

Intellect's Response to Ofcom's Spectrum Trading Consultation (Issued in November 2003)

Intellect is the trade association for the information technology, telecommunications and electronics industries in the UK representing 1000 organisations spanning blue-chip multinationals to early stage technology companies. Intellect members contribute around 10% of UK GDP.

Further information about Intellect can be found at www.intellectuk.org

Intellect welcomes Ofcom's consultation on Spectrum trading and offers the following general and detailed comments:

Intellect notes that the consultation does not invite responses to the Regulatory Impact Assessment proposals, therefore we have not made any comments on that topic.

The main themes of Intellect's response are as follows:

Intellect believes that the single overriding goal by which Ofcom's Spectrum Trading Project should be judged is the degree to which it succeeds in achieving the maximum effective use of spectrum for the social and economic benefit of the UK as identified in previous economic impact studies (c.f. Radiocommunications Agency's 'February 2001 Economic Impact of Radio' study).

It is through its use that spectrum provides the greatest benefit to the Country. All measures therefore need to be towards maximising the quantity and effectiveness of users and services.

Whilst some applications require a great deal of flexibility to maximize the benefit from spectrum, this should not be taken to encourage undue fragmentation. Many other applications achieve higher benefit through harmonisation of bands and standardisation.

Interference always reduces the available capacity of any band even though technology is employed to make such interference less visible to users. Therefore measures must be included that address interference problems.

Facilities to identify under-utilised spectrum need to be provided. It is from such bands that opportunities for improvement through spectrum trading will principally come.

Intellect remains very keen that Spectrum Trading should not be the cause of the Essential Public Services or MoD failing to obtain the spectrum they require.

We expect the biggest benefit to come from the initial introduction of the new Spectrum Trading policy within each band. In order for the advantages of Spectrum Trading to be realised, it cannot be assumed that the necessary equipment to implement the systems involved in a change of use is immediately available. Manufacturers may require time and



significant investment in order to develop the new systems needed in response to the results of the trade.

Lastly, Intellect sees Spectrum Trading as a key element in the UK's transition to a knowledge driven economy. If Spectrum Trading results in a maximum effective use of spectrum, this will in turn lead to an improved communications infrastructure. This in its turn will result in higher productivity and a successful knowledge driven economy.

Intellect offers the following answers to Ofcom's 29 Questions:

Q1a: Do you believe that Spectrum Trading will be beneficial to consumers, businesses & radio users?

Intellect: Yes, we do believe that Spectrum Trading will be beneficial to consumers, businesses & radio users, providing that it is implemented carefully and effectively. We stress that some spectrum has been internationally harmonised for good reasons and we would not wish Spectrum Trading to undermine those reasons. Spectrum Trading should be of great benefit to organisations that cannot currently obtain spectrum to sustain valuable services to end-users.

In this answer to Q1a Intellect would wish to draw attention to the main theme of our response to this consultation, as stated above.

Q1b: What could Ofcom do to increase the benefits & mitigate the disadvantages of Spectrum Trading?

Intellect: The following safeguards/preventative measures are essential:

1. avoidance of hoarding via the minimum necessary Administered Incentive Pricing levels, which should not be based on the actual traded prices achieved for spectrum or set at levels that will damage the economic benefit
2. ensure that actual effective use is made of the spectrum, perhaps requiring additional usage obligations where appropriate
3. long term as well as short term benefits must be analysed & safeguarded, and we suggest that Ofcom should continue with these economic analyses on a regular basis. (Reference 2001 Radiocommunications Agency Report 'The Economic Impact of Radio')
4. prevention of interference problems & prompt issue resolution arrangements based solely on technical considerations. Intellect fully appreciates the magnitude of this problem area & desires to further contribute to the debate.
5. administrative arrangements carefully designed to be readily usable both by large & small organisations
6. licence termination arrangements that safeguard reasonable investment decisions. A few special cases/services may require individually negotiated termination periods, since for example some classes of investments are recovered over a longer period.
7. the spectrum requirements of the safety and emergency services and other major beneficial societal functions are safeguarded.

