permanently installed at a fixed location an alternative maximum mean power of 35 dBm/(5 MHz) EIRP for uplink use of frequencies applies.

Where technologies are deployed that actively transmit in bursts then the above limits shall be applied to the active part of the transmission.

8. Permissible Out-of-block Emissions

Downlink use of frequencies

The permissible out-of-block emission limit for downlink use of frequencies is:

Offset from relevant block edge	Maximum mean EIRP for out-of-block emissions
1980 to –0.5MHz (lower block edge)	–45dBm/MHz
–0.5 to –0.2MHz (lower block edge)	+3 + 15(Δ_F + 0.2) dBm/30kHz
–0.2 to 0.0MHz (lower block edge)	+3dBm/30kHz
0.0 to +0.2MHz (upper block edge)	+3dBm/30kHz
+0.2 to +1.0MHz (upper block edge)	+3 – 15(Δ_F – 0.2) dBm/30kHz
+1.0 to +5.0MHz (upper block edge)	+4dBm/MHz
+5.0MHz (upper block edge) to 2055 MHz	–38dBm/MHz

Where: Δ_F is the frequency offset from the relevant block edge (in MHz);
the lower block edge is at 2010.5 MHz; and
the upper block edge is at 2024.7 MHz

Uplink use of frequencies

The permissible out-of-block emission limit for uplink use of frequencies is:

Offset from relevant block edge	Maximum mean EIRP for out-of-block emissions
1980 to –6MHz (lower block edge)	–19dBm/MHz
–6.0 to –5.0MHz (lower block edge)	–13dBm/MHz
–5.0 to –1.0MHz (lower block edge)	–10dBm/MHz
–1.0 to 0.0MHz (lower block edge)	–15dBm/30kHz
0.0 to +1.0MHz (upper block edge)	–15dBm/30MHz
+1.0 to +5.0MHz (upper block edge)	–10dBm/MHz
+5.0 to +6.0MHz (upper block edge)	–13dBm/MHz
+6.0MHz (upper block edge) to 2055 MHz	–19dBm/MHz

Where: Δ_F is the frequency offset from the relevant block edge (in MHz);
the lower block edge is at 2010.5 MHz; and
the upper block edge is at 2024.7 MHz.

9. Application of the Maximum Permissible Transmitted Power to base stations with multiple transmit antennas

- (a) In cases where the inputs to different antennas are not correlated, the maximum mean EIRP transmitted in the Permitted Frequency Blocks referred to in section 7 above is calculated from the sum of the EIRP for each separate antenna

Note: this applies for MIMO, transmit diversity and “antenna combining” (where different transmitter channels are fed to different branches of a diversity antenna system).

- (b) In cases where the inputs to different antennas or antenna elements are correlated, the maximum mean EIRP transmitted in the Permitted Frequency Blocks referred to in section 7 above is calculated as follows:

$$\text{EIRP}_{\text{effective}} = \Sigma P_{\text{nom}} \text{ (dBm)} + 10 \log 180/\theta + 10 \log 360/\varphi$$

Where:

ΣP_{nom} is the sum of the nominal maximum powers of the transmitter outputs feeding each element, measured at the antenna port;

θ is the -3dB beamwidth of the antenna array in the vertical plane (if this beamwidth can vary, the minimum value should be used); and

φ is the angle in the horizontal plane for which the antenna system is intended to provide service (e.g. for an antenna system that is intended to provide 360° coverage with four arrays, this angle would be 90°).

Note: this applies to adaptive or beam forming antenna arrays where, averaged over time, the power radiated by the antenna system is spread

evenly over its angle of operation (where this is not the case the calculation method in (a) above applies).

10. Interpretation of terms in this Schedule

In this Schedule:

- (a) "EIRP" means the equivalent isotropically radiated power. This is the product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain);
- (b) "TRP" means the total radiated power. This is the integral of the power transmitted in different directions over the entire radiation sphere;
- (c) "dBm" means the power level in decibels (logarithmic scale) referenced against 1milli-Watt (i.e. a value of 0 dBm is 1 milli-Watt);
- (d) "out-of-block emissions" means radio frequency emissions generated by the Radio Equipment and radiated into the frequency bands adjacent (in terms of frequency) to the licensee's Permitted Frequency Blocks;
- (e) "uplink" refers to transmissions from terminal stations or user stations to a base station, central station or broadcasting station;
- (f) "downlink" refers to transmissions from a base station, central station or broadcasting station to:
 - i. a terminal station or user station; or
 - ii. another base station, central station or broadcasting station;
- (g) "base station", "central station" or "broadcasting station" means any station that is providing communications services to associated terminal or user stations and forms part of an electronic communications network;
- (h) "terminal station" or "user station" means any station that, in relation to an electronic communications network, provides services directly to the user;.

Annex 2

Draft Auction Regulations

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STATUTORY INSTRUMENTS

2008 No.

ELECTRONIC COMMUNICATIONS

**The Wireless Telegraphy (Licence Award) (No.2) Regulations
2008**

Made - - - - - ***

Coming into force - - - - - ***

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The Office of Communications (“OFCOM”) make the following Regulations in exercise of the powers conferred on OFCOM by section 14(1), (2), (3), (4), (6) and (7) and section 122(7) of the Wireless Telegraphy Act 2006(a) (“the 2006 Act”).

Before making these Regulations OFCOM have given notice of their proposal to do so in accordance with section 122(4)(a) of the 2006 Act, published notice of their proposal in accordance with section 122(4)(b) of the 2006 Act and have considered the representations made to them before the time specified in that notice in accordance with section 122(4)(c) of the 2006 Act.

PART 1 INTRODUCTORY

Citation, commencement, and extent

1.—(1) These Regulations may be cited as the Wireless Telegraphy (Licence Award) (No.2) Regulations 2008 and shall come into force on [**date of coming into force**].

(2) These Regulations shall not extend to the Channel Islands or to the Isle of Man.

Interpretation

2.—(1) In these Regulations—

“additional price” has the meaning given in regulation 66;

(a) 2006 c.36.

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“additional supplementary bid” shall be construed in accordance with regulation 18(4);

“applicant” means a body corporate making an application for a licence;

“applicant group” means, in relation to an applicant—

- (a) that applicant;
- (b) each associate of that applicant; and
- (c) each person named by the applicant in compliance with the requirements of section 4 and Schedule 2 and in respect of whom the applicant or bidder has delivered to OFCOM a completed document in the form set out in Schedule 3;

“assignment stage” has the meaning given in regulation 15(1);

“assignment stage bid” has the meaning given in regulation 52(3);

“assignment stage bid form” has the meaning given in regulation 53;

“assignment stage option” has the meaning given in regulation 52(4);

“assignment stage round” has the meaning given in regulation 52(1);

“associate” means, in relation to an applicant or bidder, a person who has a material interest in that applicant or bidder;

“authorised person” means a person specified by an applicant in its application as authorised to bind that applicant for all purposes relating to the award process;

“basic supplementary bid” shall be construed in accordance with regulation 18(2);

“base price” has the meaning given in regulation 46;

“bidder” means an applicant which has qualified to bid in the award process and which has not withdrawn from the award process on or before the last day for withdrawal;

“bidder group” has the meaning given in regulation 6(7);

“bid selection” means a specified number of paired lots (which may be zero), a specified number of individual lots (which may be zero), and an indication as to whether or not the 2010–2025 MHz band is included;

“confidential information” means, in relation to any applicant or bidder, any information which is not in the public domain and which if it were made public, or disclosed to another applicant (or potential applicant) or bidder or a member of their respective bidder groups, would be likely to affect decisions that such other applicant (or potential applicant) or bidder may make in relation to the award process;

“contiguous range of individual lots”, means two or more consecutive individual lots;

“contiguous range of paired lots” means two or more consecutive paired lots;

“deadline”, in relation to any requirement imposed on any person by or under these Regulations, means (as the case may require)—

- (a) the time,
- (b) the date, or
- (c) the date, and the time on that date,

by which that requirement must be fulfilled by that person;

“division” shall be construed in accordance with regulation 20(2)(d);

“electronic auction system” means the system established by OFCOM for bidders to participate in the award process;

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“eligibility limit” shall be construed in accordance with regulation 24;

“end of round time” has the meaning given in regulation 31(2);

“excess demand”, in relation to a primary bid round, means—

- (a) in respect of the 2010–2025 MHz band, where the 2010–2025 MHz band has been selected in more than one valid primary bid;
- (b) in respect of the 2500–2690 MHz band where it would not be possible for OFCOM to assign—
 - (i) to each bidder submitting a valid primary bid containing paired lots, a contiguous range of paired lots such that the number of paired lots contained within that range is equal to the number of paired lots selected in that valid primary bid; and
 - (ii) to each bidder submitting a valid primary bid containing individual lots, a contiguous range of individual lots such that the number of individual lots contained within that range is equal to the number of individual lots selected in that valid primary bid,

such that lot twenty-four is not assigned, and each other lot is assigned no more than once;

- (c) where no valid primary bid contains paired lots, the total number of individual lots contained in all valid primary bids exceeds thirty-eight;

“frequency range selection menu” shall be construed in accordance with regulation 12(1);

“grant stage” has the meaning given in regulation 15(1);

“initial deposit” shall be construed in accordance with regulation 4(3)(b);

“last day for withdrawal” has the meaning given in regulation 10(1);

“licence” means a wireless telegraphy licence to be granted pursuant to these Regulations to establish or use a wireless telegraphy station or install or use wireless telegraphy apparatus in the United Kingdom at frequencies to be determined in accordance with the procedure set out in Part 4 or Part 5 of these Regulations;

“lower area” means, in relation to the 2500–2690 MHz band, the frequencies from 2500 MHz to 2615 MHz;

“material interest” means, whether held directly or indirectly—

- (a) any interest (construed in accordance with sections 820 to 825 of the Companies Act 2006(a)) in—
 - (i) any share which carries, or any shares which together carry, more than twenty five per cent. of the votes entitled to be cast at a general meeting of the applicant or bidder; or
 - (ii) any share or shares in the case of which the consent of the holder of that share or those shares is required for the conduct of any business of the applicant or bidder; or
- (b) the right to appoint or remove a majority of the applicant’s or bidder’s board of directors;

“MHz” means megahertz;

“OFCOM’s bank account” means the bank account nominated by OFCOM for the purposes of the award process, details of which are published on their internet website;

“pounds” means pounds sterling;

“primary bid” has the meaning given in regulation 16(1);

“primary bid form” has the meaning given in regulation 16(3);

(a) 2006 c.46.

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- “primary bid rounds” has the meaning given in regulation 15(2);
- “principal stage” has the meaning given in regulation 15(1);
- “principal stage bid” means a primary bid, a basic supplementary bid, or an additional supplementary bid;
- “round” means a period of time specified by OFCOM during which bidders may make bids in accordance with the procedure set out in Part 5 of these Regulations;
- “round price” has the meaning given in regulation 16(2);
- “supplementary bid” has the meaning given in regulation 18(1);
- “supplementary bids form” has the meaning given in regulation 19(1);
- “supplementary bids round” has the meaning given in regulation 15(2);
- “2010–2025 MHz band” has the meaning given in regulation 15(2)(a);
- “2500–2690 MHz band” has the meaning given in regulation 15(2)(b);
- “upper area” means, in relation to the 2500–2690 MHz band, the frequencies from 2620 MHz to 2690 MHz;
- “valid additional supplementary bid” has the meaning given in regulation 30(1);
- “valid assignment stage bid” has the meaning given in regulation 56(1);
- “valid basic supplementary bid” has the meaning given in regulation 29(1);
- “valid primary bid” has the meaning given in regulation 28(1);
- “valid principal stage bid” means a valid primary bid, a valid basic supplementary bid or a valid additional supplementary bid;
- “valid supplementary bid” means a valid basic supplementary bid or a valid additional supplementary bid;
- “winning assignment stage bid” shall be construed in accordance with regulation 64;
- “winning principal stage bid” shall be construed in accordance with regulation 45; and
- “winning bidder” means a bidder that submitted a winning principal stage bid.
- (2) A reference in these Regulations to an “individual lot” or a “paired lot” shall be construed in accordance with Schedule 1.
- (3) A reference in these Regulations to “eligibility points” shall be construed in accordance with Schedule 7.

PART 2

APPLICATION STAGE

Applications for the grant of a licence

3. Applications for the grant of a licence shall only be made in accordance with the procedure set out in these Regulations.

Application

4.—(1) Only a body corporate may apply to OFCOM for a licence.

(2) A body corporate may only make one application.

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- (3) To apply for a licence, a body corporate must—
- (a) on the day specified by OFCOM for receipt of applications, deliver to OFCOM at Riverside House, 2a Southwark Bridge Road, London SE1 9HA within the times on that day specified by OFCOM a sealed envelope containing—
 - (i) a document containing the application information required by, and the warranty set out in, Schedule 2, completed in respect of the applicant and signed on its behalf by two authorised persons;
 - (ii) for each person, not being an associate of the applicant, which the applicant wishes to join its applicant group, a document in the form set out in Schedule 3 which has been—
 - (aa) completed by the applicant and signed on its behalf by two authorised persons; and
 - (bb) completed by and signed by or on behalf of the person in respect of whom that document is completed; and
 - (b) by a deadline specified by OFCOM on their internet website, pay into OFCOM's bank account by a same day electronic transfer, with accompanying information which identifies the applicant, an initial deposit of one hundred thousand pounds.
- (4) OFCOM shall publish the day, times and deadline on their internet website.

PART 3

QUALIFICATION STAGE

Procedure for associates to be excluded from an applicant or bidder group

5.—(1) Where before the date on which OFCOM notifies applicants in accordance with regulation 9(1) of their determination under regulation 8(1)—

- (a) OFCOM receives from an applicant a document in the form set out in Schedule 4, completed by the applicant and signed on its behalf by two authorised persons;
- (b) OFCOM receives from that applicant's associate a document in the form set out in Schedule 5, completed by the associate and signed on its behalf by two authorised persons; and
- (c) that associate meets the conditions set out in paragraph (2);

OFCOM shall determine whether to exclude that associate from the applicant's applicant or bidder group.

(2) The conditions referred to in paragraph (1)(c) are that the associate does not have—

- (a) any interest (construed in accordance with section 820 to 825 of the Companies Act 2006 (a)), whether held directly or indirectly in any share which carries, or any shares which together carry, equal to or more than fifty per cent. of the votes entitled to be cast at a general meeting of the applicant; or
- (b) the right to appoint or remove a majority of the applicant's board of directors.

(3) In making their determination under paragraph (1), OFCOM shall take into account any factors which OFCOM reasonably consider relevant to the application, including:

- (a) the length of time the associate has had a material interest in the applicant, including in particular whether the associate held a material interest in the applicant before the date these regulations were made;
- (b) any information submitted to OFCOM by the associate or the applicant in the documents referred to at paragraphs (1)(a) and (1)(b);

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- (c) whether—
 - (i) any information submitted to OFCOM by the associate or the applicant in connection with the application to be excluded from the applicant or bidder group is false or misleading;
 - (ii) the grant to the associate of its exclusion from the applicant or bidder group is likely to distort the outcome of the award process.

(4) An associate or an applicant must, if requested to do so by OFCOM, provide by a deadline specified by OFCOM any information or documentation which OFCOM reasonably require to make their determination under paragraph (1).

(5) If an associate or an applicant does not provide such information or documentation by the deadline specified by OFCOM, OFCOM shall also take that fact into account in making their determination under paragraph (1).

(6) As soon as reasonably practicable after receipt of the documents referred to in paragraphs (1)(a) and (1)(b), OFCOM shall inform the associate and the applicant in writing of their determination under paragraph (1).

(7) Where OFCOM determine to exclude an associate from an applicant's applicant group—

- (a) that associate will no longer be considered to be a member of that applicant group for the purposes of these regulations; and
- (b) that associate shall be permitted to be a member of another applicant's applicant group provided that applicant complies with the procedure set out in regulation 7(3).

(8) Where OFCOM determine not to exclude an associate from an applicant's applicant group, that associate will continue to be a member of that applicant group for the purposes of these regulations.

Assessment of applicant groups

6.—(1) OFCOM shall give notice to each applicant of—

- (a) the name of each other applicant and the names of their associates; and
- (b) the deadline by when each applicant must notify OFCOM under paragraph (3) or (4) (as the case may be).

(2) On receipt of that notice, each applicant must examine the names of the other applicants and their associates and determine whether any member of its applicant group is also an associate of another applicant or is also an applicant.

(3) Where an applicant determines that a member of its applicant group is also an associate of another applicant or is also an applicant, it must notify the other applicant and OFCOM of that fact by the deadline specified by OFCOM, and OFCOM shall specify a further deadline by when each applicant concerned must—

- (a) notify OFCOM of any change in circumstances the effect of which is that no member of its applicant group is an associate of another applicant or is an applicant; and
- (b) where changes have occurred to its applicant group, provide OFCOM with a version of the document provided under regulation 4(3)(a)(i) which complies with those provisions in the changed circumstances.

(4) Where an applicant determines that no member of its applicant group is an associate of another applicant or is an applicant it must notify OFCOM of that fact by the deadline specified by OFCOM in the notice under paragraph (1).

(5) If it appears to OFCOM from any application that a member of one applicant group is also a member of another applicant group, OFCOM shall give notice to each of the applicants concerned of that fact and specify the deadline by when each applicant concerned must—

- (a) notify OFCOM of any change in circumstances the effect of which is that no member of its applicant group is also a member of another applicant group; and

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- (b) where changes have occurred to its applicant group provide OFCOM with a version of the document provided under regulation 4(3)(a)(i) which complies with those provisions in the changed circumstances.

(6) As soon as reasonably practicable after the last deadline specified by OFCOM under paragraphs (3) and (5), OFCOM shall record as a bidder group the members of each applicant group.

(7) For the purposes of these regulations a bidder group (“bidder group”) shall comprise the members of each applicant group recorded by OFCOM in accordance with paragraph (6) but not any associate which OFCOM has determined to exclude from that applicant group in accordance with regulation 5(1).

Subsequent changes to bidder groups

7.—(1) After the recording by OFCOM of the members of each applicant group as a bidder group in accordance with regulation (6), an applicant or a bidder may change its bidder group but, in relation to the award process, the applicant shall be subject to regulations 8(2) and 72 if they apply to any such change.

(2) Where the change involves the addition or removal of an associate, the applicant or bidder must notify OFCOM of the change and submit a version of the document provided under regulation 4(3)(a)(i) which complies with those provisions in the changed circumstances.

(3) To add a person who is not an associate of the applicant or bidder to its bidder group, the applicant or bidder must deliver to OFCOM a document in the form set out in Schedule 3 completed by the applicant or bidder and signed on its behalf by two authorised persons and completed by and signed by or on behalf of the person in respect of whom that document is completed.

Determination of applicants which are qualified to bid

8.—(1) OFCOM shall determine whether each applicant which has submitted an application in accordance with regulation 4 is qualified to bid in the award process.

(2) An applicant shall not be qualified to bid in the award process if a member of its bidder group is also a member of another applicant’s bidder group.

