



Fees for aeronautical radio licences

A statement

Statement

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Section 1

Summary

We have decided to implement fee changes broadly as we proposed last year

- 1.1 In this statement we are setting out our decision to revise the fees payable for licences to use aeronautical VHF communications frequencies at ground stations (typically, aerodromes and air traffic control centres). We have concluded that the rationale for the fee changes set out for consultation in December 2009 was robust and the proposed fee levels broadly appropriate.

However, we are introducing a new low coverage/low cost licence product

- 1.2 Most fees will increase in line with the proposals set out for consultation. However, we have decided that fees for frequencies used with Tower, Aerodrome Flight Information and Air/Ground services should differentiate between very localised assignments, mainly used by small aerodromes, and the generality of such assignments. Fees for such assignments with Designated Operational Coverage (DOC) no greater than 10 nautical miles radius and 3000 ft maximum service height will, therefore, rise to £650 by the end of the period of phasing-in instead of £2600 as we had proposed.

Fee increases will be phased in over several years starting in April 2012

- 1.3 As proposed, larger fee increases will be phased in over several years, with the first increases implemented in April 2012. This means that invoices payable on or after that date will attract revised fees. Subsequent changes will take effect in April each year. There will be no retrospective adjustment of sums already paid. Fees for each 25 kHz channel assignment will increase as follows (fees for 8.33 kHz channels will be reduced pro rata);

Service type	Fee today	2012/13	2013/14	2014/15	2015/16	Subsequent
Fire and distress frequencies	£25	£0	£0	£0	£0	£0
Block of shared sporting frequencies (unpowered flight and Microlight)	£25	£75	£75	£75	£75	£75
Offshore mobile stations	Included with offshore fixed fee	£75	£75	£75	£75	£75
Surface communications (incl Departure ATIS), and	£250/£150	£350	£350	£350	£350	£350

Operational Control and offshore fixed stations						
Air/Ground, Tower and Aerodrome Flight Information with limited DOC	£150/£100	£350	£500	£650	£650	£650
Other Air/Ground, Tower and Aerodrome Flight Information	£150/£100	£350	£500	£1200	£1900	£2600
Area control, Approach, Arrival ATIS, ACARS and VOLMET	£250/£150	£1000	£2000	£3000	£6000	£9900
VHF Digital Links per frequency (50 kHz channel spacing)	£250	£2000	£4000	£6000	£12000	£19800

Table 1

- 1.4 Temporary licences will continue to be available and will attract a fee of one twelfth of the annual fee for each month or part month, subject to a minimum fee of £75.

We have decided not to complicate fees by applying geographic discounts

- 1.5 We had proposed that fees for services with localised coverage should be discounted in areas of the far north and west of the UK where demand is less pressing. We agree with those stakeholders who argued that this would add a disproportionate level of complexity. We have decided not to implement these discounts which, in any event, would have equated to only about 1% of the total value of fees payable.

We intend to consult further on the possibility of introducing bespoke fees which more closely reflect the coverage of each assignment

- 1.6 We will consider further the proposals made by the CAA and others, in their responses to our consultation, that a more granular fees structure reflecting the Designated Operational Coverage of each particular assignment could offer advantages. We will take technical and operational advice from the CAA to see whether an appropriate bespoke pricing option can be devised. This option would need to be consistent with the principles as well as the cost estimates which underpin the fees which we are announcing in the current statement. The benefits would also need to be weighed against the additional administrative costs which a bespoke fees model would incur.
- 1.7 If a practicable bespoke fees algorithm can be devised, this could provide incentives for frequency users to consider using the minimum Designated Operational Coverage consistent with their operational and regulatory requirements, thus

potentially releasing spectrum for other aeronautical users, and making it easier over time for the CAA to accommodate current and future demand for assignments. It may also present some users with the option of modifying their operations so that these can be effected using a more localised, lower cost, Designated Operational Coverage if the generic fee is not considered cost effective.

- 1.8 If, after further consultation, we decide to implement a bespoke fees algorithm for some service types, the generic fees announced in the current statement would generally serve as de facto ceilings to the fees payable for each service type. We note, however, that some assignments have Designated Operational Coverage significantly more extensive than the norm for the particular service type. Subject to the further consultation, it may be necessary to restrict the generic fees set out in the present consultation to assignments which more closely approximate to the norm, with more extensive assignments attracting a fee based on the bespoke formula. We note in particular that service types Air/Ground, Tower and Aerodrome Flight Information with Designated Operational Coverage greater than 25 nautical miles radius present particular issues in this respect. To provide users with a degree of certainty about future fees, we are confirming that generic fees set out in the present statement will be available to all licensees until at least 30 March 2014.

Fees for aircraft radio licences will reduce to one third of today's rates

- 1.9 Our December 2009 consultation made no proposals to alter the fees payable for licences to use radios in aircraft. However, we intend to make these fees payable every three years instead of annually. The sums payable on each occasion will remain unchanged, representing a pro rata two thirds reduction in licence fees.

Next steps

- 1.10 Before these changes can come into force, we will need to make revised fee regulations. During 2011 we will publish draft fee regulations setting out the generic fees announced in the current statement. The same draft fee regulations will also include the change to three-yearly payments for aircraft radio licences. We will allow one month for interested parties to comment on whether the draft fee regulations accurately reflect the decisions set out in the current statement, before formalising the new regulations. These will take the form of a Statutory Instrument, which has the force of law.
- 1.11 If an appropriate arrangement can be devised, consistent with our spectrum management objectives, for calculating bespoke fees, this too will need to be subject to consultation. In principle, it is possible that this option could be implemented at the same time that the generic fees are implemented in April 2012. In any event, if the option proves to be attractive, it should be capable of being implemented at an early point in the five years over which generic fees will be phased in, and before those fees are fully implemented in April 2016.

Section 2

Introduction

Background

- 2.1 In July 2008 Ofcom published a consultation¹ which explored options for extending administered incentive pricing (“AIP”) to spectrum used by the maritime and aeronautical sectors (“the July 2008 consultation”). This was an initial consultation intended to address the issues associated with valuing and pricing this spectrum, and thereby stimulate debate on options for the role of licence fees in achieving optimal spectrum use for citizens and consumers.
- 2.2 After reviewing responses to that consultation exercise and commissioning further external consultancy, we published more detailed proposals, with a full impact assessment, for pricing aeronautical VHF communications frequencies in December 2009² (the “December 2009 consultation”). In parallel, we also published a report prepared by our consultants Helios Technology Ltd which set out recommendations on how Ofcom might determine fees for aeronautical VHF service types (the “Helios 2009 Pricing report”³).
- 2.3 Revised proposals for pricing maritime VHF communications spectrum and spectrum used with radar and aeronautical navigation aids had been published separately in August 2009 and a concluding statement on those matters was published on 15 June 2010.
- 2.4 We published on 29 March 2010 a consultation setting out a proposed general framework for spectrum pricing principles and methodologies⁴. No proposals were made for specific fees to apply to particular licence classes or spectrum bands. Although that consultation process has not yet been concluded, we consider the principles proposed in that review and those underpinning the conclusions of the present statement are fully consistent.

Legislative framework for spectrum pricing

- 2.5 Ofcom has a general duty in Section 3 of the Communications Act 2003 to secure optimal use of the radio spectrum taking account of the interests of all who wish to access it.
- 2.6 Under section 13(2) of the Wireless Telegraphy Act 2006 (“WT Act”), Ofcom may, if it thinks fit in the light of its duties under section 3 of the WT Act, prescribe fees which

¹ *Applying spectrum pricing to the Maritime and Aeronautical sectors*, published by Ofcom on 30 July 2008 at <http://www.ofcom.org.uk/consult/condocs/aip/fullpdf.pdf>

² *Applying spectrum pricing to the Aeronautical sector* – published by Ofcom on 18 December at http://www.ofcom.org.uk/consult/condocs/spectrum_pricing/aip2.pdf

³ *Administered Incentive Pricing for Aeronautical VHF Communications* prepared for Ofcom by Helios Technology Ltd, 30 October 2009 at http://stakeholders.ofcom.org.uk/binaries/consultations/spectrum_pricing/aip.pdf

⁴ See *SRSP The revised Framework for Spectrum Pricing* - published by Ofcom on 29 March 2010 at http://www.ofcom.org.uk/consult/condocs/srsp/srsp_condoc.pdf

would be greater than those that would be necessary for the purposes of recovering costs it incurs in connection with its spectrum management functions. In particular, pursuant to section 3, Ofcom may have regard to the desirability of promoting:

- the efficient management and use of the part of the electro-magnetic spectrum available for wireless telegraphy;
- the economic and other benefits that may arise from the use of wireless telegraphy;
- the development of innovative services; and
- competition in the provision of electronic communications services.

2.7 The above-mentioned enabling powers are exercisable by statutory instrument under section 12 of the WT Act.

2.8 In the context of the current statement, it is important to note that Ofcom may set fees higher than its costs only if doing so fits with its duties under Section 3 of the WT Act. We do not take into account other consequential effects of fee decisions, for example the potential effect on revenue raised for the UK Exchequer, in determining our proposals for fees.

2.9 In exercising these duties, Ofcom must, of course, fully respect international law relating to spectrum use.

The rationale for pricing aeronautical VHF communications frequencies

2.10 The purpose of applying AIP to aeronautical ground stations is to highlight for licensees the costs associated with spectrum use, so that this can be taken into account in their business planning. This will facilitate improved decision making, by ensuring that the cost of spectrum is given appropriate weight alongside other costs when determining how operational needs can best be met. In turn, this will encourage more efficient use of spectrum, including investment in more efficient technologies in the long term.

2.11 There has been a lively debate about the weight of demand for these frequencies and the best way to manage this demand, but all informed commentators agree that this is a scarce and valuable resource which needs careful management. More widespread deployment of 8.33 kHz channel spacing will, by definition, create more channels but, so far, no firm timetable has been agreed and it is not clear that this initiative will remove the excess demand such that demand for assignments will no longer need to be managed. We have concluded that spectrum fees will have an important role to play, for some years to come, in conditioning users' demand for frequencies.

2.12 Nevertheless, the CAA will continue to have a key role in determining how the frequencies are used. We would like to emphasise that we have no plans to allow other sectors of UK industry to use these aeronautical VHF frequencies, and we have no plans to permit the UK aeronautical sector to trade these frequencies between licensees. As such, the CAA will continue to be able fully to support the international aeronautical community in delivering a harmonised approach to spectrum deployment.

- 2.13 Many sectors of the UK economy rely on radio spectrum to enable services to be delivered safely and efficiently. The aeronautical sector is no exception. Responses to our consultation exercise have underlined how much the aeronautical sector relies on the frequencies which it uses, and how changes to spectrum use will often necessitate complex operational changes if they are to be consistent with safe and efficient delivery of services. Sector specific regulation by the CAA is often a further factor to be considered by spectrum users planning changes. We conclude from this that any major changes to spectrum fees should be introduced gradually to give users time to make well informed decisions.
- 2.14 We set out in section 5 of the December 2009 consultation our reasons for proposing fee changes for certain aeronautical VHF communications frequencies. We maintain the views set out in that section, and elsewhere in the December 2009 consultation, and would refer stakeholders to that explanation of how we came to those views. In Sections 6 and 7 of the December 2009 consultation we set out our assessment and proposed conclusions about the different ways to set fees. Here too, we maintain these views, and would refer stakeholders to the explanation set out in the December 2009 consultation, as amplified by Section 4 of the present statement.

Changes to the structure of licences and to fees

- 2.15 Use of frequencies for some service types is currently authorised under more than one class of Aeronautical Ground Station licence, reflecting the identity of the licensee. In future, there will be a new class of licence for each service type, each with its own fee as set out in this statement. For the avoidance of doubt, except where stated, we are using in this statement the service type terminology applied by the International Civil Aviation Organisation ("ICAO") in its EUR Frequency Management Manual.
- 2.16 Unless otherwise stated, the fees referred to will apply to 25 kHz channels. Where 8.33 kHz channels are used, now or in the future, fees will be reduced pro rata to bandwidth, although all AIP fees will be subject to a minimum level of £75 that reflects a contribution to the cost of our spectrum management functions.
- 2.17 Fee changes will be implemented from April 2012 to align with our routine cycle of annual changes to fee regulations. It will not be possible to implement these changes in 2011 as regulations to be implemented in April 2011 are already being consulted on. The precise April 2012 implementation date will be set out in the draft fee regulations. In summary, fees will be amended as follows;
- **Fire and Emergency.** As proposed, we will no longer charge any fee for ground based transmissions on the Fire and Distress frequencies, as these are used on a common (shared) basis and are always associated with at least one other assignment. Assignments on the Fire frequency currently attract a fee of £25 per year.
 - **Operational Control and Aerodrome Surface Communications.** Operational Control and Aerodrome Surface communications, including Departure ATIS, which require only relatively small geographic separation between re-use of frequencies, will attract a fee of £350 per year. As proposed, this increase from today's fees of £150/£250 per year will be implemented without phasing.
 - **Offshore stations.** Transmissions from Offshore platforms have only localised impact on other spectrum users and, as we proposed, assignments for Offshore fixed transmitters will therefore attract a fee of £350. Associated mobile

transmitters (generally on board support ships) using the same frequency will attract a fee of £75 as a contribution to spectrum management costs. As proposed, these modest fee increases will be implemented without phasing.

- **The generality of Tower, Aerodrome Flight Information Service and Air/Ground services.** The generality of 25 kHz assignments in service types Tower, Aerodrome Flight Information Service and Air/Ground will attract a fee of £350 from April 2012 and £500 from April 2013, rising in 3 further annual increments to £2600 by April 2016 and thereafter. Fee increases in 2012 and 2013 are slightly smaller than proposed in December 2009 to align with fees for the new low coverage licence product referred to below. As per our consultation proposals, the full fee payable from April 2016 reflects an assumption that a typical assignment will sterilise about a quarter (26%) of the UK landmass to alternative aeronautical use. As would be expected, some assignments sterilise a larger area and in some cases this is very significantly greater than the norm. If a bespoke fees option were to be introduced, it might be necessary to limit the applicability of the £2600 generic fee, so that all assignments with coverage greater than 25 nautical miles radius and 15,000 ft service height attract proportionately larger bespoke fees. We would consult before taking such a decision.
- **Low coverage Tower, Aerodrome Flight Information and Air/Ground services,** Having reviewed consultation responses, we have decided that assignments with DOC of no greater than 10 nautical miles radius and maximum service height of 3000 ft will attract a fee of £350 from April 2012, £500 from April 2013 and £650 from April 2014 and thereafter. The full fee payable from April 2014 is proportionate to the smaller area sterilised to alternative users by the limited coverage of these assignments. We are aligning fees payable for all Tower, Aerodrome Flight Information and Air/Ground services until April 2014 to give licensees time to consider their options.
- **Area Control, Approach Control, Automatic Terminal Information Service, and VOLMET services.** We proposed that frequencies used to support Approach Control services, Area Control services, Automatic Terminal Information Services and Meteorological broadcast (VOLMET) services should attract a fee of £1500 (Option 1) or £1000 (Option 2) in year one, rising to £9900 by the end of the five year phase-in, as the Designated Operational Coverage of these assignments typically prevents re-use within the UK. We have decided to implement the £9900 fee with the Option 2, slow start, phasing where fees in the first year from April 2012 would be £1000. Where CLIMAX is nationally-enabled for Area Control services, and multiple transmitters share the same channel, only one fee will be payable per frequency. Similarly, only one fee will be payable for each VOLMET frequency irrespective of the number of transmitters used.
- **Data services.** We proposed that spectrum used to support Aircraft Communications Addressing and Reporting System (ACARS) and VHF Data Links (VDL) should attract a fee of £9900 per 25 kHz of bandwidth, reflecting the fact that these assignments prevent re-use of the frequencies for other applications across the whole of the UK. On this basis, each VDL assignment, which requires 50kHz channel separation, would attract a fee of £19,800, with 25 kHz ACARS assignments attracting a fee of £9900. We have decided to implement these fees with the Option 2, slow start, phasing under which fees in the 12 months period commencing April 2012 will be £1000 per ACARS frequency and £2000 per VDL frequency. However, as per our consultation proposals, where a frequency is subject to multiple assignments across the

country, only one fee will be payable. Where a frequency is shared by more than one service provider, Ofcom will divide the fee equally amongst the service providers.

- **Temporary licences.** These will continue to be available and will attract a fee of one twelfth the annual fee for each month or part month, subject to a minimum fee of £75.

Future fee reviews

- 2.18 In general, and excepting the possibility of consulting on a bespoke fees option, we have no specific plans to increase (or decrease) fees over time. The level of any AIP fees may be reviewed in future. Under a proposal in our current consultation on the revised Framework for Spectrum Pricing, we would expect to review fees only in response to evidence that fees are materially out of line with levels that would promote optimal use. We will welcome evidence from stakeholder groups about material changes in the demand for particular frequencies, or the way that frequencies are used, which may have an impact on opportunity cost of this spectrum band. We will assess the available evidence and consult formally with stakeholders before taking any decisions. We discuss in Section 5 of the consultation *SRSP: the revised Framework for Spectrum Pricing*⁹ the methodology for determining when fees should be reviewed.

Section 3

Summary of responses

Overview

- 3.1 Written responses to the consultation exercise were received from 225 stakeholders.
- 3.2 A large proportion of responses were from private individuals expressing concern about the possible impact of fees on the General Aviation sector. Responses were also received from organisations representing particular interest groups within the General Aviation sector.
- 3.3 In addition, responses were received from most of the major UK airports and from the Airport Operators Association which represents their interests. Further responses were received from a number of organisations representing UK and foreign airlines, and from some airlines directly. Two providers of managed communications services to airports and airlines also responded, as did NATS the major UK provider of air traffic services. The CBI co-ordinated a joint response from some of the larger commercial associations.
- 3.4 Responses were also received from the CAA, ICAO and Eurocontrol.
- 3.5 The British Ports Association and the UK Major Ports Group submitted a joint response, which was the only corporate response from beyond the aeronautical sector.

Responses to specific questions asked in the consultation document

- 3.6 In the following paragraphs we summarise responses to the specific questions asked in the consultation document and provide a summary of Ofcom's view. In paragraphs 3.101 to 3.201 we also address some broader issues raised by respondents.

December 2009 Question 1: Do you consider that our proposed fee rates for licences in the aeronautical VHF frequencies are appropriate?

December 2009 Question 2 In devising our revised proposals, have we identified all of the aeronautical uses of VHF communications frequencies which require a distinct approach to fee setting, as set out in tables 5 and 6?

- 3.7 Aeronautical spectrum users remained generally opposed, in principle, to paying AIP based fees for aeronautical ground station radio licences. As a result, many respondents limited their responses to addressing Question 1, and chose not to engage with the detail of the proposals. Where detailed comments were made, these are addressed below.

