Notice under Section 155(1) of the Enterprise Act 2002

Consultation on undertakings offered by British Telecommunications plc in lieu of a reference under Part 4 of the Enterprise Act 2002

Annexes (A-L)

Issued: 30 June 2005

Closing date for responses: 12 August 2005

Contents

Annex A

Ofcom's Terms of Reference

Terms of Reference – Access and Backhaul Network Services

A.1 The Office of Communications ("Ofcom"), in exercise of its powers under section 131 of the Enterprise Act 2002 and in the event that it decides not to accept proposed undertakings in lieu of such a reference following its consultation under sections 155 and 169 of that Act, intends to make a reference to the Competition Commission for an investigation into the supply of the access and backhaul network services (the "reference services") in the United Kingdom excluding Hull.

A.2 Ofcom has reasonable grounds for suspecting that a feature, or a combination of features, of the markets in which the reference services are supplied prevent, restrict or distort competition in connection with the supply of the reference services in the United Kingdom excluding Hull.

A.3 For the purposes of this reference:

- "access and backhaul network services" means the provision of access and backhaul network services and all the related downstream or retail markets for which the former services are a critical input.

Signed: .....

Stephen Carter

Chief Executive of the Office of Communications

For and by authority of the Office of Communications

Date: 29/06/05

Annex B

Responding to this consultation

B.1 In this notice, Ofcom sets out the reasons for which it proposes to accept the undertakings offered by BT in lieu of a reference under section 131 of the Enterprise Act 2002, subject to comments and representations received as to the effectiveness of the undertakings. Ofcom invites written views and comments on the issues raised in this document.

When and how to respond

B.2 Responses to this consultation are to be made and received by Ofcom no later than 5 pm on 12 August 2005. Ofcom considers a six week consultation is reasonable in light of the following:

- the competition concerns relating to the structural features of the market that the undertakings are intended to address have previously been identified in the Telecoms Review process (in particular, in our Telecoms Review Phase 2 consultation document). The idea of real equality of access, involving behavioural and organisational constraints on BT, was consulted on in that process;

- following the Telecoms Review Phase 2 consultation, while discussing with BT its proposed undertakings, Ofcom has been consulting informally, on a bilateral basis and through trade bodies, with parties who would principally be affected by the acceptance of undertakings in lieu; and

- it is critical for the development of competition in UK fixed telecoms markets that these issues are resolved rapidly. In particular, continued uncertainty as to future regulation could cause important investment decisions to be postponed.

B.3 Ofcom strongly prefers to receive responses as e-mail attachments, in Microsoft Word format, as this helps us to process the responses quickly and efficiently. We should also be grateful if you would assist us by completing a response cover sheet (see below) to indicate, among other things, whether or not there are confidentiality issues. The cover sheet can be downloaded from the ‘Consultations’ section of our website.

B.4 Please can you send your response to dougal.scott@ofcom.org.uk, marked “response to consultation on undertakings”. Responses may alternatively be posted or faxed to the address below, marked with the title of the consultation.

Dougal Scott
6th Floor
Ofcom
Riverside House
2A Southwark Bridge Road
London SE1 9HA

Tel: 020 7783 4305
Fax: 020 7981 3333

B.5 Please note that we do not need a hard copy in addition to an electronic version. Also, please note that Ofcom will not routinely acknowledge receipt of responses.

Further information

B.6 If you want to discuss the issues and questions raised in this consultation, or need advice on the appropriate form of response, please contact Dougal Scott on 020 7783 4305.

Confidentiality

B.7 Ofcom thinks it is important for everyone interested in an issue to see the views expressed by consultation respondents. We will therefore usually publish all responses on our website, www.ofcom.org.uk. We will do this on receipt of responses, unless respondents request otherwise on their response cover sheet.

B.8 All comments will be treated as non-confidential unless respondents specify that part or all of the response is confidential and should not be disclosed. Please place any confidential parts of a response in a separate annex, so that non-confidential parts may be published along with the respondent's identity.