(3) In making their determination under paragraph (1) OFCOM shall take into account whether—

- (a) the grant of a licence to the applicant would be prejudicial to the interests of national security;
- (b) the applicant is a fit and proper person to hold a licence having regard to the probity of—
 - (i) the applicant;
 - (ii) each member of the applicant’s bidder group; and
 - (iii) each director of each member of the applicant’s bidder group;
- (c) any of the information submitted to OFCOM by the applicant in connection with the award process is false or misleading;
- (d) in connection with an application under regulation 5 for an associate to be excluded from an applicant or bidder group—
 - (i) the applicant has not provided to OFCOM the document referred to in regulation 5(1)(a); or
 - (ii) the associate in respect of whom the application has been made has not provided to OFCOM the document referred to in regulation 5(1)(b);
- (e) any member of the applicant’s bidder group has colluded, or attempted to collude, or is colluding or attempting to collude, with another person to distort the outcome of the award process;

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- (f) any member of the applicant's bidder group has acted or is acting in a way which is likely to distort the outcome of the award process;
- (g) any member of the applicant's bidder group, or any person to whom confidential information has been disclosed, has disclosed, or is disclosing or attempting to disclose or has incited or is inciting another person to disclose, any confidential information, whether directly or indirectly, to any person, except where the disclosure is—
 - (i) to OFCOM;
 - (ii) to a member of the applicant's bidder group;
 - (iii) to a provider of finance for the purpose of raising finance for the applicant's application; or
 - (iv) to a person for the purpose of enabling that person to decide whether to participate as a member of the applicant's bidder group;
- (h) any member of the applicant's bidder group has obtained or is obtaining or attempting to obtain confidential information relating to another applicant;
- (i) any member of the applicant's bidder group is receiving or is attempting to receive services in relation to the award process from any person who has provided or is providing services to OFCOM in relation to the award process; and
 - (i) any person who is a member or a director or employee of a member of the applicant's bidder group and is also a director or employee of a member of another bidder group is—
 - (ii) taking part in the preparation of both bidder groups for participation in the award process; or
 - (iii) receiving confidential information relating to both bidder groups.

(4) Applicants must, if requested to do so by OFCOM, provide by a deadline specified by OFCOM any information or documentation which OFCOM reasonably require to make their determination.

(5) If an applicant does not provide such information or documentation by the deadline specified by OFCOM, OFCOM shall also take that fact into account in making their determination.

(6) Where OFCOM determine that an applicant is not qualified to bid in the award process, that applicant's initial deposit shall not be forfeited for that reason.

Publication of determination

9.—(1) OFCOM shall notify each applicant of their determination under regulation 8(1).

(2) OFCOM shall also notify each applicant qualified to bid of the name of each other applicant who is so qualified and shall publish the names of all applicants who are qualified to bid on OFCOM's internet website.

Withdrawal of an application

10.—(1) OFCOM shall notify each applicant qualified to bid of the last day for withdrawal from the award process and shall publish the last day for withdrawal on OFCOM's internet website ("last day for withdrawal").

(2) If, on or before the last day for withdrawal, OFCOM receive notice of an applicant's intention to withdraw its application, signed by two authorised persons of that applicant, the application shall be withdrawn and the applicant shall be excluded from the award process and OFCOM shall notify all other applicants of the withdrawal.

(3) Where an applicant withdraws its application in accordance with paragraph (2), that applicant shall not be re-admitted to the award process.

(4) Where an applicant withdraws its application in accordance with paragraph (2), that applicant's initial deposit shall not be forfeited for that reason.

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Determination of number of bidders

- 11.**—(1) After the last day for withdrawal, OFCOM shall determine the number of bidders.
- (2) Where there are no bidders, OFCOM shall complete the award process by refunding to applicants which were not qualified, or withdrew in accordance with regulation 10, the initial deposits (where such deposits have not been forfeited under regulation 72) but not any interest which has accrued on the deposits.
- (3) Where there is only one bidder, OFCOM shall grant a licence in accordance with the procedure set out in Part 4 of these Regulations.
- (4) Where the number of bidders is more than one, OFCOM shall grant a licence or licences (as the case may be) in accordance with the procedure set out in Part 5 of these Regulations.
- (5) OFCOM shall publish the names of the bidders on OFCOM's internet website together with a statement as to whether OFCOM will proceed to grant licences in accordance with Part 4 or Part 5 (as the case may be) of these Regulations.

PART 4

PROCEDURE WHERE THERE IS ONLY ONE BIDDER

Frequency range selection menu

- 12.**—(1) Where there is only one bidder, OFCOM shall notify that bidder of—
- (a) a deadline by when the bidder must deliver to OFCOM at Riverside House, 2a Southwark Bridge Road, London SE1 9HA a frequency range selection menu in the form set out in Schedule 6 completed in accordance with paragraph (2) and signed on its behalf by two authorised persons; and
 - (b) a further deadline by when the bidder must pay into OFCOM's bank account by a same day electronic transfer, with accompanying information which identifies the bidder, a sum determined in accordance with paragraph (5);
- (2) The bidder must, on the frequency range selection menu, select no more than one frequency range in respect of each of—
- (a) the 2010–2025 MHz band;
 - (b) frequency ranges for paired lots in the 2500–2690 MHz band; and
 - (c) frequency ranges for individual lots in the 2500–2690 MHz band,
- such that the total number of eligibility points associated with that selection is no greater than sixteen.
- (3) The number of eligibility points associated with each frequency range on the frequency range selection menu shall be construed in accordance with Schedule 6.
- (4) The licence fee shall be the total amount of the prices indicated on the frequency range selection menu for the frequency ranges selected by the bidder.
- (5) The sum which the bidder must pay to OFCOM shall be—
- (a) where the initial deposit has not been forfeited in accordance with regulation 72, a sum equal to the licence fee less the initial deposit;
 - (b) where the initial deposit has been so forfeited, a sum equal to the licence fee.

Grant of licence

- 13.**—(1) Where OFCOM have received from the bidder a completed frequency range selection menu in accordance with regulation 12(1)(a) and the required sum in accordance with regulation (1)(b), OFCOM shall grant the bidder a licence for the frequency ranges selected on the frequency range selection menu that the bidder delivered to OFCOM.

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(2) Where OFCOM have not received from the bidder a completed lot selection menu in accordance with regulation 12(1)(a) or the required sum in accordance with regulation 12(1)(b), the bidder shall not be entitled to the grant of a licence and shall not receive a refund of its initial deposit, which shall (where it has not already been forfeited under regulation 72) be forfeited.

Completion of the award process

14. After the grant of the licence, OFCOM shall complete the award process by—
- (a) publishing on their internet website the name of the bidder to which a licence has been granted, the details of the frequency ranges in respect of which the licence was granted and the licence fee paid; and
 - (b) refunding to applicants which were not qualified, or withdrew in accordance with regulation 10, the initial deposits (where such deposits have not been forfeited under regulation 72) but not any interest which has accrued on the deposits.

PART 5

PROCEDURE WHERE THERE IS MORE THAN ONE BIDDER

CHAPTER 1

Principal stage, assignment stage and grant stage

Principal stage, assignment stage and grant stage

15.—(1) Where there is more than one bidder, the process for the award of licences shall consist of the procedure set out in Chapters 2 to 5 of this Part (“principal stage”), the procedure set out in Chapters 6 and 7 of this Part (“assignment stage”) and the procedure set out in Chapter 8 of this Part (“grant stage”).

(2) The frequencies available under this procedure are—

- (a) 2010–2025 MHz (“the 2010–2025 MHz band”); and
- (b) 2500–2690 MHz (“the 2500–2690 MHz band”).

(3) During the principal stage there shall be one or more rounds for the submission of primary bids (“primary bid rounds”) and a further round for the submission of supplementary bids (“supplementary bids round”).

(4) A bid made during the principal stage shall be a bid for—

- (a) the 2010–2025 MHz band;
- (b) a number of paired lots in the 2500–2690 MHz band, specified without reference to the frequencies or to lot numbers attaching to those frequencies which are specified and set out in the table in Schedule 1;
- (c) a number of individual lots in the 2500–2690 MHz band, specified without reference to the frequencies or to lot numbers attaching to those frequencies which are specified and set out in the table in Schedule 1.

(5) Following completion of the principal stage, the contiguous ranges of paired lots (if any) and the contiguous ranges of individual lots (if any), and the corresponding frequencies as set out in the table in Schedule 1, that are to be assigned to the winning bidders shall be determined in accordance with the assignment stage.

(6) Licences for the frequencies so determined shall be granted in accordance with the grant stage.

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CHAPTER 2

Structure of principal stage

Primary bids

16.—(1) A bid made during a primary bid round (“primary bid”) for a bid selection shall be at an amount in thousands of whole pounds being the total amount of the round prices in that primary bid round for each individual lot, paired lot and the 2010–2025 MHz band (as appropriate) included in the bid selection.

(2) The round price means the price per individual lot, paired lot and the 2010–2025 MHz band determined in accordance with regulation 22 or 23 (as the case may be) at which individual lots, paired lots and the 2010–2025 MHz band are offered to bidders during a primary bid round.

(3) In order to make a primary bid a bidder must, on a form provided to the bidder by OFCOM (“primary bid form”)—

- (a) specify whether it wishes the 2010–2025 MHz band to be included in a licence at the round price for that band;
- (b) specify in respect of the 2500–2690 MHz band the total number of contiguous paired lots it wishes to be included in a licence at the round price for paired lots in that band;
- (c) specify in respect of the 2500–2690 MHz band the total number of contiguous individual lots it wishes to be included in a licence at the round price for individual lots in that band; and
- (d) specify an amount in thousands of whole pounds that it is willing to pay for the licence, being the total amount of the round prices for the selected contiguous individual lots, contiguous paired lots and the 2010–2025 MHz band as the case may be.

(4) Where the bid selection comprised in a primary bid includes individual lots, that selection must include at least two such individual lots.

(5) A bidder must not submit more than one primary bid in any primary bid round.

(6) The bid selection specified in a primary bid made by a bidder must be such that the total number of eligibility points associated with the primary bid in accordance with paragraph (7) does not exceed the bidder’s eligibility limit for that primary bid round determined in accordance with regulation 26 or 27 (as the case may be) and notified to the bidder in accordance with regulation 31(1)(c).

(7) The number of eligibility points associated with a primary bid shall be a number equal to the total of the eligibility points attributed to individual lots, paired lots and the 2010–2025 MHz band (as appropriate) included in the bid selection comprised in the primary bid in accordance with Schedule 7.

Requirement for a valid primary bid in the first primary bid round

17. Any bidder which does not submit a valid primary bid in the first primary bid round shall be excluded from the award process and shall not receive a refund of its initial deposit or any sum that the bidder has paid as a deposit under regulation 25, which shall (where not forfeited under regulation 72) be forfeited.

Supplementary bids

18.—(1) A bid made during the supplementary bids round (“supplementary bid”) shall be either—

- (a) a basic supplementary bid; or
- (b) an additional supplementary bid.

(2) The number of basic supplementary bids and additional supplementary bids that can be made in the supplementary bids round is set out in regulations 19(8) and 20(7).

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(3) A basic supplementary bid shall be a bid at an amount in thousands of whole pounds for either—

- (a) a bid selection containing only paired lots; or
- (b) a bid selection containing only paired lots and the 2010–2025 MHz band; or
- (c) a bid selection containing individual lots in one contiguous range.

(4) An additional supplementary bid shall be a bid at an amount in thousands of whole pounds for a bid selection containing individual lots where—

- (a) those individual lots are divided into two contiguous ranges of individual lots; and
- (b) one such range is in the lower area and the other such range is in the upper area;

whether or not the bid includes paired lots or the 2010–2025 MHz band.

Basic supplementary bids

19.—(1) In order to make each basic supplementary bid a bidder must, on a form provided to the bidder by OFCOM (“supplementary bids form”) specify—

- (a) whether it wishes the 2010–2025 MHz band to be included in a licence;
- (b) in respect of the 2500–2690 MHz band—
 - (i) the total number of paired lots; and
 - (ii) the total number of individual lots,it wishes to be included in a licence; and
- (c) an amount in thousands of whole pounds that it is willing to pay for the licence.

(2) Where the bid selection specified in a basic supplementary bid includes individual lots, that selection must include at least two such individual lots.

(3) The bid selection specified in a basic supplementary bid made by a bidder may be the same as or different from the bid selection comprised in a primary bid made by that bidder.

(4) The amount of the basic supplementary bid shall be determined by the bidder, subject to the restrictions set out in paragraph (5).

(5) The restrictions are—

- (a) the amount of the basic supplementary bid must not be less than the total amount of the round prices in the first primary bid round for the individual lots, paired lots and the 2010–2025 MHz band (as appropriate) included in the bid selection specified in that bid;
- (b) where the basic supplementary bid is for a bid selection in respect of which the bidder has also made a primary round bid, the amount of the basic supplementary bid must be greater than the amount of the highest primary round bid made by the bidder for that bid selection;
- (c) where—
 - (i) the bidder did not make a valid primary bid in the final primary bid round; or
 - (ii) the total number of eligibility points associated with the basic supplementary bid in accordance with paragraph (9) is greater than the total number of eligibility points associated with the valid primary bid made by the bidder in the final primary bid round in accordance with paragraph (9),

the amount of the basic supplementary bid must not be greater than the amount determined in accordance with paragraphs (6) and (7).

(6) The amount referred to in paragraph (5)(c) shall be the total amount of the round prices in the primary bid round referred to in paragraph (7) for the individual lots, paired lots and the 2010–2025 MHz band (as appropriate) included in the bid selection specified in the basic supplementary bid.

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(7) The primary bid round referred to in paragraph (6) is the latest primary bid round in which a primary bid made by the bidder for that bid selection could have satisfied the restriction set out in regulation 16(6).

(8) A bidder may submit any number of basic supplementary bids in the supplementary bids round, subject to the restriction set out in paragraph (10).

(9) The number of eligibility points associated with a primary bid or a basic supplementary bid shall be a number equal to the total of the eligibility points associated with each individual lot, paired lot and the 2010–2025 MHz band (as appropriate) included in the bid selection specified in that bid in accordance with Schedule 7.

(10) A bidder may not submit more than one basic supplementary bid for each particular bid selection.

(11) A bidder is not required to submit a basic supplementary bid.

Additional supplementary bids

20.—(1) A bidder may only make an additional supplementary bid where—

- (a) the bidder has made a valid primary bid for a bid selection including three or more individual lots; or
- (b) the bidder has made a valid basic supplementary bid for a bid selection including three or more individual lots.

(2) In order to make each additional supplementary bid a bidder must, on the supplementary bids form specify—

- (a) whether it wishes the 2010–2025 MHz band to be included in a licence;
- (b) in respect of the 2500–2690 MHz band—
 - (i) the total number of paired lots; and
 - (ii) the total number of individual lots ,it wishes to be included in a licence;
- (c) an amount in thousands of whole pounds that it is willing to pay for the licence;
- (d) that the total number of individual lots referred to in paragraph (4)(c) are to be divided into two divisions where—
 - (i) one division is to be in the lower area (the “lower division”) and the other division is to be in the upper area (the “upper division”);
 - (ii) each such division contains at least two individual lots;
- (e) for the purposes of (d), how the total number of individual lots contained in the bid is to be split numerically, but bidders may not specify the number of those individual lots that shall be in the lower division and the number of those individual lots that shall be in the upper division.

(3) Each additional supplementary bid must meet the conditions set out in paragraph (4) with respect to at least one valid—

- (a) primary bid for a bid selection including three or more individual lots; or
- (b) basic supplementary bid for a bid selection including three or more individual lots.

(4) The conditions are that the additional supplementary bid is for a bid selection containing—

- (a) the same selection of the 2010–2025 MHz band (as appropriate) as the primary bid or the basic supplementary bid meeting the conditions set out in paragraph (3)(a) or (3)(b);
- (b) the same number of paired lots as the primary bid or the basic supplementary bid meeting the conditions set out in paragraph (3)(a) or (3)(b); and
- (c) $n+1$ individual lots in total, where n is the number of individual lots in the primary bid or the basic supplementary bid meeting the conditions set out in paragraph (3)(a) or (3)(b).

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(5) The amount of the additional supplementary bid shall be determined by the bidder, subject to the restrictions set out in paragraph (6).

(6) The restrictions are—

(a) the amount of the additional supplementary bid must not be less than the total amount of the round prices in the first primary bid round for the individual lots, paired lots and the 2010–2025 MHz band (as appropriate) included in the bid selection specified in that bid;

(b) where—

(i) the bidder has made a valid primary bid in accordance with paragraph (1)(a); and

(ii) the bidder has not made a valid basic supplementary bid in accordance with paragraph (1)(b) for the same bid selection; and

(iii) the additional supplementary bid satisfies the conditions set out in paragraph (4) with respect to the valid primary bid,

the amount of the additional supplementary bid shall be no greater than the amount of the highest valid primary bid for that bid selection;

(c) where—

(i) the bidder has made a valid basic supplementary bid in accordance with paragraph (1)(b); and

(ii) the additional supplementary bid satisfies the conditions set out in paragraph (4) with respect to the valid basic supplementary bid,

the amount of the additional supplementary bid shall be no greater than the amount of that valid basic supplementary bid.

(7) A bidder may submit any number of additional supplementary bids, subject to the restriction set out in paragraph (8).

(8) A bidder may not submit more than one additional supplementary bid for each particular selection and division of individual lots meeting the requirements of paragraphs (2)(d) and (4).

(9) A bidder is not required to submit an additional supplementary bid.

Number of primary bid rounds

21.—(1) After each primary bid round, OFCOM shall determine whether any of the conditions set out in paragraph (2) are met.

(2) The conditions are—

(a) there is excess demand for the 2010–2025 MHz band;

(b) there is excess demand for paired lots;

(c) there is excess demand for the 2500–2690 MHz band;

(d) the total number of individual lots selected in valid primary bids is more than nine.

(3) Where at least one of the conditions set out in paragraphs (2)(a) to (c) is met, there shall be another primary bid round unless OFCOM determine, in accordance with paragraph (4), that there shall be no further primary bid rounds.

(4) OFCOM shall only make such a determination where they are satisfied that it is unlikely that the information that would be made available to bidders under regulation 36 following any such further primary bid rounds would affect—

(a) the determination of the winning combination of principal stage bids in accordance with regulation 45;

(b) the determination of the base price payable by a winning bidder in accordance with regulation 46.

(5) Where—

(a) OFCOM have determined under paragraph (3) that there shall be no further primary bid rounds; or

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(b) none of the conditions set out in paragraphs (2)(a) to (c) is met, there shall be a supplementary bids round.

Determination of round prices for the first primary bid round

22. In the first primary bid round, the round price for—

- (a) each individual lot shall be fifty thousand pounds;
- (b) each paired lot shall be one hundred thousand pounds;
- (c) the 2010–2025 MHz band shall be one hundred thousand pounds.

Determination of round prices for subsequent primary bid rounds

23.—(1) Subject to paragraph (2), the round price for the 2010–2025 MHz band shall be the same amount as it was in the previous primary bid round.

(2) Where after the previous primary bid round OFCOM have determined under regulation 21(1) that there is excess demand for the 2010–2025 MHz band, the round price for the 2010–2025 MHz band shall be an amount that is higher than the amount that was the round price for that band in the previous primary bid round, subject to the limit set out in paragraph (7).

(3) Subject to paragraph (4), the round price for paired lots shall be the same amount as it was in the previous primary bid round.

(4) Where after the previous primary bid round OFCOM have determined under regulation 21(1) that—

- (a) there is excess demand for the 2500–2690 MHz band; or
- (b) there is excess demand for paired lots,

the round price for paired lots shall be an amount that is higher than the amount that was the round price for paired lots in the previous primary bid round, subject to the limit in paragraph (7).

(5) Subject to paragraph (6), the round price for individual lots shall be the same amount as it was in the previous primary bid round.

(6) Where after the previous primary bid round OFCOM have determined under regulation 21(1) that—

- (a) there is excess demand for the 2500–2690 MHz band; and
- (b) the total number of individual lots selected in valid primary bids is more than nine,

the round price for individual lots shall be equal to an amount that is half the amount of the round price for paired lots determined in accordance with paragraph (3) or (4) (as the case may be).

(7) The round price for the 2010–2025 MHz band and the round price for paired lots shall not be more than twice the amount of the round prices for the 2010–2025 MHz band and the round price for paired lots in the previous primary bid round.

Bidder's eligibility limit for primary bid rounds

24. Before each primary bid round OFCOM shall determine an eligibility limit for each bidder for that primary bid round in accordance with regulation 26 or 27 (as the case may be).

Additional deposit before first primary bid round

25.—(1) In addition to the initial deposit paid in accordance with regulation 4(3)(b), a bidder may pay an additional sum in pounds as a deposit which shall be taken into account by OFCOM in accordance with regulation 26 for the purpose of calculating the bidder's eligibility limit for the first primary bid round.

(2) A bidder wishing to pay such an additional sum must, by such a deadline as may be specified by OFCOM, pay the additional sum into OFCOM's bank account by a same day electronic transfer with accompanying information which identifies the bidder.