Fee differentiation to reflect bandwidth

- 3.8 There was broad agreement that, if AIP fees are to be applied, fees for 8.33 kHz frequencies should be one third of the level of fees for 25 kHz frequencies. However,

NATS stated that it had already completed a major programme to install 8.33 kHz capable radios but is unable to transition to 100% use of 8.33 kHz frequencies until all aircraft which rely on its services have equipped with 8.33 kHz capable radios. NATS argued, therefore, that an organisation such as itself should not be expected to pay fees based on 25 kHz bandwidth when it is ready and willing to move to 8.33 kHz frequencies but is constrained from doing so by others.

Ofcom response

- 3.9 We recognise that some spectrum users have already equipped themselves with 8.33 kHz capable radios but, nevertheless, need to deploy 25 kHz frequencies to be able to communicate with others which are equipped only to use 25 kHz channels. Our intention in applying AIP fees is to provide price signals so that the opportunity cost of spectrum is reflected in wider decision making by all in the supply chain. Where a service provider believes it is necessary to continue using 25 kHz channels because some or all of his customers are not yet able to operate with 8.33 kHz channels, the additional cost is likely to be passed on to some or all of those customers who will, as a consequence, face some incentives to review their own capabilities. More broadly however, the impact, on other potential users, of one organisation's use of 25 kHz frequencies does not vary with the reason for 25 kHz channels being used instead of 8.33 kHz. It is, therefore, appropriate that the opportunity cost of 25 kHz channels is reflected in the cost base of the user.
- 3.10 Fees for all service types will therefore reflect the bandwidth concerned, with fees for 25 kHz frequencies being three times as high as fees for 8.33 kHz channels, subject to a £75 minimum fee.

Fee differentiation to reflect varying density of demand

- 3.11 NATS supported the principle of "density based tariffs" although it questioned some of the detail of Ofcom's calculations.
- 3.12 Many other stakeholders expressed concern about the proposal that fees should vary according to the density of demand around the country. The CAA commented that as standards and requirements for aviation frequency use are not affected by geographical variation, population density or demand, the proposal to vary fees in different regions is inappropriate. One private individual who wished to remain anonymous argued that, while demand for frequencies may vary across the country, users are unable to take advantage of lower fees by moving their airfields and, therefore, there is little benefit to be derived from geographically differentiated fees. The Light Aircraft Association also noted that use of aeronautical frequencies in Europe is a key cause of the shortage of available frequencies in the south and east of England, and implied that UK users should not be penalised for the resulting shortage. Another private respondent who wished to remain anonymous criticised the illustrative analyses set out in the Helios 2009 Pricing Report which considered different bases on which the extent of spectrum sterilisation might be assessed across the country and questioned what account had been taken of additional channels created by 8.33 kHz deployment.
- 3.13 Eurocontrol perceived that the basis on which regional fee differentials had been proposed to be determined was based on population density as per Business Radio licences. That view was also shared by a private individual who wished to remain anonymous. Eurocontrol proposed that frequencies in the uncongested north of Scotland should be considered more valuable than elsewhere because alternative use is less constrained by existing aeronautical use. Highlands and Islands Airports,

conversely, expressed concern that one of its remote airports is in an area proposed to be classified as facing “high” congestion, resulting in fees per frequency the same as those faced by Heathrow.

Ofcom response

- 3.14 The basis on which fees were proposed to vary in different parts of the country was intended to reflect the proportion of frequencies sterilised to alternative aeronautical users by existing use within the UK and in other territories. This was set out in paragraphs 2.6 -2.7, and bullets 8 to 10 of paragraph 7.9 of the December 2009 consultation. The proposed lower fees were not derived by reference to population density. Furthermore, as we set out in the December 2009 consultation, no account was taken of the value of these frequencies in alternative use as alternative use is not considered feasible in the medium term. Therefore, even though fewer frequencies are sterilised to other users in some parts of the north and west, this does not mean that they are more valuable for alternative use; the opportunity cost to alternative (non aeronautical) uses remains zero.
- 3.15 We recognise that, in practice, an aerodrome is unlikely to relocate to another part of the country in order only to minimise spectrum fees. More broadly, however, local cost variations within the UK economy do influence the decisions of suppliers and consumers of services, including those in the aeronautical sector. As such, in principle, there would be merit in signalling geographic variations in the opportunity cost of spectrum so that this may be taken into consideration alongside other costs which vary by region.
- 3.16 Where frequencies are unavailable to potential UK users, it makes no difference to those potential users whether this is a consequence of existing UK assignments or assignments based in other countries. In both cases, remaining frequencies may be in short supply and, if so, there is an opportunity cost associated with their use. If there are fewer available frequencies at particular locations, then each licensee’s assignment has a greater effect on the likelihood that another user may be able to secure an assignment. In applying AIP in these cases, it is not our intention to penalise spectrum users, as one respondent claimed. Our objective is to ensure that UK users, who may be influenced by the application of AIP, take full account of the opportunity cost to other UK users when deciding whether to seek an assignment.
- 3.17 The Helios 2009 Pricing Report illustrated the fact that conclusions on the extent of frequency sterilisation across the country depend not only on the location and nature of existing assignments but also on assumptions about the nature of the hypothetical future demand. The maps constructed by Helios Technology Ltd were intended to illustrate the very different conclusions reached as to the number of frequencies unavailable to meet that future demand where that demand is assumed to be for (a) ground based use or (b) communication with aircraft at 45,000ft. The report did not present the latter analysis (communication up to 45,000ft) as representative of a typical ATIS assignment. Helios Technology Ltd’s analyses assumed that there are approximately 720 frequencies currently available in the VHF band, but acknowledged that this number slightly understates the true number as the relatively small number of 8.33 kHz frequencies had not been taken into account. In practice, the number of additional frequencies created to date by 8.33 kHz deployment is small relative even to the number of frequencies not available because they are currently the subject of impending reassignment.
- 3.18 For the reasons set out in paragraphs 3.14 to 3.16 above, we had proposed to apply discounts to fees in areas of the far north and west, reflecting the relatively low

density of frequency sterilisation in these areas. However, we note that only 7% of assignments would have attracted the proposed discounts and, of these, two thirds were assignments which would attract relatively low value fees of £350 or less, even without a discount. As such this differentiation would have added a level of complexity to the administrative process that might have been disproportionate to the benefits in terms of better use of the frequencies concerned. As the benefits may be finely balanced and the proposed regional differentiation received little support from stakeholders, we have decided not to implement these discounts. We have assessed the impact of this change in section 4 below.

The importance of reflecting coverage in fees

- 3.19 There was broad agreement that, if fees are to be applied, these should reflect the size of the area sterilised to alternative users. However a number of stakeholders argued that some fees proposed in the December 2009 consultation were not sufficiently reflective of the coverage of specific service types or specific assignments.
- 3.20 NATS made four specific proposals for more closely reflecting coverage in fees:
- First that fees should distinguish between high level and low level Area Control Services service types, with fees for Area Control functions operating below Flight Level 245 being set at half (£4950) of the fee for Area Control functions operating above Flight Level 245 (£9900).
 - Second, that there should be greater differentiation between fees applied to Approach services, with Approach service assignments with a Designated Operational Coverage ceiling up to 10,000 feet attracting a fee of £2600 and those with a ceiling above that level attracting a fee of £9900.
 - Third, that account should be taken of the smaller area impacted by broadcast services such as Automatic Terminal Information Service and weather broadcast (VOLMET) which do not involve transmission by aircraft. NATS reported that frequencies supporting such services are planned using a minimum ratio of signal strength between wanted and unwanted signals rather than line of sight and that the fees should be £2600 rather than £9900.
 - Fourth, that fees should differentiate between the generality of Automatic Terminal Information Service (ATIS) assignments and Departure ATIS which is used only to communicate with aircraft on the ground. NATS proposed that the latter should attract a fee similar to the £350 which was propose to apply to ground based services.
- 3.21 BAA and Peel Airports Group both argued that the proposed fees for Approach frequencies and Automatic Terminal Information Service frequencies, which assume full national coverage, are over-stated as some re-use across the UK is possible. BAA agreed, however, with the more modest fee increases for Aerodrome Surface and Operational Control assignments.
- 3.22 Denham Aerodrome and the co-located Pilot Centre argued that more account should be taken of the relatively localised impact of frequencies used by some General Aviation airfields, instead of relying on a simple “one fee fits all” approach. Denham provided data which compared coverage at a number of different aerodromes, and also noted that small airfields are required by the CAA to keep radiated power levels to a minimum. On this basis, Denham proposed that fees

should differentiate between Tower frequencies used to support Air Traffic Control services typically at larger aerodromes/airports and Air/Ground and Aerodrome Flight Information Services which provide less formal assistance, typically at small airfields. Wellesbourne Mountford Aerodrome argued that distinct fees should be applied to Tower frequencies and to Air/Ground and Aerodrome Flight Information Service frequencies reflecting the different types of organisations which use these types of frequencies. Dr J Tannock and Mr M Sapsed similarly argued in favour of a distinction between fees applicable to Tower use at a large airfield and those applicable to Air Ground or Aerodrome Flight Information Services at smaller airfields. Dr G Keeler argued that the proposed fees were deficient in not making a distinction between the size of the aerodrome and the power of transmitter used. A private respondent who wished to remain anonymous also proposed that fees should take into account the sterilisation impact of particular assignments.

- 3.23 The CAA noted that the proposed pricing mechanism did not reflect “volumes” of geographic space sterilised, even though the pricing structure allows for broad variations based on the areas sterilised by use. The CAA observed that factoring in the volume of use would allow future demand for coverage to be influenced by AIP, noting in particular that this would provide appropriate differentiation between smaller areas required by General Aviation and those supporting en-route operations. The CAA acknowledged, however, that this could introduce an additional level of complexity.

Ofcom response

- 3.24 We note with interest the proposals from NATS that fees should more closely reflect differentiation within service types, and the related proposals from Denham Aerodrome, the Pilot Centre and a number of private individuals that account should be taken of the claimed smaller impact of General Aviation use of frequencies. We agree that, in principle, fees which more closely reflect the area sterilised to alternative users can provide more effective incentives for efficient use of spectrum.
- 3.25 We also note the views of NATS that specific generic fees should be more granular, with sub divisions for Area Control services with Designated Operational Coverage flight levels above or below 24,500ft and for Approach services with Designated Operational Coverage flight levels above or below 10,000ft. We understand that ICAO’s European Frequency Manual used to recognise the concepts of Lower/Lower, Lower, Medium and Upper Area Control services, with those operating between 15,000ft and 25,000ft being classified as Lower. Similarly, ICAO used to recognise the concepts of High, Medium and Low Approach services, with those operating at up to 10,000ft being classified as Low altitude. Although the current ICAO Frequency Management Manual illustrates the principle of minimum co-channel separation with examples which include Approach services at 10,000ft and 15,000ft and Area Control services at several levels including 45,000ft, we understand that the former service type sub classifications are no longer recognised by ICAO and the subdivisions proposed by NATS may, therefore, be considered somewhat arbitrary.
- 3.26 Nevertheless, we acknowledge that some frequencies assigned to Approach services are re-used and, as might be expected, the proportion of frequencies which are able to be reused elsewhere in the UK is, indeed, greater amongst those used for assignments with a relatively low level Designated Operational Coverage. It remains the case, however, that many frequencies associated with DOCs which have ceilings below 10,000ft, as well as with DOCs with ceilings above 10,000ft, are not shared. We have therefore concluded that there is no strong logic to adopting 10,000ft as a

sub division of this service, and that a large step change in fees from £9900 to £2600 operating at that boundary would create anomalous distinctions between similar assignments.

- 3.27 It is true that Area Control frequencies associated with a Designated Operational Coverage ceiling of less than 24,500ft are more likely to be reused elsewhere in the UK than frequencies associated with a Designated Operational Coverage ceiling above 24,500 ft. However, overall, there are relatively few Area Control assignments with Designated Operational Coverage below 24,500 ft and, in practice, these account for less than one third of all frequencies assigned to Area Control services which are re-used. Clearly, the ability to reuse a frequency depends in part on the locations of the sites where reuse may take place as well as on the Designated Operational Coverage of both (or all) of the sites where re-use is considered. In these circumstances, the proposal to discount by 50% fees for Area Control assignments with a Designated Operational Coverage of below 24,500 ft would introduce a large step change in fees which would not reflect the variety of DOCs associated with Area Control assignments.
- 3.28 Having considered the merits of the particular counter proposals made in respect of fees for Approach and Area Control assignments, we have concluded that the generic fees set out in the December 2009 consultation will serve as a fairer and more reasonable basis for the initial application of AIP, as the proposed modifications would create material anomalies.
- 3.29 We see merit in the proposal from Denham Aerodrome and the Pilots Centre that, where possible, fees should reflect closely the sterilisation impact of different applications used by General Aviation. We also agree that frequency assignments made to small aerodromes often have more localised DOCs than those made to larger aerodromes. However, analysis of the DOCs of Air /Ground, Aerodrome Flight Information Service and Tower assignments indicates extensive overlaps in terms of size of Designated Operational Coverage between these service types. Indeed the largest outliers are found in the Air/ Ground service type where there are some very extensive DOCs.
- 3.30 As noted in Section 1 above, we have decided to introduce a new licence product with a reduced fee to apply to Air/Ground, Aerodrome Flight Information and Tower service assignments with a DOC no greater than 10 nautical miles radius and 3000ft service height. This particular DOC is widely used by smaller aerodromes and its parameters are well suited to defining a new licence product. More broadly, however, we do not consider that fees should vary according to the identity of the licensees for these different service types, as the opportunity costs remains the same irrespective of the identity of the spectrum user. For that reason, the new licence product will be available to any licensee with a relevant assignment.
- 3.31 Generic fees, broadly reflective of opportunity cost, will, therefore, be implemented without undue delay. This will provide spectrum users with incentives to start reviewing the quantity of each service type which they require, in the light of the new fees. To the extent that some users decide that they wish to operate with fewer assignments or with service types which have a smaller sterilisation impact, this will help ensure that demand from others who require frequencies to support high value services is met.
- 3.32 Nevertheless, we have concluded that further careful consideration should be given to the possibility of devising an alternative fees option based on an algorithm which would determine fees on a bespoke basis reflecting the Designated Operational

Coverage of each relevant assignment. This could, for example, mean that low altitude Area Control and Approach services would attract lower fees than high altitude assignments (other factors being equal). Fees calculated on this basis could provide additional incentives to use spectrum efficiently by minimising coverage.

- 3.33 We note the reservations of the CAA, which manages aeronautical spectrum licensing on Ofcom's behalf (under contract to Ofcom), that such arrangements could be administratively complex. Whilst we acknowledge that bespoke fees could potentially increase administrative complexity, we would seek to work with CAA to understand the technical and operational issues which would support such a scheme. Ultimately, any decision to deploy a bespoke fees algorithm would rest with Ofcom, which has the statutory duties and powers in relation to radio spectrum.
- 3.34 If a practicable bespoke option can be devised, we would seek to implement that as swiftly as possible. The generic fees would then become de facto maxima, with the possible exceptions referred to in paragraph 1.8 above. If such an option proves feasible, it may even be possible to introduce this simultaneously with the introduction of generic fees.

Fees for aeronautical broadcast frequencies

- 3.35 Concern was expressed about the proposal to apply fees to frequencies assigned to support NATS' VOLMET weather broadcast service. Many stakeholders noted the safety critical purpose of VOLMET and the way that it frees up resources of air traffic controllers and their associated frequencies. A small number of private pilots associations claimed that the VOLMET frequencies are allocated for this purpose internationally, which in their view implied that they cannot be used for other aeronautical applications and so AIP would serve little purpose. The Royal Aero Club further argued that NATS is bound by the terms of its contract with the CAA to provide a VOLMET service using these frequencies.
- 3.36 NATS made no comment about the international standing of the frequencies used for VOLMET in the UK, but argued instead that frequencies used to support broadcast services such as VOLMET (and recorded Automated Terminal Information Services) sterilise a much smaller area than frequencies used for two way communication between ground stations and aircraft. NATS proposed that fees should therefore be proportionately lower, although did not provide any data to support a specific level of fee. In respect of recorded Automated Terminal Information Services, NATS further proposed that fees should distinguish between those frequencies used to communicate with aircraft on the ground (Departure ATIS) and those used to communicate with airborne craft, with the former attracting lower fees reflecting the much more localised impact. Peel Airports Group made the same observation.
- 3.37 A private individual who wished to remain anonymous similarly argued that it is not appropriate for all Automated Terminal Information Service frequencies to attract a fee which assumes full national coverage, as some assignments have much more constrained DOCs.

Ofcom's response

- 3.38 Contrary to the views of some respondents, the frequencies used to support the VOLMET service in the UK are not internationally allocated solely for this purpose and are used to support a variety of other service types elsewhere in Europe. If these frequencies were not used in the UK to support VOLMET, they could be used to support other service types in the UK. As such, use with VOLMET has an opportunity

cost. We have concluded that it is appropriate that this opportunity cost is taken into account by the provider of the VOLMET service and, indirectly, by those with whom the provider contracts to provide the service. This will ensure that there are incentives to consider whether there are more efficient ways to provide this service.

- 3.39 We agree that ground based Departure ATIS has a very different spectrum sterilisation impact to other ground to air ATIS deployment. This fact is recognised by ICAO's classification of Departure ATIS as an Aerodrome Surface (AS) service. Frequency assignments to Departure ATIS will therefore attract a fee of £350 in line with other Aerodrome Surface assignments.
- 3.40 We acknowledge that, all other factors being equal, these Broadcast frequencies tend to have a more localised geographic impact on possible re-use than frequencies used for two-way communications, particularly where the frequency is to be re-used to support a further Broadcast service. However, as illustrated by ICAO in its European Frequency Management Manual, recommended separation distances remain extensive. In practice, the frequencies used to support the VOLMET service are not re-used anywhere in the UK, and it is rare for ATIS frequencies (other than Departure ATIS) to be reused. Only 15% of frequencies assigned to an Automated Terminal Information Service (other than Departure ATIS) are re-used and in these exceptional cases the transmitters tend to be located at the two extreme ends of the UK including Fair Isle and Shetland and the southern coasts of England and Wales. For these reasons, it remains our view that the proposed fee of £9900, which assumes typical UK-wide sterilisation, is a fair representation of the opportunity cost of this spectrum use. However, we have concluded that only one fee should be payable for each frequency used to support VOLMET even though each frequency is the subject of two or more assignments at different locations. As these assignments are made to just one licensee (NATS), apportionment of the fee will not be problematic.

December 2009 Question 3: Do you agree with our proposal not to charge any fees for Fire assignments?

- 3.41 This proposal was supported by all respondents who commented on this question. Many respondents also proposed that all frequencies used for safety related purposes should be exempt from fees, and some specifically referred to the Safetycom and distress frequencies.

Ofcom's response

- 3.42 We confirm that we will not apply fees to the Fire frequency (121.6MHz), international distress frequencies (121.5 MHz and 123.1MHz) or 122.950 DEPCOM. As we explained in the December 2009 consultation (paragraph 4.159), it would serve no useful purpose to apply AIP to frequencies such as this which are used on a private commons basis, including air to air frequencies. For the same reasons, AIP will not apply to the Safetycom frequency (135.475 MHz) either. We address below the particular circumstances under which some other frequencies are used on a private commons basis for sporting purposes. Furthermore, we do not intend to apply even a cost-based fee as licences to use the Fire, distress and Safetycom frequencies require no technical planning and are invariably associated with assignments to use other frequencies which do attract a fee.