B.9 Ofcom reserves its power to disclose any information it receives where this is required to carry out its functions. Ofcom will exercise due regard to the confidentiality of information supplied.

B.10 Please also note that copyright and all other intellectual property in responses will be assumed to be licensed to Ofcom to use, to meet its legal requirements. Ofcom's approach on intellectual property rights is explained further on its website, at: www.ofcom.org.uk/about_ofcom/gov_accountability/disclaimer

Ofcom's consultation processes

B.11 Ofcom is keen to make responding to consultations easy, and have published some consultation principles (listed below) which it seeks to follow, including on the length of consultations.

B.12 If you have any comments or suggestions on how Ofcom conducts its consultations, please call our consultation helpdesk on 020 7981 3003 or e-mail us at consult@ofcom.org.uk. We would particularly welcome thoughts on how Ofcom could more effectively seek the views of those groups or

individuals, such as small businesses or particular types of residential consumers, whose views are less likely to be obtained in a formal consultation.

B.13 If you would like to discuss these issues, or Ofcom's consultation processes more generally, you can alternatively contact Tony Stoller, External Relations Director, who is Ofcom's consultation champion:

Tony Stoller
Ofcom
Riverside House
2A Southwark Bridge Road
London SE1 9HA
Tel: 020 7981 3550
Fax: 020 7981 3630
E-mail: tony.stoller@ofcom.org.uk

Consultation response cover sheet

B.14 In the interests of transparency, we will publish all consultation responses in full on our website, www.ofcom.org.uk, unless a respondent specifies that all or part of their response is confidential. We will also refer to the contents of a response when explaining our decision, without disclosing the specific information that you wish to remain confidential.

B.15 We have produced a cover sheet for responses (see over) and would be very grateful if you could send one with your response. This will speed up our processing of responses, and help to maintain confidentiality by allowing you to state very clearly what you don't want to be published. We will keep your completed cover sheets confidential.

B.16 The quality of consultation can be enhanced by publishing responses before the consultation period closes. In particular, this can help those individuals and organisations with limited resources or familiarity with the issues to respond in a more informed way. Therefore Ofcom would encourage respondents to complete their cover sheet in a way that allows Ofcom to publish their responses upon receipt, rather than waiting until the consultation period has ended.

B.17 We strongly prefer to receive responses in the form of a Microsoft Word attachment to an email. Our website therefore includes an electronic copy of this cover sheet, which you can download from the 'Consultations' section of our website.

B.18 Please put any confidential parts of your response in a separate annex to your response, so that they are clearly identified. This can include information such as your personal background and experience. If you want your name, address, other contact details, or job title to remain confidential, please provide them in your cover sheet only so that we do not have to edit your response.

Cover Sheet for response to an Ofcom consultation

BASIC DETAILS

Consultation title:

To (Ofcom contact):

Name of respondent:

Representing (self or organisation/s):

Address (if not received by email):

CONFIDENTIALITY

What do you want Ofcom to keep confidential?

Nothing	☐	Name/contact details/job title	☐
Whole response	☐	Organisation	☐
Part of the response	☐	If there is no separate annex, which parts?	

Note that Ofcom may still refer to the contents of responses in general terms, without disclosing specific information that is confidential. Ofcom also reserves its powers to disclose any information it receives where this is required to carry out its functions. Ofcom will exercise due regard to the confidentiality of information supplied.

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response. It can be published in full on Ofcom's website, unless otherwise specified on this cover sheet, and I authorise Ofcom to make use of the information in this response to meet its legal requirements. If I have sent my response by email, Ofcom can disregard any standard email text about not disclosing email contents and attachments.

Ofcom seeks to publish responses on receipt. If your response is non-confidential (in whole or in part), and you would prefer us to publish your response only once the consultation has ended, please tick here. ☐

Name Signed (if hard copy)

Ofcom's consultation principles

Ofcom has published the following seven principles that it will follow for each public written consultation:

Before the consultation

1. Where possible, we will hold informal talks with people and organisations before announcing a big consultation to find out whether we are thinking in the right direction. If we do not have enough time to do this, we will hold an open meeting to explain our proposals shortly after announcing the consultation.