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Determination of bidder's eligibility limit for the first primary bid round

26.—(1) After the deadline specified in regulation 25(2) and before the start of the first primary bid round, OFCOM shall determine each bidder's eligibility limit for the first primary bid round in accordance with the requirements of this regulation.

(2) OFCOM shall divide by fifty thousand the total amount of pounds that the bidder has on deposit (including the initial deposit and any additional sum paid under regulation 25, but not including any sum forfeited under regulation 72).

(3) Where the number that results from the calculation in paragraph (2) is greater than sixteen, the eligibility limit shall be sixteen.

(4) Where the number that results from the calculation in paragraph (2) is not greater than sixteen, the eligibility limit shall be—

- (a) that number, or
- (b) where the number is not a whole number, that number rounded down to the nearest whole number.

(5) Where a bidder's eligibility limit calculated in accordance with this regulation is less than two, that bidder shall be excluded from the award process and shall not receive a refund of its initial deposit or any sum that the bidder has paid as a deposit under regulation 25, which shall (where not forfeited under regulation 72) be forfeited.

Determination of bidder's eligibility limit for subsequent primary bid rounds

27.—(1) For subsequent primary bid rounds, OFCOM shall determine each bidder's eligibility limit under paragraph (2) or (5) (as the case may be).

(2) Where a bidder makes a valid primary bid in a primary bid round, OFCOM shall determine the bidder's eligibility limit for the next primary bid round by calculating the number of eligibility points associated with that valid primary bid.

(3) The number of eligibility points associated with a valid primary bid shall be a number equal to the total of the eligibility points associated with each individual lot, paired lot and the 2010–2025 MHz band (as appropriate) included in the bid selection specified in that valid primary bid in accordance with Schedule 6.

(4) The bidder's eligibility limit shall be a number equal to the number of eligibility points associated with that valid primary bid.

(5) Where a bidder does not make a valid primary bid in a primary bid round, the bidder's eligibility limit for the next primary bid round shall be zero.

Valid primary bids

28.—(1) A primary bid shall only be taken into consideration for the purposes of determining—

- (a) whether the conditions set out in regulation 21(2) are met;
- (b) the winning combination of principal stage bids in accordance with regulation 45;
- (c) the base price payable by a winning bidder in accordance with regulation 46;

if it is a primary bid which satisfies the conditions set out in paragraph (2) (“valid primary bid”).

(2) The conditions are that—

- (a) the primary bid is made on a primary bid form that has been completed in accordance with regulation 16(3);
- (b) the primary bid is submitted in accordance with the restriction set out in regulation 16(5);
- (c) the primary bid complies with the restrictions set out in regulation 16(6) and with the requirement set out in regulation 16(4); and
- (d) the completed primary bid form is submitted to OFCOM in accordance with regulation 32(1) and is received by OFCOM in accordance with regulation 32(2).

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Valid basic supplementary bids

29.—(1) A basic supplementary bid shall only be taken into consideration for the purposes of determining—

- (a) the winning combination of principal stage bids under regulation 45;
- (b) the base price payable by a winning bidder under regulation 46;

if it satisfies the conditions set out in paragraph (2) (“valid basic supplementary bid”).

(2) The conditions in respect of a basic supplementary bid are that—

- (a) the basic supplementary bid is made on a supplementary bid form that has been completed in accordance with regulation 19;
- (b) the amount of the basic supplementary bid specified by the bidder under regulation 19(1)(c) complies with the restrictions set out in regulation 19(5);
- (c) the basic supplementary bid complies with the restrictions set out in regulation 19(10) and with the requirement set out in regulation 19(2); and
- (d) the completed supplementary bids form is submitted to OFCOM in accordance with regulation 39(1) and is received by OFCOM in accordance with regulation 39(2).

Valid additional supplementary bids

30.—(1) An additional supplementary bid shall only be taken into consideration for the purposes of determining—

- (a) the winning combination of principal stage bids under regulation 45;
- (b) the base price payable by a winning bidder under regulation 46;

if it satisfies the conditions set out in paragraph (2) (“valid additional supplementary bid”).

(2) The conditions in respect of an additional supplementary bid are that—

- (a) the additional supplementary bid is made on a supplementary bid form that has been completed in accordance with regulation 20(2);
- (b) the amount of the additional supplementary bid specified by the bidder under regulation 20(2)(c) complies with the restrictions set out in regulation 20(6);
- (c) the additional supplementary bid complies with the restriction set out in regulation 20(8) and with the requirements set out in regulation 20(4); and
- (d) the completed supplementary bids form is submitted to OFCOM in accordance with regulation 39(1) and is received by OFCOM in accordance with regulation 39(2).

CHAPTER 3

Procedure for primary bid rounds

Notice to be given to bidders before primary bid rounds and extensions to rounds

31.—(1) Before the start of each primary bid round, OFCOM shall notify each bidder of—

- (a) the date on which, and the times on that date within which, the primary bid round will take place;
- (b) the round price for—
 - (i) an individual lot;
 - (ii) a paired lot; and
 - (iii) the 2010–2025 MHz band,

in that primary bid round (determined in accordance with regulation 22 or 23, as the case may be);

- (c) the bidder’s eligibility limit for that primary bid round (determined in accordance with regulation 26 or 27, as the case may be).

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(2) The time notified by OFCOM under paragraph (1)(a) as the end of the primary bid round (“end of round time”) may be treated by a bidder in respect of—

- (a) no more than two primary bid rounds, and
- (b) where paragraph (3) applies to the bidder, a further primary bid round,

as that time extended by thirty minutes and OFCOM shall treat that extended time as the end of round time for the purposes of paragraph (1)(a).

(3) This paragraph applies to a bidder where—

- (a) in respect of a previous primary bid round, the bidder treated the end of round time for that round as extended by thirty minutes in accordance with paragraph (2);
- (b) the bidder submitted its completed primary bid form for that primary bid round so that it was received by OFCOM by the end of round time so extended; and
- (c) OFCOM have notified the bidder that they are satisfied that, in respect of that primary bid round, circumstances existed which were beyond the bidder’s control which had the effect that the bidder could not have submitted its primary bid form so that it was received by OFCOM by the end of round time without such an extension.

Submission of primary bid form to OFCOM

32.—(1) Except as provided for in regulation 33, a bidder must submit the completed primary bid form to OFCOM by using the electronic auction system.

(2) The completed primary bid form must be received by OFCOM by the end of round time.

Alternative method for submission of primary bid form

33.—(1) Where OFCOM are satisfied that a bidder is unable to submit a primary bid form by using the electronic auction system because of technical failure (or an event or circumstance with similar effect on the bidder’s ability to use the electronic auction system), OFCOM shall notify the bidder of an alternative method of submitting the primary bid form and any requirements relating to the authentication of communications made by means of the alternative method.

(2) The bidder must submit the primary bid form by means of the alternative method and must comply with any requirements which have been notified to it under paragraph (1) relating to the authentication of communications.

Incomplete or defective primary bid form

34.—(1) Where, due to the manner of completion, a primary bid form is incomplete or defective but OFCOM believe that they can ascertain the bidder’s intention in relation to the making of the primary bid, OFCOM shall ask the bidder to confirm in a notice to OFCOM by a specified deadline that OFCOM have correctly ascertained the bidder’s intention in relation to the making of the primary bid.

(2) Where the bidder confirms in a notice given to OFCOM by the specified deadline which is signed by two authorised persons of that bidder that OFCOM have correctly ascertained the bidder’s intention, the primary bid form in its entirety shall be accepted by OFCOM on that basis.

(3) Where the bidder does not give such confirmation in a notice given to OFCOM by the specified deadline which is signed by two authorised persons of that bidder, the primary bid form in its entirety shall be rejected by OFCOM and the primary bid submitted on the primary bid form shall not be a valid primary bid and accordingly shall not be taken into consideration for the purposes of determining—

- (a) whether the conditions set out in regulation 21(2) are met;
- (b) the winning combination of principal stage bids in accordance with regulation 45;
- (c) the base price payable by a winning bidder in accordance with regulation 46.

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Notification that primary bid not valid

35. Where a bidder submits a primary bid that is not a valid primary bid during a primary bid round, OFCOM shall, after the end of that primary bid round, notify the bidder of that fact and shall give the reasons why the bid is not a valid primary bid.

Release of information on primary bids in principal stage

36.—(1) After the end of a primary bid round and before the start of the subsequent primary bid round (or before the start of the supplementary bids round if there is no subsequent primary bid round), OFCOM shall notify bidders of the total number of—

- (a) selections of the 2010–2025 MHz band;
- (b) paired lots; and
- (c) individual lots,

included in valid primary bids.

(2) OFCOM may, from time to time, publish on their internet website the total number of—

- (a) selections of the 2010–2025 MHz band;
- (b) paired lots; and
- (c) individual lots,

included in valid primary bids submitted in the latest primary bid round completed at that time.

Further deposit for primary bid rounds

37.—(1) Where in respect of a primary bid the amount specified by a bidder under regulation 16(3)(d) is greater than double the total amount that the bidder has on deposit (including the initial deposit, any sum paid as a deposit under regulation 25 and any sum or sums paid as a deposit under this regulation, but not including any sum forfeited under regulation 72) OFCOM may, having regard to the desirability of securing an efficient outcome to the principal stage, subsequently notify the bidder that the bidder is required to pay a further sum in pounds as a deposit.

(2) The further sum shall be an amount specified by OFCOM such that the total amount that the bidder is required to have on deposit (including the initial deposit, any sum paid as a deposit under regulation 25 and any sum or sums paid as a deposit under this regulation, but not including any sum forfeited under regulation 72) is at most half the amount of the highest valid primary bid that the bidder made before OFCOM gave notice to the bidder under paragraph (1).

(3) Any such sum shall be paid into OFCOM's bank account by a same day electronic transfer, with accompanying information which identifies the bidder, by a deadline specified by OFCOM.

(4) Where a bidder does not satisfy the requirements set out in paragraph (3), OFCOM shall notify the bidder of that fact, and for any primary bid rounds following notice being given under this paragraph the bidder's eligibility limit shall be zero.

CHAPTER 4

Procedure for supplementary bids round and further deposit for supplementary bids round

Notice to be given to bidders before supplementary bids round

38.—(1) Before the start of the supplementary bids round, OFCOM shall notify each bidder of—

- (a) the date on which, and the times on that date within which, the supplementary bids round will take place;
- (b) the deadline by when bidders must pay a further sum in pounds as a deposit in accordance with regulation 44; and
- (c) if applicable, the proportion referred to in regulation 44(1)(a).

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Submission of supplementary bids form to OFCOM

39.—(1) Except as provided for in regulation 40, a bidder must submit the completed supplementary bids form to OFCOM by using the electronic auction system.

(2) Except as provided for in regulation 41, the completed supplementary bids form must be received by OFCOM by the time notified to bidders under regulation 38(1)(a) as the end of the supplementary bids round.

Alternative method for submission of supplementary bids form

40.—(1) Where OFCOM are satisfied that a bidder is unable to submit a supplementary bids form by using the electronic auction system because of technical failure (or an event or circumstance with similar effect on the bidder's ability to use the electronic auction system), OFCOM shall notify the bidder of an alternative method of submitting the supplementary bids form and any requirements relating to the authentication of communications made by means of the alternative method.

(2) The bidder must submit the supplementary bids form by means of the alternative method and must comply with any requirements which have been notified to it under paragraph (1) relating to the authentication of communications.

Extension to supplementary bids round

41.—(1) Where—

- (a) OFCOM have not received a completed supplementary bids form from a bidder by the time notified to bidders under regulation 38(1)(a) as the end of the supplementary bids round, and
- (b) paragraph (2) applies,

the time by which the bidder's completed supplementary bids form must be received by OFCOM shall be the time sixty minutes after the time notified to bidders under regulation 38(1)(a) as the end of the supplementary bids round.

(2) This paragraph applies where OFCOM are satisfied that circumstances existed which were beyond the bidder's control which had the effect that the bidder could not submit its supplementary bids form so that it was received by OFCOM by the time notified to bidders under regulation 38(1)(a) as the end of the supplementary bids round.

Incomplete or defective supplementary bids form

42.—(1) Where, due to the manner of completion, a supplementary bids form is incomplete or defective but OFCOM believe that they can ascertain the bidder's intention in relation to the making of the supplementary bid or bids, OFCOM shall ask the bidder to confirm in a notice to OFCOM by a specified deadline that OFCOM have correctly ascertained the bidder's intention in relation to the making of the supplementary bid or bids.

(2) Where the bidder confirms in a notice given to OFCOM by the specified deadline which is signed by two authorised persons of that bidder that OFCOM have correctly ascertained the bidder's intention, the supplementary bids form in its entirety shall be accepted by OFCOM on that basis.

(3) Where the bidder does not give such confirmation in a notice given to OFCOM by the specified deadline which is signed by two authorised persons of that bidder—

- (a) where the incompleteness or defect relates to one or more of the supplementary bids made on the supplementary bids form, that supplementary bid or those supplementary bids (as the case may be) shall be rejected by OFCOM and shall not be taken into consideration for the purposes of determining—
 - (i) the winning combination of principal stage bids in accordance with regulation 45;
 - (ii) the base price payable by a winning bidder in accordance with regulation 46;

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- (b) where sub-paragraph (a) does not apply, the supplementary bids form in its entirety shall be rejected by OFCOM and none of the supplementary bids made on that supplementary bids form shall be taken into consideration for the purposes of determining—
 - (i) the winning combination of principal stage bids in accordance with regulation 45;
 - (ii) the base price payable by a winning bidder in accordance with regulation 46.

Notification that supplementary bid not valid

43. Where a bidder submits a supplementary bid that is not a valid supplementary bid, OFCOM shall, after the end of the supplementary bids round, notify the bidder of that fact and shall give the reasons why the bid is not a valid supplementary bid.

Further deposit for supplementary bids round

44.—(1) By the deadline notified to bidders under regulation 38(1)(b), each bidder must pay into OFCOM's bank account by a same day electronic transfer, with accompanying information which identifies the bidder, a further sum in pounds as a deposit so that the total amount the bidder has on deposit (including the initial deposit, any sum paid as a deposit under regulation 25 or 37 and any sum paid as a deposit under this paragraph, but not including any sum forfeited under regulation 72) is not less than—

- (a) where a bidder has on all occasions satisfied the requirements set out in regulation 37(3) in respect of every notice it has received under regulation 37(1), the greater of—
 - (i) a proportion of the amount of the bidder's highest valid primary bid as specified by the bidder under regulation 16(3)(d); and
 - (ii) the same proportion of the amount of the bidder's highest valid supplementary bid as specified by the bidder under regulation 19(1)(c) or regulation 20(2)(c) as the case may be;

where that proportion shall be specified by OFCOM in the notice to bidders under regulation 38 and shall be at most one half;

- (b) where a bidder has not satisfied the requirements set out in regulation 37(3) in respect of every notice it has received under regulation 37(1), the greater of—
 - (i) the amount of the bidder's highest valid primary bid as specified by the bidder under regulation 16(3)(d); and
 - (ii) the amount of the bidder's highest valid supplementary bid as specified by the bidder under regulation 19(1)(c) or regulation 20(2)(c) as the case may be.

(2) Where a bidder does not satisfy the requirements set out in paragraph (1), OFCOM shall notify the bidder and the bidder shall be excluded from the award process and shall not receive a refund of its initial deposit or any sum paid as a deposit under regulation 25 or 37 or under paragraph (1), which shall (where not forfeited under regulation 72) be forfeited, and all of that bidder's primary bids and supplementary bids (if any) shall be deemed to be invalid and shall not be taken into consideration for the purposes of determining—

- (a) the winning combination of principal stage bids in accordance with regulation 45;
- (b) the base price payable by a winning bidder in accordance with regulation 46.

CHAPTER 5

Determination of winning principal stage bids and conclusion of principal stage

Determination of the winning principal stage bids and the winning combination of principal stage bids

45.—(1) The winning principal stage bids shall be those valid principal stage bids that comprise the winning combination of principal stage bids.

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(2) Unless paragraph (4) applies, the winning combination of principal stage bids shall be the valid combination of principal stage bids having the highest total value of amounts bid.

(3) A valid combination of principal stage bids is any combination of valid principal stage bids within which—

- (a) there is at most one valid principal stage bid from any one bidder;
- (b) the 2010–2025 MHz band is included in at most one of the bids;
- (c) subject to sub-paragraphs (d) and (e), in respect of the 2500–2690 MHz band, it would be possible for OFCOM to assign—
 - (i) in respect of each valid principal stage bid containing paired lots, a contiguous range of paired lots where the number of paired lots within that range is equal to the number of paired lots selected in that valid principal stage bid; and
 - (ii) in respect of each valid principal stage bid containing individual lots, a contiguous range of individual lots where the number of individual lots contained within that range is equal to the number of individual lots selected in that valid principal stage bid,

such that lot twenty-four is not assigned and each other lot is assigned no more than once;

- (d) where a combination of valid principal stage bids includes at least one additional supplementary bid, it would be possible for OFCOM to assign—
 - (i) in respect of each valid principal stage bid containing paired lots, a contiguous range of paired lots where the number of paired lots within that range is equal to the number of paired lots selected in that valid principal stage bid;
 - (ii) in respect of each valid principal stage bid containing individual lots, that is not an additional supplementary bid, a contiguous range of individual lots where the number of individual lots contained within that range is equal to the number of individual lots selected in that valid principal stage bid; and
 - (iii) in respect of each valid principal stage bid containing individual lots, that is an additional supplementary bid, two contiguous ranges of individual lots where—
 - (aa) the number of individual lots within one range corresponds to the number of individual lots within one of the divisions specified in accordance with regulation 20(2)(d); and
 - (bb) the number of individual lots within the other range corresponds to the number of individual lots within the other division so specified,

such that lot twenty-four is not assigned and each other lot is assigned no more than once;

- (e) where a combination of valid principal stage bids includes no bids for paired lots, it would be possible for OFCOM to assign contiguous ranges of individual lots in respect of each winning principal stage bid such that there is no overlap between those ranges and any of the thirty-eight lots in the 2500–2690 MHz band may be assigned;

(4) Where there is more than one valid combination of principal stage bids for which the total value is equal highest, the winning combination of principal stage bids shall be determined in accordance with the order of precedence set out in paragraph (5) or, where paragraph (6) applies, in accordance with that paragraph.

(5) The order of precedence shall be determined by the total number of eligibility points associated with each such valid combination of principal stage bids in accordance with paragraph (8) such that valid combinations of principal stage bids with which a greater total number of eligibility points are associated prevail over valid combinations of principal stage bids with which a lesser total number of eligibility points are associated.

(6) Where there is more than one valid combination of principal stage bids for which—

- (a) the total value is equal highest; and
- (b) the associated number of eligibility points is equal highest,

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OFCOM shall select that combination of principal stage bids which includes the smallest number of additional supplementary bids.

(7) Where after the provisions in paragraph (6) have been applied more than one valid combination of principal stage bids remains, OFCOM shall employ a method of random selection from amongst those valid combinations of principal stage bids to determine the winning combination of principal stage bids.

(8) The number of eligibility points associated with a valid combination of principal stage bids shall be a number equal to the total of the eligibility points associated with—

- (a) each individual lot;
- (b) each paired lot; and
- (c) each selection of the 2010–2025 MHz band,

included in the bid selection specified in the bids constituting that valid combination of principal stage bids in accordance with Schedule 7.

Determination of base price of winning principal stage bids

46. In respect of each winning principal stage bid OFCOM shall determine an amount in accordance with Schedule 8 (“base price”) which shall be payable by the relevant winning bidder.