December 2009 Question 4: Do you agree with our proposal to set a £75 fee for licences in any of the sporting frequencies?

- 3.43 The British Gliding Association submitted detailed comment about the frequencies assigned for use by gliding clubs, implying that some are only used for air-to-air applications, and that AIP fees should not apply for this reason. Mr G Knight drew attention to the fact that licences for aeronautical sporting frequencies currently authorise the use of a block of frequencies appropriate to the particular sport. Mr Knight also proposed that a distinction should be drawn between licences to transmit on the glider frequencies from fixed airfield locations and from mobile retrieve vehicles.
- 3.44 Conversely, NATS criticised the proposal that shared glider frequencies should attract an administrative cost based fee of just £75 and asked how Ofcom intended to provide an incentive for the gliding community to adopt 8.33 kHz channels thereby freeing up spectrum for others.
- 3.45 The CAA proposed that a pricing algorithm should apply reflecting actual coverage of individual assignments. However the CAA did not explain how the private commons nature of these assignments should be reflected in fees.
- 3.46 Mr R Seth-Smith noted that many Air/Ground frequencies are also used to support sporting use and asked why these too should not attract a relatively low fee as per the proposals in respect of frequencies generally used with unpowered flight or microlights. Denham Aerodrome, the Rural Flying Corps and Mr G Trowse, similarly, asked why flying clubs and gliding clubs are proposed to be treated differently. Mr N Thomason proposed that, if there is a shortage of frequencies, frequencies should be made available for use on a private commons basis at aerodromes which are lightly used by powered craft, such as is the case in France and the USA. Other stakeholders, including Mr J Milner, however, warned that wider use of private commons frequencies such as the Safetycom frequency would be detrimental to safety, particularly in South East England.
- 3.47 Mr K Taylor did not support the application of fees to the generality of glider frequency use, but proposed that fees should be applied to “commercial” use of these frequencies to support air shows and other special events.
- 3.48 ATC Lasham Ltd agreed that the proposed fees are appropriate as they can be recovered from event sponsors.

Ofcom's view

- 3.49 The frequencies used by the gliding community are all UK National Aerodrome frequencies which could be used to meet demand from other parts of the aeronautical community if not used for the current gliding applications. As such, use of these frequencies with gliding activity has an opportunity cost and, for that reason, we have concluded that it would be appropriate to apply AIP fees. We recognise that mobile use by retrieve vehicles often operates with less power than use at fixed stations. However, the fee per licence which we have decided to apply, will, in any event, apply to the full block of frequencies which the licensee is authorised to use, including any used by mobile retrieve vehicles.
- 3.50 In principle, we agree that fees for the glider frequencies, and almost all other frequencies, should reflect the bandwidth used so that there are incentives to reduce that bandwidth where possible. If the channel spacing of the frequencies used for gliding, and the other sporting frequencies, was reduced from 25 kHz to 8.33 kHz we

believe the assumed underlying opportunity cost of the frequencies should be reduced pro rata, subject to AIP based fees not falling below a level which reflects a contribution to the cost of our spectrum management functions. Similarly, we believe that a reduction in the number of channels used should be reflected in the total value of fees paid.

- 3.51 The five glider frequencies and the other four channels used for sporting applications are, however, currently shared by a large number of licensees on a private commons basis. We noted, for example, that the British Gliding Association reports that it has 85 member clubs with 9000 full members and 21000 occasional members between them, and the British Microlight Aircraft Association reports that it represents 4100 members operating and flying 2100 Microlight aircraft. In view of the large numbers of users sharing these frequencies on a private commons basis, we proposed that a fee of £75 should apply as a reasonable contribution to the opportunity cost of these frequencies. The text of the December 2009 consultation may have left some room for doubt as to whether the £75 would apply per frequency or per licence, and a licence might include rights to transmit on more than one frequency. We apologise for any confusion. It is our intention that the £75 fee should apply per block of sporting frequencies licensed to any one licensee. Thus, for example, a gliding club with rights to transmit on five gliding frequencies would pay a single fee of £75.
- 3.52 We recognise that some sporting frequencies are much more widely assigned than others, and two are subject to less than 10 assignments while some others have more than 100 assignments. Also, some sports have more frequencies available to them than other sports. In principle, we believe these variations should be reflected in fees and we propose that the CAA and the General Aviation community should review these allocations so that, when fees are next reviewed, the extent of sharing and the volume of frequencies licensed can be more closely reflected in fees. The current practice of granting blocks of five frequencies to gliding clubs gives individual licensees no choice but to accept five assignments. In these circumstances, we do not think it would be reasonable to expect licensees to pay five separate fees. However, we note that the fee of £75 per block of sporting frequencies, which we have decided to apply for the time being, significantly under-recovers from the gliding community the opportunity cost of these frequencies (£49,500 in total) and should to be addressed in due course. We believe this further review should be undertaken when the sector has had a reasonable amount of time to consider its future use of these frequencies, including the number of frequencies which should be allocated to particular sporting activities.
- 3.53 Ofcom would look to be guided by the CAA as to whether frequencies should or could be made available for use on a private commons basis by powered aircraft, as some stakeholders have proposed. If the CAA decided that this is appropriate, Ofcom would be minded to set fees on a basis which reflects the expected level of sharing, and these might well be similar to those which we have decided to apply to frequencies used to communicate with unpowered craft. If parts of the General Aviation community favour this approach, we would encourage them to initiate discussions in the first instance with the CAA.

December 2009 Question 5: Do you agree with our proposal to set annual fees of £9,900 and £19,800 per channel respectively for ACARS and VDL assignments, with no variation related to the number of transmitters used in such channels?

- 3.54 A number of stakeholders, including the British Air Transport Association, made specific comments about the fees proposed to apply to frequencies assigned to support ACARS and VDL services. Many, including SITA and ARINC (the two licensees) questioned Ofcom's proposal that frequencies used to support the much more efficient VDL service should attract a fee twice as high as the fee for the much less efficient ACARS. Other respondents expressed surprise that the fees proposed for both ACARS and VDL are high relative to fees for some other more traditional (and less spectrally efficient) services and claimed that these fees would create perverse incentives to use old technology. SITA argued that if AIP fees are to be introduced, these should apply only to the relatively inefficient voice communications.
- 3.55 The CAA's response noted that it is important that fees do not create a perception that Ofcom does not support technical developments which enable more efficient use of spectrum.
- 3.56 A number of stakeholders also drew attention to an error in Annex 4 of the December 2009 consultation which purported to replicate in one place the questions posed throughout the main body of the consultation document. As stakeholders pointed out, Question 5 as recorded in Annex 4 differed from Question 5 as set out in the main body of document in so far as Question 5 as set out in the annex implied that both ACARS and VDL assignments would attract a fee of £19800, whereas throughout the rest of the document (eg Tables 3, 5 and 7 and paragraphs 7.9) it was made clear that the proposal was to apply a fee of £9900 to ACARS and that the £19800 fee would apply only to VDL assignments.

Ofcom's response

- 3.57 VDL and ACARS assignments are both assumed to sterilise the whole of the UK to alternative users and, for that reason, might be expected to attract similar fees. However, as was highlighted in the December 2009 consultation (paragraph 7.9), VDL is allocated, taking into account guard band requirements, twice the bandwidth of ACARS and this is the reason why the proposed fee is twice as high as the fee proposed to apply to ACARS.
- 3.58 We agree with the CAA's comment that it is important that stakeholders should understand this rationale clearly.
- 3.59 The differential between the relatively low value fees proposed for individual Operational Control frequencies compared with the relatively high value fees proposed to apply to ACARS and VDL reflects the very different impacts of these service types on other potential spectrum users. Operational Control assignments require relatively small separation distances between assignments, allowing frequencies to be reused much more often than ACARS or VDL which require very extensive separation from other assignments and have service coverage areas extending across the whole of the UK enabling the service providers to offer very extensive services to their customers. It should also be noted that we maintain the view set out in the December 2009 consultation (paragraph 7.9) that only one fee should be payable for each ACARS and VDL frequency, even where there are multiple assignments enabling transmissions at different locations. Where a VDL or ACARS frequency is shared between multiple licensees, as is currently the case with one of the VDL frequencies, the fee will be split equally between the licensees. As there are currently only two organisations which are licensed to use ACARS and VDL frequencies, we consider that this simple apportionment is equitable. Should the number of sharers increase, it may be appropriate to devise a more sophisticated sharing arrangement which reflects the basis on which the frequencies are shared.

- 3.60 We apologise for the error in Annex 4 and confirm that the correct version of the question was that set out in the main body of the text, which was fully consistent with the explicit narrative of the consultation document.

December 2009 Question 6 Do you consider that our proposed general approach to phasing in fees for use of the aeronautical VHF communications channels are appropriate? If there are particular reasons why you consider that any user or group of users would need longer phasing-in periods, please provide any supporting evidence for us to consider. Specifically, do you have any evidence for us to consider that would support either of Options 1 and 2 for the highest proposed fee in this sector?

- 3.61 As noted in paragraph 3.7 above, many stakeholders chose not to engage with the detail of Ofcom's proposals. Some may have done so to leave no room for doubt about their opposition in principle to applying AIP fees, however structured, to these frequencies. Some of these respondents expressed a view that the proposal to phase in some fee increases was a device intended to reduce opposition to the wider proposals rather than a reasoned response to the risk of avoidable shock effects on spectrum-dependent operations. The Aircraft Owners and Pilots Association, for example, argued that, if it is not right to introduce the full fee today, it cannot be right to phase this in over 5 years, and this view was reiterated by a number of private individuals and small airfields. The Vintage Aircraft Club feared that the five year phasing, involving annual increases, would set a precedent for subsequent year on year increases. Mr J Milner proposed that phasing should be extended for at least 10 years while any impacts on safety are monitored. Mr N Hitchman proposed that phasing should be extended over 30 years.
- 3.62 Most of the commercial sector was broadly supportive of the proposal to phase in fees over 5 years. All of those who expressed a preference favoured Ofcom's slow start "Option 2" phasing over the straight line "Option 1", as under Option 2 step changes would be smaller in the early years and larger in the later years. The CAA agreed that the phasing proposals are a pragmatic way forward for mitigating impacts, although noted that spectrum users are best placed to provide detailed comment.
- 3.63 BAA argued that a more gradual phase-in programme would help the CAA to monitor the response to fees by the General Aviation sector, and BAA proposed that fees should be held at the Year 1 level for perhaps 5 years to allow their impact to be reassessed. Other respondents, including NATS and some major airports, argued more broadly that phasing should be aligned with the emerging timetable for the Single European Skies ATM Research (SESAR) programme. However, BAA reported that the SESAR programme is not expected to be fully completed until 2020.
- 3.64 The Hull Aero Club was opposed to the annual fee increased proposed, but recommended that fees should increase in line with RPI or some other index.

Ofcom's response

- 3.65 Recognising the widespread concern expressed about possible unintended and unforeseeable consequences of material increases in fees, we have concluded that it is important to introduce fee changes gradually. This will give spectrum users time to consider their options and, where necessary, agree any changes to CAA approvals required by a change of spectrum use. It will also enable the CAA to respond in a timely fashion to any unexpected outcomes. Given this intent, we agree with those

stakeholders who commented that the slow start Option 2 set out in the December 2009 consultation is the better option, as it will be in the early years when there is greatest uncertainty about scope to respond to AIP fees in a manner consistent with operational and regulatory requirements.

- 3.66 We do not believe that fees frozen at the Year 1 level would create appropriate incentives, as these fee levels are well below the assessed opportunity cost of the spectrum. Absent a clear signal that fees will rise, albeit gradually, to a level more reflective of opportunity cost, there is a high probability that fees will have little or no impact on spectrum use.
- 3.67 We are unclear what would be the advantage of aligning the phasing in of fee changes with the SESAR programme, or what form that alignment might take, particularly given the very extended timeframe for that programme. As set out in Ofcom's Strategic Review of Spectrum Pricing⁵, we have a preference, in general for setting fees review priorities following possible consultation in Ofcom's Annual Plan. To provide spectrum users with a high degree of certainty, we have proposed to review only when the evidence justifies it. A major change in spectrum use, such as for example a transition to new technology or narrower bandwidth, may well warrant a further review of fees. In practice, progress with the SESAR programme may therefore have a significant impact on the timing of a further review.
- 3.68 An annual increase in fees in line with inflation might have some merit if opportunity cost tended to increase in line with inflation. We believe this is highly unlikely as, for example, spectrum value may well reduce as more supply is made available, whereas, historically, general prices have tended only to rise. We have no current plans to increase fees beyond the levels which will apply at the end of the five years phasing. Any subsequent, or prior, change in fees would require public consultation. As set out in the preceding paragraph, we have proposed that further reviews of spectrum pricing decisions should be conducted only when the evidence justifies this. Our decision to phase in generic fee changes will also provide an opportunity to introduce a further bespoke fees option, if this is considered appropriate, before generic fees are applied in full. In any event, increasing current fees in line with inflation would not be a substitute for phasing in AIP.

December 2009 Question 7: Do you have any further quantified information to contribute to the analysis of financial impacts of the proposed fees on particular spectrum users, as set out in Annex 5? We would like to publish all responses, but will respect the confidentiality of any material which is clearly marked as such.

December 2009 Question 8: Do you consider that our assessment of the impacts of our proposals has taken full account of relevant factors? If you consider that there is additional evidence that would indicate particular impacts we should take into account, we would be grateful if you could provide this

- 3.69 Many responses from the General Aviation sector claimed that the proposed fees will have a severe impact on the sector, causing small airfields and clubs to close or operate unsafely without aeronautical radio. Many cited the cumulative impact of a variety of sector-specific regulatory initiatives. Many in the General Aviation sector

⁵ See *A revised framework for spectrum pricing* at <http://www.ofcom.org.uk/consult/condocs/srsp/>

pointed to their inability to pass on fees to a wide base of customers, and some objected to having to pay fees on the grounds that they are not profit oriented organisations. The British Helicopter Association and the Light Aircraft Association noted, more specifically, that at unlicensed airfields pilots may not charge passengers to recover costs. One of the groups representing private pilots (PPL/IR) proposed that the commercial sector should pay for all aeronautical spectrum, and cited as a supporting precedent the recent CAA agreement that the commercial sector should fund NATS' en route facilities as controlled airspace is mainly intended to benefit the commercial sector. Mr M Hogg presented a similar view. Mr M Long argued that the fees proposed to apply to small airfields (£2600 after 5 years) are unnecessarily high in relation to their intended purpose, and that much lower fees would have sufficient impact on users. He proposed that a relatively low fee of £25 might be set for the first assignment at each aerodrome, to promote the use of radio on safety grounds, with any further fees set at a premium (Mr Long proposed £500).

- 3.70 In contrast, although they criticised the cumulative impact of spectrum fees on top of Air Passenger Duty and additional security, most larger commercial airlines and airports recognised that the fees proposed to apply VHF communications frequencies are modest in the context of wider operating costs, but these commercial operators continued to be concerned that Ofcom or government may attempt to impose more material fees for radar and aeronautical navigation aids in due course. A private respondent who wished to remain anonymous expressed similar concerns. Some, however, also warned that fees will fall disproportionately on smaller commercial airports, and one small airport operator (Southend) argued that fees will give NATS Services (the competitive arm which provides air traffic services to individual airports) further competitive advantage derived from economies of scale. Virgin Atlantic also considered that, if fees were applied unilaterally in the UK, companies operating within the UK would be placed at a competitive disadvantage.
- 3.71 Much of the commercial sector, including the British Air Transport Association, the International Air Transport Association, the European Low Fares Airline Group, the Air Transport Association of America, and a number of individual airlines expressed concern about the prospect of airports and providers of air traffic control services passing on spectrum fees to aircraft operators which have little or no direct influence on spectrum decisions taken by airports. SITA (a major international providers of aeronautical communications infrastructure) noted that a large proportion of all fees would be payable by NATS and argued that without effective competition to NATS, fees will simply be passed on to airports and airlines without any impact on spectrum use.
- 3.72 Airports, in contrast, expressed concern that they are prevented by long term contracts from passing on additional costs to their customers (the aircraft operators). However, no detail was provided about the nature and duration of these contracts.
- 3.73 NATS was perceived by some as an over-powerful 'monopolist' and the British Business and General Aviation Association argued more specifically that NATS should be required to pay fees from its existing profits, instead of being allowed to pass these on to airports and aircraft operators. However, the Association drew attention to a contrasting risk that, if NATS is made to pay spectrum fees it might relocate its operations abroad. NATS itself made no such claim but argued that by the time it has passed on fees to aircraft operators the impact will be so diluted that there will be no economic incentive.
- 3.74 Altair Aviation argued that, as broadcast services benefit overflying traffic as well as those landing at an aerodrome it would be difficult for service providers to pass on

costs to the beneficiaries, which might increase the likelihood that these services would be withdrawn.

- 3.75 A number of respondents argued that when the cost of accidents resulting from reduced use of radio is taken into account, there will be a net detriment to UK citizens and consumers. A small number of General Aviation respondents claimed that the cost of clearing up one additional fatal accident could exceed the total value of AIP receipts for these frequencies. The Light Aircraft Association estimated a cost of £1m to £5m per death and, on that basis, argued that the cost of the proposals will very quickly exceed the revenue. The Board of Airline Representatives in the UK objected that safety is not an “externality” but a first priority.
- 3.76 The Board of Airline Representatives in the UK, and the International Air Transport Association and some of its member airlines, took the view that Ofcom’s Impact Assessment was intended to establish whether the sector could afford to pay AIP fees without undue disruption to its operations, and that it is Ofcom’s view that the sector should pay if it can afford to pay. Virgin Atlantic and BMI similarly appeared to believe that as Ofcom has observed that airlines pay for other inputs it now believes it should also pay for spectrum. The Association of European Airlines considered that the Impact Assessment had argued that, because the aeronautical sector already pays a much higher sum in taxes, payments in respect of AIP would not even be noticed. More broadly, the commercial airlines viewed the fee proposals as a cost with no benefit.
- 3.77 A number of respondents provided specific information about the likely impact of AIP on their own operations as follows;
- The Shuttleworth Collection, stated that it would be forced to give up its Air/Ground frequency and manage the consequent safety issues as best it could.
 - Strubby airfield similarly claimed that it would have to cease using its Air/Ground frequency as it has only a handful of members who, together, would be unable to afford the £2600 per year (at the end of the five year phasing).
 - Maypole Airfield also claimed that it would terminate its licence to use its Air/Ground frequency if fees are increased, and noted that a radio licence above £100 will be seen as an avoidable cost, notwithstanding that, in the opinion of the licensee, the radio has already saved lives.
 - Stoke Golding presented a similar argument to the effect that it would abandon its Air/ Ground frequency if the annual fee is increased by any amount, however small, notwithstanding that the airfield considers this will increase the potential for loss of life.
 - Northampton Sywell aerodrome reported that its average landing fee is £10 and that at least one full summer month’s visitors would be needed to pay the increased fee for its Aerodrome Flight Information service frequency.
 - Devon Airports which operates Eaglescott Airfield also claimed that it would have to abandon its frequency.
 - Ince Blundell Flying Club, which operates an Air Ground frequency to support micro light flights and training, made the same claim.