During the consultation

2. We will be clear about who we are consulting, why, on what questions and for how long.

3. We will make the consultation document as short and simple as possible with a summary of no more than two pages. We will try to make it as easy as possible to give us a written response. If the consultation is complicated, we may provide a shortened version for smaller organisations or individuals who would otherwise not be able to spare the time to share their views.

4. We will normally allow ten weeks for responses to consultations on issues of general interest.

5. There will be a person within Ofcom who will be in charge of making sure we follow our own guidelines and reach out to the largest number of people and organisations interested in the outcome of our decisions. This individual (who we call the consultation champion) will also be the main person to contact with views on the way we run our consultations.

6. If we are not able to follow one of these principles, we will explain why. This may be because a particular issue is urgent. If we need to reduce the amount of time we have set aside for a consultation, we will let those concerned know beforehand that this is a 'red flag consultation' which needs their urgent attention.

After the consultation

7. We will look at each response carefully and with an open mind. We will give reasons for our decisions and will give an account of how the views of those concerned helped shape those decisions.

Annex C

The importance of the fixed telecoms sector

C.1 Telecommunications services are critically important both to the society and to the economy of the UK. A climate of widespread, easily-accessible and low-priced telecoms is essential if the UK is to maintain its position as one of the world's leading industrialised nations.

C.2 Total revenues for the UK telecoms industry in 2004 were £45 billion[1]. Stripping out double counting of wholesale turnover between network operators, revenues in the sector have increased by over 240 per cent in real terms since 1984 (the year in which BT was privatised). This growth can be attributed to a number of factors: increased competition across the sector; the introduction and rapid growth of competitive mobile telecoms services; the growth of the internet, and its adoption by both businesses and domestic consumers; and innovation in value-added services such as voicemail and call waiting.

C.3 As telecoms services have become more embedded in homes and businesses, their value to the UK has increased. In 2003, the Office for National Statistics (ONS) estimated that the value added by the UK telecoms industry was over £25 billion – or 3.8 per cent of GDP[2]. By comparison, the gas, electricity and water supply industries together contributed 2.5 per cent, and the combined radio and TV sector contributed less than 1 per cent.

C.4 The UK telecoms industry is also a major private[3] sector employer, with an estimated 250,000 jobs across the sector; this represents around 1 per cent of the total UK workforce. Whilst BT has shed more than half its staff over the past two decades, there has been a concurrent rise in employment from a combination of new competitors to BT and companies operating in new telecoms markets (for example, mobile operators, cable companies, and internet service providers).

C.5 Capital investment by UK telecoms companies plays a significant role in the UK economy. In the five years from 1999-2003 inclusive, it is estimated that total net capex across the UK telecoms sector was £40 billion – almost 10 per cent of all capital expenditure in the UK over that period[4]. This investment has helped to create new fibre optic networks, internet infrastructure, and advanced telephone exchanges – all of which are critical to the UK's standing as a leading economy in the information age.

C.6 All of the statistics noted above show how important the UK telecoms sector is in terms of its size and position in the economy. Even more important, perhaps, is the contribution that telecommunications makes to general UK

1 Source: Ofcom
2 Source: ONS Annual Business Enquiry, 2003
3 Source: ONS Employee Jobs, September 2003
4 Source: ONS Annual Business Enquiry, 2003

economic growth, and the impact that it has on the social and educational environment. Historically, these effects have been difficult to quantify or even to measure qualitatively.