Notification of results of principal stage and refund of deposits

47. Following the determination of the winning principal stage bids and the winning combination of principal stage bids under regulation 45 and the determination of the base price for each winning principal stage bid under regulation 46, OFCOM shall—

- (a) notify—
 - (i) winning bidders of—
 - (aa) the bid selection included in their winning principal stage bids as determined under regulation 45;
 - (bb) the value of the base price for its winning principal stage bid as determined under regulation 46; and
 - (cc) the further sum (if any) in pounds as a deposit that it is required to pay in accordance with regulation 48 (“final principal stage deposit”); and
 - (ii) all other bidders that they have not made a winning principal stage bid as determined under regulation 45;
- (b) refund to applicants which were not qualified or which withdrew in accordance with regulation 10 and to bidders which were not winning bidders the initial deposits and any sum paid as a deposit under regulation 25, 37 or 44 (where such deposits have not been forfeited under regulation 17, 44(2) or 72), but not any interest which has accrued on the deposits.

Final principal stage deposit

48.—(1) The final principal stage deposit notified to winning bidders in accordance with regulation 47(a)(i)(cc) shall be an amount such that the total amount that the bidder has on deposit (including the initial deposit, any sum paid as a deposit under regulation 25, 37 or 44 and any sum paid as a deposit under this regulation, but not including any sum forfeited under regulation 44(2) or 72) is not less than the amount of the base price for that bidder determined under regulation 46.

(2) The final principal stage deposit shall be paid into OFCOM’s bank account by a same day electronic transfer, with accompanying information which identifies the bidder, by a deadline specified by OFCOM.

(3) Where a bidder does not satisfy the requirements set out in paragraph (2), OFCOM shall notify the bidder and the bidder shall be excluded from the award process and shall not receive a

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refund of its initial deposit or any sum paid as a deposit under regulation 25, 37, 44 or paragraph (2), which shall be forfeited.

Publication of results of principal stage

49. After the deadline specified under regulation 48(2), OFCOM shall publish on their internet website—

- (a) the names of the winning bidders that have satisfied the requirements of regulation 48(2);
- (b) in respect of each winning bidder that has satisfied the requirements of regulation 48(2)—
 - (i) the bid selection or bid selection and division of individual lots (as the case may be) comprised in its winning principal stage bid; and
 - (ii) the base price for its winning principal stage bid;
- (c) the names of any winning bidders that have not satisfied the requirements of regulation 48(2) and who have been excluded from the award process in accordance with regulation 48(3);
- (d) in respect of each winning bidder that has not satisfied the requirements of regulation 48(2) and has been excluded from the award process in accordance with regulation 48(3)—
 - (i) the bid selection or bid selection and division of individual lots (as the case may be) comprised in the bid which would have constituted its winning principal stage bid; and
 - (ii) the base price for the bid which would have constituted its winning principal stage bid.

CHAPTER 6

Assignment of frequencies for the 2010–2025 MHz band and for the 2500–2690 MHz band where only one winning principal stage bid includes paired lots or only one winning principal stage bid includes individual lots

Assignment of the 2010-2025 MHz band

50. OFCOM shall assign to the bidder that submitted the winning principal stage bid for the 2010–2025 MHz band the frequencies between 2010 MHz and 2025 MHz.

Procedure for the 2500–2690 MHz band

51.—(1) Where paired lots were selected in only one winning principal stage bid, OFCOM shall assign to the bidder that submitted that winning principal stage bid a contiguous range of paired lots such that—

- (a) the number of paired lots contained within that range is equal to the number of paired lots selected in that winning principal stage bid; and
- (b) lot one is contained within that range.

(2) Subject to paragraph (3), where individual lots were selected in only one winning principal stage bid, OFCOM shall assign to the bidder that submitted that winning principal stage bid a contiguous range of individual lots in the lower area such that—

- (a) the number of individual lots contained within that range is equal to the number of individual lots selected in that winning principal stage bid; and
- (b) lot twenty-three is contained within that range.

(3) Where—

- (a) individual lots were selected in only one winning principal stage bid; and
- (b) that winning principal stage bid was an additional supplementary bid,

paragraph (4) shall apply.

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(4) OFCOM shall assign to the bidder that submitted the winning principal stage bid meeting the requirement of paragraph (3)(b) two contiguous ranges of individual lots such that—

- (a) one contiguous range of individual lots is assigned in the lower area such that—
 - (i) the number of individual lots within that range is equal to the number of individual lots in the division containing the larger number of individual lots specified in that winning principal stage bid; and
 - (ii) lot twenty-three is contained within that range; and
- (b) one contiguous range of individual lots is assigned in the upper area such that—
 - (i) the number of individual lots within that range is equal to the number of individual lots in the division containing the smaller number of individual lots specified in that winning principal stage bid; and
 - (ii) lot thirty-eight is contained within that range.

CHAPTER 7

Assignment of frequencies to winning bidders for the 2500–2690 MHz band where more than one winning principal stage bid includes paired lots or individual lots

Assignment stage round and assignment stage bids

52.—(1) Where more than one winning principal stage bid included—

- (a) paired lots; or
- (b) individual lots,

there shall be one further round of bidding (“assignment stage round”) to determine which frequencies in the 2500–2690 MHz band shall be assigned to each winning bidder.

(2) Where the assignment stage round relates to—

- (a) paired lots, only bidders that submitted a winning principal stage bid which included paired lots may take part in the assignment stage round;
- (b) individual lots, only bidders that submitted a winning principal stage bid which included individual lots may take part in the assignment stage round.

(3) A bid made during the assignment stage round (“assignment stage bid”) shall be in the case of—

- (a) paired lots, a bid for a contiguous range of paired lots;
- (b) individual lots where the winning principal stage bid was not an additional supplementary bid, a bid for a contiguous range of individual lots;
- (c) individual lots where the winning principal stage bid was an additional supplementary bid, a bid for a combination of two contiguous ranges of individual lots where one range is in the lower area and the other range is in the upper area,

at an amount in whole pounds specified by the bidder.

(4) A bidder in the assignment stage round may only bid—

- (a) in respect of individual lots, for the contiguous ranges or combination of two contiguous ranges of individual lots (as the case may be); and
- (b) in respect of paired lots, for the contiguous range of paired lots,

that OFCOM determine are available to the bidder in accordance with regulation 54 (“assignment stage options”).

Assignment stage bids

53.—(1) In order to make an assignment stage bid for an assignment stage option, a bidder must, on a form provided to the bidder by OFCOM (“assignment stage bid form”), specify an amount in whole pounds that it is willing to pay for a licence that includes—

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- (a) the contiguous range of individual lots;
- (b) the combination of two contiguous ranges of individual lots; or
- (c) the contiguous range of paired lots (as the case may be),

in addition to the base price for that bidder's winning principal stage bid determined under regulation 46.

(2) A bidder may submit no more than one assignment stage bid for each of the assignment stage options determined in accordance with regulation 52(4).

(3) A bidder is not required to submit an assignment stage bid.

Determination of frequencies

54.—(1) The assignment stage options that are available to each winning bidder in the assignment stage round for—

- (a) paired lots, where the assignment stage round relates to paired lots; and
- (b) individual lots, where the assignment stage round relates to individual lots,

shall be determined by OFCOM such that the conditions in paragraphs (2) and (3) are satisfied.

(2) In respect of paired lots those assignment stage options shall be those contiguous ranges of paired lots which satisfy the following conditions—

- (a) the number of paired lots contained in that contiguous range of paired lots is equal to the number of paired lots included in the bidder's winning principal stage bid; and
- (b) the lowest lot of a paired lot included in that range is such that the following conditions could be satisfied—
 - (i) each winning bidder that included paired lots in its winning principal stage bid is assigned a contiguous range of paired lots that, in respect of that bidder's winning principal stage bid, satisfies the condition in sub-paragraph (a);
 - (ii) there is no overlap between the frequencies assigned;
 - (iii) the combination of all of the contiguous ranges of paired lots assigned is a single contiguous range of paired lots; and
 - (iv) lot one is included in that contiguous range of paired lots.

(3) In respect of individual lots those assignment stage options shall be those contiguous ranges, or combinations of two contiguous ranges of individual lots (as the case may be) that satisfy the following conditions—

- (a) where the bidder's winning principal stage bid was not an additional supplementary bid, the contiguous ranges of individual lots shall be such that the number of individual lots contained in each such contiguous range of individual lots is equal to the number of individual lots included in the bidder's winning principal stage bid;
- (b) where the bidder's winning principal stage bid was an additional supplementary bid, the combinations of two contiguous ranges of individual lots shall be such that—
 - (i) the number of individual lots contained in one of those contiguous ranges of individual lots is equal to the number of individual lots within one of the two divisions specified in the bidder's winning principal stage bid; and
 - (ii) the number of individual lots contained in the other of those contiguous ranges of individual lots is equal to the number of individual lots within the other of the two divisions specified in the bidder's winning principal stage bid;
- (c) the lowest individual lot included in each contiguous range of individual lots is such that the following conditions could be satisfied—
 - (i) each winning bidder that included individual lots in its winning principal stage bid is assigned a contiguous range of individual lots, or in the case of a winning principal stage bid that was an additional supplementary bid, a combination of two contiguous ranges of individual lots that, in respect of that bidder's winning principal stage bid,

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satisfies the condition set out in sub-paragraph (a) or the conditions set out in sub-paragraph (b) as the case may be;

- (ii) there is no overlap between the frequencies assigned;
 - (iii) the combination of all contiguous ranges of individual lots assigned in the lower area (if any) is a contiguous range of individual lots which includes lot twenty-three but does not include lot X, where X is equal to the total number of paired lots selected in winning principal stage bids;
 - (iv) the combination of all contiguous ranges of individual lots assigned in the upper area (if any) is a contiguous range of individual lots which includes lot thirty-eight but does not include lot Y, where Y is equal to the sum of twenty-four and the total number of paired lots selected in winning principal stage bids;
- (d) where no valid principal stage bids contained paired lots—
- (i) all individual lots awarded are awarded in one contiguous range of individual lots;
 - (ii) each winning bidder is awarded a contiguous range of individual lots;
 - (iii) there is no overlap between the contiguous ranges of individual lots awarded to winning bidders; and
 - (iv) any of the thirty-eight individual lots in the 2500–2690 MHz band may be assigned.

Assignment stage bid deposit

55.—(1) Each bidder that makes an assignment stage bid must, by a deadline specified by OFCOM where that deadline shall expire after the end of the assignment stage round, pay into OFCOM’s bank account by a same day electronic transfer, with accompanying information which identifies the bidder, a further sum in pounds as a deposit so that the total amount the bidder has on deposit (including the initial deposit, any sum paid as a deposit under regulation 25, 37 or 44 and any sum paid as a deposit under this paragraph, but not including any sum forfeited under regulation 72) is an amount that is not less than the amount (“*d*”) calculated in accordance with the formula set out in paragraph (2).

(2) The formula is—

$$d = b + a_p + a_u$$

where—

“*b*” is the amount of the base price of the bidder’s winning principal stage bid (determined in accordance with regulation 46);

“*a_p*” is the amount of the highest assignment stage bid made by the bidder for an assignment stage option in relation to paired lots;

“*a_u*” is the amount of the highest assignment stage bid made by the bidder for an assignment stage option in respect of individual lots.

(3) Where a bidder does not satisfy the provisions set out in paragraph (1)—

- (a) all of the assignment stage bids submitted by the bidder in the assignment stage round shall be deemed to be invalid and shall not be taken into consideration for the purpose of determining—
 - (i) the winning combination of assignment stage bids under regulation 64;
 - (ii) the additional price payable by a winning bidder under regulation 66;
- (b) the bidder will be deemed to have made a valid assignment stage bid of zero for each assignment stage option available to the bidder in accordance with regulation 54 for the purposes mentioned in sub-paragraph (a).

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Valid assignment stage bids

56.—(1) An assignment stage bid shall only be taken into consideration for the purposes of determining—

- (a) the winning combination of assignment stage bids under regulation 64; and
- (b) the additional price payable by a winning bidder under regulation 66,

if it satisfies the conditions set out in paragraph (2) (“valid assignment stage bid”).

(2) The conditions are—

- (a) the assignment stage bid is submitted in accordance with the restrictions set out in regulation 52(4) and 53(2);
- (b) the assignment stage bid is made on an assignment stage bid form that has been completed in accordance with regulation 53; and
- (c) the completed assignment stage bid form is submitted to OFCOM in accordance with regulation 58(1) and is received by OFCOM in accordance with regulation 58(2).

Notice to bidders before the assignment stage round

57. Before the start of the assignment stage round, OFCOM shall notify each bidder that may make an assignment stage bid in the assignment stage bid round in accordance with regulation 52 of—

- (a) the assignment stage options that are available to that bidder as determined in accordance with regulation 54;
- (b) the date on which, and the times on that date within which, the assignment stage round will take place.

Submission of assignment stage bid form to OFCOM

58.—(1) Except as provided for in regulation 59, a bidder must submit the completed assignment stage bid form to OFCOM by using the electronic auction system.

(2) Except as provided for in regulation 60, the completed assignment stage bid form must be received by OFCOM by the time notified to the bidder under regulation 57(b) as the end of the assignment stage round.

Alternative method for submission of assignment stage bid form

59.—(1) Where OFCOM are satisfied that a bidder is unable to submit an assignment stage bid form by using the electronic auction system because of technical failure (or an event or circumstance with similar effect on the bidder’s ability to use the electronic auction system), OFCOM shall notify the bidder of an alternative method of submitting the assignment stage bid form and any requirements relating to the authentication of communications made by means of the alternative method.

(2) The bidder must submit the assignment stage bid form by means of the alternative method and must comply with any requirements which have been notified to it under paragraph (1) relating to the authentication of communications.

Extension to assignment stage round

60.—(1) Where—

- (a) OFCOM have not received a completed assignment stage bid form from a bidder by the time notified to bidders under regulation 57(b) as the end of the assignment stage round; and
- (b) paragraph (2) applies,

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the time by which the bidder's completed assignment stage bid form must be received by OFCOM shall be the time thirty minutes after the time notified to bidders under regulation 57(b) as the end of the assignment stage round.

(2) This paragraph applies where OFCOM are satisfied that circumstances existed which were beyond the bidder's control which had the effect that the bidder could not submit its assignment stage bid form so that it was received by OFCOM by the time notified to bidders under regulation 57(b) as the end of the assignment stage round.

Incomplete or defective assignment stage bid form

61.—(1) Where, due to the manner of completion, an assignment stage bid form is incomplete or defective but OFCOM believe that they can ascertain the bidder's intention in relation to the making of assignment stage bids, OFCOM shall ask the bidder to confirm in a notice to OFCOM by a specified deadline that OFCOM have correctly ascertained the bidder's intention in relation to the making of assignment stage bids.

(2) Where the bidder confirms in a notice given to OFCOM by the specified deadline which is signed by two authorised persons of that bidder that OFCOM have correctly ascertained the bidder's intention, the assignment stage bid form in its entirety shall be accepted by OFCOM on that basis.

(3) Where the bidder does not give such confirmation in a notice given to OFCOM by the specified deadline which is signed by two authorised persons of that bidder—

- (a) where the incompleteness or defect relates to one or more of the assignment stage bids made on the assignment stage bid form, that assignment stage bid or those assignment stage bids (as the case may be) shall be deemed to be invalid, and regulation 63 shall apply accordingly;
- (b) in all other cases, the assignment stage bid form in its entirety shall be rejected by OFCOM and all of the assignment stage bids made on that assignment stage bids form shall be deemed to be invalid, and regulation 63 shall apply accordingly.

Notification that assignment stage bid is not valid

62. Where a bidder submits an assignment stage bid that is not a valid assignment stage bid, OFCOM shall, after the end of the assignment stage round, notify the bidder of that fact and shall give the reasons why the bid is not a valid assignment stage bid.

Procedure where there is no valid assignment stage bid

63. In respect of each assignment stage option available to a bidder in accordance with regulation 52(4), where the bidder does not make a valid assignment stage bid for that option, the bidder shall be deemed to have made a valid assignment stage bid of zero for that option for the purposes of determining—

- (a) the winning combination of assignment stage bids in accordance with regulation 64;
- (b) the additional price payable by a winning bidder in accordance with regulation 66.

Determination of the winning assignment stage bids and the winning combination of assignment stage bids

64.—(1) OFCOM shall determine separately the winning assignment stage bids for paired lots and individual lots in accordance with paragraphs (2) to (4).

(2) The winning assignment stage bids shall be—

- (a) in the case of paired lots those valid assignment stage bids with respect to paired lots that comprise the winning combination of assignment stage bids;
- (b) in the case of individual lots those valid assignment stage bids with respect to individual lots that comprise the winning combination of assignment stage bids.

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(3) Unless paragraph (4)(f) applies, the winning combination of assignment stage bids shall be the valid combination of assignment stage bids having the highest total value of amounts bid.

(4) For paired lots and individual lots respectively, a valid combination of assignment stage bids is any combination of valid assignment stage bids with respect to paired lots and individual lots respectively within which—

- (a) there is one valid assignment stage bid from each winning bidder that specified paired lots or individual lots or both paired lots and individual lots in its winning principal stage bid;
- (b) there is no overlap between the contiguous ranges of individual lots or paired lots comprised in those valid assignment stage bids;
- (c) in the case of paired lots—
 - (i) the combination of all of the contiguous ranges of paired lots comprised in those valid assignment stage bids is a contiguous range of paired lots; and
 - (ii) one of those contiguous ranges of paired lots includes lot one;
- (d) in the case of individual lots where at least one winning principal stage bid contains paired lots—
 - (i) the combination of all contiguous ranges of individual lots in the lower area comprised in those valid assignment stage bids (if any) is a contiguous range of individual lots which includes lot twenty-three but does not include lot X, where X is equal to the total number of paired lots selected in winning principal stage bids;
 - (ii) the combination of all contiguous ranges of individual lots in the upper area comprised in those valid assignment stage bids (if any) is a contiguous range of individual lots which includes lot thirty-eight but does not include lot Y, where Y is equal to the sum of twenty-four and the total number of paired lots selected in winning principal stage bids;
- (e) in the case of individual lots where none of the winning principal stage bids contains paired lots—
 - (i) all individual lots are assigned in one contiguous range of individual lots;
 - (ii) each winning bidder is assigned a contiguous range of individual lots;
 - (iii) there is no overlap between the contiguous ranges of individual lots awarded to winning bidders;
 - (iv) any of the thirty-eight individual lots in the 2500–2690 MHz band may be assigned; and
 - (v) any individual lots which are not included in valid assignment stage bids themselves form a contiguous range of individual lots which will not be assigned to any bidder.
- (f) Where there is more than one valid combination of assignment stage bids for which the total value is equal highest OFCOM shall employ a method of random selection from amongst those valid combinations of assignment stage bids to determine the winning combination of assignment stage bids.

Assignment of lots twenty-four and thirty-eight in specific circumstances

65.—(1) Lot twenty-four shall be assigned in accordance with paragraph (2) and lot thirty-eight shall be assigned in accordance with paragraph (3) where—

- (a) a valid combination of assignment stage bids includes both paired lots and individual lots; and
- (b) the specific conditions set out in paragraphs (2) and (3) respectively apply.

(2) Where lot twenty-three is assigned as an individual lot, OFCOM shall add lot twenty-four to the assignment of frequencies for the winning bid which includes lot twenty-three.

(3) Where—

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- (a) lots thirteen and thirty-seven are assigned as a paired lot; and
- (b) lot fourteen is assigned as an individual lot,

OFCOM shall add lot thirty-eight to the assignment of frequencies for the winning bid which includes lot thirty-seven.

Determination of additional price of winning assignment stage bids

66. In respect of each winning assignment stage bid OFCOM shall determine an amount in whole pounds in accordance with Schedule 9 (“additional price”) which shall be payable by the relevant winning bidder.

Notification of results of assignment stage

67. Following determination of the winning assignment stage bids and the winning combinations of assignment stage bids under regulation 64, and the determination of the additional price for each winning assignment stage bid under regulation 66, OFCOM shall notify each winning bidder of—

- (a) the frequencies in respect of which the bidder made winning assignment stage bids;
- (b) the additional price for each winning assignment stage bid made by the bidder.

CHAPTER 8

Grant stage

Determination of the licence fee

68. The licence fee payable by a winning bidder shall be an amount equal to the total of—

- (a) the base price determined by OFCOM in accordance with regulation 46; and
- (b) the additional price for each winning assignment stage bid made by the bidder determined by OFCOM in accordance with regulation 66.