Q2: How could Ofcom's proposals for Spectrum Trading be amended to reflect the potential benefits of emerging transmission technologies?

Intellect: The key issue here is the ability for emerging technologies to coexist with legacy equipment *and* be more efficient in general *and* be more resilient to a higher level of interference. This question is wider than just Software Defined Radios or UWB. It is likely that the Proposals for Spectrum Trading should include a review of the Interface Specifications which may have to be rewritten to accommodate this point. In addition, consideration must be given to the impact of emerging technologies on legacy systems.

Q3a: Should tradability be universal within Licence Classes, and not an option, as proposed?

Intellect: 'Yes'. We are concerned that more clarity is needed on the legal definition of 'trading'. The general principle should be that for the same use Licences should be tradable.

Q3b: Do you agree that liberalisation of spectrum use should be implemented through issuing guidance rather than through the precise definition of licence terms?

Intellect: yes, definitely.

Q4: Are there any reasons why existing licence holders should not be authorised to participate in the trading process? If so, please provide details of which types of licence holders you consider should be excluded from the new trading process, and why?

Intellect: generally, existing licence holders should not be prevented from participating in the trading process provided they are in compliance with competition and anti-trust rules.

Intellect remains very keen that Spectrum Trading should not be the cause of the Essential Public Services or the MoD failing to have access to the spectrum they require.

Q5: Should RSA be tradable?

Intellect: It is not wholly clear what RSA means in the context of this Consultation. In its response to the Consultation Document "Introducing Recognised Spectrum Access" issued by the Radiocommunications Agency in July 2002, and in subsequent discussions on the drafting of the Communications Act, Intellect gave a clear view that it was opposed to the introduction of RSA. This is still the view of Intellect. However, it is noted that the Communications Act 2003 allows Ofcom to introduce RSA under appropriate conditions, and we understand that another consultation detailing what RSA will offer and how it could be implemented is expected. It is hoped that this will clarify the likely impact if RSA is implemented.

Without this information, it is very difficult to provide an answer to this question and to determine whether trading of RSA would be beneficial or even possible.

As currently envisaged, RSA could lead to an unnecessary scarcity of spectrum and reduction in the ability to successfully coordinate different applications in shared bands, particularly between the FSS and FS (both links and wireless local access).

Q6: Do you think that trading should be introduced more or less rapidly than suggested above?

Intellect: we believe that the target timing is satisfactory but is less important than implementing Spectrum Trading properly.

- The entry 'other Mobile Satellite' in Exhibit 1 should be removed. Mobile satellite should be in harmonised primary exclusive bands on a licence-exempt basis.
- An entry for 'Military Spectrum' should be added, and the MoD timescale included.

Q7a: Do you anticipate problems in defining the right to transmit in terms of transmitted power or equivalent isotropically radiated power and a 'spectrum mask', and if so what?

Intellect: we are happy in principle with this proposal. Note however that the actual interference zone may be different from the licensed interference zone, and the two need to be 'brought together'. This might include 'politeness protocols', namely 'only transmit when no-one else is'. There may be bands where DFS/Dynamic Frequency Selection & TPC/Transmit Power Control might be required. There is

also the question of taking effective measures to avoid raising the noise floor excessively. Directivity may be a parameter that should also be employed.

Q7b: What alternative approaches (such as standardised frequency trading units) would you prefer?

Intellect: We have no alternative preferences. We welcome the abandonment of Spectrum Trading Units.

Q8a: How important is it to provide guidelines on levels of interference for each licence class?

Intellect: We believe there should be no need for separate guidelines documents, since appropriately worded Interface Regulations should suffice. The latter should contain informative guidelines as well as the normative requirements. Intellect stresses that controlling/managing the interference is crucial to the success of the whole Spectrum Trading policy.