C.7 In terms of measuring the impact of telecoms on the UK economy, it is only recently that studies have started to illustrate a proposition that seems intuitive to most people – that advanced communications and information technology can help most industries to become more productive and more efficient. Analysis carried out in 2001 for the Bank of England suggested that the use of information, communications and technology (ICT) accounted for 21 per cent of UK output growth between 1989 and 1999[5]. A further study by the Centre for Economic and Business Research (CEBR) has estimated that, due to the growth in the number of broadband connections, annual UK GDP could be up to £22 billion higher by 2015 than it otherwise would have been[6]. Additionally, a survey for the British Chambers of Commerce found that 84 percent of small- and medium-sized enterprises (SMEs) identified some benefits from broadband adoption, 46 per cent thought that broadband led to increased productivity, and 13 per cent felt that broadband increased sales[7].

C.8 Clearly, measuring just how much telecoms services have contributed to economic growth is far from straightforward. Often, parallel changes need to take place in other sectors before technological change in any one sector can impact the economy as a whole. Therefore the relationship between telecoms and economic growth is complex and diffused. A study commissioned by Oftel (Office of Telecommunications) and OEE (Office of the E-Envoy) looked at how other innovations in products and services eventually took hold in the economy[8]. It concluded that all were related to the bandwagon effect, which has yet to be felt in the context of broadband services. It is also plausible that because of their pervasive influence on all sectors of the economy, the continued development of communications networks is critical to ensuring that prospective improvements in productivity across the economy do indeed take place.

C.9 Telecoms services also have an important role to play in the social and educational infrastructure of the country. A recent report by the Department for Education and Skills (DfES) highlighted the critical importance of ICT in schools, colleges, and as a means for adult education and learning[9]. The report recommends a more strategic approach to the use of ICT, with a number of key aims: transforming teaching in schools (for example, by using broadband to make lessons more exciting and interactive); engaging "hard to reach" learners; building an open accessible system for pupils, teachers, parents and adult learners; and generally achieving greater efficiency and effectiveness across the entire education system.

C.10 It is also clearly important that consumers across the UK's nations and regions have widespread access to advanced communications services. A study currently being undertaken by the Office of the Deputy Prime Minister

5 Oulton (2001), ICT and productivity growth in the United Kingdom, Bank of England Working Paper 140

6 CEBR report for the Broadband Industry Group, The Economic Impact of a Competitive Market for Broadband, November 2003Source: ONS Annual Business Enquiry, 2003

7 Business Broadband: a BCC Survey, BCC in association with Cisco Systems and Oracle

8 Propelling the Broadband Bandwagon, Strategic Policy Research, August 2002

9 Harnessing Technology: transforming learning and children's services, DfES, March 2005

(ODPM) is addressing the ways in which ICT can help address the needs of the most disadvantaged and excluded social groups in the UK, with the aim of closing this "digital divide"[10].

C.11 The importance of telecommunications in UK society was summed up in a recent report by the Cabinet Office and the DTI, which outlined the Government's commitment to promoting advanced telecoms services[11]. The report sets out the framework for ensuring that all citizens have access to advanced, affordable communications by 2008, in order to make the UK "a world leader in digital excellence". The Prime Minister's foreword to the report states that the Government places a high priority on implementing its conclusions, and that they "will play a crucial role in improving the cohesion of our society, the wealth of our economy, and the quality of life of our people".

[10] Inclusion through Innovation, ODPM and Social Exclusion Unit, pre-publication
[11] Connecting the UK: the Digital Strategy, Cabinet Office and DTI, March 2005

Annex D

Possible Relevant Markets

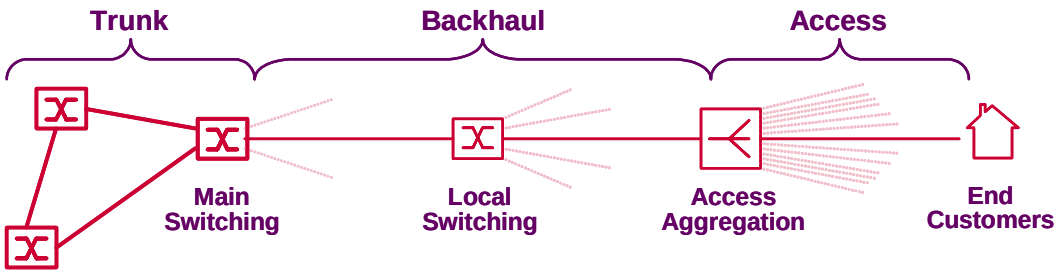
D.1 In making a market investigation reference to the Competition Commission (CC), the Office of Fair Trading (OFT) suggests that whilst it may not be necessary, a view should normally be given as to the possible definition of the market (or markets) for the supply of goods or services in which it is suspected that competition is adversely affected. Ofcom considers it equally appropriate to express such a view when consulting on undertakings in lieu of a reference.