Procedure where the amount of a winning bidder’s deposit is less than the licence fee

69.—(1) Where, after completion of the assignment stage, the amount of a winning bidder’s deposit (including the initial deposit and any sum paid as a deposit under regulation 25, 37, 44 or 55, but not including any sum forfeited under regulation 72) is an amount that is less than the amount of the winning bidder’s licence fee calculated in accordance with regulation 68—

- (a) OFCOM shall notify the bidder of a deadline by when the bidder must comply with subparagraph (b); and
- (b) the bidder must by the deadline specified pay into OFCOM’s bank account by a same day electronic transfer, with accompanying information which identifies the bidder, a sum in pounds calculated in accordance with paragraph (2).

(2) The sum which the bidder must pay to OFCOM shall be the difference between the amount of the winning bidder’s licence fee calculated in accordance with regulation 68 and the amount of the bidder’s deposit (including the initial deposit and any sum paid as a deposit under regulation 25, 37, 44 or 55, but not including any sum forfeited under regulation 72).

(3) Where a bidder has satisfied the requirement set out in paragraph (1)(b), OFCOM shall grant the bidder a licence for—

- (a) the frequencies that are to be assigned to the bidder in accordance with Chapter 6 of this Part; and
- (b) the frequencies for which the bidder submitted a winning assignment stage bid or winning assignment stage bids in accordance with Chapter 7 of this Part.

(4) Where frequencies are awarded as—

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- (a) paired lots, they shall be subject to the technical restrictions set out in the licence which apply to paired frequencies, as defined in the licence;
- (b) individual lots, they shall be subject to the technical restrictions set out in the licence which apply to unpaired frequencies or restricted unpaired frequencies, as defined in the licence.

(5) Where a bidder does not satisfy the requirement set out in paragraph (1)(b), the bidder shall not be entitled to the grant of a licence under these Regulations and shall not receive a refund of its initial deposit or any sum paid as a deposit under regulation 25, 37, 44 or 55, which shall (where not forfeited under regulation 72) be forfeited.

Procedure where the amount of a winning bidder's deposit is greater than or equal to the licence fee

70.—(1) Where, after completion of the assignment stage, the amount of a winning bidder's deposit (including the initial deposit and any sum paid as a deposit under regulation 25, 37, 44 or 55, but not including any sum forfeited under regulation 72) is greater than or equal to the amount of the winning bidder's licence fee calculated in accordance with regulation 68, OFCOM shall—

- (a) grant the winning bidder a licence for—
 - (i) the frequencies that are to be assigned to the bidder in accordance with Chapter 6 of this Part; and
 - (ii) the frequencies in respect of which the bidder submitted a winning assignment stage bid or winning assignment stage bids in accordance with Chapter 7 of this Part;
- (b) refund to the winning bidder a sum in pounds calculated in accordance with paragraph (3).

(2) Where frequencies are awarded as—

- (a) paired lots, they shall be subject to the technical restrictions set out in the licence which apply to paired frequencies, as defined in the licence;
- (b) individual lots, they shall be subject to the technical restrictions set out in the licence which apply to unpaired frequencies or restricted unpaired frequencies, as defined in the licence.

(3) The sum which OFCOM shall refund to a winning bidder shall be the difference (if any) between the amount of the winning bidder's deposit (including the initial deposit and any sum paid as a deposit under regulation 25, 37, 44 or 55, but not including any sum forfeited under regulation 72) and the amount of the winning bidder's licence fee calculated in accordance with regulation 68, but not any interest which has accrued on the deposit.

Completion of the award process

71. After the grant of licences and the payment of refunds to winning bidders in accordance with regulation 70(1), OFCOM shall complete the award process by publishing on their internet website—

- (a) details of all valid principal stage bids and all valid assignment stage bids made by each bidder;
- (b) the names of the persons to whom licences were granted, including—
 - (i) details of the frequencies in respect of which the licences were granted; and
 - (ii) details of the licence fees paid;
- (c) the names of any persons who did not meet the requirements of regulation 69(1)(b) and who were excluded from the award process in accordance with regulation 69(5), including—
 - (i) details of the frequencies in respect of which licences would have been granted to them; and

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- (ii) details of the licence fees which would have been payable for those licences had they been granted.

PART 6 ACTIVITY RULES

Forfeit of deposit and exclusion from award process

72. If, in relation to an applicant which is qualified to bid or a bidder, OFCOM are satisfied that any of the events set out in regulation 74 are occurring (or have occurred) and that the occurrence would materially affect the outcome of the award process—

- (a) the initial deposit and any sum or sums paid as a deposit under regulation 25, 37, 44 or 55 shall be forfeited by, and not refunded to, the applicant or bidder concerned; and
- (b) that applicant or bidder may also be excluded by OFCOM from the award process by OFCOM giving that applicant or bidder notice in writing.

Bids made by an excluded bidder

73.—(1) Where a bidder is excluded from the award process under regulation 72(b) during the principal stage, all of the principal stage bids submitted by the bidder shall be deemed to be invalid and shall not be taken into consideration for the purposes of determining—

- (a) the winning combination of principal stage bids in accordance with regulation 45;
- (b) the base price payable by a winning bidder in accordance with regulation 46.

(2) Where a bidder is excluded from the award process under regulation 72(b) during the assignment stage, all of the assignment stage bids submitted by the bidder (including any bids which the bidder is deemed to have submitted under regulation 63) shall be deemed to be invalid and shall not be taken into consideration for the purposes of determining—

- (a) the winning combination of assignment stage bids in accordance with regulation 64;
- (b) the additional price payable by a winning bidder in accordance with regulation 66.

Events

74. The events referred to in regulation 72, in relation to an applicant or bidder, are—

- (a) the submission to OFCOM of any information in connection with the award process which is false or misleading;
- (b) any member of that applicant's or bidder's bidder group colluding or attempting to collude with another person to distort the outcome of the award process;
- (c) any member of that applicant's or bidder's bidder group acting in a way which is likely to distort the outcome of the award process;
- (d) any member of that applicant's or bidder's bidder group, or any person to whom confidential information has been disclosed, disclosing, or attempting to disclose, or inciting another person to disclose, any confidential information, whether directly or indirectly, to any person, except where the disclosure is—
 - (i) to OFCOM;
 - (ii) to a member of that applicant's or bidder's bidder group;
 - (iii) to a provider of finance for the purpose of raising finance for a bid; or
 - (iv) to a person for the purpose of enabling that person to decide whether to participate as a member of the applicant's or bidder's bidder group;
- (e) any member of that applicant's or bidder's bidder group obtaining or attempting to obtain confidential information relating to another applicant or bidder;

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- (f) any member of that applicant's or bidder's bidder group receiving or attempting to receive services in relation to the award process from any person who has provided or is providing services to OFCOM in relation to the award process;
- (g) any person who is a member or a director or employee of a member of that applicant's or bidder's bidder group and also a director or employee of a member of another bidder group is—
 - (i) taking part in the preparation of both bidder groups for participation in the award process; or
 - (ii) receiving confidential information relating to both bidder groups;
- (h) a member of that applicant's or bidder's bidder group is or becomes a member of another applicant's or bidder's bidder group;
 - (i) a change occurring in the membership of that applicant's or bidder's bidder group from that notified to OFCOM in its application except as a result of —
 - (ii) a person ceasing to be a member of that bidder group;
 - (iii) a person joining that bidder group under the procedure in regulation 7(3);
 - (iv) a person becoming an associate through merger or acquisition activity provided that such activity is not for a purpose related to the award process.

PART 7

MISCELLANEOUS

General power of exclusion

75. OFCOM may, at any time, notify any applicant or bidder of its exclusion from the award process if, in their opinion, the grant of a licence to that applicant or bidder would be prejudicial to the interests of national security or the applicant or bidder is not a fit and proper person to hold a licence.

Notification to OFCOM

76. If, in accordance with any provision of these Regulations, an applicant or bidder is required, or wishes, to notify OFCOM of any fact or circumstance, it must do so by notice in writing which is marked for the attention of the OFCOM personnel who are specified by OFCOM for that purpose on OFCOM's internet website and must deliver that notice to OFCOM—

- (a) by electronic mail to an electronic mail address dedicated to the award process which is published by OFCOM on their internet website;
- (b) by personal delivery to Riverside House, 2a Southwark Bridge Road, London, SE1A 9HA; or
- (c) by fax to a number dedicated to the award process which is published by OFCOM on their internet website.

Changes to timing or location

77.—(1) Subject to regulations 78 and 79, paragraph (2) applies where OFCOM determine that it is impracticable for any reason—

- (a) for any document which is to be delivered to OFCOM under these Regulations to be delivered at the place specified or by the deadline specified under these Regulations; or
- (b) for any action which is required to be undertaken in accordance with these Regulations to be completed by the deadline specified.

(2) Where this paragraph applies, OFCOM shall take all reasonable steps to notify the applicants or bidders (as the case may be) that—

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- (a) delivery must be made on a different day or within different times on that day or at a different place;
- (b) the action must be completed on a different day or by a different deadline.

Changes to round times and use of electronic auction system

78.—(1) Where a time for the start of a round has been notified to bidders and OFCOM determine that it is impracticable for any reason to start the round at that time, OFCOM shall take all reasonable steps to notify bidders of a revised time for the start of the round.

(2) Where a time for the end of a round has been notified to bidders and OFCOM determine that it is impracticable for any reason for the round to end at that time, OFCOM shall take all reasonable steps to notify bidders of a revised time for the end of the round.

(3) Where OFCOM determine that it is impracticable for any reason to use the electronic auction system for any of the purposes specified in Part 5 of these Regulations, OFCOM shall take all reasonable steps to notify bidders of an alternative method of participating in the award process and any requirements relating to the authentication of communications made by means of the alternative method.

(4) Bidders must use the alternative method of participating in the award process in accordance with a notification under paragraph (3).

Rerunning rounds

79.—(1) Paragraph (2) applies where a round is in progress and OFCOM determine that it is not possible to continue the round because of technical failure (or an event or circumstance with similar effect on the continuation of the round).

(2) Where this paragraph applies, OFCOM shall—

- (a) take all reasonable steps to notify bidders of its determination under paragraph (1);
- (b) disregard the bids made in that round;
- (c) resume the award procedure from the end of the previous round (or, if there was no previous round, from the start of the first primary bid round).

(3) Paragraph (4) applies where OFCOM determine that it is not possible to continue the award process in accordance with the provisions of Part 5 of these Regulations because of technical failure (or an event or circumstance with similar effect on the continuation of the award process).

(4) Where this paragraph applies, OFCOM shall—

- (a) determine the rounds for which bids made in those rounds should be disregarded in order to have a fair and efficient outcome to the award process;
- (b) take all reasonable steps to notify bidders of its determinations under paragraph (3) and sub-paragraph (a); and
- (c) resume the award process from the end of the latest round for which bids are not disregarded under sub-paragraph (a), or, where all bids are to be disregarded under that sub-paragraph, to rerun the award process from the start of the first primary bid round.

Refunds

80. OFCOM may, in such cases as they think fit, refund, in whole or in part, sums which have been paid to them in accordance with any provision of these Regulations.

[Date]

[Signature]

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SCHEDULE 1

Regulation 2(2)

MEANING OF INDIVIDUAL LOT AND PAIRED LOT

In these Regulations—

- (a) “individual lot” means any one of the lots listed in column (1) of the following table comprising the frequencies listed in the corresponding entry in column (2) of the same table;
- (b) “paired lot” means any one pair of lots listed in column (1) of the following table where the separation between the lowest frequency of one such lot and the lowest frequency of the other such lot is 120 MHz.

<i>Column (1)</i>	<i>Column (2)</i>
<i>Lots</i>	<i>Frequencies (MHz)</i>
Lot 1	2500–2505
Lot 2	2505–2510
Lot 3	2510–2515
Lot 4	2515–2520
Lot 5	2520–2525
Lot 6	2525–2530
Lot 7	2530–2535
Lot 8	2535–2540
Lot 9	2540–2545
Lot 10	2545–2550
Lot 11	2550–2555
Lot 12	2555–2560
Lot 13	2560–2565
Lot 14	2565–2570
Lot 15	2570–2575
Lot 16	2575–2580
Lot 17	2580–2585
Lot 18	2585–2590
Lot 19	2590–2595
Lot 20	2595–2600
Lot 21	2600–2605
Lot 22	2605–2610
Lot 23	2610–2615
Lot 24	2615–2620
Lot 25	2620–2525
Lot 26	2625–2630
Lot 27	2630–2635
Lot 28	2635–2640
Lot 29	2640–2645
Lot 30	2645–2650
Lot 31	2650–2655
Lot 32	2655–2660
Lot 33	2660–2665
Lot 34	2665–2670
Lot 35	2670–2675

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Lot 36	2675–2680
Lot 37	2680–2685
Lot 38	2685–2690

SCHEDULE 2

Regulation 4(3)(a)(i)

APPLICATION FORM AND WARRANTY

1. Details of the applicant

Provide the following details for the applicant—

Applicant's full name

Registered number of company

Registered office of company

Applicant's contact address (if different from registered office)

Telephone number

Fax number

Electronic mail address

Bank sort code and account number

2. Authorised persons

Provide details of the name and position in the applicant of at least three and no more than five persons, each of whom has authority to bind the applicant for all purposes relating to the award process. Also provide a specimen signature of each of these persons.

3. Directors or members of managing body

Provide the name and job title of each of the directors of the applicant or each of the members of the managing body of the applicant.

4. Applicant group

Provide the names of the applicant's associates (as defined in the Wireless Telegraphy (Licence Award) (No.2) Regulations 2008 ("the Regulations")) and for each provide details of their material interest (as defined in the Regulations) in the applicant.

Provide the names of any of the applicant's associates who wish to apply to be excluded from the applicant's applicant group in accordance with regulation 5(1) of the Regulations.

Provide the names of all other members of the applicant group (as defined in the Regulations) in respect of which the applicant has completed a document in the form set out in Schedule 3 to the Regulations in accordance with regulation 4(3)(a)(ii) of the Regulations.

5. Qualification to bid

In relation to the determination by the Office of Communications ("OFCOM") under regulation 8 of the Regulations concerning whether or not to qualify the applicant to bid in the award process—

- (a) provide details of any reason why the grant of a licence to the applicant may be prejudicial to the interests of national security;
- (b) provide details of any reason why the applicant may not be a fit and proper person to hold a licence;
- (c) state whether any member of the applicant's applicant group has colluded, or attempted to collude, or is colluding or attempting to collude, with another person to distort the outcome of the award process and provide a description of any such collusion;

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- (d) state whether any member of the applicant's applicant group has acted or is acting in a way which is likely to distort the outcome of the award process and provide a description of any such actions;
- (e) state whether any member of the applicant's applicant group, or any person to whom confidential information has been disclosed, has disclosed confidential information, whether directly or indirectly, to any person, and provide a description of the circumstances of any disclosure and the information disclosed, except where the disclosure—
 - (i) was to a member of the applicant's applicant group; or
 - (ii) was to OFCOM;
- (f) state whether any member of the applicant's applicant group has obtained or is obtaining or attempting to obtain confidential information relating to another applicant and provide a description of any such circumstances;
- (g) state whether any member of the applicant's applicant group is receiving or is attempting to receive services in relation to the award process from any person who has provided or is providing services to OFCOM in relation to the award process and provide a description of the services concerned; and
- (h) state whether (and provide a description of any circumstances in which) any person who is a member or a director or employee of a member of the applicant's applicant group and also a director or employee of a member of another applicant group is—
 - (i) taking part in the preparation of both applicant groups for participation in the award process; or
 - (ii) receiving confidential information relating to both applicant groups.

6. Other information

Provide a brief description of the substance of—

- (a) agreements (if any) relating to the management of the applicant; and
- (b) any criminal investigations or proceedings in the United Kingdom or overseas of which the applicant is aware relating to the applicant or any member of its applicant group or its directors or officers.

7. Warranty

Provide the following warranty as part of your application—

“[Insert name of applicant] (the “applicant”) represents and warrants to the Office of Communications that—

- (a) the persons authorised in section 2 of this application have read and understood the Regulations, the terms of the licence to be granted under the Regulations and the Wireless Telegraphy Act 2006;
- (b) the applicant has the legal authority to participate in the award process under the Regulations and to have a licence granted to it, and has in place all necessary consents, permissions and internal approvals for this purpose;
- (c) the information provided in, or in support of, the application is, to the best of the knowledge and belief of the applicant true, accurate and complete in all material respects; and
- (d) the applicant is aware of the provisions in regulations 72 and 74 of the Regulations, including the provisions about disclosure of confidential information (as defined in the Regulations) and obtaining confidential information relating to another applicant or bidder and that any such activities may lead to forfeiture of sums on deposit and exclusion from the award process.”

SCHEDULE 3

Regulation 4(3)(a)(ii)

**DOCUMENT FOR MEMBER OF APPLICANT'S APPLICANT OR
BIDDER GROUP WHO IS NOT AN ASSOCIATE**

[Insert name of applicant or bidder] (the "applicant/bidder") wishes to include [insert name and address of person to be included in applicant or bidder group who is not an associate] as a member of the applicant/bidder's applicant or bidder group as defined in the Wireless Telegraphy (Licence Award) (No.2) Regulations 2008 ("the Regulations") for the purpose of the award process under the Regulations.

Under regulation 8(2) of the Regulations an applicant shall not be qualified to bid in the award process where a member of its bidder group is also a member of another applicant's bidder group. Regulations 72 and 74 contain provisions on disclosure of confidential information (as defined in the Regulations) and obtaining confidential information relating to another applicant or bidder. Under the Regulations such activities may lead to forfeiture of sums on deposit and exclusion from the award process.

1. Applicant/bidder

In relation to regulations 8(2), 72 and 74 of the Regulations, the applicant/bidder represents and warrants to the Office of Communications ("OFCOM") that so far as it is aware, having made all reasonable enquiries, [insert name of person to be included in applicant or bidder group who is not an associate] is not a member of any other applicant's or bidder's applicant or bidder group.

The applicant/bidder undertakes to inform OFCOM immediately if it becomes aware that [insert name of person to be included in applicant or bidder group who is not an associate]—

- (a) has ever been or becomes a member of any other applicant's or bidder's applicant or bidder group;
- (b) has ever been or becomes a subsidiary of a member of any other applicant's or bidder's applicant or bidder group during the award process; or
- (c) has ever obtained or ever obtains confidential information (as defined in the Regulations) relating to another applicant or bidder.

2. [Insert name of person to be included in applicant or bidder group who is not an associate]

[Insert name of person to be included in applicant or bidder group who is not an associate] represents and warrants to OFCOM that it—

- (a) consents to be a member of the applicant/bidder's applicant or bidder group;
- (b) is not a member of any other applicant's or bidder's applicant or bidder group; and
- (c) is aware of the provisions in regulations 72 and 74 of the Regulations about disclosure of confidential information (as defined in the Regulations) and obtaining confidential information relating to another applicant or bidder.

[Insert name of person to be included in bidder applicant or group who is not an associate] undertakes to OFCOM that it will immediately inform OFCOM and the applicant/bidder—

- (a) if it has ever been or becomes a member of any other applicant's or bidder's applicant or bidder group;
- (b) if it has ever been or becomes a subsidiary of a member of any other applicant's or bidder's applicant or bidder group during the award process; or
- (c) if it has ever obtained or if it ever obtains confidential information (as defined in the Regulations) relating to another applicant or bidder.

**DOCUMENT FOR AN APPLICANT RELATING TO AN
ASSOCIATE'S APPLICATION TO BE EXCLUDED FROM AN
APPLICANT OR BIDDER GROUP**

[Insert name of applicant] is an applicant (as defined in the Wireless Telegraphy (Licence Award) (No.2) Regulations 2008 (the "Regulations")). [insert name of associate] is an associate (as defined in the Regulations) of [insert name of applicant] and is therefore a member of [insert name of applicant]'s bidder group.