Q8b: Do you anticipate any problems in doing this, and if so what?

Intellect: Yes, we do anticipate problems in providing merely guidelines, and that is the basis for relying instead on correctly constructed interface regulations as noted above.

Q8c: What alternative approaches might Ofcom adopt?

Intellect: (please see answers already given to 8a & 8b)

Q9a: Do you agree that on the introduction of trading, current licences should have a rolling term with a defined notice period for termination?

Intellect: There may be a case for making the termination period negotiable in certain licence classes. It cannot be the case that 'one size fits all', given the very lengthy payback periods on many capital intensive communications projects.

Q9b: What notice period do you think would be appropriate?

Intellect: We would emphasise that we understand such terminations would only be in a *very exceptional situation*. There is a need for a clear notice period, however not just 'one size fits all'. It is vital to take into account the lifetime/amortisation period of the affected equipment. We believe that 10 years minimum use (for termination without compensation) should be the norm, with a minimum 5 years notice outside of this rule.

Q10a: In what circumstances do you believe it would be appropriate for Ofcom to revoke or serve notice on licences?

Intellect: Examples include a) changes to international obligations following consultations, b) the need to introduce a high-priority public service, c) national emergency and d) major realignments of the spectrum.

Q10b: Would the proposed guidelines provide sufficient certainty to licensees and potential purchasers and sufficient flexibility for the necessary management of the spectrum by Ofcom?

Intellect: Yes, subject to the caveats we have flagged up being adequately taken into account.

Q10c: Are there circumstances in which it might be appropriate for Ofcom to have a power to terminate licences on shorter notice, with compensation?

Intellect: in case of a National Emergency, or when 'Change of Use' might be enforced from outside the UK such as from international treaties/harmonisation. Ofcom should formally and openly consult prior to approving changes of use, of course. Compensation should be forthcoming through Ofcom if the latter needs to clear a Band. This also means that *transparency in International negotiations is essential*

Q11: What problems do you anticipate in separating non-spectrum licence conditions (such as roll-out obligations) from spectrum-related licence conditions, and allowing licensees to pass on their obligations as part of a trade should they wish?

Intellect: Separation is desirable, on a case by case basis. We recommend that the original conditions/obligations should remain in force when a spectrum trade occurs. We have noted from earlier discussions that Ofcom intends to scrutinise 'newcomers' for their ability to fulfil roll-out or other obligations. We believe however that it will be difficult to undertake this scrutiny in a timely & consistent manner that also uses small amounts of manpower resources. This answer is given on the basis of this being a UK consultation. The answer would be different in some other European countries. The 'separation problem' will be more difficult for spectrum-related conditions than for others. The latter can normally be transferred without too much difficulty. Note that a more efficient use of spectrum can result in a lower spectrum requirement, and any attendant obligations might only require to be enforced for/tied to the service rather than the original spectrum. Note also that as a result of Spectrum Trading certain roll-out obligations may not viably be achieved by a single party. When Wireless & Telecom licences require to be combined, this process may be made more complex by the need to combine also the non-spectrum licence conditions.

Q12a: What intermediaries do you expect to emerge in the market for spectrum licences?

Intellect: We agree with the analysis of section 7.3.3. However, we believe that many trades will initially tend to be done bilaterally (between licence holders), i.e. without any intermediary. It is possible that the intermediaries in this new market could be existing trading companies. Bilateral trading is also likely to continue for the foreseeable future, however.

Note that since spectrum is quite often not required until some point in the future (for example, partway through the implementation of a project), there might be a natural tendency for a 'spectrum options' market to evolve. Clearly, whether or not this will be viable will among other things be heavily influenced by whatever rolling licence duration/s are decided upon.

Although Banks might begin to get involved in a Mergers & Acquisition context, we believe that brokers might not emerge other than to allow spectrum owners to divest themselves of unwanted spectrum when they want to.

Note that Intermediaries might find themselves intentionally or inadvertently in a dominant/monopoly position related to spectrum.