D.2 This Annex sets out Ofcom's views of a possible market definition in the light of its suspicion that a combination of features, covering both structure (discussed further in Annex F) and conduct (discussed further in Annexes G to K), are present and restrict, prevent or distort competition in connection with the supply and acquisition of services in the United Kingdom. Ofcom considers that BT has a position of market power in markets for the provision of access and backhaul network services. This, combined with its vertical integration into directly related downstream markets, provides BT with the ability and incentive to engage in discriminatory behaviour against its downstream competitors.

Description of access and backhaul network services

D.3 The terms 'access' and 'backhaul' network services refer to specific elements of BT's current architecture of its electronic communications network. Other networks, such as mobile and cable networks, are structured differently. Although the exact boundaries of each element of a hierarchical network are not always amenable to precise definition, one could broadly describe BT's network as consisting of three main elements: access, backhaul and trunk (or core) networks. These are illustrated in Figure 1 below.

Figure 1: Topography of BT's electronic communications network



D.4 'Access'[12] (also known as 'the local loop' or 'the last mile') consists of that part of the network that connects each end customer to the local exchange.

[12] The term "access" is in certain contexts used differently when making reference particularly to 'network access' as defined in the Communications Act 2003.

D.5 'Backhaul' is that part of the network used to connect the equipment that aggregates traffic from the multitude of access network connections back into the operator's trunk network. BT has between 5,000 and 6,000 of these aggregation sites (most of them situated in the "local exchange" buildings).

D.6 Lastly, 'trunk' (or 'core') refers to the backbone of the network. It can carry very high volumes of traffic from one major urban centre to another. Ofcom considers that BT does not have a sufficient degree of market power in the provision of trunk network services to raise a suspicion that competition may be distorted in this and directly related downstream markets. This is because the barriers to entry in the form of sunk costs and economies of scales are not so pronounced for the provision of trunk network services as for that of access and backhaul.

Product Markets

D.7 It is useful to clarify how upstream and downstream markets for the provision of electronic communications services are related. Downstream markets consist of markets for the provision either of retail services directly to residential or business final consumers, or of intermediate services which nonetheless require a provider to obtain upstream elements.

D.8 These downstream services are provided by a number of suppliers. In order to provide such services, suppliers in downstream markets need to obtain some critical upstream inputs such as the access and backhaul network services briefly described above. While some suppliers, such as BT and to some extent cable operators, self-provide most of these critical upstream inputs, others need to purchase them from providers – to a very large extent in practice limited to BT – active in the upstream markets. As a result, there is a direct link between the provision of services in upstream and downstream markets.

Upstream markets

D.9 Ofcom suspects that there are no sufficient, direct or indirect, demand or supply constraints on the ability of a hypothetical monopolist supplier of access network services to raise the price of such services profitably. Similar arguments apply to the provision of backhaul network services.

D.10 On the demand side[13], Ofcom considers that, while there are a number of potential alternative direct providers of wholesale access and backhaul network services, these providers do not generally provide such wholesale services. For example, cable operators, who rolled out their networks to cover about half of UK residential population, do not generally supply such wholesale services to third parties.

D.11 Ofcom has also considered whether cable and mobile networks might offer some kind of indirect competitive constraint on the demand side. For example, cable networks offer similar retail services as those that are provided by the service providers and other network operators who use wholesale access and backhaul network services supplied by BT. This might indirectly constrain the ability of suppliers of access and backhaul network services profitably to raise the price of these services. However,

[13] Demand-side substitution assesses the extent to which customers would substitute other services for those in question as a response to a small but not temporary price increase.