Under regulation 8(2) of the Regulations an applicant shall not be qualified to bid in the award process where a member of its bidder group is also a member of another applicant's bidder group. Under regulation 5 of the Regulations an associate of an applicant may apply to OFCOM to be excluded from that applicant's applicant or bidder group in order no longer to be a member of that applicant or bidder group for the purposes of the Regulations.

[Insert name of associate] wishes to be excluded from [insert name of applicant]'s applicant or bidder group in accordance with regulation 5 of the Regulations. [Insert name of associate] has delivered to the OFCOM a document in the form set out at Schedule 5 of the Regulations.

1. [Insert name of applicant]'s Representations and Warranties

[Insert name of applicant] represents and warrants to OFCOM that it has not received any confidential information (as defined in the Regulations) which relates in any way to [insert name of associate] or any other applicant or bidder.

2. [Insert name of applicant]'s Undertakings

[Insert name of applicant] undertakes to OFCOM that—

- (a) it has not sought or accepted receipt of any confidential information relating to [insert name of associate] or any other applicant or bidder, and will not do so prior to the date of completion of the award process under regulation 71 of the Regulations;
- (b) no person who is a director or employee of, or seconded to [insert name of applicant]—
 - (i) has taken part in; or
 - (ii) will take part inany discussion or activity which relates in any way to any potential or actual bid by [insert name of associate] or any applicant or bidder group to which [insert name of associate] belongs;
- (c) any person who is a director or employee of, or seconded to [insert name of associate] and also a director of [insert name of applicant] will be excluded from any meeting or any part of any meeting of the board of directors of [insert name of applicant] at which any aspect of [insert name of applicant]'s participation in the award process under the Regulations is or is to be discussed;
- (d) any person who is a director or employee of, or seconded to [insert name of applicant] and also a director of [insert name of associate] will not take part in any meeting or any part of any meeting of the board of directors of [insert name of associate] at which any aspect of [insert name of associate]'s participation in the award process under the Regulations is or is to be discussed;
- (e) it has not taken and will not take any actions the intent or effect of which are or would be to influence in any way the behaviour of—
 - (i) [insert name of associate]; or
 - (ii) any member of any applicant or bidder group of which [insert name of associate] is or becomes a member;

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in relation to any aspect of their participation in the award process under the Regulations;

(f) all employees and directors of, and persons seconded to [insert name of applicant] who in the usual course of their employment may come into contact with any employee or director of, or person seconded to—

(i) [insert name of associate]; or

(ii) any member of any applicant or bidder group of which [insert name of associate] is or becomes a member;

will be made fully aware of the undertakings given by [insert name of applicant] to OFCOM in this document.

3. Provision of Further Information in Relation to [insert name of applicant]'s Representations, Warranties and Undertakings

To the extent that [insert name of applicant] is unable to make or give any of the representations, warranties and undertakings set out in sections 1 and 2 of this document, [insert name of applicant] has set out below full details of the reasons why it is unable to do so. OFCOM will take these details into account when making a determination in relation to the application to be excluded from the applicant or bidder group in accordance with regulation 5(1) of the Regulations.

[Insert full details of any reasons why the representations, warranties and undertakings set out in sections 1 and 2 of this document can not be made or given by [insert name of applicant].]

SCHEDULE 5

Regulation 5(1)(b)

**DOCUMENT FOR AN ASSOCIATE TO APPLY TO BE EXCLUDED
FROM AN APPLICANT OR BIDDER GROUP**

[Insert name and address of associate] wishes to opt out of the applicant or bidder group (as defined in the Wireless Telegraphy (Licence Award) (No.2) Regulations 2008 (the “Regulations”)) of which [insert name of applicant] is the applicant as defined in the Regulations.

Under regulation 8(2) of the Regulations an applicant shall not be qualified to bid in the award process where a member of its bidder group is also a member of another applicant’s bidder group. Under regulation 5 of the Regulations an associate of an applicant may apply to OFCOM to be excluded from that applicant’s applicant or bidder group in order no longer to be a member of that applicant or bidder group for the purposes of the Regulations.

1. [Insert name of associate]’s Representations and Warranties

[Insert name of associate] represents and warrants to the Office of Communications (“OFCOM”) that—

- (a) it does not hold, whether directly or indirectly, any interest (construed in accordance with section 820 to 825 of the Companies Act 2006 (a)), in any share which carries, or any shares which together carry, equal to or more than fifty per cent. of the votes entitled to be cast at a general meeting of [insert name of applicant];
- (b) it does not have the right to appoint or remove a majority of [insert name of applicant]’s board of directors; and
- (c) it has not received any confidential information (as defined in the Regulations) relating to [insert name of applicant]’s applicant or bidder group.

2. [Insert name of associate]’s Undertakings

[Insert name of associate] undertakes to OFCOM that—

- (a) it will not prior to the date of completion of the award process under regulation 71 of the Regulations seek or accept receipt of any confidential information relating to [insert name of applicant] or any member of [insert name of applicant]’s applicant or bidder group;
- (b) no person who is a director or employee of, or seconded to, [Insert name of associate]—
 - (i) has taken part in; or
 - (ii) will take part inany discussion or activity relating to any potential or actual bid by [insert name of applicant];
- (c) any person who is a director or employee of, or seconded to, [insert name of associate] and also a director of [insert name of applicant] will not take part in any meeting or any part of any meeting of the board of directors of [insert name of applicant] at which any aspect of [insert name of applicant]’s participation in the award process under the Regulations is or is to be discussed;
- (d) any person who is a director or employee of, or seconded to [insert name of applicant] and also a director of [insert name of associate] will be excluded from any meeting or any part of any meeting of the board of directors of [insert name of associate] at which any aspect of [insert name of associate]’s participation in the award process under the Regulations is or is to be discussed;

(a) 2006 c.46.

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- (e) it has not taken and will not take any actions the intent or effect of which are or would be to influence in any way the behaviour of—
 - (i) [insert name of applicant]; or
 - (ii) any member of [insert name of applicant]’s applicant or bidder groupin relation to any aspect of their participation in the award process under the Regulations;
- (f) all employees and directors of, and persons seconded to, [insert name of associate] who in the usual course of their employment may come into contact with any employee or director of, or person seconded to—
 - (i) [insert name of applicant]; or
 - (ii) any member of [insert name of applicant]’s applicant or bidder group;will be made fully aware of the undertakings given by [insert name of associate] to OFCOM in this document.

3. Provision of Further Information in Relation to [insert name of associate]’s Representations, Warranties and Undertakings

To the extent that [insert name of associate] is unable to make or give any of the representations, warranties and undertakings set out in sections 1 and 2 of this document, [insert name of associate] has set out below full details of the reasons why it is unable to do so. OFCOM will take these details into account when making a determination in relation to the application to be excluded from the applicant or bidder group in accordance with regulation 5(1) of the Regulations.

[Insert full details of any reasons why the representations, warranties and undertakings set out in sections 1 and 2 of this document can not be made or given by [insert name of associate].]

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SCHEDULE 6

Regulation 12(1)(a)

FREQUENCY RANGE SELECTION MENU WHERE THERE IS ONLY ONE BIDDER

Bidder's full name:

Bidder address:

Telephone number:

Fax number:

E-mail address:

<i>Frequency range (MHz)</i>	<i>Eligibility Points</i>	<i>Price of frequency range</i>	<i>Selection of frequency ranges (indicate selected frequency ranges with a cross ("X"), selecting no more than one frequency range in respect of each of the 2010-2025 MHz band, frequency ranges for paired lots and frequency ranges for individual lots and ensuring that the total number of eligibility points attributed to the frequency ranges so selected is no more than sixteen)</i>
2010–2025 MHz band			
1. 2010–2025	2	£100,000	
Frequency ranges for paired lots (MHz)			
2. 2500–2505 paired with 2620–2625	2	£100,000	
3. 2500–2510 paired with 2620–2630	4	£200,000	
4. 2500–2515 paired with 2620–2635	6	£300,000	
5. 2500–2520 paired with 2620–2640	8	£400,000	
6. 2500–2525 paired with 2620–2645	10	£500,000	
7. 2500–2530 paired with 2620–2650	12	£600,000	
8. 2500–2535 paired with 2620–2655	14	£700,000	
9. 2500–2540 paired with 2620–2660	16	£800,000	
Frequency ranges for individual lots (MHz)			
10. 2605–2620	1	£100,000	
11. 2600–2620	2	£150,000	

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12. 2595–2620	3	£200,000
13. 2590–2620	4	£250,000
14. 2585–2620	5	£300,000
15. 2580–2620	6	£350,000
16. 2575–2620	7	£400,000
17. 2570–2620	8	£450,000
18. 2565–2620	9	£500,000
19. 2560–2620	10	£550,000
20. 2565–2620 and 2680–2690	10	£600,000
21. 2560–2620 and 2680–2690	11	£650,000
22. 2555–2620 and 2680–2690	12	£700,000
23. 2560–2620 and 2675–2690	12	£700,000
24. 2555–2620 and 2675–2690	13	£750,000
25. 2550–2620 and 2675–2690	14	£800,000
26. 2555–2620 and 2670–2690	14	£800,000
27. 2550–2620 and 2670–2690	15	£850,000
28. 2545–2620 and 2670–2690	16	£900,000
29. 2550–2620 and 2665–2690	16	£900,000

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SCHEDULE 7

Regulation 16(7)

**ELIGIBILITY POINTS ASSOCIATED WITH INDIVIDUAL LOTS,
PAIRED LOTS AND THE 2010–2025 MHZ BAND**

1. Subject to paragraph 2, the number of eligibility points associated with a paired lot and the 2010–2025 MHz band as set out in Column (1) is the number of points shown in the corresponding entry in Column (2).

2. Where a bid selection contains individual lots, the number of eligibility points attributed to those individual lots will be—

- (a) where the bid selection is not contained in an additional supplementary bid, $n-1$;
- (b) where the bid selection is contained in an additional supplementary bid, $n-2$,

where n is the total number of individual lots selected.

<i>Column (1)</i>	<i>Column (2)</i> <i>Number of eligibility points</i>
2010–2025 MHz band	2
Paired lot	2

SCHEDULE 8

Regulation 46

DETERMINATION OF BASE PRICE

Base price

1.—(1) OFCOM shall determine a base price for each winning principal stage bid by imposition of the requirements that the base prices must satisfy that are set out in paragraphs 2 to 5.

(2) Where a base price so determined includes a fraction of a pound, the base price shall be that price rounded up to the nearest pound.

First requirement

2. The base price for each winning principal stage bid shall be—

- (a) no less than the total of the round prices in the first primary bid round for the paired lots, individual lots and the 2010–2025 MHz band (as appropriate) included in the bid selection specified in that winning principal stage bid; and
- (b) no greater than the amount of that winning principal stage bid.

Second requirement

3.—(1) Taking the base prices for the winning principal stage bids together, the base prices shall be such that if—

- (a) the amount bid by each winning bidder for the bid selection specified in its winning principal stage bid had been the base price rather than the amount of its winning principal stage bid (“reduced winning principal stage bid”), and
- (b) the amount bid by each winning bidder in respect of each other valid principal stage bid made by that bidder had been reduced by an amount equal to the difference between the amount of its winning principal stage bid and the base price for that winning principal stage bid,

the combination of the reduced winning principal stage bids submitted by the winning bidders would have been the valid combination of principal stage bids or one of the valid combinations of principal stage bids (as the case may be) having the highest total value of amounts bid.

(2) The bids mentioned in sub-paragraphs (1)(a) and (1)(b) shall, after a reduction of the amount of those bids in accordance with those paragraphs, be treated as valid principal stage bids for the purposes of those paragraphs.

Third requirement

4. Taking the base prices for the winning principal stage bids together, the total of those base prices shall be no greater than the total of any other prices for the winning principal stage bids that satisfy the requirements set out in paragraphs 2 and 3.

Fourth requirement

5.—(1) Taking the base prices for the winning principal stage bids together, the opportunity cost variance of those base prices calculated in accordance with sub-paragraph (2) shall be less than the opportunity cost variance, calculated in accordance with sub-paragraph (2), of any other prices for the winning principal stage bids that satisfy the requirements set out in paragraphs 2 to 4.

(2) The opportunity cost variance (“ OCV_B ”) of the prices mentioned in sub-paragraph (1) is the amount calculated in accordance with the formula—

$$OCV_B = \sum (p_B - c_B)^2$$

where—

“ p_B ” is the price for a winning principal stage bid; and

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“ c_B ” is the amount calculated in accordance with the formula set out in sub-paragraph (3) in respect of that winning principal stage bid.

(3) The formula is—

$$c_B = u_B - t_B + b_B$$

where—

“ u_B ” is the amount calculated in accordance with sub-paragraph (4);

“ t_B ” is the total amount of the winning principal stage bids; and

“ b_B ” is the amount of the winning principal stage bid for which p_B is the price.

(4) The amount calculated in accordance with this sub-paragraph is the total amount of the valid combination of principal stage bids or one of the valid combinations of principal stage bids (as the case may be) having the highest total value of amounts bid, where the valid combination or combinations of principal stage bids do not include any of the principal stage bids made by the winning bidder that submitted the winning principal stage bid for which p_B is the price.

Interpretation

6. In this Schedule “valid combination of principal stage bids” shall be construed in accordance with regulation 45.

SCHEDULE 9

Regulation 66

DETERMINATION OF ADDITIONAL PRICE

Additional price

1.—(1) OFCOM shall determine an additional price for each winning assignment stage bid by imposition of the requirements that the additional prices must satisfy that are set out in paragraphs 2 to 5.

(2) Where an additional price so determined includes a fraction of a pound, the additional price shall be that price rounded up to the nearest pound.

First requirement

2. The additional price for each winning assignment stage bid shall be no less than zero and no greater than the amount of that winning assignment stage bid.

Second requirement

3.—(1) Taking the additional prices for the winning assignment stage bids in respect of paired lots together and of individual lots together, the additional prices for winning assignment stage bids in respect of paired lots and individual lots (as the case may be) shall be such that if—

- (a) the amount bid by each winning bidder for the assignment stage option selected in its winning assignment stage bid in respect of paired lots or individual lots (as the case may be) had been the additional price rather than the amount of its winning assignment stage bid (“reduced winning assignment stage bid”), and
- (b) subject to sub-paragraph (2), the amount bid by each winning bidder in respect of each other valid assignment stage bid made by that bidder in respect of paired lots or individual lots (as the case may be) had been reduced by an amount equal to the difference between the amount of its winning assignment stage bid in respect of paired lots or individual lots (as the case may be) and the additional price for that relevant winning assignment stage bid,

the combination of the reduced winning assignment stage bids submitted by the winning bidders would have been the valid combination of assignment stage bids or one of the valid combinations of assignment stage bids (as the case may be) in respect of paired lots or individual lots (as the case may be) having the highest total value of amounts bid.

(2) Where the amount of a bid has been reduced in accordance with sub-paragraph (1)(b) and is less than zero, the amount of that bid shall be treated as if it were zero for the purposes of this paragraph.

(3) The bids mentioned in sub-paragraphs (1)(a) and (1)(b) shall, after reduction of the amount of those bids in accordance with those paragraphs, be treated as valid assignment stage bids for the purposes of this paragraph.

Third requirement

4. Taking the additional prices for the winning assignment stage bids in respect of paired lots together and of individual lots together, the total of those additional prices for winning assignment stage bids in respect of paired lots or individual lots (as the case may be) shall be no greater than the total of any other prices for the winning assignment stage bids in respect of paired lots or individual lots (as the case may be) that satisfy the requirements set out in paragraphs 2 and 3.

Fourth requirement

5.—(1) Taking the additional prices for the winning assignment stage bids in respect of paired lots together and individual lots together, the opportunity cost variance of those additional prices for winning assignment stage bids in respect of paired lots or individual lots (as the case may be) calculated in accordance with sub-paragraph (2) shall be less than the opportunity cost variance,

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calculated in accordance with sub-paragraph (2), of any other prices for the winning assignment stage bids in respect of paired lots or individual lots (as the case may be) that satisfy the requirements set out in paragraphs 2 to 4.

(2) The opportunity cost variance (“ OCV_A ”) of the prices mentioned in sub-paragraph (1) is the amount calculated in accordance with the formula—

$$OCV_A = \sum (p_A - c_A)^2$$

where—

“ p_A ” is the price for a winning assignment stage bid; and

“ c_A ” is the amount calculated in accordance with the formula set out in sub-paragraph (3) in respect of that winning assignment stage bid.

(3) The formula is—

$$c_A = u_A - t_A + b_A$$

where—

“ u_A ” is the amount calculated in accordance with sub-paragraph (4);

“ t_A ” is the total amount of the winning assignment stage bids in respect of paired lots or individual lots (as the case may be); and

“ b_A ” is the amount of the winning assignment stage bid for which p_A is the price.

(4) The amount calculated in accordance with this sub-paragraph is the total amount of the valid combination of assignment stage bids or one of the valid combinations of assignment stage bids (as the case may be) in respect of paired lots or individual lots (as the case may be) having the highest total value of amounts bid, where, for each assignment stage bid for an assignment stage option relating to paired lots or individual lots (as the case may be) made by the winning bidder that submitted the winning assignment stage bid for which p_A is the price, the amount of that assignment stage bid is treated as if it were zero for the purposes of this sub-paragraph.

(5) Where the amount of an assignment stage bid is treated as if it were zero in accordance with sub-paragraph (4), that assignment stage bid shall be treated as a valid assignment stage bid for the purposes of that sub-paragraph.

Interpretation

6. In this Schedule “valid combination of assignment stage bids” shall be construed in accordance with regulation 64.

Annex 3

MUK/France MoU



Agence Nationale des Fréquences

**MEMORANDUM OF UNDERSTANDING ON
FREQUENCY CO-ORDINATION BETWEEN
FRANCE
AND
THE UNITED KINGDOM
IN THE FREQUENCY BANDS
2500 - 2690 MHz**

1. INTRODUCTION

- 1.1. This Memorandum of Understanding (MoU) describes the procedures for the coordination of radio services between France and the United Kingdom (UK) in the frequency band 2500 to 2690 MHz.
- 1.2. In order to facilitate the deployment of systems operating in neighbouring countries, it is necessary to establish, by agreement, regulatory and technical procedures for frequency co-ordination. Moreover, this agreement is designed to reduce the administrative procedures in the frequency bands in the countries concerned.
- 1.3. This MoU does not apply to the Channel Islands.
- 1.4. This MoU does not apply to the Channel tunnel.
- 1.5. In the UK the frequency band 2500-2690 MHz is expected to be awarded on a technology neutral basis, in accordance with decisions to be made by Ofcom following a consultation process.⁹⁹
- 1.6. In France the frequency band 2500 to 2690MHz is currently used for military radiolocation services, tactical and infrastructure relay links. It will be made progressively available for electronic communication mobile services. The military systems will be switched off at a date T0 which is not defined at the date of signature of this MoU. T0 is subject to negotiations between ARCEP and the French Ministry of Defence, and will also depend on the market demand in France. The radiolocation services are planned to be switched off by summer 2012 at the latest. If the date T0 is earlier than summer 2012, then the radiolocation service will also be switched off at T0.
- 1.7. The frequency band 2500-2690 MHz is currently under discussion within EC and CEPT in the context of WAPECS¹⁰⁰ which may change coordination requirements in this frequency band.
- 1.8. Accordingly, the Administrations of the UK and France have agreed the co-ordination procedures in this MoU.
- 1.9. The co-ordination procedure is based on the principle of equitable access to the spectrum resource.
- 1.10. Ofcom is the Administration of the United Kingdom responsible for all relations with France concerning this MoU.
- 1.11. The Agence Nationale des Fréquences (ANFR) is the Administration of France responsible for all relations with the UK concerning this MoU.

⁹⁹ Ofcom's consultation proposals are set out in a consultation document published on 11 December 2006 (<http://www.ofcom.org.uk/consult/condocs/2ghzawards/>), a discussion document published on 1 August 2007 (<http://www.ofcom.org.uk/consult/condocs/2ghzdiscuss/>) and a consultation document published on 19 December 2007 (<http://www.ofcom.org.uk/consult/condocs/2ghzrules/>).