Q12b: Are there any features of intermediaries which may require regulation?

Intellect: Because of the way spectrum is managed, intermediaries are likely to be well placed to assume dominant positions. Therefore, vigilance will be necessary to prevent this occurring.

For example, if a band was to be made available to intermediaries, it would have to be made available to more than one such.

Intermediaries who actually purchase the spectrum asset must also assume related roll-out obligations. Those who act purely as agents need not do so.

Q13: Do you agree with Ofcom's proposed arrangements for the spectrum currently managed by JFMG, JRC, CSS and the CAA?

Intellect: before we can reply we need some further clarifications on how this spectrum would become available on the market.

Q14: Do you agree with the extent of information that Ofcom is proposing to make available to the market?

Intellect: Yes, we welcome the proposals in the consultation, including the plans for recording pricing and ownership details.

As a general observation, it will be difficult to assess the value of spectrum (for due diligence or other purposes) with the minimal level of information proposed. Currently, although there is suitable commercial software available to do sharing studies in the shared FS / FSS bands, because of a lack of transparency in the UK assignment process it is not possible for any organisation other than Ofcom to complete an analysis in all of the bands because of the lack of available data. As such it is likely that Ofcom will be inundated with numerous "what if requests" whenever a new requirement occurs for a satellite uplink or downlink to a new location. The lack of data also makes it extremely difficult for satellite uplink operators to assess the best location for new Teleports. In order to take full advantage of the opportunities offered by the introduction of Spectrum Trading it is necessary to make available the detailed technical data as currently found in the NFR and Site Clearance Data bases. Ideally this would be as comprehensive as that suggested for inclusion in the draft revision of ITU Rec 1413, Radiocommunications Data Dictionary for notification and coordination purposes. Such a data base should be available to all parties with an interest in spectrum engineering or trading in the UK and should be accurately maintained with updates on a regular basis (ideally daily). As a minimum, a periodicity of one week is suggested.

Q15a: What problems do you anticipate in the process for administering Spectrum Trading?

Intellect: there is of course the potential for this process to become costly & resource-consuming unless it is very carefully thought out and then implemented in like manner. As a general point on this, we believe that Ofcom is trying (quite validly) to either devolve or outsource as much of 'the process' as it viably can. However, the answers we have given to other questions in this consultation make it clear that there are many top level questions yet to be decided *before* a start can be made on designing the necessary processes. These questions arise primarily in the areas of a) sign-off of trades, b) technical scrutiny of change of use, c) scrutiny for monopoly concerns. We would comment however that on the basis of the information supplied to date, the proposed cost-recovery profile seems to be reasonable.

Detailed & fast responses from Ofcom will be required to support the overall Spectrum Trading service.

Q15b: Do you agree with Ofcom's outline procedure?

Intellect: Although the procedure shown in Exhibit 6 does not show where 3rd parties etc. are given the opportunity to comment, we welcome the intention to notify neighbouring licensees and/or co-located users and other interested parties as detailed in Section 8.3.6. Intellect believes that notification will in practice be an essential component in the success of Spectrum Trading.

Intellect notes also that the procedure seems to imply a paper-based system, whereas it is in fact very desirable that it should operate largely by up-to-date electronic communication methods. We would also suggest that responsibility for registration of the trade and transfer should rest *with the seller*, rather than the purchaser of a spectrum licence. In the case where there is no change of use, the procedures appear unnecessarily complex and costly. We would expect that only an examination from a competition aspect would be needed and a subsequent change in the register. Where a current user sublets without change of use, then only a notification to Ofcom should be necessary. If trading and innovation is to be encouraged, the regulatory regime must be light.

Q16a: What kind of leasing & hiring arrangements do you envisage arising?

Intellect: it is almost impossible to predict; there could be very many variations. We would wish to reconfirm however our understanding that it is *Licences to use Terrestrial Equipments* that are to be traded, not for example any surplus capacity on a satellite network. In other words it is a *Licence Lease* rather than a *Capacity Lease* that is under discussion here.