- Darlton Gliding Club recommended that more consideration should be given to the impact of fees on small glider sites operating at weekends and a limited numbers of days per year.
 - The Rural Flying Corps Ltd stated that as a small flying school and club it could not afford the £2600 proposed to apply to its Air Ground frequency by the end of the proposed five year phasing, and would find the Year 1 £400 fee hard to accommodate.
 - Chiltern Aero Club stated that the proposed fee of £2600 per year for its Air/Ground frequency is ten times the club's income from visiting aircraft. However, the club did not provide information about other revenue resources such as from the flying school and membership fees.
 - Manchester Barton airport estimated that the revised fees will require a 2% increase in landing charges.
 - Mr R Tatlow reported that at his gliding club (identity not revealed) there are some 6000 glider launches each year and that the proposed fee of £2600 per full Air Ground frequency would add a further 46p to each launch. In Mr Tatlow's view, this increase will cause small clubs to discontinue radio use.
 - A private individual who wished to remain anonymous estimated that an average General Aviation pilot faces an annual hangarage bill of £3600, an insurance bill of £1400 and a fuel bill based on 50 hours flying per year of £2500. In the light of these fees, the writer considered many amateur pilots are already having to reduce to a minimum operating and maintenance standards.
 - ATC Lasham Ltd described itself as an aircraft maintenance company which typically uses its frequency only once every two days, and stated that the proposed fee increases for its one frequency would be very serious for a small company.
 - The MOD warned that increased fees could force it to reduce its use of VHF assignments which could "fracture the integrated approach to airspace within the UK and negatively impact the existing agreements with the CAA". However, the MOD did not elaborate on this comment. The ASF CG further argued that AIP fees could result in a reduction in military frequencies which could impact operational readiness. For this reason ASF CG argued that provision should be made for guest national forces to have access to the radio spectrum free of charge.
- 3.78 A private respondent who wished to remain anonymous noted that some services, such as Automated Terminal Information Services, are of benefit to overflying pilots who do not necessarily have a contractual relationship with the licensee who, therefore, has no means of passing on the costs.
- 3.79 Mr A Curtis warned of the administrative cost to aerodromes which change their frequency use and, accordingly, need to amend publications and databases which refer to the frequencies.
- 3.80 The CAA expressed concern about the additional administrative burden which it might face.

Ofcom's view

- 3.81 It would be difficult for Ofcom to try to comment in detail on the very limited information provided by individual users of VHF communications frequencies who claim that they would face no alternative but to cease using VHF communications frequencies if the proposed fees were introduced. We recognise that, in some instances, it may well be that published accounts, or club membership details, do not provide a complete picture of costs and revenues, and we fully recognise that, ultimately, it is for spectrum users to decide how to respond to an increase in costs.
- 3.82 The fee which will apply to the Aerodrome Flight Information Service frequency used by the Shuttleworth Collection will increase to £350 in the first year rising to £2600 at the end of five years. It will of course be for the Trustees and the organisers of the Shuttleworth Collection to determine how it should respond to the increased fees, and how much of the Trust's overall income should be devoted to supporting flying at the site, but the published accounts imply that the Collection does have choices other than simply to cease using its frequency and manage as best it can any consequent safety issues. The Trust derives significant revenue from a wide range of visitor attractions related to flying.
- 3.83 As Mr A Beney observed in his response to our consultation, the income of many other aerodromes is also derived in part from activities other than flying, such as property development, which make more intensive use of the site. We note that Northampton/Sywell Aerodrome Ltd also operates a hotel and conference centre as well as other property and farming interests on the site. It will be for the operator of the aerodrome (in association with the CAA) to judge whether its Aerodrome Flight Information Service frequency should be retained only if the annual fee (£2600 by the end of the five years phasing) can be recovered through summer visitor landing charges alone. However, we conclude from the published accounts that the aerodrome would be able to pay the increased fee if it valued the frequency at or above the opportunity cost. As Manchester Barton aerodrome noted, others have much less diverse income streams. We recognise that fee increases will be unwelcome to any spectrum users and, in particular, to small airfields and flying schools such as the Rural Flying Corps Ltd, Maypole Airfield and the Chiltern Aero club. We do not under-estimate the financial pressure which some such pilot training schools may face, and this is reflected in our decision to phase in fees over five years which will give all users time to accommodate the changing cost base. Our decision to apply AIP may also prompt changes to the way VHF spectrum is used and licensed, which could have a material impact on the level of fees payable before the end of the five years phasing. Our decision to make available localised assignments at lower cost will be one such factor to consider.
- 3.84 Nevertheless, it is helpful to place the proposed spectrum fees in the context of other costs and revenues faced by the General Aviation sector. We note, for example, that the modified Year 1 fee for an Air/Ground frequency (£350 per year) is equivalent to the cost of hiring an aircraft (Cesna 182) from the Rural Flying Corps for less than 3 hours, and the full Year 5 fee (£2600) equates to about 16 hours of aircraft hire. Similarly, we note that the cost of one 25 hour training package with the Chiltern Aero club is advertised at £4,100. Finally, we also note the advice of the stakeholder who wished to remain anonymous, referred to in the thirteenth bullet of paragraph 3.77 above, in respect of the fees typically payable for hangarage, insurance and fuel.
- 3.85 We also note that many small aerodromes which advertise radio facilities in practice are able to man these for only a small part of the time. We note, for example, that

Stoke Golding airfield's website warns that its frequency is usually unmanned except at weekends.

- 3.86 We understand that ATC Lasham is one of the UK's leading independent aircraft maintenance organisation which offers facilities for servicing large passenger jets. It would be for the company (in consultation with the CAA) to decide whether it wishes to retain its frequency, but the nature of the work undertaken, and the annual turnover reported in Companies House returns, would suggest that the company would place a high value on being able to receive and despatch its clients' aircraft safely.
- 3.87 We understand that Strubby airfield is used mainly by glider pilots and is the home of the Lincolnshire Gliding Club. As we have clarified in this statement, the five glider frequencies will attract a fee of just £75 per block of five frequencies, although we recognise that if the airfield also requires an Air/Ground frequency to communicate with any powered craft this would incur additional costs. We note that Eaglescott airfield is similarly used by a gliding club and also by a micro light club and, here too, a single £75 fee would apply to the appropriate block of sporting frequencies. As an unlicensed aerodrome, it would be for the site operator to determine whether he wished to retain the existing Air/Ground frequency, but we note that the airfield website warns that, in any event, the radio is usually unmanned. Ince Blundell Flying Club is a micro light club and, like Eaglescott, will be eligible to use appropriate sporting frequencies for £75 for the block.
- 3.88 In the light of the specific additional information provided by some stakeholders, as discussed above, and the information set out in the December 2009 consultation, we maintain the view set out in the December 2009 consultation that the introduction of revised fees will provide incentives for users to consider their spectrum use alongside all other inputs, in the light of the potential value of spectrum to other users. We believe that fees materially below the estimated opportunity cost would not have this impact. If, alternatively, all of the opportunity cost of these frequencies was paid by the commercial sector alone, as some stakeholders proposed, General Aviation spectrum users would face no incentives to make more efficient use of spectrum.
- 3.89 As noted in paragraph 3.83 above in relation to Northampton/Sywell Airport, many airfields (large and small) are used intensively and enjoy varied sources of income in addition to landing fees, including fuel sales, hangarage, maintenance, exhibitions and displays, property rental, restaurants and accommodation. In these cases, while the revised fees may represent an unwelcome cost increase, they are unlikely to be insupportable, being modest in relation to other costs and revenues. Where such aerodromes consider radio facilities make an important contribution to safe traffic management, the aerodrome is highly unlikely to abandon the use of radio entirely.
- 3.90 We recognise that for some small airfields and flying schools, which have less diverse sources of revenue, the fee of £2600 per year, which we proposed should apply to the generality of Air/Ground frequencies by the end of the five year phasing, may represent a significant cost increase which some may conclude is in excess of the value which they place on the facility, particularly if the radio service is often not manned and/or reliance is placed on pre planning arrivals by phone.
- 3.91 For this reason, taking into account specialist advice from the CAA, we have decided to introduce a new spectrum licence product for aerodromes which require an assignment with limited operational coverage. Air/Ground, Tower and Aerodrome Flight Information assignments with a Designated Operational Coverage (DOC) of no more than 10 nautical miles radius and 3000 feet vertical coverage will attract a fee

of £350 from April 2012, rising to £500 from April 2013 and to £650 from April 2014 and thereafter. This fee reflects the smaller area impacted by such assignments compared with the generality of such assignments. This low coverage licence product will be available to any such assignment but we anticipate that it will be of particular interest to small aerodromes.

- 3.92 We would anticipate that the prospect of increasing fees will also provide incentives for spectrum users themselves to give careful thought to whether alternative lower cost, ways of using frequencies can be identified.
- 3.93 We also anticipate that there may be renewed interest in whether it might be feasible to operate a fully bespoke fees algorithm which more closely reflects the limited coverage of particular Air/Ground and Aerodrome Flight Information Service frequencies. We are seeking specialist advice from the CAA as to whether these options are feasible and consistent with the safe operation of aerodromes.
- 3.94 We do not accept that fee increases on the phased schedule which we will implement will have a detrimental impact on safety, as the CAA has confirmed that it has adequate powers to address any safety concerns. Therefore we do not accept that there is a safety related cost associated with these changes. Furthermore, the benefits of applying AIP to these frequencies have to do with the benefits to citizens and consumers in terms of more efficient use of spectrum. We do not consider AIP “receipts” to be benefits.
- 3.95 We recognise that some UK aerodromes, particularly those which are used as transit hubs, face competition from non UK aerodromes. In principle, the unilateral application of spectrum fees in the UK could place spectrum users at a commercial disadvantage. In practice, however, the scale of the fees (less than £4m per year at the end of the five years phasing for the entire UK aeronautical sector) is so small in relation to other costs faced by large hub aerodromes that we have concluded that there will be a negligible reallocation of aeronautical activity away from the UK. This issue was addressed more fully in paragraph 7.82 of the December 2009 consultation. For the same reasons, to the extent that fees are passed on to UK based airlines by UK aerodromes, the impact on the competitive position of these airlines is likely to be minimal.
- 3.96 In response to the concern that the sector may in future face more substantial fees in respect of radar and aeronautical navigation aids, we reiterate that we currently have no plans to propose revisions to fees for these spectrum bands. As we explained in the June 2010 statement *Applying spectrum pricing to the maritime sector, and new arrangements for the management of spectrum used with radar and aeronautical navigation aids*⁶ government has agreed to take a strategic management role in relation to these bands.
- 3.97 We note the concern that NATS may be relatively unconstrained in passing on increased costs to its customers. A large part of NATS’ operations are, however, subject to economic regulation by the CAA and, in addition, NATS is subject to general competition law. It would not be for Ofcom to investigate the operation of the markets in which NATS operates. Similarly, the ease with which airports may be able to pass on cost increases to airlines is a reflection of the competitiveness of the relevant markets. We note that a number of airports are subject to economic regulation and this would be the appropriate vehicle for addressing any competition

⁶ See http://stakeholders.ofcom.org.uk/binaries/consultations/aip_maritime/statement/statement.pdf

concerns. As a number of airports reported, and as might be expected in a complex market, there are also contractual constraints on additional costs being passed on to customers.

- 3.98 One of the purposes of our Impact Assessment was to consider whether the fees which we had proposed would cause inefficient shock effects which could be avoided if fees were phased in over a longer period. This included the possibility that, in the near term, services for end users could be disrupted to an unacceptable level as providers reliant on spectrum would be unable to fund the increased spectrum costs. For this reason, it was highly relevant to consider how easily spectrum users would be able to absorb or pass on the increased costs. This analysis post-dated, rather than pre-dated, our provisional view that AIP fees would contribute to an improvement in spectrum efficiency. Therefore, the view presented by the International Air Transport Association and others, that our assessment that the sector could afford to pay AIP fees had influenced our assessment of whether AIP is applicable in principle, is incorrect.
- 3.99 The MOD provided no information to support its contention that fees for aeronautical VHF communications frequencies could fracture the integrated approach to airspace within the UK. The Lower Airspace Radar Service, referred to by the MOD, relies on a network of some 32 transmitters, about 40% of which are operated by the MOD. If the MOD was to pay AIP based fees for its frequencies, the annual cost would be about £130k. In the context of the MOD's multi-billion pound budget, we consider this a small sum. We also note that, in any event, payments by Crown bodies in respect of spectrum use are a matter for government to decide, and that the MOD has paid for its use of other spectrum bands on a comparable basis to commercial users for some years.
- 3.100 We acknowledge the CAA's concern that changes to spectrum fees, in pursuance of Ofcom's distinct statutory duties, may have an impact on the CAA's own workload if planned changes to frequency deployment by some aerodromes and providers of air traffic services necessitate renegotiation of CAA operating licences. However, we believe the phasing in of fee increases, and the delay in implementing the first changes, is likely to mean that consequent requests for changes to operating licences will be spread over many months and years. As such, we do not anticipate that administration of these changes is likely to require additional resources.

Other key issues of concern

- 3.101 The following issues were of particular concern to stakeholders and we comment on these below in more detail;
- Whether there is excess demand for aeronautical VHF communications frequencies (the rationale for AIP in this band) and how this should be measured
 - The future impact and timing of the deployment of narrower 8.33 kHz channels which will enable more channels to be offered from the same amount of spectrum.
 - Scope to respond to fees in a manner beneficial to UK citizens and consumers
 - Safety issues and whether it is acceptable regulatory practice for Ofcom to rely explicitly on the CAA to take action to counter any adverse safety impacts of Ofcom's own actions.

- “Ownership” of aeronautical frequencies

Whether there is excess demand for VHF comms frequencies

- 3.102 A significant minority of General Aviation responses challenged Ofcom’s assertion that there is excess demand for aeronautical VHF communications frequencies from within the aviation sector (which is the rationale for applying AIP based fees to the use of spectrum). Most of these responses relied on public comment made by a CAA official to the effect that there are currently no unfulfilled requests for such frequencies. However, we note that the CAA’s own written response stated that the VHF band is heavily congested across Europe and that there is insufficient spectrum to satisfy medium term operational requirements. A few General Aviation responses also argued that, in any event, there would be no excess demand if all frequency assignments were managed centrally across Europe instead of being devolved to national authorities such as the CAA.
- 3.103 The Aircraft Owners and Pilots Association noted that aeronautical VHF requirements do not often change. The Shuttleworth Collection argued, similarly, that, as aviation infrastructure in the UK is mature and well established, need for frequencies changes only slowly. The Collection also noted that individual channels are not congested.
- 3.104 The commercial sector put more weight on future changes which, in its view, will address current excess demand, even absent AIP. Commercial Airports, and NATS, asserted that demand for frequencies is unlikely to grow at same rate as over the last 10 years. In support of this view, NATS, Thomas Cook Airlines and BMI noted that future datalink services are expected to reduce demand for voice channels. KLM, however, warned that the need for bandwidth will increase in line with demand for flight efficiency and the need to reduce environmental impacts.
- 3.105 The Airport Operators Association noted that while there is little spare capacity, in the relevant frequencies, it understood that there are currently no outstanding frequency requests either. This view was reiterated by several member airports.
- 3.106 It was the opinion of Manchester Airports Group that demand for more spectrum is almost exclusively derived from NATS for its en route services.
- 3.107 Use of the term “congestion” was confusing to some respondents who were unclear whether this referred to high channel occupancy or a shortage of frequencies able to be assigned for exclusive use in a given area.

Ofcom’s view

- 3.108 Although Eurocontrol’s response made no specific comment about current or future excess demand, its website stated, in respect of Europe as a whole, that in spite of the currently decreasing air traffic levels, the demand for new VHF assignments continues and is expected to increase once traffic levels rise again. The website went on to state that, as a consequence, Europe is reviewing a number of measures to alleviate VHF congestion. We also note that Commission Regulation 1265/2007, which implemented the extension of 8.33 kHz channel spacing to flight levels between FL195 and FL245, forecast that demand for VHF channels would continue to grow with increasing levels of air traffic.
- 3.109 We believe it is significant that both the CAA and Eurocontrol take the view that these frequencies are highly congested across Europe and we note the CAA’s observation

that European demand studies indicate that there is insufficient spectrum to meet medium term operational requirements. We note that the CAA has used its professional expertise to manage demand such that there are currently no outstanding requests for frequencies. However, as set out in paragraphs 4.2 to 4.9 below, it is Ofcom view that, in general, AIP based fees should be used to complement micro-management of scarce frequencies, as outcomes are then more likely to serve the wider interests of UK citizens and consumers.

- 3.110 We acknowledge that new technologies are often capable of delivering increased data handling capacity, and we also note the view that voice communications between aircraft and ground stations may increasingly be replaced by data exchange which can be expected to require less spectrum. We will monitor the impact of these developments carefully, but we note that no respondents claimed that they can be expected to result in an excess of spectrum allocated to the aeronautical sector in the medium term. We also observe that traffic levels are expected to rise over the next few years and that, in many other sectors of the UK economy, demand for data exchange tends to rise as capacity increases.
- 3.111 Our fee proposals were not based on a belief that occupancy of individual frequencies is excessive. The rationale for proposing fees rests on an understanding that there is a shortage of frequencies available to meet new requests for assignments. We acknowledge that the needs of individual frequency users may change only slowly, but the views of Eurocontrol and the CAA support the proposition that there is a shortage of frequencies available to meet new requests. We observe that in the 12 months period from April 2009, about 70 new licensed assignments were made by the CAA on Ofcom's behalf.
- 3.112 We noted in the December 2009 consultation that NATS is a major user of these frequencies and will face nearly one third of the total fee increase. Therefore, the incentive properties of the fees will, quite properly, be felt by NATS. However, other users of these frequencies also contribute materially to the shortage of available frequencies and we consider it would be inequitable and ineffective to expect one user alone to make changes intended to benefit the sector as a whole.
- 3.113 We observe that in the event that technological or management changes result in a global or regional excess of aeronautical VHF communications frequencies, such that use no longer has an opportunity cost, it would be appropriate for the ITU to review the international allocations so that the frequencies may be used to meet relevant demand for VHF frequencies from other aeronautical uses or industry sectors, to ensure the continued efficient supply of usable spectrum across the economy.
- 3.114 Ofcom has no view as to whether a centralised European aeronautical spectrum management unit would be in a position to achieve make more efficient use of this resource, but we note that currently there is no legal framework for such an entity to take over management of UK and European administrations' radio spectrum.
- 3.115 In the light of these comments, it remains Ofcom's view that the aeronautical VHF communications frequencies are a scarce resource and will remain so for some time, and therefore demand needs to be managed carefully.

Future impact of the move to 8.33 kHz channels

- 3.116 Many respondents noted that if, as planned, the current 25 kHz channels are replaced with 8.33 kHz channels, this could result in a near tripling of available channels. As respondents have noted, this raises two key questions; (a) whether

there will still be excess demand for frequencies when 8.33 kHz has been deployed more widely, and (b) whether AIP applied today can facilitate or accelerate the transition programme.