¹⁰⁰ EC Mandate to CEPT to develop least restrictive technical conditions for frequency bands addressed in the context of WAPECS', 5 July 2006.

2. COMMITMENT OF THE ADMINISTRATIONS

- 2.1. The Administration of France and the UK are committed to ensuring that the radio-communication stations operating in the band 2500-2690 MHz, respect the limits for establishment of base stations without co-ordination given at paragraph 3.1, unless the stations are specifically exempt from the coordination procedure in accordance with paragraph 4.
- 2.2. The Administration of France and the UK are committed to take into account the future EC decision on the band 2500-2690 MHz as well as any EC derogation on a transitional period in France.

3. CRITERIA FOR COORDINATION

- 3.1. Within the frequency band 2500-2690 MHz, a radio-communication station may be operated, established or modified in a country, without co-ordination with the neighbour country, provided that the predicted field strength of each carrier produced by that station does not exceed the threshold of 21 dB μ V/m in a bandwidth of 5 MHz at and beyond the coast line of the neighbouring country at a height of 3 m above ground level.
- 3.2. Radio-communication stations for which the predicted field strength exceeds the values given in 3.1 must be co-ordinated in accordance with paragraph 6, except where an arrangement exists between operators as described in paragraph 4.
- 3.3. To establish the predicted field strength produced by a station, the methodology set out at paragraph 5 shall be employed.
- 3.4. In the case of time division duplex technology the interference power shall be the power, during the active part of the signal, in the stated bandwidth.

4. ARRANGEMENTS BETWEEN OPERATORS

- 4.1. A "Framework" MoU between the administrations of France and the United Kingdom, which enables planning arrangements between mobile operators, subject to agreement of the Administrations, was signed on 13 October 1999¹⁰¹. The administrations of France and the United Kingdom agree to extend the applicability of this MoU to all operators of systems in the frequency bands 2500-2690 MHz subject of the present MoU.
- 4.2. To facilitate reasonable and timely development of their systems, licensees are encouraged to develop Arrangements in accordance with the Framework MoU of 13 October 1999.
- 4.3. Operators may only negotiate Arrangements concerning the common part of those frequency bands for which they have been licensed by the National Administration. The provisions in the Arrangements shall not result in an

¹⁰¹ Agreement between the administrations of France and the United Kingdom concerning the approval of planning arrangements between mobile radio communications network operators. 13 October 1999

impairment of the authorised use of radio frequencies by third parties not involved in the Arrangements.

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

5. PREDICTION OF PROPAGATION

The field prediction method shall be according to the latest version of Recommendation ITU-R P. 1546¹⁰²

With parameters:

- 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 values:

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

¹⁰² 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-ORDINATION PROCEDURE

- 6.1. Exchanges of information for coordination/notification purposes shall be in the format set out in the HCM agreement Annex 2A (revised at Vilnius 2005)¹⁰³.
- 6.2. A coordination request must be sent by the licensee through the Administration responsible for its authorisation.
- 6.3. The coordination procedure shall follow the one described in the HCM Agreement.
- 6.4. In the event of interference between authorised users of the band 2500-2690 MHz in France 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 France and the UK agree to facilitate the exchange of information between authorised users of the band.

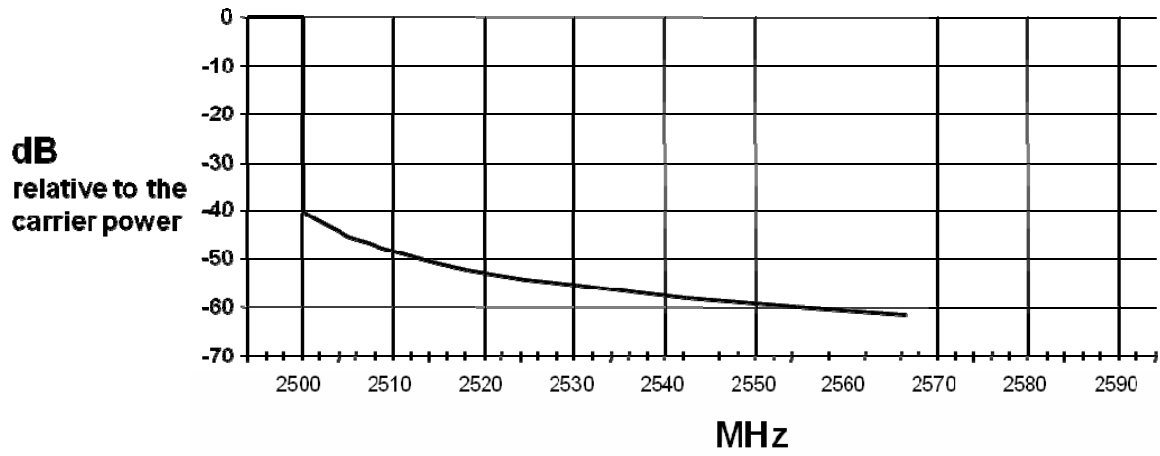
7. OTHER RADIO-COMMUNICATION IN FRANCE ALREADY IN SERVICE

- 7.1. Military infrastructure (point to point) relay links may be used over France. These relay links will gradually cease operating in the frequency range 2500-2690MHz until complete closure at T0, as indicated in § 1.6.
- 7.2. Using the prediction parameters as set out in § 5 above, the 21 dBµV/m threshold is not reached or exceeded at the UK coastline or beyond, for the point to point services as they exist at the time of agreement of this MoU.
- 7.3. Radars are currently operating on northern France with field strengths which may exceed 21dBµV/m in the UK. These radars operate in frequencies below 2500 MHz. However the band 2500-2520 MHz may also be used in case of national emergency. These radars operate continuously with a 360 ° sweep. As indicated in § 1.6, all radars operating in this frequency band are planned to be switched off by summer 2012 at the latest.
- 7.4. Other radars which operate in the frequency band 2500 to 2520MHz will not be used at any location in France such that their field strength at the UK coast line or beyond is greater than or equal to 21 dBµV/m, except in cases of national emergency
- 7.5. The nominal emission mask of the radar is given in Figure 1, in line with Annex 8 of ITU R Recommendation SM 1541¹⁰⁴.

¹⁰³ Agreement between the Administrations of ... on the Coordination 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

¹⁰⁴ Rec. ITU-R SM.1541-2 1Recommendation ITU-R SM.1541-2, Unwanted emissions in the out-of-band domain

Figure 1 Nominal radar emission mask



7.6. Coverage plots for radars in France referred to par 7.3 are given in figures 2, 3, and 4, which would apply in the frequency range 2500-2520MHz in cases of national emergency as described in § 7.3, with modelling parameters according to par 5 .

Figure 2 Estimated on axis field strength of French radio location services on UK
Field strength = 21db μ V/M in a bandwidth of 5MHz
At a height of 3m

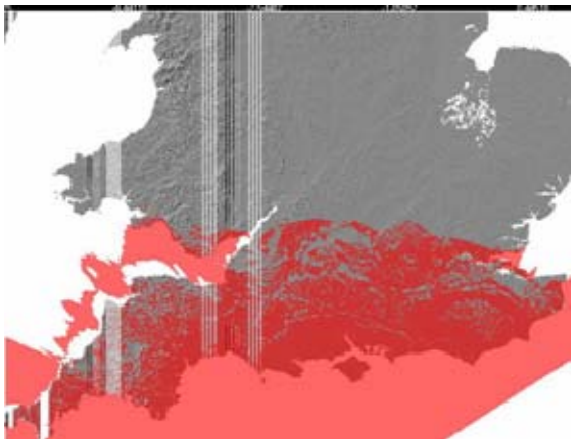


Figure 3 Estimated off axis field strength of French radio location services on UK
Field strength = 21db μ V/M in a bandwidth of 5MHz
At a height of 3m

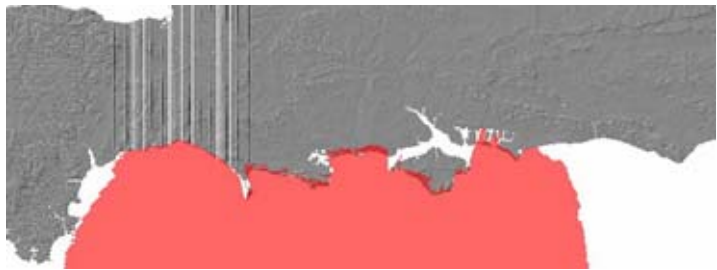
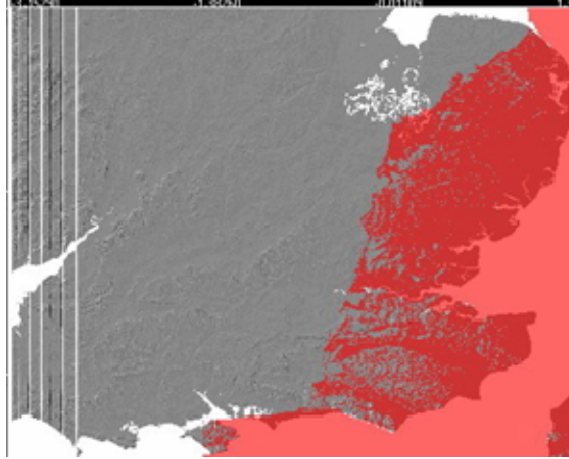


Figure 4 Estimated on axis field strength of French radio location services on UK

Field strength = 21dB μ V/M in a bandwidth of 5MHz
At a height of 3m



- 7.7. Using the prediction parameters as set out in § 5 above, the 21 dB μ V/m threshold is not reached or exceeded at any point at the UK coastline or beyond, for the off axis beam of French radio location services identified in Fig 4.

8. REVIEW OF MoU

- 8.1. The coordination threshold and prediction methods defined in this MoU may be reviewed in the light of experience of operation of networks in both countries and future prediction developments.
- 8.2. This MoU may be updated following the adoption of an EC decision relevant to the band 2500-2690MHz and any related derogation requested by France, the results of the French consultation anticipated in 2008 on electronic communications in the frequency band 2500-2690MHz or the award of licences to use the frequency band 2500-2690MHz in the UK.

9. TERMINATION OF THE MEMORANDUM OF UNDERSTANDING

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

10. DATE OF ENTRY INTO FORCE

This Memorandum of Understanding shall enter into force on 1 March 2008.

For the administration of FRANCE

A RIGOLE

Signed at Paris on 2008.

For the UNITED KINGDOM administration

P BURY

Signed at London on 2008.

Annex 4

UK/Republic of Ireland MoU



**MEMORANDUM OF UNDERSTANDING ON
FREQUENCY CO-ORDINATION BETWEEN
THE REPUBLIC OF IRELAND
AND
THE UNITED KINGDOM
IN THE FREQUENCY BANDS
2500 - 2690 MHz**

1. INTRODUCTION

- 1.1. This Memorandum of Understanding (MoU) describes the procedures for the coordination of radio services between the Republic of Ireland (RoI) and the United Kingdom (UK) in the frequency band 2500 to 2690 MHz.
- 1.2. In the UK the frequency band 2500-2690 MHz is expected to be awarded on a technology neutral basis, in accordance with decisions to be made by Ofcom following a consultation process.¹⁰⁵
- 1.3. In the RoI the frequency band 2500 – 2686 MHz is currently licensed for Multipoint Microwave Distribution System (MMDS) according to the relevant Statutory Instrument ¹⁰⁶.
- 1.4. Ofcom is the Administration of the United Kingdom responsible for all relations with the RoI concerning this MoU.
- 1.5. The Commission for Communications Regulation (ComReg) is the Administration of the RoI responsible for all relations with the UK concerning this MoU.
- 1.6. Accordingly, the Administrations of the UK and the RoI have agreed the co-ordination procedures in this MoU.
- 1.7. The co-ordination procedure is based on the principle of equitable access to the spectrum resource.

2. COMMITMENT OF THE ADMINISTRATIONS

- 2.1. The Administration of the ROI and the UK are committed to ensuring that the radio-communication stations operating in the band 2500-2690 MHz, respect the limits for establishment of base stations without co-ordination given at paragraph 3.1, unless the stations are specifically exempt from the coordination procedure in accordance with paragraph 4.

¹⁰⁵ Ofcom's consultation proposals are set out in a consultation document published on 11 December 2006 (<http://www.ofcom.org.uk/consult/condocs/2ghzawards/>) and a discussion document published on 1 August 2007 (<http://www.ofcom.org.uk/consult/condocs/2ghzdiscuss/>).

¹⁰⁶ Statutory Instrument No. 529 of 2003, Wireless Telegraphy (Multipoint Microwave Distribution System) Regulations 2003. Published by the Stationery Office, Dublin.

3. CRITERIA FOR COORDINATION

- 3.1. Within the frequency bands 2500-2690 MHz, a radio-communication station may be operated, established or modified in a country, without co-ordination with the neighbour country, provided that the predicted field strength of each carrier produced by that station does not exceed the threshold of 21 dB μ V/m in a bandwidth of 5 MHz at and beyond the coast line of the neighbouring country at a height of 3 m above ground level.
- 3.2. Radio-communication stations for which the predicted field strength exceeds the values given in 3.1 must be co-ordinated in accordance with paragraph 6, except where stations are listed in paragraph 6.1 or an arrangement exists between operators as described in paragraph 4.
- 3.3. To establish the predicted field strength produced by a station, the methodology set out at paragraph 5 shall be employed.
- 3.4. In the case of time division duplex technology the interference power shall be the power, during the active part of the signal, in the stated bandwidth.
- 3.5. For systems with a working bandwidth other than 5 MHz the trigger level, expressed in dB μ V/m, may be revised to $21 + 10 \cdot \log\left(\frac{Bandwidth}{5 \times 10^6}\right)$, where bandwidth is the channel width measured in MHz.

4. ARRANGEMENTS BETWEEN OPERATORS

- 4.1. To facilitate reasonable and timely development of their systems, licensees are encouraged to develop Bilateral Arrangements.
- 4.2. Licensees holding rights, in each of the neighbouring countries, to use the frequencies of operation of a radio communication station may mutually agree conditions in which that station can exceed the predicted field strengths set out at paragraph 3.1.
- 4.3. Where licensees have reached such a mutual agreement, coordination of the corresponding station in accordance with paragraph 6 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 paragraph 3.1.
- 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. 1546¹⁰⁷:

- 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 values:

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

¹⁰⁷ 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

6.1. 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	Freq Band MHz	Modulation	Individual Channel bandwidth	Lat	Long	East	North	Ground H AMSL (m)	H AGL (m)	EIRP dBm	Ant. Style	Pol	3dB BW Degs	Az Degs E of N.	Ant. Style
1	KEEPER	2500-2690	Dig/Anl	8 MHz	52 45 05	08 15 30	194,374	166,699	695	10	54	Omni	H			
2	WOODCOCK	2500-2690	Dig/Anl	8 MHz	52 43 25	08 42 40	151,959	163,842	300	15	54	Omni	H	360		HMD12-VW-05
3	WOLFTRAP	2500-2690	Dig/Anl	8 MHz	53 05 30	07 35 50	226,981	204,636	489	12	54	Omni	V			
4	SLIEVE BAWN	2500-2690	Dig/Anl	8 MHz	53 43 40	08 04 00	195,600	275,351	258	15	54	Omni	H			
5	DUNMURRY	2500-2690	Dig/Anl	8 MHz	53 11 54	06 56 02	271,239	216,960	231	15	55	Omni	H			
6	MOUNT ORIEL	2500-2690	Dig/Anl	8 MHz	53 47 29	06 30 44	298,036	283,455	247	15	53	Omni	H			
7	BALLYGUILLE	2500-2690	Analog	8 MHz	52 58 31	06 02 42	331,308	193,397	188	10	54	Omni	H			
8	FORTH MOUNTAIN	2500-2690	Dig/Anl	8 MHz	52 18 00	06 34 55	296,725	117,418	237	15	53	Omni	H			
9	RATHFADDEN	2500-2690	Digital QAM	8 MHz	52 15 41	07 07 41	259,528	112,533	74	15	57	Omni	V			
10	CORK AIRPORT	2500-2690	Dig/Anl	8 MHz	51 50 54	08 27 39	168,247	66,319	176	15	57	Omni	H			
11	NOWEN HILL	2500-2690	Dig/Anl	8 MHz	51 43 19	09 14 31	114,188	52,888	535	15	54	Omni	H			
12	MISH	2500-2690	Dig/Anl	8 MHz	52 13 04	09 43 43	81,875	108,731	427	15	55	Omni	H			
13	KNOCKANORE	2500-2690	Dig/Anl	8 MHz	52 31 20	09 36 10	91,224	142,404	268	15	54	Omni	V			
14	CARRON MOUNTAIN	2500-2690	Dig/Anl	8 MHz	52 18 21	08 33 44	161,655	117,269	447	15	54	Card	V	360	Omni	HMD12-VW-05
15	BARNESMORE	2500-2690	Analog	8 MHz	54 43 03	07 56 35	203,750	385,500	470	30	42	Card	H	40	245	SD 26 4505H NV
16	SLEVE BUOY	2500-2690	Digital	8 MHz	52 39 22	06 29 20	302,243	157,166	213	30	34	Card	H	180		HMD16HC-W-05
17	BALLYSPELLAN	2500-2690	Dig/Anl	8 MHz	52 45 35	07 30 40	233,001	167,735	305	35	54	Omni	H			

Auction of spectrum: 2500-2690MHz and 2010-2025MHz

18	GLENCOUM WOOD	2500-2690	Dig/Anl	8 MHz	52 33 28	07 01 23	266,250	145,601	344	15	54	Card	V	180	320	HMD16VC-W-05
19	BRALLEE	2500-2690	Dig/Anl	8 MHz	54 11 24	08 39 30	157,031	326,992	330	30	55	Omni	H			
20	NAUL	2500-2690	Digital QAM	8 MHz	53 34 32	06 15 41	315,200	259,800	180	80	59	Card	V	180	185	HMD16VC-W-05
21	CLASHMORE	2500-2690	Dig/Anl	8 MHz	52 02 10	07 44 49	217,364	87,140	302	30	55	Omni	H			
22	TONABROCKY	2500-2690	Digital QAM	8 MHz	53 17 27	09 06 40	125,913	227,299	300	90	58	Omni	H			
23	CAVAN	2500-2690	Digital	8 MHz	53 57 20	07 17 40	246,300	300,900	321	30	54	Card	H			
24	MONAGHAN	2500-2690	Digital	8 MHz	54 10 44	07 02 00	263,100	325,900	214	30	54	Card	V			

7. CO-ORDINATION PROCEDURE

- 7.1. Exchanges of information for coordination/notification purposes shall be in the format set out in the HCM agreement Annex 2A (revised at Vilnius 2005) ¹⁰⁸
- 7.2. In the event of interference between authorised users of the band 2500-2690 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. Coordination request should be sent by licensee through the administration responsible for its authorisation.

8. REVIEW OF MoU

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

9. TERMINATION OF THE MEMORANDUM OF UNDERSTANDING

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

¹⁰⁸ Agreement between the Administrations of ... on the Coordination 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 1st March 2008.

Signed on 30 January 2008.