Q16b: Do you agree with Ofcom's proposed arrangements for approval and registration of spectrum leases and hires?

Intellect: Yes. Intellect recommends that each Spectrum Licence should contain within its Terms & Conditions an all embracing caveat emptor clause. The buyer/lessee should satisfy himself that he is not signing up with a 3rd party on the basis of terms which do or may contravene the licence terms & conditions.

We would point out however that at all times Ofcom must be able to identify those parties who are responsible for delivering the licence-related obligations. Typically this would be done by the mandatory notification of sub-leases.

Q17a: Do you think liberalisation of spectrum use as proposed should be pursued as well as trading?

Intellect: Yes. In cases of major changes of use a wide ranging economic analysis should be carried out. It cannot be assumed that because a change of use is good for the licensee it is also good for the wider contribution to the UK economy. Investment in equipment design requires a degree of stability in use & bandplans to be available.

We believe that a more flexible categorisation of 'spectrum use' should be made, in order to encourage innovation. We encourage Ofcom to work in close collaboration with existing work done within the RSPG in Brussels to develop new categories of spectrum use.

Band fragmentation will reduce benefits in markets that are successful and popular with end-users precisely because harmonisation has allowed economies of scale to act, for example, GSM.

Q17b: Do you agree with the constraints on liberalisation outlined above?

Intellect: We acknowledge that in some bands unconstrained liberalisation is inadvisable. This statement can apply across harmonised and also non-harmonised bands. We strongly believe that

the market should drive/determine how spectrum should be used. This entails encouraging multiple standards, where these assist the fulfilment of market demands.

Q18a: Do you agree with the proposed process for approval of licence reconfigurations or changes of use?

Intellect: Yes, provided that there is an open public comment process on each change of use (for which a formal definition is therefore necessary), and that Ofcom considers the wider costs and benefits. Given that it is apparently legally not permissible for Ofcom to demand the unwinding of a trade that is valid according to the *basic* Terms & Conditions for trading, there is a strong case for requiring all trades to be submitted 'x' days in advance for scrutiny. The value of 'x' might vary according to the spectrum involved, and decisions will need to be taken *in advance* regarding the areas of spectrum that are likely to require anti-monopoly monitoring & possible interventions.

Q18b: Are there any other factors which Ofcom should take into account in whether or not to approve an application for change of use?

Intellect: We have indicated some additional factors in our answer to Q18a.

Q18c: Should Ofcom make commitments to performance targets for assessing applications for change of use?

Intellect: Yes, this will be essential.

Q19a: What types of disputes do you envisage arising as a result of Spectrum Trading & licence liberalisation?

Intellect: We believe that most disputes will be based on technical factors and/or on abuse of dominant position. The latter may often tend to arise as a result of changing the use of spectrum. We would instance the TDD/FDD dispute in the ITU. We understand that the methodology adopted in China is that the new deployer has to 'resolve' any problems that arise. This is akin to a kind of 'grandfather' principle. This is relatively straightforward as a procedure, however it may ignore the fact that the new deployer is adhering to the rules whereas the previous licensees might not have been!

There may very well be a case for an Ofcom 'troubleshooting team', to rapidly measure and profile levels of interference resulting from alleged interferers. This must be adequately resourced, and depending on the number of occurrences to be dealt with may include handling by suitable technical experts/resources temporarily drafted into Ofcom. Whatever arrangements are adopted, the production of incontrovertible results on a timely basis will be a significant technical challenge.

The possible introduction of trading intrinsically brings a higher potential for disputes.

Cases of litigation claiming 'an invalid prospectus for a spectrum parcel' could become widespread if extreme care is not taken in defining the spectrum assets. This is the reason for our 'caveat emptor' recommendation in our response to Q16b.

Q19b: Beyond its statutory duties on disputes, how far should Ofcom become involved?