- 3.117 Several respondents reported that Europe is already developing a programme to roll out the use of 8.33 kHz channels. These noted that 8.33 kHz channels are already used by ground stations to communicate with aircraft above 19,500 feet, and the intention is to extend this to all flight levels. The commercial sector also reported that its aircraft (and most of NATS' ground transmitters) are already 8.33 kHz capable. The commercial sector observed that, in contrast, few light aircraft are fitted with 8.33 kHz capable radios, and claimed that owners are resisting having to pay the significant cost of changing their radios. The commercial sector reported that until all have fitted 8.33 kHz capable radios (or have been given reasonable warning of future obsolescence of 25 kHz radios), licensed airfields will continue to be required by the CAA to use 25 kHz channels.
- 3.118 Some responses from the General Aviation community expressed the belief that Ofcom has an agenda to force light aircraft owners to re-equip their aircraft. The Airport Operators and Pilots Association claimed that Ofcom was attempting to move aviation solely into 8.33 kHz channels. The British Gliding Association similarly asserted that one of Ofcom's stated aims is to move all aircraft to 8.33 kHz channel spacing. In NATS' view too, the proposals were aimed at incentivising the use of 8.33 kHz channels. In the light of these views, some respondents argued that Ofcom's impact assessment should have taken into account the cost to the sector of implementing the 8.33 kHz transition programme.
- 3.119 As many respondents noted, the European Commission is expected to set out the dates by which new aircraft must be fitted, and existing aircraft retrofitted, with 8.33 kHz capable radios. In the view of many respondents, when this exercise has been completed it will be possible to replan the band. However, stakeholders reported that the EC Implementing Rule has yet to be drafted and consulted on. In NATS' view the dates for mandatory equipment are unlikely to be earlier than 2012 for new aircraft and 2018 for retrofitting.
- 3.120 Many respondents argued that Ofcom had taken insufficient account of the likely impact of this programme. NATS reported that Eurocontrol, in its own cost benefit analysis in relation to the 8.33 kHz programme, believes that when fully implemented, it will be possible to satisfy all requests for VHF communications assignments from 2018 to 2024 (the end date of Eurocontrol's simulation period). However this view was subject to the caveat that this outcome would be seen in the context of other modernisation programmes. NATS reported that it is not convinced that the VHF band will be subject to excess demand in the UK following completion of the 8.33 programme, but respondents were unable at this stage to conclude with confidence when the transition to 8.33 kHz working will be completed and what impact that may have on the supply/demand ratio. The Airport Operators Association noted that this programme, and others like it, indicates that the sector takes spectrum efficiency seriously, but the Association stopped short of claiming that replanning will result in there being more channels than the sector will need. Manchester Airports Group in its own response appeared to place more weight on ICAO's "Future Communications System" which is expected to drive greater use of spectrum efficient data transfer in place of voice, and over a much longer time frame.
- 3.121 NATS was doubtful that AIP can provide incentives for more rapid adoption of 8.33 kHz frequencies noting, as already recorded, that it has already taken its own modernisation programme as far as it can. BAA, too, argued that the UK cannot

unilaterally mandate that all aircraft carry 8.33 kHz equipment, so airports will continue to need 25 kHz assignments until there is Europe-wide implementation.

- 3.122 The British Business and General Aviation Association noted that most of its members' aircraft are already 8.33 kHz equipped, but implied that in other parts of Europe more provision has been made for the use of 8.33 kHz channels than in the UK. Other respondents from within the General Aviation sector noted that it would not be possible for small airfields to implement 8.33 kHz channels in advance of a UK-wide (or Europe-wide) transition.

Ofcom's view

- 3.123 In our view, it is too early to judge whether the likely increase in the number of available channels will generate more capacity than is required by the sector. The cautious predictions of the sector suggests that 8.33 kHz channels may well alleviate congestion but fall short of generating so much extra capacity that channel use ceases to have an associated opportunity cost. In that event, AIP would continue to have a role to play in managing demand.
- 3.124 We note that the timeframe for implementing 8.33 kHz channels across Europe is not yet clear, and the discretion, if any, to be afforded to individual states, to determine how swiftly the transition should be completed, is not yet known. We acknowledge that, if individual states have little or no discretion, AIP applied in the UK may have limited impact on the pace of this particular transition programme. Conversely, to the extent that the UK is afforded some discretion, a delay in implementing fees pending completion of the transition to 8.33 kHz channels would present perverse incentives which would be likely to delay rather than accelerate the change as completion of the programme might be expected to trigger the application of AIP fees. A further review of the appropriateness of fees after the transition has been completed would be more likely to contribute to efficient use of spectrum.
- 3.125 We note the concern of some in the General Aviation sector that Ofcom has a specific objective to force the owners of light aircraft to fit 8.33 kHz capable radios. We have a technology neutral approach when applying AIP, and it is not within Ofcom's competence to judge how the aeronautical sector should equip its aircraft. Ofcom is not proposing that 8.33 kHz radios should be deployed and, therefore, it would not be appropriate for Ofcom to consider the cost of this programme within our Impact Assessment. However, we recognise that AIP fees which vary in proportion to the bandwidth used may well provide incentives for small airfields (as well as large) to equip with 8.33 kHz radios to an earlier timescale than required by the EC Implementation Rule, which would mean light aircraft owners who wish to communicate with such ground stations would have to re-equip.
- 3.126 In summary, we recognise that a transition to 8.33 kHz working across the sector could have a significant impact on the supply/demand ratio for these frequencies, but we believe it is too early to conclude that this will result in an excess of spectrum such that use of these aeronautical frequencies will cease to have an opportunity cost in terms of the current use. Were that to turn out to be the case, it is highly likely that the frequencies would be reallocated either for other applications within the aeronautical sector or more widely by the ITU. In practice, however, we acknowledge that long timescales generally apply to reviews of allocations such as this and we note the numerous forecasts of continued growth in demand for frequencies from this sector. More broadly, we also note that it is not yet clear when the transition will be completed, although we recognise that there is an expectation that this may be achieved by 2018. Whether the application of AIP will accelerate this transition will

depend in part on the detail of the EC Implementation Rule. We wish to emphasise, however, that individual operators' transition to 8.33 kHz channel spacing is just one of many changes which the application of AIP may influence.

Scope to respond to fees in a manner beneficial to UK citizens and consumers

- 3.127 Against the background of Ofcom's conclusion that there is excess demand for aeronautical VHF communications spectrum now and that this will persist for the long term, the question arises as to whether AIP can help ensure that the available channels are assigned to those users who value them most highly. This would depend in part on whether users have discretion about their future use of these frequencies.
- 3.128 The joint response from a number of aeronautical and maritime trade associations, co-ordinated by the CBI, expressed the view that charging for aeronautical frequencies, and internationally recognised maritime channels, will not lead to behavioural changes in the use of spectrum.
- 3.129 The response from the Aircraft Owners and Pilots Association implied that AIP fees would not have the desired effect of improving spectrum efficiency as there is no scope to trade these frequencies with non aeronautical users and little likelihood of trading between aeronautical users.
- 3.130 The commercial sector claimed that it has only limited discretion, as operating licences would be revoked unless a reasonable level of radio based services is provided. That sector tended to characterise the benefits of AIP, as set out by Ofcom, as being as somewhat hypothetical and academic. Some of the airlines argued, more specifically, that Ofcom had not made clear what is the problem and how AIP can fix it. Manchester Airports Group noted that Ofcom had been unable to quantify the benefits and so had had to rely on an academic argument that absent some form of price mechanism the current assignment practice must be inefficient. Manchester Airports Group called for a more quantified comparison of costs and benefits.
- 3.131 Notwithstanding the broad contention that regulated aerodromes have no discretion in respect of spectrum use, many responses explored the ways in which they could respond to fees. Examples were often intended to illustrate concerns about a negative impact of AIP but, nevertheless, we consider these provide useful illustrations of some of the trade-offs, which we would expect AIP to prompt, consideration of, between deployment of scarce frequencies and deployment of other resources, such as labour, or a change to commercial operating practices. We summarise the comments as follows;
- The objections raised in responses from the General Aviation sector, in respect of adverse impacts on safety (discussed below), implied a belief that unlicensed airfields (which constitute the great majority of sites used by light aircraft) have discretion as to how many, if any, frequencies they use. Indeed some claim that they will hand back their spectrum licences.
 - In the results of a straw poll conducted by the Airport Operators Association and associated with the Association's response, one airport operator reported that it might give up a Radar Approach frequency, although warned that this could increase radio congestion and reduce safety *margins*. In the same report, another airport said it could consider dropping the use of an Automated Terminal Information Service.

- Infratil Airports set out in its own response an analysis of the scope for change at its airports. In setting out the disadvantages of these changes, Infratil drew a link between spectrum use and commercial advantage by warning that a reduction in frequencies deployed would have an impact on the workload to be faced by air traffic controllers and that a reduction in Automated Terminal Information Services would be unpopular with Infratil's customers. Infratil Airports also noted that it has a frequency set aside for overload and training, which would also imply a degree of judgement as to the number of frequencies required.
- NATS noted that alternative frequencies are maintained to mitigate Radio Frequency Interference when this arises.
- Southend Airport noted that AIP would provide a financial barrier to airfields with plans to develop capacity, thus indicating a link between business development and spectrum use.
- NATS was concerned that a reduction in the number of frequencies which it uses, made in response to AIP fees, would impact its ability to meet customer demand, in terms of capacity and operational delay. NATS noted that its en route business is economically regulated and would suffer financial penalties if unacceptable delays occurred.
- CANSO Europe similarly appeared to take the view that AIP risks forcing a change of new technologies on the aeronautical sector, and that this is not an appropriate role for Ofcom.
- The CAA similarly warned that changes to spectrum use, consequent on AIP, would be likely to have a negative impact on day to day operations.
- ICAO warned that a reduction in spectrum use could cause an increase in flight delays.
- The Light Aircraft Association expressed a view that AIP might helpfully persuade some commercial users of Operational Control frequencies to exit these frequencies
- The British Business and General Aviation Association supported the application of fees for datalinks such as VDL and ACARS.
- The British Gliding Association acknowledged that one of the frequencies allocated for ground based communications with gliders could be replaced by a Business Radio channel (which might release the aeronautical frequency for other aeronautical applications).
- A few responses from the General Aviation sector noted that some other countries, notably France, make available frequencies for use by small airfields on a private commons (rather than exclusive) basis and implied that a similar system could be deployed in the UK, thereby releasing other frequencies for exclusive assignments elsewhere. The General Aviation Safety Council also recommended that a private commons frequency should be made available for training purposes.
- The CAA recognised that a more granular fees structure could have an influence on the size of some Designated Operational Coverage areas (which, it might be assumed, would increase the feasibility of frequency reuse in some areas).

- NATS broadly shared the CAA's view that AIP, if appropriately structured, could provide incentives for spectrum users to keep to a minimum the licensed operational coverage area which they request.
- 3.132 KLM and Delta, however, noted that airlines are subject to international carriage rules (ICAO "Standards and Recommended Practices") which are beyond the control of an airline. Cathay further argued that providers of air traffic services already face pressures to reduce the number of frequencies which they use as each typically requires the resources of an additional air traffic controller to deploy it.
- 3.133 The Air Transport Association of America asserted that ICAO and the World Radio Conference dictate aircraft and ground based equipment purchase and use decisions and operational procedures.
- 3.134 Cathay asserted that actual use (and density of use) of a frequency is monitored by local authorities and ICAO and that frequencies are reallocated and relocated based on operational requirements. SITA and the British Microlight aircraft Association lent their support to schemes of this kind in place of AIP.
- 3.135 Mr A Beney noted the observation in the report at Annex 8 to the December 2009 consultation that the selection of non reporting and small reporting aerodromes reviewed by Helios Technology Ltd held licences appropriate to their operations. In Mr Beney's view, this statement tended to confirm that AIP would serve no purpose as there are no frequencies which need to be given up.
- 3.136 The ASFCG asserted that there is no opportunity for users to change their behaviour in frequency use in response to price, as frequency requests are already scrutinised at both national and international levels within a co-ordinated and harmonised infrastructure.
- 3.137 In NATS' opinion, AIP will not have any significant impact on technology or procedures used by the international aviation community, and recommended that State input to ICAO to achieve international uniformity in standards will be more effective. The CAA, too, stated that it was not convinced that AIP could deliver greater efficiency of aeronautical operations.
- 3.138 Peel Airports Group questioned the implication in Ofcom's consultation document that the industry in the UK has a mandate or responsibility to negotiate changes in international agreements.
- 3.139 Many responses rehearsed the argument, explored at length in the December 2009 consultation document, that aeronautical communications frequencies released in the UK in response to AIP will be returned to the European pool and reassigned in other countries. We note, however, that the commercial sector was more nuanced, than General Aviation, claiming this as a possibility rather than a certainty. Conversely there was recognition from some respondents that the most populous frequency types widely used by General Aviation (Air/Ground and Aerodrome Flight Information Service) are not subject to European co-ordination, although these responses express scepticism about the ability to reassign such frequencies within the UK. For example, the Shuttleworth Collection argued that where an Air Ground or Aerodrome Flight Information Service frequency is released, it could only be reassigned either locally or a long way from the original site, as reassignment in other locations would tend to cause interference.

- 3.140 Mr N Long presented the view that re-use of frequencies is currently very poor, being reliant on having large distances between stations on the same frequency. In Mr Long's view, in any other field techniques such as selective calling or selective signalling would be used to enable closer packing. However, as Mr Long pointed out, such changes are not within the control of individual users and will require international agreement. In his view, therefore, the focus of attention should be on driving changes to international agreements rather than changes by individual spectrum users through AIP.
- 3.141 Nearly half of all responses expressed the view that fees are just a means of raising revenue. A few responses from the General Aviation sector implied a belief that Ofcom is increasing fees for its own benefit. Wellesbourne Mountford Airfield, for example, asked whether fees are retained by Ofcom for its own use or forwarded to central government.

Ofcom's view

- 3.142 Consultation responses reinforce our view that there is scope for change, in the light of AIP fees, in the way individual licensees choose to use aeronautical spectrum. We recognise that this scope is conditioned by both operational and regulatory demands, as illustrated by stakeholders and the CAA. While the safety-related activities of the aeronautical sector may be subject to more regulation than some sectors of the UK economy, we do not accept that this removes all scope for spectrum users to respond to fees. It remains the case that users constantly have to take commercial (and safety-related) decisions in relation to a wide range of inputs to their businesses, including spectrum. In many cases, as stakeholders' responses very clearly indicated, the operational impact of ceasing to use a particular resource (or using less of it) may be unacceptable as the user values the resource at or above its cost.
- 3.143 We acknowledge that there are already some costs associated with deployment of VHF communications frequencies, including the costs of skilled personnel and equipment needed to make use of VHF communications frequencies. Where there is no cost associated with the spectrum resource itself, decisions as to the optimal mix of inputs will be distorted. Understandably, many stakeholders have emphasised the likely negative impacts of reducing spectrum use. An increase in the cost of any input is unlikely to be favoured and, from a commercial perspective, will be viewed as having a negative impact. Responses do, however, highlight that users have real choices. We recognise that many may place a high value on access to spectrum, such that they would not choose to forego this. Others may reach a different conclusion. We believe that fees which reflect the opportunity cost of the spectrum will help to ensure that such decisions are soundly based.
- 3.144 Spectrum trading can enable efficient allocation of scarce frequencies, and in a well-functioning market the ability of users to trade might mean that AIP is no longer required. However, the ability of spectrum users to trade their licences is not a prerequisite for effective implementation of AIP as the Aircraft Owners and Pilots Association appeared to believe. In most bands, the application of AIP operates to encourage the efficiency gains that would arise in a well-functioning market, where those who value spectrum most highly and are able to generate the most benefits for citizens and consumers get access to it.
- 3.145 As was explained in Section C.2.3 of the report at Annex 8 of the December 2009 consultation, the review of licences held by non reporting and small reporting aerodromes was intended as a review of possible outliers within the wider pattern of

spectrum use by these types of aerodromes. The review was not intended as an assessment of scope for change as Helios had only limited information about each aerodrome considered. This was made clear by Helios on page 52 of the report.

- 3.146 We set out in paragraphs 5.33 to 5.44 of the December 2009 consultation our views on the reported risk that frequencies released in the UK in response to AIP fees may be reassigned in Europe. We maintain the views expressed in that document and would refer interested parties to the detailed explanation provided. We continue to be of the view that, although there is necessarily an international dimension to frequency assignment in this sector, and in some instances a frequency released in the UK may enable an assignment to be granted in another country, release is more likely to benefit UK users than others. This is, principally, because assignments sterilise adjacent areas (albeit that some of those areas may be transnational) and, therefore, there is a higher probability that an existing UK assignment will prevent alternative use of a frequency elsewhere in the UK than elsewhere in Europe. The geography and location of the UK also tends to strengthen this factor, as fewer Designated Operational Coverage areas include or are adjacent to foreign territories than would be the case with a country surrounded by other states. We also note that many UK assignments are made in one of the national aerodrome frequencies which are not subject to international assignment processes.
- 3.147 We understand that, contrary to the views of some stakeholders, channel occupancy is not routinely monitored by the CAA. Ofcom observes that it would be likely to be problematic for any external authority to attempt to ration frequency assignments by relying on such monitoring. It would be for the CAA to judge whether monitoring would serve any other purposes, for example to prevent overloading.
- 3.148 Ofcom's statutory duties do not permit us to consider the revenue raising potential of AIP fees. Our objective in applying the fees referred to in this statement is to promote optimal use of spectrum in the interests of UK citizens and consumers. Furthermore, we wish to clarify that, although the level of AIP fees are determined by Ofcom and collected on Ofcom's behalf by the CAA, no part of these fees is retained by Ofcom or the CAA for its own benefit. Ofcom's expenditure on spectrum management is determined by agreement with Government and receipts from licence fees, which are paid over to Government, do not affect the amount we may spend on our spectrum management activities.
- 3.149 We believe that, in addition to providing incentives for individual users to consider how many frequencies of each service type they require, fees may also stimulate consideration amongst spectrum users about the conditions attached to spectrum use. We note, for example, comments from some in the General Aviation community that some frequencies might be used on a private commons basis. Ofcom has no view as to whether greater use of private commons channels for particular service types would be consistent with operational and regulatory requirements, but we note with interest that our proposal to apply AIP has caused some users to consider afresh the framework within which assignments are made. Such consideration could lead to more efficient use of spectrum in the medium term.
- 3.150 We also note with interest the views of other stakeholders, including the CAA and NATS, that fees which reflect the Designated Operational Coverage of each assignments could provide incentives for spectrum users to consider additionally the size of the Designated Operational Coverage which they require. Here again, we are encouraged to note that our proposals to apply AIP have caused the sector to consider afresh whether aeronautical frequencies could be used more efficiently.