J CONNOLLY

For the administration of The Republic of Ireland

P BURY

For the UNITED KINGDOM administration

Annex 5

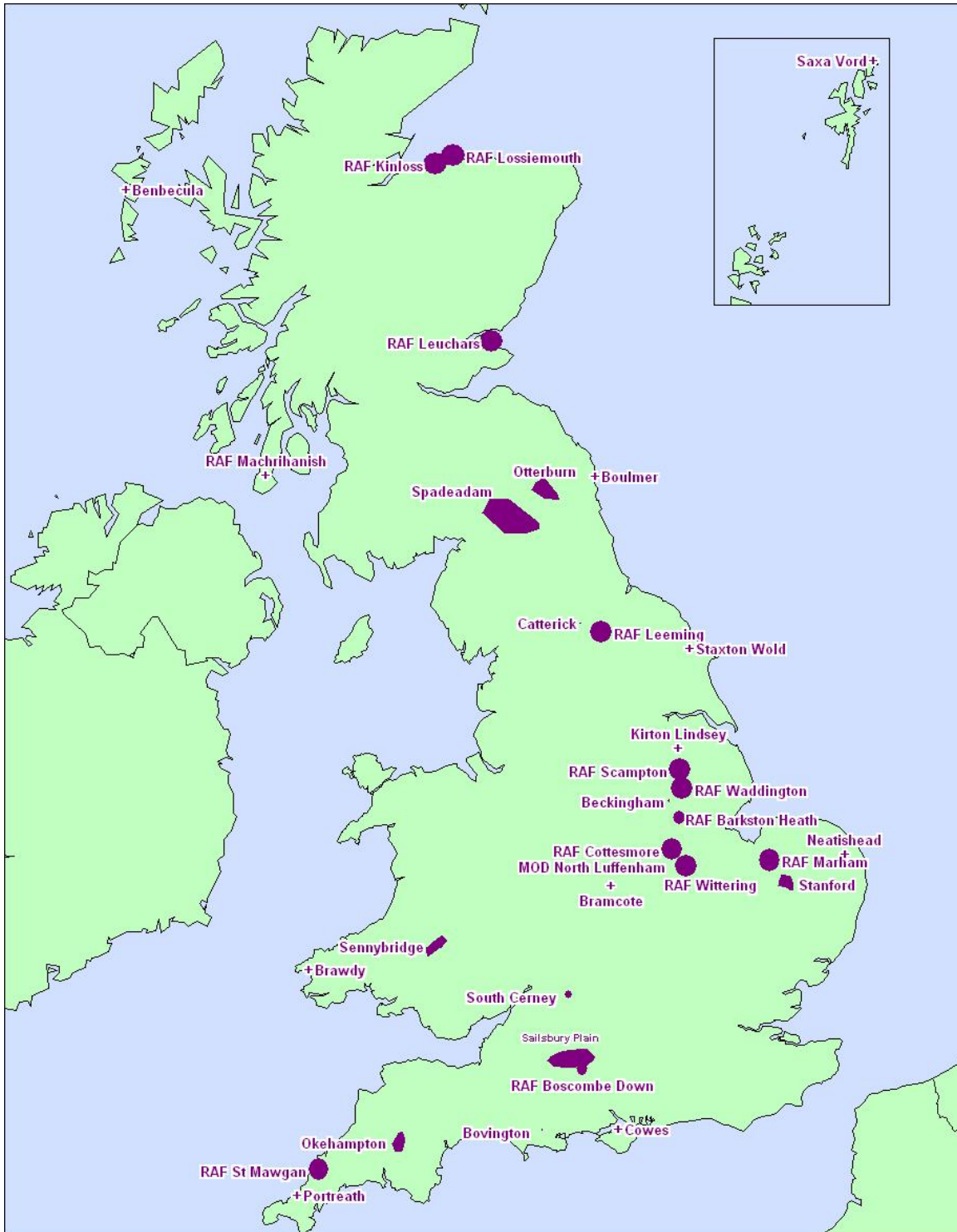
Emissions from Aeronautical Radionavigation and Radiolocation stations at 2700 to 2900 MHz

- A5.1 In the December 2006 Consultation, Ofcom provided information on the use of civil radars in the 2700 to 2900 MHz band. This data was supplemented within the Discussion Document by information received by Ofcom from the MoD on military radar systems which also operate in this band. This Annex summarises the information made available to Ofcom from the CAA and MoD on radars systems operating within the UK adjacent to the 2700 to 2900 MHz band.
- A5.2 Table 6 below provides a summary on the current numbers of radar systems Ofcom is aware of operating within the 2700 to 2790 MHz band. This frequency range has been chosen by Ofcom to capture the majority of the radar out-of-band (OOB) emissions that are likely to fall into the 2.6 GHz Band.
- A5.3 The CAA and MoD operate Air Traffic Control (ATC) radars at fixed locations throughout the UK and on a continuous basis, mainly sited around airfields. In addition, the MoD operates Air Defence radars predominately from fixed locations, but in some cases, radars are also used on an intermittent basis from various locations within the UK. Figure 11 identifies the areas within the UK where mobile MoD Air Defence (AD) Radars may be deployed and locations where fixed AD radars are currently deployed.

Table 6: Summary of current UK radars systems operating in the 2700-2790 MHz band

Number of installations	Radar Type	Comments
Civil radars with frequency assignments within 2700 to 2790 MHz (March 2008)		
26	12 Magnetron @ peak EIRP up to 92 dBW 6 TWT @ peak EIRP up to 82dBW 8 Solid State @ peak EIRP up to 80dBW	Radars used at fixed locations operating on a continuous basis. Centre frequencies fixed subject to reorganisation of the band by the DAP/CAA. Magnetrons likely to be replaced by Solid State radars over the longer term.
Military radars: Air Traffic Control (ATC) radars with frequency assignments within 2700 to 2790 MHz (March 2008)		
10	8 TWT of 81dBW peak EIRP 1 estimated TWT of 50dBW EIRP 1 Magnetron of 89dBW EIRP	Radars used at fixed locations on a continuous basis. Centre frequencies fixed subject to the operational requirements of the MoD.
Military radars: Air Defence (AD) radars with the possibility of assignments within 2700 to 2790 MHz (March 2008)		
6	Solid State of 89 dBW EIRP	Four installations are predominantly deployed individually at four fixed locations. They are typically used on an intermittent basis at carrier frequencies that are fixed but may be assigned anywhere in the 2700 to 3100 MHz band subject to the operational requirements of the MoD. However frequencies will need to be coordinated with other civil and military ATC radars at the time of deployment. Remaining installations are used on an intermittent basis from various locations within the UK. Carrier frequencies for these installations may be assigned anywhere within the 2700 to 3100 MHz band according to military operational requirements and are similarly co-ordinated at the time of deployment.

Figure11: Likely areas¹⁰⁹ where mobile MoD Air Defence (AD) Radars may be deployed and locations where fixed AD radars are currently deployed.



¹⁰⁹ These areas are subject to change based on operational requirements.

Annex 6

Glossary

2010 MHz Band

The frequencies between 2010 megahertz and 2025 megahertz.

2010-2025 MHz Lot

Means, in relation to the 2010 MHz Band, the block of frequencies between 2010 megahertz and 2025 megahertz.

2.6 GHz Band

The frequencies between 2500 megahertz and 2690 megahertz.

2.6 GHz Lot

Means, in relation to the 2.6 GHz Band, a Paired Lot or an Unpaired Lot

2G

"Two G": second generation of mobile telephony systems using digital encoding. 2G networks support voice and limited data communications.

Activity Rules

The rules set out at Part 6 of the Regulations.

Additional Member Warranty

The warranty set out at Schedule 3 of the Regulations.

Additional Price

Has the meaning given to it in paragraph 4.185.

Additional Supplementary Bid

Has the meaning set out in paragraphs 4.121 to 4.129.

AIP

Administered incentive pricing: a fee charged to users of the spectrum to encourage them to make economically efficient use of their spectrum.

Alternative Method

A means of submitting Bids, other than by the Electronic Auction System, as described in paragraph 4.61.

Applicant

A body corporate who has submitted an Application Form.

Application Day

The day notified on the Ofcom Website for the submitting of Application Forms and Additional Member Warranties.

Application Form

A form containing the application information specified at Schedule 2 of the Regulations.

Application Warranty

The warranty set out at Section 7 of Schedule 2 of the Regulations.

Assignment Stage

The stage of the Auction described in paragraphs 4.156 to 4.186.

Assignment Stage Bid

A Bid made in the Assignment Stage Round.

Assignment Stage Bid Deadline

Has the meaning given in paragraph 4.171.

Assignment Stage Bid Form

A form provided to Bidders by Ofcom in order to make Assignment Stage Bids.

Assignment Stage Options

Has the meaning given in paragraph 4.162.

Assignment Stage Round

A further round of Bidding where more than one Winning Principal Stage Bid includes Paired Lots or Unpaired Lots, to determine which frequencies shall be assigned to Winning Bidders.

Associate

Any person who has a Material Interest in a Bidder or Applicant.

Authorised Person

A person specified by an Applicant in its application as authorised to bind that Applicant for all purposes relating to the Award Process.

Auction

The procedure set out at Part 5 of the Regulations for the award of Licences.

Award Process

The procedures set out in the Regulations for the award and issue of the Licences.

Band

Any of the 2010 MHz Band and the 2.6 GHz Band.

Base Price

The amount payable by each Winning Bidder in respect of his Winning Principal Stage Bid, as calculated in accordance with Schedule 8 of the Regulations.

Base Station

A station that forms part of the Electronic Communications Network, providing bi-directional services to user stations within its area of operation.

Basic Supplementary Bid

Has the meaning given in paragraph 4.109

Bid

A Primary Bid, a Supplementary Bid or an Assignment Stage Bid, as the case may be.

Bid Deposit

Shall be construed in accordance with paragraph 4.63 as the context requires.

Bidder

An Applicant which has qualified to Bid in the Award Process and which has not withdrawn from the Award Process on or before the Last Day for Withdrawal.

Bidder Group

Means, in relation to an Applicant or Bidder—

- that Applicant or Bidder;
- each Associate of that Applicant or Bidder that has not been excluded in accordance with paragraphs 4.34 to 4.41; and
- each person in respect of whom the Applicant or Bidder has submitted an Additional Member Warranty.

Bid Selection

Means, a specified number of Paired Lots (which may be zero), a specified number of Unpaired Lots (which may be zero), and an indication as to whether or not the 2010 – 2025 MHz Lot is included.

Broadcasting Station

A station that forms part of the Electronic Communications Network, providing uni-directional services to user stations within its area of operation.

Business Day

A day (other than a Saturday or Sunday) on which banks are generally open in London for normal business.

Central Station

A station that forms part of the Electronic Communications Network, providing bi-directional services to terminal stations located within its area of operation.

CEPT

Conference of European Postal and Telecommunications administrations, comprising over 40 European administrations.

Conditions of Entitlement

Conditions of entitlement determined by Ofcom under section 45 of the Communications Act, applying to providers of ECNs and/or ECSs.

Confidential Information

Means, in relation to any Applicant or Bidder, any information which is not in the public domain and which, if it were made public or disclosed to another Applicant (or potential Applicant) or Bidder or a member of their respective Bidder Groups, would be likely to affect the decisions that such other Applicant (or potential Applicant) or Bidder may make in relation to the Award Process.

Co-ordination This term refers to the process under which users seek mutual agreement to the technical parameters of use in their respective ranges of frequencies in order to avoid undue interference.

dBm Decibels above one milliwatt: a logarithmic representation of radio frequency power with respect to one milliwatt.

dBW Decibels above one Watt: a logarithmic representation of radio frequency power with respect to one Watt.

Division

Means in relation to unpaired (individual) lots in the 2.6 GHz Band, a range of at least two contiguous lots in either the Lower Area or in the Upper Area.

Downlink

“downlink” refers to transmissions from a base, central or broadcasting stations (i.e. from stations providing communications directly to a terminal or user station, or directly to another base, central or broadcasting station).

ECC Electronic Communications

Committee: a committee that reports to CEPT.

ECN An electronic communications network, as defined in section 32 of the Communications Act.

ECS An electronic communications service, as defined in section 32 of the Communications Act.

EIRP

Equivalent Isotropically Radiated Power: a theoretical measure of the power radiated by a transmitter/antenna - defined as the product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

EIRP density mask

A way of specifying the amount of power that a transmitter is allowed to transmit within a given bandwidth.

Electronic Auction System

The system established by Ofcom and Bidders for the purposes of running the Auction.

Eligible Bid

Has the meaning given in paragraph 4.121.

Eligibility Points

The number of eligibility points assigned to a Lot in each Band as specified in Table 3 at paragraph 4.4 .

Eligibility Limit

The limit on the selection of Lots on which a Bidder can make a Valid Primary Bid and a Valid Supplementary Bid by reference to the number of Eligibility Points associated with those Lots.

Excess Demand

Has the meaning given in paragraphs 4.694.69 to 4.72.

Exclusion Declarations

A Member Exclusion Warranty and/or an Exclusion Request Form, as applicable.

Exclusion Request Form

Has the meaning given in paragraph 4.37.

First Primary Bid Round

The first Primary Bid Round conducted as part of the Award Process.

First Round Price

The price at which each Lot is made available to Bidders in the First Primary Bid Round as set out in Table 3 at paragraph 4.4.

Frequency Range Selection Menu

A form used by a Bidder to select the frequencies to be included in its Licence where it is the only Bidder.

GHz

Gigahertz: a unit of frequency equal to 1000 million (1×10^9) Hz or cycles per second.

Grant Stage

The stage of the Auction described at paragraph 4.190 to 4.196.

Guard Block

Lot Number 24 (2615-2620MHz) in the 2.6 GHz Band, which is not awarded as part of the Principal Stage if the Winning Combination of Principal Stage Bids includes both Paired and Unpaired Lots.

Initial Deposit

A sum of £100,000 to be paid on the application of a Licence as specified at regulation 4(3)(b) of the Regulations.

Initial Bid Deposit

Has the meaning given paragraph 4.63.

ITU

International Telecommunication Union: an international organisation within the United Nations System where governments and the private sector coordinate, discuss and agree the logistics of global telecom networks and services.

kHz

Kilohertz: a unit of frequency, equal to 1000 (1×10^3) Hz or cycles per second.

Last Day for Withdrawal

The date specified by Ofcom in accordance with Regulation 10 of the Regulations.

Liberalisation

Progressive removal of unnecessary restrictions on technology and usage in Wireless Telegraphy Act licences.

Licence

A wireless telegraphy licence to be granted pursuant to the Regulations to establish or use a wireless telegraphy station or install or use wireless telegraphy apparatus in the United Kingdom at frequencies to be determined in accordance with the Award Process.

Licence Fee

The fee payable for a Licence, in accordance with the Regulations.

Licence Term

With respect to a Licence, the period beginning on the date the Licence is issued, and ending on the twentieth anniversary of that date.

Licensee

A holder of a Licence.

Lot

Means—

- the 2010-2025 MHz Lot;
- any Paired Lot; or

- any Unpaired Lot.

Lower Area

Means, in relation to the 2.6 GHz Band, the frequencies from 2500 megahertz to 2615 megahertz.

Material Interest

Means, whether held directly or indirectly—

- any interest (construed in accordance with sections 820 to 825 of the Companies Act 2006(110)) in—
- any share which carries, or any shares which together carry, more than 25% of the votes entitled to be cast at a general meeting of the Applicant or Bidder; or
- any share or shares in the case of which the consent of the holder of that share or those shares is required for the conduct of any business of the Applicant or Bidder; or
- the right to appoint or remove a majority of the Applicant's or Bidder's board of directors.

Member Exclusion Warranty

Has the meaning given to it in paragraph 4.36.

MHz

Megahertz: a unit of frequency equal to 1,000,000 (1×10^6) Hz or cycles per second.

MoD

Ministry of Defence.

Ofcom

The Office of Communications, which is the independent regulator and competition authority for the UK communications industries, with responsibilities across television, radio, telecommunications and wireless communications services.

Ofcom's bank account

Means the bank account nominated by Ofcom for the purposes of the Award Process, details of which are published on the Ofcom Website.

Ofcom Website

⁽¹¹⁰⁾ 2006 c.46.

The website maintained by Ofcom at www.ofcom.org.uk.

Out of block emissions

Emissions caused by use of the spectrum covered by a particular licence that fall immediately outside the spectrum block covered by that licence.

Paired Lot

Means, in relation to the 2.6 GHz Band, two blocks of frequencies each specified by a lower frequency limit and an upper frequency limit, where one block of frequencies is entirely within the lower Division and the other block of frequencies is entirely within the upper Division.

PMSE

Programme Making and Special Events – a category of licensing relating to services ancillary to the broadcasting and entertainment industry.

Primary Bid

A Bid made during a Primary Bid Round.

Primary Bid Form

A form used by a Bidder to submit a Primary Bid.

Primary Bid Round

Has the meaning given to it in paragraph 4.59.

Primary Bid Round Extension

Has the meaning given in paragraph 4.83.

Principal Stage

The stage of the Auction described in paragraphs 4.59 to 4.155.

Principal Stage Bid

Means a Primary Bid, a Basic Supplementary Bid, or an Additional Supplementary Bid.

Qualification Stage

The stage of the Auction described in paragraphs 4.30 to 4.48.

Radio Equipment

Radio equipment as defined in the schedule to the Wireless Telegraphy Licence.

Radio Regulations

An international treaty produced by the ITU that sets out at a global level how spectrum should be used by countries. The Radio Regulations are developed and maintained by WRCs. See WRC.

Regulations

The Wireless Telegraphy (Licence Award No.2) Regulations 2008.

Reserve Price

The minimum price that a Bidder must pay to include a Lot in its Licence as specified in Table 3 at paragraph 4.4.

Restricted Unpaired Lot

A block of 5MHz in the 2.6 GHz Band awarded as an Unpaired Lot and for which the technical conditions allow use at the restricted in-block power of 25 dBm/5MHz EIRP.

Round Price

The price per Lot at which Lots are offered to Bidders during a Primary Bid Round.

Spectrum Framework Review (SFR)

Ofcom consultation published in November 2004 and resulting statement published in June 2005 by Ofcom on how spectrum will be managed in the future.

Spectrum trading

Process through which spectrum licence holders are able to transfer some or all of their rights to a third party.

Standard Unpaired Lot

A block of 5MHz in the 2.6 GHz Band awarded as an Unpaired Lot and for which the technical conditions allow use at the 'standard' in-block power of 61 dBm/5MHz EIRP.

Supplementary Bid

A Bid included in a Supplementary Bids Form.

Supplementary Bids Form

A form used by a Bidder to submit a Supplementary Bid.

Supplementary Bids Round

Has the meaning given to it in paragraph 4.107.

Trading Regulations

The statutory regulations made by Ofcom in respect of spectrum trading.

UKFAT (UK Frequency Allocation Table)

A table which identifies responsibility for management of frequency bands or services, showing whether they are managed by Ofcom, MoD, or another Government department.

Unpaired Lot

Means, in relation to the 2.6 GHz Band, a blocks of frequencies specified by a lower frequency limit and an upper frequency limit.

Uplink

“uplink” refers to transmissions from terminal or user stations (i.e. from stations providing services directly to a user to a base, central or broadcasting station);

Upper Area

Means, in relation to the 2.6 GHz Band, the frequencies from 2620 megahertz to 2690 megahertz.

User Station

A station that, in relation to an Electronic Communications Network, provides services directly to a user.

UWB

Ultra-Wideband – a short range, high data rate radio technology

Valid Additional Supplementary Bid

An Additional Supplementary Bid made in accordance with paragraph 4.140.

Valid Assignment Stage Bid

An Assignment Stage Bid made in accordance with paragraph 4.171.

Valid Basic Supplementary Bid

A Basic Supplementary Bid made in accordance with paragraph 4.139.

Valid Combination of Assignment Stage Bids

Has the meaning given paragraph 4.181.

Valid Combination of Principal Stage Bids

Has the meaning given paragraph 4.149.

Valid Primary Bid

An Primary Bid made in accordance with paragraph 4.93.

Valid Principal Stage Bid

A Valid Primary Bid, a Valid Basic Supplementary Bid or a Valid Additional Supplementary Bid.

Valid Supplementary Bid

A Valid Basic Supplementary Bid or a Valid Additional Supplementary Bid.

Winning Assignment Stage Bid

Has the meaning given to it in paragraphs 4.177 to 4.182.

Winning Bidder

A Bidder which has submitted a Winning Principal Stage Bid.

Winning Combination of Assignment Stage Bids

The Valid Combination of Assignment Stage Bids having the highest total value of amounts bid.

Winning Combination of Principal Stage Bids

The Valid Combination of Principal Stage Bids having the highest total value.

Winning Principal Stage Bids

Each of the Valid Principal Stage Bids that comprise the Winning Combination of Principal Stage Bids.

Wireless Telegraphy

The means of sending information without the use of a wired system.

WRC

World Radiocommunications Conference: an ITU convened conference, held approximately every two or three years, which updates the International Radio Regulations.

WT Act

Wireless Telegraphy Act 2006