Intellect: We urge Ofcom to be heavily involved in the accreditation of external bodies who are charged with complex technical studies and investigations of interference as part of the dispute resolution procedure. These bodies would supplement Ofcom's own role in this area, which should be continued.

Q20a: Do you agree that an assessment of whether a spectrum trade can be expected to result in a substantial lessening of competition is appropriate?

Intellect: Yes, for those categories of trade for which such a lessening of competition is likely. This aspect needs more study to determine, however. The assessment must complete within a predetermined maximum timeframe.

Q20b: How should such a test be applied in practice?

Intellect: Based on OFT/Office of Fair Trading guidelines & having due regard to EU law.

Q21: In what ways do you anticipate that administered incentive pricing will need to be changed to take account of Spectrum Trading?

Intellect: AIP (= an annual fee) is a necessary adjunct to Spectrum Trading and is seen as a useful tool in Spectrum Management. However, any change in AIP should be open to public comment. Trading itself should not require a change in AIP. Low/high AIP could also be used to encourage certain applications if there are external social benefits/costs that would not impact the licensee directly. There is an argument for AIP being set at a level that discourages spectrum hoarding. There is also an argument for AIP being set at a level that will allow Ofcom to recover reasonable across-the-board costs of administering spectrum licensing & trading & to fund relevant research. It is Intellect's understanding that although Ofcom will not normally be willing to buy back spectrum or participate in the spectrum after-market, AIP charges for any given spectrum can be ceased by returning the related licences to Ofcom without compensation.

Intellect recommends that the issue of whether all license holders should have precisely the same rules applied to them on AIP should be deferred for consideration in a separate consultation.

As a footnote on AIP, what is required is stability & certainty/predictability of these fees. Generally, Intellect would expect fees to be decreased from current levels, however, once Spectrum Trading has released more spectrum.

Q22: Do you agree with the proposals for application of Spectrum Trading to television and radio broadcasting spectrum?

Intellect: Yes. We support the caution that has been indicated in allowing change of use. We support Spectrum Trading provided it allows for change of use only to an alternative broadcasting usage until such time as details of the analogue/digital switchover are known in detail and understood.

It should be noted that the consumer surpluses from broadcasting are again not accounted for by the trade price, which is related to advertising revenue (except for pay-per-view).

We note that this question does not address the matter of *when* one might want to introduce administered incentive pricing. In our view it is an important matter to address.

We look forward to a further opportunity to discuss the proportion of capacity that may be used for non programme related services.

Q23: Do you agree with the proposals for programme-making and special events spectrum?

Intellect: Yes. We believe that PMSE facilities could relatively easily be upgraded & hence free up spectrum.

Q24: Do you agree with the proposals for application of spectrum trading to public wireless networks?

Intellect: We first make a general point on Exhibits 9 and 11. We consider that perhaps the 5.8GHz 'light licensing' network assignments should be considered under 'FWA' rather than PBR.

Our answers to the individual points are as follows:

Q24a: the proposed timing of its introduction?

Intellect: In general we agree that it should be introduced as soon as practicable in full licensed spectrum. Liberalisation is crucial to achieve the economic benefits expected. Ofcom can expect commercial disputes where new services overlap those already offered by some major public networks. It is therefore essential that the trading/liberalisation processes are well defined and that the political will to enforce them exists. We would also expect Ofcom to take a lead where necessary in pressing for changes to international frequency harmonisation.

Intellect opposes Spectrum Trading and/or RSA in licence exempt spectrum. As apparent from Exhibit 9, mobile satellite networks operate in licence exempt spectrum. The Ofcom proposal for future regulation is to introduce secondary trading, subject to RSA. As discussed further under Q5, Intellect is opposed to the introduction of RSA since it sees no potential benefit in the concept to any party beyond the rights and obligations of the international co-ordination and national sharing arrangements already in place. We hope that Ofcom recognises the validity of the arguments against RSA for the particular case of MSS as soon as possible in order to avoid unnecessary uncertainty about spectrum availability and terms of usage.