- 3.151 We acknowledge that some parts of the supply chain which relies on access to VHF frequencies have more influence over decision making than others. However, except where airports have market power, it is reasonable to assume that they face competitive pressure to reduce costs, including by making more efficient use of spectrum. Although some fee increases can be expected to be passed on to airlines without changes to use of the particular frequency, we do not accept that all fee increases will be passed on in this way such that airlines, which have little or no direct influence over decisions in relation to the radio frequencies deployed, will end up facing the opportunity cost of all current assignments.
- 3.152 In the event that an airport has market power in the provision of particular services, they are likely to be regulated which would restrict their ability to pass on costs, at least any above efficient levels. We addressed the possibility that markets may not be fully competitive in paragraph 3.97 above.
- 3.153 We also acknowledge that some changes, for example the deployment of new spectrum-efficient technology, may not be within the control of individual spectrum users as international agreement may be required. Nevertheless, as noted above, we have concluded that the generic fees on which we consulted will provide incentives for frequency users to consider how many assignments of each service type they require, potentially releasing some assignments for others who value them more highly. We therefore intend to implement these fees, phased in over up to five years from 2012.
- 3.154 However, we are minded also to consult further on an optional alternative fees structure which more closely reflects DOCs. We would re-consult with a view to introducing this as an option which licensees may choose to have applied to some or all service types in place of generic fees. Any such new option would need to be based on the same underlying opportunity cost estimates as the generic fees option and be consistent with the broad principles underpinning the application of generic AIP fees. We believe this two stage approach will be helpful to the aeronautical sector in providing early clarity about the underlying opportunity cost of these frequencies and incentives to continue the process of engagement to refine the structure of fees in the light of the sector's own perception of their ability to respond to fees.

Adverse impacts on safety

- 3.155 Many responses from the General Aviation sector claimed that AIP will have an adverse impact on safety by causing small unlicensed airfields to give up frequencies used to communicate with aircraft, thereby making it more dangerous to use those airfields. Some warned that increased use of the common Safetycom frequency would overload that frequency. Some more explicitly argued that the £75 per year proposed to apply to gliding clubs will force those ground stations to give up radio facilities. A small minority of responses from the General Aviation sector further claimed that lives will be lost as a consequence of AIP as airfields cease to offer radio facilities. Mr R Seth Smith warned, in particular, that small airfields which have a limited amount of traffic across the year, but become congested during fine summer weather, will be unable to afford a full annual licence fee and will cease to offer radio facilities, to the detriment of safety. Mr S Winter warned that the fee proposals will result in a reduction in the number of Air Traffic Zones (ATZs), with consequent impacts on safety, as smaller aerodromes will be unable to afford fees for the frequencies needed to operate ATZs.

- 3.156 The Aircraft Owners and Pilots Association forecast that AIP fees will cause an increase in the use of non radio rules by small aerodromes, and the Association questioned whether this would be consistent with European law as set out in Regulation EC1108/2009.
- 3.157 Responses from the commercial sector were more cautious about claimed impacts on safety. None of these operators claimed that they would respond to AIP in a manner which will compromise safety. Some, however, claimed that safety “margins” will be narrowed, within a wider safe window, and that AIP may have unintended consequences. Many in the commercial sector also expressed concerns about the possible response to AIP by the General Aviation sector.
- 3.158 Ofcom’s comment, in the December 2009 consultation document, that the CAA has confirmed that it has adequate powers to respond to safety concerns, drew criticism in two forms. Many stakeholders sought to argue that it would be contrary to Better Regulation principles for one regulator (Ofcom) to take action which would necessitate remedial action by another regulator (the CAA). Some extended the logic of this argument to claim that this outcome would tend to result in two sets of additional regulation cancelling each other out. Others, including the Airport Operators Association, warned that AIP may cause safety standards to be eroded to a degree which does not require regulatory intervention by the CAA but which, nevertheless, is material with flying becoming “less safe” rather than “unsafe”. The Light Aircraft Association perceived that it was Ofcom’s intention to remove the safety management function from the CAA, replacing it with market forces.
- 3.159 Although Ofcom has always made explicit its intention not to apply AIP to aircraft radio licences there was an implied assumption, in some of the comments presented in respect of safety impacts, that AIP will in some way cause pilots of light aircraft to cease equipping with radios. The British Helicopter Association argued that pilots will, where possible, avoid using their radios as fees applied to ground based radios will be passed on to those pilots who avail themselves of radio facilities. NATS drew attention to its own investment in initiatives to reduce airspace infringements by light aircraft and warned that a reduction in carriage of VHF equipment by light aircraft would devalue that investment.
- 3.160 ICAO asserted that the proposal could have a negative impact on safety but provided no explanation other than to note that financial pressures cause industries to focus on cutting costs and maximising gains, and that AIP may cause “disharmonisations” across national boundaries, thus creating inadvertent but serious safety concerns. The CAA noted the safety related benefits of voluntary use of frequencies by the General Aviation community and warned that AIP could result in unintended consequences on safety were current users to cease using voice communications, and that there would be a cost to the CAA (and to users) if individual safety cases had to be reviewed. In a footnote to its response to the December 2009 consultation, the CAA further noted that voluntary use of frequencies generates benefit to all users of the affected airspace and potentially to individuals on the ground and that, if the external benefit is not taken into account, fees could reduce overall efficiency and benefit rather than increasing it.

Ofcom’s view

- 3.161 As highlighted in the December 2009 consultation, we recognise the critical importance of safety in the aeronautical sector. We note, however, that the CAA stands by the view expressed to Ofcom before the December 2009 proposals were published, and recorded in the consultation document, that it has adequate powers to

respond to any safety concerns arising from Ofcom's proposals to apply AIP. We also note that the CAA has made no specific representations that AIP will cause safety standards to be degraded to an unacceptable degree, although the CAA remains wary of the "unintended consequence" of change. Therefore, we do not accept that AIP fees will generate an outcome inconsistent with European law.

- 3.162 While we acknowledge that unintended consequences may flow from any action, we do not believe it would be appropriate for any regulatory authority to conclude that regulatory structures should remain unchanged, indefinitely, simply to avoid any unintended consequences of change. Any change risks unintended consequences if not carefully considered. For this reason we have conducted an extended consultation with the sector across two years, and have held very detailed discussions with the CAA over the period. This preparatory work, and our decision to apply fees only gradually, has led us to conclude that the risks of adverse unintended consequences are low and any such impacts would be felt only gradually, enabling a timely response from the CAA. As already noted, the CAA has confirmed that it has adequate powers to respond to any safety related concerns that may arise as a consequence of applying AIP.
- 3.163 We acknowledge that if the CAA felt the need to intervene to prevent all material changes of spectrum use consequent on the application of AIP, this might be considered to represent very poor regulatory practice, with one regulatory initiative effectively cancelling out another. As illustrated by the comments in paragraphs 3.127 to 3.154 in relation to scope for change, we do not accept that this is a probable outcome. More broadly, however, it is right that users should face the resource costs of their decisions. Safety regulation by the CAA would not necessarily require the current level of spectrum usage to continue. Therefore, a combination of fee increases and some additional regulation could still lead to efficiency gains.
- 3.164 Spectrum users are already subject to stringent safety regulation intended to ensure that commercial and other cost pressures do not cause safety standards to suffer. As noted in our impact assessment published with the December 2009 consultation, the overall level of fees which we have decided to implement are modest in relation to other fluctuating costs faced by the sector. We also note that no airport operator has claimed that it would respond to AIP fees by reducing safety standards to an unacceptable level, even though some have claimed that others may do so. We also note that aerodromes and pilots are all subject to general health and safety, and sector-specific, legislation which are intended to safeguard against acting in an unsafe manner. Finally, as noted in the December 2009 consultation (paragraph 5.69), the aviation sector faces strong commercial incentives to ensure that its services are safe.
- 3.165 We acknowledge the concern that increased fees may cause some unlicensed aerodromes to decide to cease using VHF communications frequencies. However, as we noted at length in the December 2009 consultation, the great majority of unlicensed aerodromes already operate without VHF communications and reliance is placed on the common Safetycom frequency made available by the CAA explicitly for air to air use in the vicinity of airfields that do not have a dedicated frequency. We understand that this, currently, raises no safety concerns. It would be for the CAA to determine if increased use of the Safetycom was causing congestion problems and, if so, whether further such channels should or could be made available for this use. Furthermore, despite the steeply rising costs of operating light aircraft (as cited by many respondents to both the July 2008 and December 2009 consultations) we are not aware that this is raising concerns that, as a consequence, operators of unlicensed aerodromes may cut safety margins to an unacceptable level. The proper

response to any such concerns would, indeed, be for sector specific regulation to be applied to address the risk directly and in a focused way, rather than apply subsidies, which do not guarantee the provision of the desired outcome, to encourage small aerodromes to adopt safer practices.

- 3.166 We also acknowledge, however, the widespread concern expressed about the possibility of some of those unlicensed aerodromes which currently offer radio facilities taking precipitous action to remove radio facilities at short notice in response even to moderate fee increases. We recognise that a proportionate light touch response by the safety regulator to any consequent safety concerns may take time to devise and implement and, for this reason, we have decided to phase-in much more slowly fee increases for Air/Ground (and Tower and Aerodrome Flight Information Service) assignments. As we have set out in this statement, fees for these assignments will increase to £350 from April 2012, rising to £500 from April 2013. Thereafter, fee for assignments with DOC no greater than 10 nm and 3000ft will rise to £650 from April 2014 and thereafter, and fees for the generality of such assignments will rise via further 3 annual increments to £2600 by April 2016. Other large fee increases too will be phased in over five years.
- 3.167 We appreciate that this additional cost will be unwelcome, particularly when set in the context of other, often much larger, cost increases (including the anticipated transition to 8.33 kHz capable radios) which CAA sector-specific regulation is expected to necessitate in the next few years.
- 3.168 We wish to emphasise, once again, that we have no plans to apply AIP to aircraft radio licences and, therefore, the decisions announced in this statement will not cause owners to remove radios from the existing fleet of light aircraft. In consequence there will be no impact on the proportion of pilots which are equipped to benefit from the Lower Airspace Radar Service (LARS) when flying in uncontrolled airspace or straying into controlled airspace. It has been implied by some stakeholders that, if fewer unlicensed aerodromes offer radio facilities as a consequence of AIP, the benefits of newly equipping an aircraft with a radio will reduce. In practice, we believe this effect will be negligible, as there will remain a large population of licensed (and, likely, unlicensed) aerodromes offering radio facilities. Aircraft not fitted with radios are restricted to uncontrolled airspace and are not permitted to use many aerodromes and, as such, there are strong practical disadvantages in not carrying a radio. We also understand that all aircraft flying in excess of 250 knots, even in uncontrolled airspace, are required to have radios. More than 70%⁷ of light aircraft (<3200kg) are already fitted with radios and virtually all new fixed wing, powered aircraft are fitted with radios. We have concluded that the application of AIP to aeronautical ground stations will not have a material impact on the carriage of radios by light aircraft.

Ownership of aeronautical spectrum

- 3.169 The commercial and General Aviation sectors asserted, as Ofcom has acknowledged from the outset of this consultation process, that any aeronautical frequencies released in response to AIP could not currently be used for other applications. In the

⁷ According to CAA data, there are 12,476 aircraft <3200kg on the UK register, and 8,982 radio licences associated with aircraft <3200kg. These craft include balloons, gliders, microlights etc, as well as conventional powered fixed-wing aircraft, and many of these rely on hand held radios covered by "transportable radio" licences, of which there are, in addition, some 1259 in force. Transportable radios are often shared between club gliders, and it may be reasonable to assume that the percentage of all aircraft <3200kg which have radios of one kind or another exceeds 80%.

view of these stakeholders, this reduces the value of the AIP fees initiative for society at large. Many stakeholders also reiterated that aeronautical allocations are protected by international agreements. Many respondents remained suspicious that Ofcom's principal objective is precisely to make some of these aeronautical frequencies available to other sectors. The Light Aircraft Association expressed the view that Ofcom has proposed that the UK should lead the world working towards releasing aeronautical spectrum for other uses. In support of a similar view, Peel Airports Group drew attention to sections of the December 2009 consultation where reference was made to the hypothetical possibility of excess demand for spectrum from other sectors of the economy being met by use of aeronautical frequencies.

- 3.170 SITA (a provider of aeronautical communications infrastructure) and the Light Aircraft Association both claimed that Ofcom's proposals were an attempt to "wrest control" of this spectrum from the CAA. In similar vein, Monarch Airlines commented that it failed to understand how Ofcom believed it could "assert management control" of UK aviation spectrum when the effect of the spectrum pricing proposal will extend far beyond our borders. Monarch questioned whether Ofcom or the UK is in a position to remove internationally agreed radio spectrum. The European Low Fares Airline Association asserted that individual governments have no individual locus to propose charges on the basis of opportunity cost. SITA was more specific and presented an argument that Ofcom has no jurisdiction over this spectrum under EU law. The Air Transport Association of America claimed that the consultation raised questions to do with the appropriate relationship of an individual state's regulatory jurisdiction to the long standing international systems of civil aviation and communications regulation.
- 3.171 The Light Aircraft Association believed AIP would move spectrum management responsibility from the CAA to the end user (via the market), and this view was mirrored by Infratil Airports which asserted that Ofcom believed market mechanisms are the only efficient basis on which spectrum can be allocated. Euro Seaplane Services Ltd, too, believed that Ofcom's proposals were intended to replace the CAA's safety functions with market driven self management, and the company linked this to UK government proposals that the CAA role should be refined as a champion of the consumer. The British Gliding Association also indicated that it believed it was Ofcom's intention that market forces alone should determine how aeronautical frequencies should be assigned.
- 3.172 In the view of Peel Airports Group, aeronautical radio spectrum is "ring fenced" and, should Ofcom believe any spectrum is not being used efficiently, Ofcom should highlight this to the CAA. Like others in the commercial sector, Peel Airports Group favoured a wholly regulator-defined approach to any perceived shortcomings.
- 3.173 ICAO's comment, already referred to above in the context of concerns about impacts on safety, that fees applied in the UK could cause "disharmonisations" of spectrum allocations across national boundaries was mirrored by the ASFCG which described Ofcom's AIP proposals as "divisive". United Airlines warned that the UK's unilateral introduction of fees risked interfering with the ability of governments worldwide to enhance safety and improve system efficiencies and capacity, but the airline did not explain how this impact would arise.
- 3.174 The CAA argued that these frequencies should be managed by DfT (through the agency of the CAA). This broad view was repeated by many others, including those trade associations associated with the response co-ordinated by the CBI. SITA more specifically proposed that the sector's spectrum costs should be absorbed as public service costs as, SITA believed, is the position elsewhere in Europe.

Ofcom's view

- 3.175 We recognise the widespread concern amongst stakeholders that the proposal to apply AIP based fees to aeronautical VHF communications frequencies may appear to put at risk future access to these frequencies by the aeronautical sector. We note that this anxiety is articulated forcefully by Eurocontrol on the Spectrum Management Activities section of its website⁸, which identifies two key factors which appear to threaten this continued security of access; (a) the concept of economic value in relation to the radio spectrum and (b) the trend for states with common interests to form a powerful lobby group. Eurocontrol's anxiety is further underlined by its stated belief that the international negotiation machinery, in which aviation does not participate directly, occasionally has a hostile view of the aviation sector and is often biased towards other interests, particularly telecommunications commercial interests.
- 3.176 We acknowledge that the focus of Eurocontrol and many national aviation authorities is necessarily directed at securing the future viability of the aviation sector and its safe operation. Ofcom's statutory duties require it, more broadly, to secure optimal use of radio spectrum for all UK citizens and consumers. To that extent, our objectives are distinct and may, sometimes, not be fully aligned. However, in applying AIP based fees to aeronautical VHF communications spectrum, it is not our intention to reduce the CAA's influence over the way these frequencies are used nor to reassign it to other sectors of the UK economy.
- 3.177 Ofcom is not a government department. Our spectrum management duties were set out by parliament in the Communications Act 2003 and our objective on this occasion is to ensure that the opportunity cost of using scarce spectrum resources is fully recognised by all decision makers, irrespective of how that resource is used. As was set out in the December 2009 consultation, the assumed opportunity cost which underpins the fees which we have decided to implement (£9900 per nominal 25 kHz with full UK coverage) is based on an assessment of the value of these scarce frequencies to others in the aviation sector. As it is not currently feasible to use these frequencies to meet demand for VHF from other sectors of the UK economy (nor likely to be so in the foreseeable future), we have taken no account of the value which might be placed on these bands by potential alternative users. We also note that, in any event, the report commissioned by Ofcom from Indepen⁹ implied a higher valuation of these frequencies in aviation use than is placed on similar frequencies in alternative uses.
- 3.178 The CAA's statutory duty, to secure the most efficient use of airspace consistent with the safe operation of aircraft and the expeditious flow of air traffic whilst taking into consideration the requirements of operations and owners of all classes of aircraft, will be unaffected by Ofcom's decision to apply AIP to aeronautical VHF communications frequencies. We will continue to seek the expert advice of the CAA, in its role of specialist aviation regulator, in relation to proposals for the deployment of spectrum by the aeronautical sector and in determining the structure of licences, including fees. We intend that the CAA should also continue to manage, under contract to Ofcom, Ofcom's spectrum licensing function assigned to Ofcom under the Communications Act. Indeed, a new contract was agreed during 2009. AIP fees are intended to complement, not replace, the current technical management of this resource.

⁸ See http://www.eurocontrol.int/sma/public/standard_page/key.html

⁹ See *Aeronautical and maritime spectrum pricing April 2007* by Indepen Consulting at <http://stakeholders.ofcom.org.uk/binaries/research/spectrum-research/aipreport.pdf>

- 3.179 We have already agreed with government that strategic management of spectrum used with radar and other aeronautical navigation aids should be handled by a nominated government department, which should face incentives to ensure efficient use of these bands. As we explained in paragraphs 1.20 to 1.22 of the December 2009 consultation, there is currently no excess demand for those spectrum bands from within the aeronautical sector and, therefore, no need to apply AIP to manage that demand. In some cases, however, there may be scope to share (or release) some of that spectrum so that it can be used by other sectors of the UK economy. That change of use would require co-ordinated research and planning, and we do not believe that this would currently be encouraged by applying AIP to end users. For these reasons, government has agreed to create appropriate incentives for a part of government to take on this role. The circumstances surrounding aeronautical VHF communications spectrum are very different, where there is a continuing need to manage demand from within the aeronautical sector, and no current expectation that, with co-ordinated research and planning, these frequencies can be shared with other sectors of the UK economy.
- 3.180 We reject the argument presented by SITA that the EU Regulatory Framework for Electronic Communications does not apply to aeronautical frequencies. The scope of the Framework is not limited to public telecommunications networks as SITA claims. We also reject SITA's argument that aeronautical frequencies sit outside the scope of the Wireless Telegraphy Act 2006. The term "wireless telegraphy" is defined very broadly in section 116 of the Wireless Telegraphy Act 2006 and does not exclude aeronautical frequencies.

Other issues

- 3.181 Stakeholders made a number of other observations not covered by the preceding discussion.

Calculation of fees for Aerodrome Control frequencies.