Ofcom considers that this does not provide a sufficient constraint to a short term exercise of market power, and more precisely in the form of an increase in price, by suppliers of wholesale access network services. For example, cable networks could only potentially provide retail services to about half of UK (residential) consumers. For other providers of retail services, such as mobile networks, Ofcom considers that the constraint is not only of an indirect nature but further that such services are at best an imperfect substitute for those on fixed networks. Mobile networks provide a more limited range of services than fixed telecoms networks. Ofcom also considers mobile services offer different quality and attributes to fixed network services and that there appears to be evidence that consumers treat mobile services as complements rather than substitutes to fixed services.

D.12 Ofcom considers that supply side substitution[14] in the provision of access and backhaul network services is unlikely to be a sufficient constraint on the pricing behaviour of current providers of such services. Supply side substitution could be possible by cable operators in the areas where they have already rolled out their networks. Ofcom considered in the past that cable operators could be part of the relevant market, as they self supply access (and backhaul) services to themselves. However, Ofcom notes that cable companies might not be able to provide a sufficiently significant and timely constraint to make such a hypothetical price increase by other fixed line providers unprofitable. If this was the case they should not be included in the relevant market for the provision of access (and backhaul) network services. This may be for a number of reasons including:

- first, in order to switch to alternative wholesale suppliers such as cable, service providers and other network operators would need to sink considerable costs in order to be able to (physically) interconnect with these alternative suppliers' networks. In other words, service providers and other network operators would face significant switching costs if they were to change supplier; and

- second, cable operators and other direct providers would not be able to offer the same level of ubiquity as BT. This is a feature that is valued by the service providers and other network operators who purchase such wholesale services.

D.13 The conclusions that supply side substitution might not be able sufficiently to constrain a hypothetical monopolist's ability to raise its prices for wholesale access network services are considerably stronger in the case of potential operators that have yet to roll-out their access (and backhaul) networks. This is because it is very unlikely for supply side substitution in the provision of access network services to occur within the short timeframe required for market definition. Ofcom also considers that currently there appear to be no expected technological innovations that could alter such conclusions.

D.14 For the purposes of the present consultation Ofcom does not consider it necessary or appropriate to try to define precisely in this document each

[14] Supply-side substitution considers the extent to which suppliers would switch, or expand, production to supply the relevant products or services, as a response to a small but not temporary price increase.

potential market related to the provision of access and backhaul network services. Ofcom notes that in the course of carrying out market reviews pursuant to the arrangements put in place by the EC Communications Directives, it has identified a range of particular upstream markets for the purposes of assessing whether BT has Significant Market Power. These are set out in the last section to this Annex.

Downstream Markets

D.15 Ofcom notes that access and backhaul network services are critical inputs in order to compete in a number of directly related downstream markets. While the conduct that Ofcom suspects has taken place and that disadvantages downstream competitors takes place in upstream markets for the provision of access and backhaul network services, such conduct affects competition in all the directly related downstream markets. For these reasons Ofcom considers that such downstream markets should equally be included.

D.16 As in the case of the upstream markets, Ofcom notes that in the course of carrying out market reviews, it has also identified a range of particular downstream markets for the purposes of assessing whether BT has Significant Market Power. These are set out in the last section to this Annex.

Geographic Markets

D.17 For historical reasons, BT is the incumbent supplier of fixed telecommunications services including access and backhaul network services in the UK, except for the area around the city of Hull where the incumbent fixed telecommunications provider is Kingston Communications plc. Ofcom considers that the geographic dimension of the identified product markets separately covers the UK and Hull area. In other words, there are two sets of separate geographic markets for all the upstream and downstream product markets identified above: one for the Hull area and one for the whole of the UK excluding Hull. For example, there appears to be evidence that the pricing behaviour within each of such markets broadly follows a pattern of geographically uniform prices. This is so, for example, in services and markets which are not subject to an ex ante obligation to charge geographically uniform prices.