Q24b: the proposals for the extent of licence reconfiguration & change of use that would in principle be permissible;

Intellect: We consider that in general options for licence reconfiguration and change of use are fundamental to gain the expected economic benefits from trading. We would consider that the UK may be able to gain more economically through the most open interpretation possible of the harmonised use and the international coordination obligations. In some regional reconfigurations there could be the opportunity to adopt a highly a flexible approach. For example, there could usefully be combined fixed service rural broadband, digital PMR/PAMR and perhaps cellular, networks in some of the more isolated parts of the UK.

With respect to MSS, Intellect would urge Ofcom to rely on the principle set out in section 4.3.1 of the Consultation Document to make much greater use of licence exemption as a spectrum management tool rather than issuing tradable licences and to continue the application of the existing licence-exempt regime to MSS. Intellect considers MSS to be among the spectrum uses which are *not* suited for trading since the use of MSS spectrum is subject to international coordination. Ofcom has partially recognised this by excluding reconfiguration and change of use from its trading proposals for MSS.

Intellect further considers that it is unnecessary to introduce spectrum trading for MSS simply to allow the transfer of spectrum rights in the case of change of ownership of an MSS network, since this is a simple formality which does not impact on the use of the spectrum or the technical parameters of the network. The Competition Act and the Enterprise Act are sufficient to address the issue of market power, with no additional intervention from Ofcom needed. Finally, it is noted that MSS operators routinely add new customers, address new markets, introduce new technologies (e.g. carriers with different modulation schemes) and lease capacity under their own spectrum rights to third parties. Hence the MSS use of the spectrum is already highly "liberalised". Maintaining the current licence-exempt regime for MSS would ensure that the same degree of liberalisation and flexibility is retained, provided the internationally coordinated parameters of the system are respected.

Q24c: and the proposals for amendment to licence conditions?

Intellect: In general we are happy with the proposals and agree that the new definition of transmission rights will assist in managing the sort of disputes referred to in answer to Q24(a) above.

One exception is that for some large scale public networks, which require large initial capital expenditure, it may be necessary to establish a minimum licence duration of 10 years. Another exception is for MSS, which Intellect considers should continue to be licence-exempt, as discussed above.

Footnote to this answer: In exhibit 10 of the consultation document we believe there is a typographical error in that the first three entries for "Remote meter reading" should apply instead to "Mobile Satellite".

Q25: Do you agree with the proposals for application of Spectrum Trading to private business systems? Specifically, do you agree with:

Q25a: the proposed timing of its introduction?

Intellect: Yes

Q25b: the proposals for the extent of licence reconfiguration and change of use that would in principle be permissible;

Intellect: Yes

Q25c: the proposals for amendment to licence conditions?

Intellect: Yes

Q26: Do you agree with the proposals for application of Spectrum Trading to fixed terrestrial and satellite links?

Specifically, do you agree with:

Q26a: the proposed timing of its introduction;

Q26b: the proposals for the extent of licence reconfiguration and change of use that would in principle be permissible; and

Q26c: the proposals for amendment to licence conditions?

Intellect: The following responds to Q26a, Q26b and Q26c taken together. We generally agree with the proposals. However some change of use *is* desirable in order to provide more flexibility.

We are very much against RSA/Recognised Spectrum Access as currently envisaged.

Specifically in relation to the satellite services we would make the following comments.

Any changes to the spectrum management processes relating to satellite services need very careful consideration because of the huge financial investments needed to build and launch a satellite. Also, satellites in general do not yet have the capability of reconfiguring their spectrum capabilities during

their operational lifetime, which is often in excess of 15 years. Furthermore, individual frequency assignments arise from a complex chain of authorisations from the ITU, CEPT, national administrations, satellite operators and satellite users, none of which have complete control of the spectrum to be used. Taking these into account, it can be seen that Spectrum Trading in satellite bands is likely to be extremely complicated and of limited benefit.