- 3.182 Dr J Tannock and the Light Aircraft Association both drew attention to an error in the calculations use by Ofcom's consultants Helios Technology Ltd when determining fees for Aerodrome Control frequencies. Both responses noted that the Helios 2009 Pricing Report had erroneously taken 166km (rather than 162km) as half the underlying separation distance of 324 km.

Ofcom's response

- 3.183 We have discussed this observation with our consultants who confirm that the assumed co-channel sterilisation radius for Aerodrome Control in Table 4 of the report *Administrative Incentive Pricing for Aeronautical VHF Communications*¹⁰ should have read 162km, and not 166km. The impact of this error on assumed fees is, however, negligible.
- 3.184 As was illustrated in Table 5 of the report, Helios assumed that a swept radius of 166km would impact thirty seven 50km squares in the configuration set out in Table 5. As would be expected, the radius impacts some grid squares more fully than others, but in most cases 80% or more of the grid square is within the swept radius and in all cases at least 50% of the grid square is within the radius. Use of the correct swept radius of 162km makes no difference to this assessment as none of the 37

¹⁰ See http://stakeholders.ofcom.org.uk/binaries/consultations/spectrum_pricing/aip.pdf

grid squares assumed to be materially impacted by the 166km swept radius is excluded if a 162 km swept radius is deployed and the same assessment of materiality deployed (ie at least 50% of the grid square within the swept radius). The Light Aircraft Association's contention that a swept radius of 162km would impact just 33 squares (rather than 37) appears to be based on a very different assessment, that the area of a circle with radius of 162km would equate to the combined area of 33 such grid squares. However this was not the basis on which Helios derived its recommended fee. We note that if such an approach was to be taken, the underlying unit fee rate would also need to be re-calculated so that fees reflect the proportion of the UK sterilised by the particular transmission rather than the number of hypothetical grid squares impacted.

- 3.185 Finally, as we noted in paragraph 7.9 of the December 2009 consultation, our fee proposals were not based solely on the advice presented by Helios Technology Ltd, but also reflected responses from stakeholders to the July 2008 consultation and discussion with the CAA. We set out in the sixth bullet of paragraph 7.9 our view that as Aerodrome Control frequencies (Air/Ground, Aerodrome Flight Information Services and Tower) typically exclude other assignments in just over a quarter of the national available spectrum in a given channel, we were proposing a corresponding fee of £2,600. We did not propose to adopt a Business Radio area defined style of fee algorithm which relates fees to the number of grid squares sterilised, although we found the Helios 2009 Pricing Report helpful in providing a guide to the typical geographic impact of the different service types.

Claimed discrepancies in licence data

- 3.186 The Light Aircraft Association asserted that Ofcom's consultants, Helios Technology Ltd, had relied on inaccurate licence data in relation to Lasham and Northolt aerodromes, and argued that this suggested the whole analysis could not be relied on. Mr J Bastin also questioned the data in relation to Lasham. Mr A Beney also questioned the data in relation to Northolt.
- 3.187 Mr A Beney questioned the statement in the report at annex 8 to the December 2009 consultation that the minimum landing fee applicable to small aircraft at Farnborough is £365.
- 3.188 Southend Airport reported that it saw 31,785 aircraft movements in 2009, which is a marked reduction on the 2007 figures relied on by Helios Technology Ltd in the report published at annex 8 to the December 2009 consultation. As a consequence, Southend noted that the cost of the revised fees payable by Southend Airport will be the equivalent of £1.34 per movement, which would require a 6% increase per typical General Aviation movement.
- 3.189 Manchester Barton Airport reported that the figures presented in Annex 8 of the December 2009 consultation in respect of that airport are misleading. Manchester Barton reported that it handles about 15,000 flights per year and not 31,849 as stated and the impact per flight of the proposed fees will be proportionately greater.

Ofcom's response

- 3.190 We can confirm that our consultants relied on licensing records provided by the CAA at Ofcom's request. According to those records, and as reiterated by the response to the December 2009 consultation from ATC Lasham Ltd, Lasham aerodrome does indeed have an Approach frequency as Helios Technology Ltd was led to believe. Our consultants were requested to report on the likely impact of fees on licensees.

They were not requested to consider the impact on government spectrum users such as the RAF. For that reason, the records relied on by Helios Technology Ltd included only the civilian Operational Control frequency at Northolt.

- 3.191 We have confirmed with Helios Technology Ltd that the minimum landing fee at Farnborough Airport does indeed appear to be £365.
- 3.192 We recognise that business activity at individual aerodromes can vary year by year, but we do not consider that the overall reduction in traffic volumes in the UK over the last two years has been so great as to invalidate the conclusions of the report at Annex 8 to the December 2009 consultation. We also note Eurocontrol's view, cited in paragraph 3.108 above, that traffic volumes can be expected to grow again as the economic climate improves. The data presented by Helios Technology Ltd in respect of aerodrome traffic volumes related to aircraft movements (ie landings and take-offs) which is a widely used convention. On this basis the data presented by Helios in respect of Manchester Barton is consistent with the data in relation to "flights" presented by that aerodrome in its response.

Geographic analysis of current levels of frequency sterilisation

- 3.193 NATS questioned the validity of the analysis illustrated on the map at annex 6 to the December 2009 consultation which, in NATS' view, indicated that there up to 1700 assignments in some 50km grid squares. NATS also proposed that the analysis should be extended to develop maps appropriate to an 8.33 kHz environment.
- 3.194 The British Gliding Association questioned, more specifically, the accuracy of the maps generated by Helios Technology to illustrate the varying levels of frequency sterilisation across the country. The Association reported that a grid square in the north west of Northern Ireland which contains, in practice, just one small municipal airport, a gliding site and a parachute site had been coded red as an area with High levels of frequency sterilisation.

Ofcom's response

- 3.195 The map at annex 6 set out the proposed geographic differentiation of grid squares, under which each area would be classified in one of three ways; High, Medium or Low probability of excess demand. In that context, the numeric data in each grid square was not relevant and, with hindsight, should have been removed before publication. The numeric data actually reflected the number of assignments elsewhere in the UK and Europe which would impact that grid square in the hypothetical scenario that one was seeking to make a further assignment in that grid square which required 150 km clearance. That was one of six such hypothetical scenarios considered by Helios Technology Ltd in its report¹¹ published alongside the 2009 consultation. Any attempt to take into account future deployment of 8.33 kHz channel spacing would, necessarily, be speculative and the purpose of Helios' analysis was to consider current geographic differentiation in the probability of encountering high density of demand. As indicated above, we have, in any event, decided not to proceed with geographic differentiation of fees.
- 3.196 The availability of frequencies in the grid square in the north west of Northern Ireland, referred to by the British Gliding Association, is impacted by assignments elsewhere in the UK and Republic of Ireland, as is the case in all areas of the UK. As noted in the preceding paragraph, the number (764) written in the grid square on the map

¹¹ See footnote 3 above.

referred to the total number of extant assignments which would impact a new assignment in that square which required 150km clearance.

Revenue from aircraft radio licences

3.197 A private individual who wished to remain anonymous argued that, when setting fees for aeronautical ground stations, account should be taken of revenue derived from aircraft radio licences. This respondent noted that ship's radio licences attract no fees if applied for on-line.

Ofcom's response

3.198 We confirm that we are reviewing the way aircraft radio licences are administered and, as noted in paragraph 1.9 above, intend that these fees, which contribute only to the administrative cost of the licensing process, should fall.

Value of underlying opportunity cost

3.199 Mr N Long questioned the validity of the assumed underlying opportunity cost of the spectrum (£9900 per notional 25 kHz national channel). He argued that as end users have no means of influencing the speed with which 8.33 kHz frequencies are deployed, it had been inappropriate for Ofcom's consultants, Indepen and Aegis, to take into account the likely cost of a transition from 25 kHz to 8.33 kHz when conducting an assessment of least cost alternatives to continued use of current assignments. Mr Long also argued that it would also be inappropriate to take into account the value of Business Radio spectrum, as aeronautical VHF frequencies cannot currently be deployed to meet demand for Business Radio channels and, in any event, aeronautical VHF and Business Radio each deploy spectrum in very different ways with very different amounts of data being transferred. In the light of these comments, Mr Long considered that Ofcom had failed to provide an adequate explanation of the derivation of the underlying opportunity cost.

Ofcom's response

3.200 As was set out in Section 6 of the December 2009 consultation, Ofcom did not rely on any one source of information when determining the underlying opportunity cost. Consideration was given to both the "least cost alternative" methodology and comparison with fees set for comparable spectrum. We did not reject the least cost alternative approach as Mr Long claimed. Rather, consistent with the recommendations of our consultants, Indepen and Aegis, we considered that there was a general level of uncertainty associated with the analysis which warranted applying a discount to the output of that analysis. Section 6 of the December 2009 consultation also made explicit our view, shared by Mr Long, that Business Radio is not currently a feasible alternative use for spectrum currently used for aeronautical VHF communications and, therefore, may not have a *direct* relevance in determining the opportunity cost of aeronautical VHF spectrum. Nevertheless, as we set out, we considered that the Business Radio rate could suggest an alternative benchmark for determining that opportunity cost, alongside the least cost alternative approach. In practice, the fee reference rates for Business Radio spectrum (£396k for high congestion bands and £330k for medium congested bands) served to inform the degree to which the output of the least cost alternative analysis (£846k) was discounted.

3.201 The least cost alternative approach, which has been deployed for many years by Ofcom and its predecessor the Radiocommunications Agency, considers the cost of

deploying an alternative technology or strategy in response to a hypothetical denial of, or constraint on, access to spectrum. Although we readily accept that few individual users currently have scope to change to 8.33 kHz frequencies without wider agreement across the sector, we do not accept that this invalidates the basis on which the least cost routing analysis was conducted. As we have said, the analysis is necessarily based on a hypothetical denial or constraint on access to spectrum. In the event that this hypothetical scenario became a widespread reality, the sector as a whole would urgently need to review alternative means to address the problem and, in doing so, would *consider* the cost of implementing the various solutions identified, comparing these costs against the alternative cost of a continued constraint or denial of access to spectrum. In practice, this will already have formed part of past and present reviews of how extensively, and when, the sector should transition to 8.33 kHz deployment. As such, this particular least cost alternative analysis is less hypothetical than many.

Section 4

Conclusions and summary of revised fees

The underlying principles

- 4.1 In some spectrum bands there are sufficient frequencies to meet demand for the foreseeable future and, therefore, no need for regulatory rationing or micro management of assignments and no need for users to justify their requests for spectrum. In these instances, AIP serves no spectrum management purpose and we would not seek to apply it. The legislation which created Ofcom and defines the statutory framework within which we operate permits fees higher than required to recover spectrum management costs only in order to meet spectrum management objectives. Therefore, where there are sufficient frequencies, we would not apply AIP based fees and would seek only to recover a contribution to spectrum management costs.
- 4.2 Conversely, where demand for frequencies is high and requires careful management to ensure that providers of high value services continue to have access to the spectrum which they need, AIP can help to condition demand. Charging a fee based on the price likely to result from a well functioning market, should make it more likely that those who make best use of the frequencies, in terms of providing services which are highly valued by UK citizens and consumers, will have access to the frequencies which they need. In other words, applying prices that reflect the opportunity cost of spectrum increases the likelihood that spectrum will be allocated efficiently.
- 4.3 As a general principle, we believe that spectrum users are better placed than regulators to take decisions about their own future deployment of frequencies, as there is always an information asymmetry between regulators and those that they regulate. In some cases of spectrum scarcity, an AIP based pricing discipline may be sufficient to mean there is no longer any need for regulatory rationing or micro management. In other cases, pricing may simply complement continuing regulatory management.
- 4.4 In reviewing whether there is sufficient spectrum to meet demand, we generally consider both demand from the existing community of users and demand from any feasible alternative community.
- 4.5 We have concluded that aeronautical frequencies could not feasibly be used to meet demand for VHF spectrum from other parts of the UK economy, as this would cause interference with aeronautical use in breach of the UK's treaty obligations. For these reasons, we have taken no account of the possibility of these frequencies being used for alternative purposes when determining fee levels.
- 4.6 However, demand for frequencies from within the aeronautical community does exceed supply. As the CAA has noted in its response to the 2009 consultation, the VHF band is heavily congested across Europe and demand forecasts indicate that there is insufficient VHF spectrum within Europe to satisfy long term operational requirements. Although the CAA reports that there are currently no unsatisfied requests, as it has been relatively successful in micro managing this resource, it also states that there is no doubt that the lack of sufficient frequencies will be a potentially limiting factor in accommodating future airspace operational changes.

- 4.7 In the absence of fees, individual users of aeronautical frequencies will continue to face few if any incentives to minimise their use of the available VHF communications frequencies. This creates a risk that current licensees would simply hold what they have and it would become increasingly difficult, and sometimes impossible, to accommodate requests for assignments from other users, even if they place a higher value on the use of that spectrum. We have, therefore, concluded that AIP fees should be applied to help manage this excess demand for radio frequencies from within the aeronautical sector.
- 4.8 We recognise, however, that in the case of aeronautical frequencies fees alone will not be sufficient to manage demand as there are complex interactions between sector specific regulation, including safety-related regulation and interference management, and deployment of these frequencies. There will continue to be a very significant role for the CAA in applying its technical expertise to manage this resource and to advise Ofcom on emerging issues in relation to spectrum used by the aeronautical sector in a manner consistent with its wider statutory responsibilities towards the aeronautical sector at home and abroad. It is Ofcom's general policy¹², however, that AIP based fees should be deployed where these can contribute to achieving Ofcom's wider statutory duties towards UK citizens and consumers, including the duty to secure optimal use of the radio spectrum taking into account the interests of all who wish to use it.
- 4.9 Reflecting the parallel, but distinct, statutory objectives of Ofcom and the CAA, AIP based fees will complement, not replace, technical management of aeronautical frequencies for the reasons cited in paragraph 4.8 above. In setting out the general principles underpinning the decision to apply AIP to these frequencies, we do not intend to minimise the significance of the many initiatives being pursued by the international aeronautical community, including the planned transition to 8.33 kHz bandwidth. These too are complementary to the application of AIP.

The specific conclusions

- 4.10 We are setting out in Table 2 below the fees which we have decided to apply. Fees will be applied uniformly across the country without the discounts initially proposed to apply in the far north and west. Fees will be phased in over five years commencing in April 2012.

	2012/2013	2013/2014	2014/2015	2015/16	Thereafter
Fire and Distress frequencies	£ zero	£ zero	£ zero	£ zero	£ zero
Sporting frequencies (per block of frequencies assigned to each licensee)	£75	£75	£75	£75	£75
Offshore mobile stations	£75	£75	£75	£75	£75
Surface communications (including Departure ATIS), and	£350	£350	£350	£350	£350

¹² See Ofcom's *Spectrum Framework Review* published in June 2005 at <http://stakeholders.ofcom.org.uk/consultations/sfr/>

Operational Control and Offshore fixed units					
The generality of Tower, Aerodrome Flight Information Service and Air Ground services	£350	£500	£1,200	£1,900	£2,600
Tower, Aerodrome Flight Information Service and Air Ground services with DOC equal to or less than 10nm radius and 3000ft service height	£350	£500	£650	£650	£650
Approach services, Area Control service, Arrival ATIS, Aircraft Communications Addressing and Reporting System (ACARS), and VOLMET	£1,000	£2,000	£3,000	£6000	£9,900
VHF digital links (VDL) per frequency	£2,000	£4,000	£6,000	£12,000	£19,800
Temporary licences	1 twelfth of the relevant annual fee for each month or part month, subject to a minimum fee of £75				

Table 2 Summary of fees

4.11 Fees will apply only to ground stations. Fees for aircraft radio licences are being reviewed separately and, as noted in paragraph 1.9 above, we propose to reduce the frequency with which these licences need to be renewed from annual to once every three years.

Conclusions on impact assessment

4.12 In Section 7 of the December 2009 consultation, we presented a comprehensive impact assessment in support of our pricing proposals.

The citizen and consumer interests

4.13 First, we identified the citizen and consumer interest which underpinned our proposal to apply AIP fees to the aeronautical sector.

4.14 As reiterated in paragraph 4. 1 above, where the supply of spectrum is sufficient to meet demand, without recourse to prescriptive command and control of assignments, there is little to be gained in efficiency terms from setting fees other than to recover some or all of our relevant administrative costs. However, where there is excess demand for spectrum, we believe the cost to others and to the wider UK economy should be recognised by the current users so that they can make appropriate decisions. AIP based licence fees are intended to achieve this outcome.

- 4.15 There is excess demand for these frequencies from within the aeronautical sector. We noted in the December 2009 consultation that it is often very difficult to meet new requests for aeronautical VHF frequencies required by aerodromes and air traffic controllers. We set out in paragraphs 3.102 to 3.115 above stakeholder comments on this issue and Ofcom's response. In particular, we noted in paragraph 3.102 the view of the CAA that the aeronautical VHF band is heavily congested across Europe and that there is insufficient spectrum to satisfy medium term operational requirements. In paragraph 3.108 we noted the view of Eurocontrol that Europe is reviewing a number of measures to alleviate VHF congestion, including a likely extension of the use of narrower 8.33 kHz channels at additional flight levels. However as we set out in paragraphs 3.123 to 3.126, our view is that it is too early to conclude that these measures will result in additional capacity such that use of aeronautical frequencies no longer has an associated opportunity cost.
- 4.16 In paragraphs 3.127 to 3.141 above we summarised stakeholders' views on the scope to respond to fees in a manner beneficial to UK citizens and consumers. We responded to those views in paragraphs 3.142 to 3.154, noting that there are operational and regulatory constraints on the ability of spectrum users to respond to fees by using spectrum more efficiently in the short term. However, we also noted that users do have scope to respond in the long term, even if a change of spectrum use necessitates significant changes to the way operations are conducted or changes to the services provided in some cases.
- 4.17 There is also potential excess demand from other sectors of the economy which face shortages of spectrum which could be overcome if spectrum currently used by the aeronautical sector was made available to them. We recognise, however, that it is not feasible to use aeronautical VHF communications frequencies for other applications today as this is likely to cause unacceptable interference with the current applications, in contravention of the UK's obligations under international treaties. Whether this situation might change in future, and in what timeframe, is unclear. In determining the appropriate level of fees, therefore, no account has been taken of potential use of these frequencies by other sectors of the UK economy.
- 4.18 In conclusion, we consider that licence fees based on opportunity costs will help manage excess demand for these frequencies, and promote efficiency improvements where possible, making it more likely, as we noted in paragraph 4.2 above, that those who provide spectrum dependent services which are highly valued by UK citizens and consumers will have access to the frequencies which they need to deliver those services. We conclude that this will generate net benefits for UK citizens and consumers.

The policy objective

- 4.19 Second, we maintain the view set out in the December 2009 consultation that the decision to apply AIP licence fees to the use of spectrum in the aeronautical sector is consistent with our duties and functions under the Communications Act 2003 and Wireless Telegraphy Act 2006, since we have a general duty to promote the "efficient use and management of the electro-magnetic spectrum for wireless telegraphy".

Options for determining fee levels

- 4.20 Third, we set out in Sections 2 and 3 of the December 2009 consultation why we believe AIP licence fees should be applied to the aeronautical sector and how the level of those fees should be determined. The case for applying opportunity cost based AIP licence fees for spectrum has previously been set out by Ofcom in its

Strategic Framework Review for the Public Sector¹³ (see paragraphs 3.42-3.46), and its July 2008 consultation (paragraphs 2.33-2.39), and by Professor Martin Cave in the Review of Radio Spectrum Management 2002¹⁴ (paragraphs 134-137) and in the 2005 Cave Audit (paragraphs 2.30-2.32).

- 4.21 In Section 6 of the December 2009 consultation we identified two broad options for setting licence fees: administrative cost (including zero cost) based fees and AIP fees based on underlying opportunity costs.
- 4.22 Under the broad option for setting fees based on opportunity costs where there is excess demand for spectrum, we considered a number of possible reference rates to reflect the value of a nominal 1 MHz national channel for aeronautical VHF communications frequencies, including adjustments to reflect uncertainty regarding spectrum release and taking a conservative approach. The reference rate proposed in the December 2009 consultation, which underpins the fees which we have concluded should be applied, is £396,000 per notional 1 MHz of spectrum with full national coverage.
- 4.23 We consider that fees based on opportunity costs are likely to generate higher welfare benefits for consumer and producers overall where there is excess demand in current or alternative uses in line with our pricing objectives as set out in this section.
- 4.24 Where frequencies are used on a “commons” basis, often for safety of life purposes, Ofcom has decided to apply zero rated fees (eg SafetyCom, international distress and Fire frequencies).
- 4.25 In line with these conclusions we proposed detailed AIP based fee structures to apply to individual service types to reflect an appropriate estimate of the opportunity cost of the relevant national channels. The fees reflect the fact that some service types operate at less than national scale and some require more bandwidth than others (see Section 7 of the December 2009 consultation).
- 4.26 We have summarised in paragraphs 3.8 to 3.60 above stakeholders’ detailed comments on the fee proposed to apply to the various service types. Within those paragraphs we have also set out Ofcom’s view. In summary, we have accepted the views of stakeholders that frequency assignments to support Departure ATIS should attract the same fees as other Aerodrome Surface assignments (see paragraphs 3.36- 3.37 and 3.39). We have also clarified that assignments in the sporting frequencies used with unpowered flight and microlights will attract a single fee of £75 for the block of relevant frequencies (see paragraph 3.51).
- 4.27 We have set out in paragraphs 3.11 to 3.13 stakeholders’ view on the proposal that fees should reflect varying levels of demand around the country. We set out in paragraphs 3.14 to 3.18 our conclusion that the proposed differentiation would have added a level of complexity disproportionate to the benefits in terms of better use of the frequencies concerned.
- 4.28 In Section 7 of the December 2009 consultation, we also considered options for phasing in detailed fees structures. This was intended to minimise unproductive

¹³ <http://www.ofcom.org.uk/consult/condocs/sfrps/statement/statement.pdf>

¹⁴ http://www.ofcom.org.uk/static/archive/ra/spectrum-review/2002review/1_whole_job.pdf

disruption to spectrum users, their customers, and citizens and consumers more widely.

- 4.29 Based on this analysis, we proposed to introduce licence fees as set out in this Section 7 of the December 2009 consultation, subject to an assessment of the distribution of the financial impacts of fees on individual users to identify the likelihood of any unintended consequences or possible short term transitional issues. The analysis of financial impacts was set out across all section of the December 2009 consultation, with a particular focus in Section 7 and Annex 7.

Impacts on different types of stakeholders

- 4.30 Fourth, we identified the distribution of financial impacts of the detailed fees structures on different types of licensees. We commissioned specialist consultants Helios Technology Ltd to make a detailed assessment of the relevant fees impacts on individual licensees. The analysis concluded the following:
- The impact of imposing AIP based licence fees for VHF on aviation users will fall on a number of different classes of user. The impact on the industry as a whole will be less than £4m annually.
 - The largest individual financial impact (£1.3m) falls on NATS En-Route plc (NERL), the regulated UK air navigation service provider. The total extra costs amount to 0.24% of NERL's regulated cost base. We understand that, although there may be intervening cash consequences, these costs are likely to be passed through to airlines under the next regulatory price review.
 - At the large airports where charges are regulated by the CAA, AIP charges are also unlikely to be able to be passed through in the short term so the airports affected will experience a cash impact in the relevant intervening periods before costs are potentially passed onto airlines. However, particularly in the light of our phasing proposals, such cash impacts are likely to amount to only a fraction of a penny per passenger movement.
 - The larger commercial competitive airports will face AIP charges amounting to a relatively small proportion of their aeronautical revenue which (because the proposed licence fees are industry-wide) are likely to be passed on to users. Charges amount to no more than a few pence per passenger movement at such airports.
 - The impact on smaller airports becomes proportionately larger, although at typically around 6p per passenger, in the more extreme cases, these impacts are small both in absolute terms and relative to overall costs in the aviation value chain. Nevertheless, phasing will mitigate significantly any specific transitional issues.
 - Other impacts fall on a wide range of different types of licensee including airlines, aeronautical clubs, flying schools, private individuals, oil companies operating offshore installations, and research establishments. In total they form around 13% of the total charges, or around £600,000 a year in total. To put this into perspective, we note that a 2006 estimate of overall annual expenditure on private general aviation was £318 million¹⁵. Typically,

¹⁵ Helios "Aeronautical and Maritime VHF Spectrum Pricing – Impact on markets and customers: Final Report", section 3.8.

licensees in this category will face new fees of £2,600 per year (£650 where the DOC has a radius not greater than 10nm and service height not greater than 3000ft). The proposed charges may well have a more significant proportionate impact on small airfields, aeronautical clubs, etc, which can hold multiple licences, and in the medium term could influence them in their choice of whether to maintain or replace these. Again however our phasing proposals should enable these organisations to review the impacts of fees and make any consequent business adjustments over an extended period.

- Small aerodromes – whether reporting or non-reporting - would typically see annual cost increases of 20p/movement or less (assuming a fee of £2600 payable for a DOC greater than 10nm radius and 3000ft service height). Ofcom notes that per movement charges for sampled non-reporting aerodromes are low when compared to the cost of renting a small single engine craft (i.e. £80-£130 per hour before additional fees including fuel, landing fees, parking). Furthermore, the same charges are very low when compared against the variable per hour operating cost of a business jet (e.g. between £526 and £5,482 total cost per hour). Many small aerodromes may choose to operate with a more localised DOC which will attract an annual fee of £650 instead of £2600

- 4.31 We have set out in paragraphs 3.69 to 3.80 above the further information about impacts provided by stakeholders in response to the December 2009 consultation. We responded to that information in paragraphs 3.81 to 3.100 above. In the light of our decision not to vary fees to reflect geographic variations in the density of demand, we have reviewed the financial impact of fees on those who are reliant on frequency assignments in those parts of the country where fees were originally proposed to be discounted.
- 4.32 Under the proposals set out in the December 2009 consultation, about 7% of all assignments would have been subject to lower fees reflecting geographic difference in the availability of frequencies. The total value of the fee reductions would have been approximately £30k, which is less than 1% of the total value of fees proposed. The biggest beneficiaries of these fee reductions would have been Highlands and Islands Airports (c. £4k saving), BP Exploration (c. £3.5k saving), Shetland Council (c. £2.5k saving), Argyle and Bute Council (c. £1.5k saving), CNR (c. £1.5k saving), and Talisman Energy (c. £1k saving). All other licensees faced fee reductions of less than £1k.
- 4.33 50% of all assignments which would have been subject to fee reductions are Offshore assignments to users associated with the oil and gas industries. A further 30% are Operational Control assignments made, generally, to large commercial organisations associated with the commercial airline sector. In both cases, fee changes are relatively modest rising from £250 today to £350 when the new fees are implemented. We consider that fee increases of this scale are very low in relation to other costs faced by these industries. The remaining 20% of assignments which would have been subject to reduced fees include small aerodromes and flying clubs. In respect of these, we rely on our original assessment of the impact of full price fees on this group, and have identified no reason why fees should present those based in the far north and west with difficulties not faced by the generality of such spectrum users. We also note that our decision to apply a reduced fee of £650 to Air/Ground, Tower and Aerodrome Flight Information Service assignments with localised coverage will provide an opportunity for some frequency users to reduce their fees liability.

- 4.34 Based on the analysis set out in the December 2009 consultation, we considered specific phasing-in options for detailed fees structures (see paragraphs 7.29 to 7.60 of the December 2009 consultation) aimed at mitigating the transitional financial impacts that specific licensees may experience. Our proposals were aimed at reducing risks of inefficient responses to the new fees, including from the smaller organisations which are proportionately more affected. We noted that our phasing proposals were highly relevant to ensuring operators of non-reporting aerodromes are able to adjust to paying full AIP fee levels. We considered our proposals would enable us to identify the impacts of incremental changes for these operators prior to full fees applying. By gradually introducing fees over time, this would ensure that Ofcom can respond quickly, as and when appropriate, during this period.
- 4.35 We set out in paragraphs 3.61 to 3.64 above stakeholders' responses to the proposed options for phasing set out in the December 2009 consultation, and responded to those comments in paragraphs 3.65 to 3.68 above. In the light of stakeholders' comments, we have concluded that where two alternative phasing options were offered, we should implement the Option 2 Slow Start phasing where fee increases are relatively small in the early years and proportionately greater in the later years. We have concluded that Option 2 is preferable because it will be in the early years that uncertainty about scope to respond in a manner consistent with safe and efficient operation will be greatest.

Impacts on competition

- 4.36 Fifth, in relation to final demand, as, and to the extent that, changes in licence fees are passed on to final consumers, we considered whether demand will be correspondingly reduced.
- The Department for Transport estimate the price elasticity – a measure of how users react to changes in price - of air transport as -1.0 for the UK leisure sector and -0.2 for the foreign leisure market. No air fare effect could be identified for the business sector. Charter and domestic travel showed some fare effects (-0.4 and -0.3 respectively). International to international interliner traffic was found to have a price elasticity of -0.3. The resulting overall air fare elasticity is -0.45.¹⁶ Other estimates include the European Commission estimate of -1.5 for leisure travel.¹⁷ Whilst the Department for Transport study excluded general aviation, a study for the FAA in the US included a price elasticity of demand for general aviation piston aircraft was higher than that for other aviation at -1.5 versus -1.0 for other aircraft.¹⁸
 - However, the magnitude of final fee increases likely due to the application of AIP for VHF use in the aeronautical sector is in general fairly modest relative to other costs and changes in those costs over time. It is unlikely that all the cost changes would be passed through, as a range of input efficiencies are likely to be adapted to in response to the incentives concerned. Accordingly, the overall demand impact is likely to be significantly lower than 0.1 per cent.

¹⁶ Department for Transport. January 2009. "UK air passenger demand and CO2 forecasts." <http://www.dft.gov.uk/pgr/aviation/atf/co2forecasts09/co2forecasts09.pdf>

¹⁷ EC. December 2006. "Commission staff working paper – impact assessment of the inclusion of activities in the scheme for greenhouse gas emission allowance trading within the Community." Page 37. http://ec.europa.eu/environment/climat/pdf/aviation/sec_2006_1684_en.pdf

¹⁸ www.library.unt.edu/gpo/NCARC/whitepaper/costallo.doc

- A negligible reallocation of aeronautical activity away from the UK is anticipated as a result of the proposals even if all licence fee changes are fully passed through, although in practice, we consider that pass through is likely to be less than 100%. (See Appendix to the Helios Technology Report at Annex 7 to the December 2007 consultation.)
- In comparison, Helios Technology Ltd noted that changes in both air passenger duty and the potential cost of inclusion of aviation in the European Emissions Trading scheme from 2012 are roughly two orders of magnitude greater than the charges envisaged with AIP. Hence a €30 per tonne carbon charge would amount to €1,080 million per annum while increases in air passenger duty in the UK are expected to increase the cost impact of this measure from around £1 billion currently to over £3 billion in 2011/12¹⁹. In contrast, the annual cost of AIP to the UK aeronautical sector, arising from the decision set out in this statement, will be less than £4m.

Impacts on safety

- 4.37 Sixth, we considered in Section 5 (paragraphs 5.64 to 5.84) of the December 2009 consultation the possible impact of AIP on safety, and the most appropriate response.
- 4.38 Our analysis explicitly recognised the critical importance of safety in the aeronautical sector and the relevant duties of the CAA as safety regulator.
- 4.39 We noted that where services which are provided using spectrum give rise to externalities or support the provision of public goods, the appropriate policy interventions to maximise such social value, or minimise social disbenefits, take the form of targeted subsidies and taxes for the outputs concerned, or direct regulation, rather than subsidies for the required inputs (including spectrum).
- 4.40 The CAA has confirmed that it has adequate powers to respond to any safety concerns arising from Ofcom's proposals to apply AIP to the aeronautical sector, and that the adequacy of VHF communications provision will be subject to safety regulation by the CAA using appropriate regulatory instruments taking into account safety justification provided by the service providers via, for example, safety cases.
- 4.41 We have set out in paragraphs 3.155 to 3.160 above stakeholders' further comments on the likely impact of AIP fees on safety, and we responded to those concerns in paragraphs 3.161 to 3.168 above.

Environmental and social impacts

- 4.42 The DfT and the CAA (amongst others) are the UK public bodies variously responsible for assessing the effects of a range of regulatory policies in the aeronautical sector that may impact the economy, the environment and society. These bodies have specific industry expertise and accordingly we have discussed our proposals with them as set out in Section 1 of the December 2009 consultation, and subsequently. As noted in Section 4 of the December 2009 consultation, we recognised that, in principle, an increase in the cost of using UK aerodromes or UK airspace might cause some airline operators to try to reroute to avoid these costs, thereby burning more fuel, to the detriment of the environment. However, as noted in

¹⁹ http://www.hm-treasury.gov.uk/d/pbr08_annexb_262.pdf , Table B13.

paragraphs 4.87 to 4.92 of the December 2009 consultation, the proposed cost increases are so small compared with the variable costs of operating a commercial aircraft that such a strategy would not be cost effective. We therefore do not believe that these proposals will have an adverse impact on the environment. In any event, the correct way to deal with negative environmental externalities would be by a tax on pollution directly.

Equality Impact Assessment

- 4.43 As discussed above, the direct financial impacts of applying AIP licence fees to licensees in the aeronautical sector may vary between groups or classes of UK consumers and citizens, depending on the geographic area in which they consume aeronautical services (e.g. flights) as well as the extent and ways in which fee changes are passed on to citizens and consumers, and the extent to which different citizens and consumers benefit from the more efficient use of spectrum which we believe will result, in aggregate, from these fees in the longer term.
- 4.44 Nevertheless as set out above, the estimated aviation passenger impacts are unlikely to exceed a penny per passenger movement in the vast majority of cases and, at their largest are no more than of 6 pence per passenger (e.g. at some of the smaller airports).
- 4.45 In addition, we note that there is no available evidence to suggest that our proposals would have a significantly greater direct financial impact on identifiable groups including any groups based on gender, race or disability, or groups of consumers in Northern Ireland relative, to consumers in general. Ofcom considers that the small financial impacts (in both absolute and relative terms) would not be expected to suggest significantly different fees for aviation related services for these aforementioned groups of consumers and citizens relative to consumers and citizens in general.
- 4.46 Ofcom has therefore not carried out a full Equality Impact Assessment in relation to race equality or equality schemes under the Northern Ireland and disability equality schemes at this stage.

Final conclusion

- 4.47 In light of the objectives we identified for setting fees in Section 5 of the December 2009 consultation and in paragraphs 4.13 to 4.19 above, we consider that:
- fees should provide incentives for users to consider their spectrum use alongside all other inputs, in light of the potential value of spectrum to other users; and
 - in proposing fee levels and how we will implement them, we are mindful of the risk of charging fees that result in inefficient under-use of spectrum, and take steps to reduce that risk.
- 4.48 As set out in this Section, our conclusions on the fee levels and decision to phase in increases for a number of fees, have been made in the light of these objectives. Hence for VHF communications spectrum used by the aeronautical sector, where we consider there is excess demand for the current use, it is appropriate to set AIP licence fees to reflect underlying opportunity costs. Were there no excess demand in current use and no excess demand from alternative uses, Ofcom would consider it appropriate to set fees to contribute to spectrum management costs. Where channels are used on a “commons” basis (for example the distress, SafetyCom and Fire

frequencies), and most opportunity costs are not determined by individual user choices, there is little scope for licence fees to drive spectrum efficiency, and it is appropriate for fees to be zero rated (for end users). Where charities whose sole or main objective is the safety of human life in an emergency use the spectrum, they will continue to be entitled to receive a 50% discount, although we are currently not aware of any such charities which will be liable to pay spectrum fees for aeronautical ground stations.

- 4.49 Despite the expected benefits of these proposals, we recognise the potential risks in moving to a regime where licence fees reflect opportunity costs of the spectrum since this can, in some cases, imply materially higher fees for existing users. There could then be a risk of a larger reduction in aeronautical use than was efficient if fees were adjusted too quickly. Ofcom concludes that in this case, where alternative uses are not possible, this could mean that some spectrum would be unused. In such circumstances, as there are no strong a priori grounds for believing that potential new users place a particularly high value on the relevant spectrum, relative to the existing users, a conservative approach is likely to be appropriate. Therefore, we have decided to take a conservative approach to setting fee levels. This includes taking account of uncertainty in the estimation of opportunity costs of the spectrum through downward adjustments of expected opportunity costs in the proposed Year 5 fee rates by more than 40%.
- 4.50 In addition, recognising the risks inherent in setting fees too high, we propose that where fee increases are significant, fee increases will be phased in over five years. Full fees will apply thereafter until such time as a review suggests amending the fee levels
- 4.51 We consider that, in the light of these proposals, the wider societal benefits of applying AIP, i.e. greater efficiency, output and welfare, as summarised in this Section 4, outweighs the small risks of inefficient transition arising from the immediate financial impacts on licence holders, customers and end-users.
- 4.52 Nonetheless, Ofcom has undertaken an analysis of the financial impacts to consider the distribution of the impacts on end-users to minimise the risks of unintended consequences or relevant short term transitional issues for specific user groups. The analysis indicates that, relative to other input costs in relation to spectrum related services, licence fee changes would be in some cases material at the margin and hence could reasonably be expected to change efficient behaviour over time. However, in relation to overall costs in the value chain comprising final service provision, the proposed aggregate levels of licence fee changes are very modest and would therefore be expected to have a negligible impact on final demand for services.
- 4.53 We have concluded that there are grounds for phasing in larger fee increases over a longer time period due to the relative size of the proposed changes and the diversity of potentially affected licensees. Accordingly, to avoid disruptive effects on licensees making the transition to paying full AIP fees, we have decided to phase-in some fee increases over up to five years.
- 4.54 **In summary**, therefore, we are not persuaded that we should modify materially the conclusions of the impact assessment set out in the December 2009 consultation and we continue to rely on this in deciding to implement fee changes as described in this statement, except to the extent referred to in this Section 4.