The consultation document is proposing trading only in the frequency bands shared with other services, and not until RSA is introduced. Intellect comments on the implementation of RSA and its suitability for trading have been made in the response to Question 5. Intellect believes that trading in these bands can only be considered after the consultation process on RSA is completed and consideration can be given to the impact of its possible implementation.

We would point out that in both these bands and possibly others, efficient use of the spectrum might be better served by the introduction of a voluntary receive licence for satellite receive terminals and other devices requiring protection from interference. This would enable operators to seek protection of specific sites. This would avoid the unnecessary restrictions on sharing which would otherwise occur if wide area RSA is introduced as previously advocated by Ofcom.

Q27: Do you agree with the proposals for application of Spectrum Trading to maritime & aviation spectrum?

Intellect: Yes.

Specifically, do you agree with:

Q27a: the proposed timing of its introduction;

Q27b: the proposals for the extent of licence reconfiguration and change of use that would in principle be permissible; and

Q27c: the proposals for amendment to licence conditions?

Intellect: In answer to Q27a through Q27c, we see no fundamental reason why users in these areas should not also benefit from Spectrum Trading, where appropriate. AIP should also be applied to these bands where it is possible to do so.

Q28: Do you agree with the proposals for application of trading to science and technology spectrum, and that trading is inappropriate for licence exempt spectrum?

Intellect: The area of T&Ds/Test & Development Licences is a complicated one that requires consideration in a separate consultation. For example, why should one have to buy a T&D Licence under a trading regime? T&D Licences are usually on a non-interference/non-protection basis. This might work better with a non-Governmental middleman. There are a lot of unclarities in this area. Consideration should be given to continuing with the existing system for T&D Licences.

Scientific uses, for example, involve transmission & reception over a very wide range of frequencies. We consider that this community should be subject to the same regime as everyone else. However, research budgets should be adjusted to sustain their use of the spectrum. . They should be handled under an interference-protection regime.

Intellect agrees that Spectrum Trading is inappropriate for licence exempt spectrum, and we support the consultations' proposals to increase the amount of LE spectrum.

Q29: Do you agree with the proposals for application of Spectrum Trading to the emergency services and Ministry of Defence?

Intellect: Yes, we believe these organisations should be allowed to sublease or trade their spectrum. However, it will be appropriate for these organisations to very carefully consider what spectrum they might need in the future, since once they have sold spectrum it might not be readily retrievable.

Intellect's concluding comments:

In conclusion, we would wish to reiterate that:

Intellect believes that the single overriding goal by which Ofcom's Spectrum Trading Project should be judged is the degree to which it succeeds in achieving the maximum effective use of spectrum for the social and economic benefit of the U.K. as identified in previous economic impact studies (please see earlier quoted reference).

It is through its use that spectrum provides the greatest benefit to the Country. All measures therefore need to be towards maximising the number and effectiveness of users and services.

Whilst some applications require a great deal of flexibility to maximize the benefit from the spectrum, this should not be taken to encourage undue fragmentation. Many other applications achieve higher benefit through harmonisation of bands and standardisation.

Interference always reduces the available capacity of any band even though technology is employed to make such interference less visible to users. Therefore measures must be included that address interference problems

Facilities to identify under-utilised spectrum need to be provided. It is from such bands that opportunities for improvement through spectrum trading will principally come.

Intellect remains very keen that Spectrum Trading should not be the cause of the Essential Public Services or MoD failing to obtain the spectrum they require.

We expect the biggest benefit to come from the initial introduction of the new Spectrum Trading policy within each band. In order for the advantages of Spectrum Trading to be realised, it cannot be assumed that the necessary equipment to implement the systems involved in a change of use is immediately available. Manufacturers may require time and significant investments in order to develop the new systems needed in response to the results of the trade.

(end of Intellect's response document)

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