D.18 Ofcom has not reached any firm conclusions as to whether the features identified in the markets where BT supplies its services are also present for the markets in the Hull area. The relevant geographic dimension is, therefore, the UK excluding Hull.

Conclusions

D.19 In the light of the above analysis, Ofcom considers that the market or set of markets in which competition is adversely affected by the combination of features it has identified consist of the upstream markets for the provision of access and backhaul network services and all the related downstream markets for which the former services are a critical input in the UK (excluding Hull).

D.20 The analysis undertaken by Ofcom in considering the need for ex ante regulatory obligations under the EC Communications Directives has been of assistance in identifying the current boundaries of the access and backhaul network services markets. All the markets identified under the EC Communications Directives share some or all of the features that Ofcom suspects lead to a restriction, prevention or distortion of competition.[15] Ofcom notes that the list below, although not exhaustive, provides some useful examples of both upstream and downstream markets. Ofcom further notes that, whilst the exact product market definition and boundaries of such markets might change over time, the identified features which we suspect restrict competition are likely to remain in all or most of them. This is the case, for example, of markets that are likely to be defined in the context of future change in BT's network architecture – for example through the introduction of 21st Century Network.

Markets identified under the EU Communications Directives

D.21 Ofcom has identified the following Wholesale markets in which BT has been designated as having SMP:

(1) Review: Number Translation Services - Call Termination Market Review[16]
Market(s): BT has SMP in NTS call termination in the UK.

(2) Review: Review of the fixed narrowband wholesale exchange line, call origination, conveyance and transit markets[17] [18]
Market(s): BT has SMP in wholesale residential analogue exchange line services in the UK exc. Hull;
BT has SMP in wholesale residential ISDN2 exchange line services in the UK exc. Hull;
BT has SMP in wholesale business analogue exchange line services in the UK exc. Hull;
BT has SMP in wholesale business ISDN2 exchange line services in the UK exc. Hull;
BT has SMP in wholesale ISDN30 exchange line services in the UK exc. Hull;
BT has SMP in call origination on fixed public narrowband networks in the UK exc. Hull;
BT has SMP in local-tandem conveyance and transit on fixed public narrowband networks in the UK exc. Hull;
BT has SMP in inter-tandem conveyance and transit on fixed public narrowband networks in the UK exc. Hull; and
BT has SMP in single transit on fixed public narrowband networks in the UK exc. Hull.

(3) Review: Review of the retail leased lines, symmetric broadband origination and wholesale trunk segments markets[19]

[15] The list of such markets excludes those for the provision of international calls. Ofcom notes that such international call markets are mainly concerned with international call conveyance and do not involve the provision of access and backhaul network services. However, Ofcom has reached no firm view on whether these markets should be included.
[16] http://www.ofcom.org.uk/consult/condocs/ntsctmr/; Ofcom, consultation published 22 Oct 2004
[17] http://www.ofcom.org.uk/consult/condocs/narrowband_mkt_rvw/nwe/; Oftel, 28 Nov 2003
[18] Note: the call origination, conveyance and transit elements of this review are currently subject to possible change as a result of the current consultation on Network Charge Controls; http://www.ofcom.org.uk/consult/condocs/charge/

Market(s): BT has SMP in wholesale low bandwidth traditional interface symmetric broadband origination (up to and including 8Mbit/s) in the UK exc. Hull;
BT has SMP in wholesale high bandwidth traditional interface symmetric broadband origination (above 8Mbit/s up to and including 155Mbit/s) in the UK exc. Hull;
BT has SMP in wholesale alternative interface symmetric broadband origination at all bandwidths in the UK exc. Hull; and
BT has SMP in wholesale trunk segments at all bandwidths in the UK.

(4) Review: Review of the Wholesale Broadband Access Markets[20]
Market(s): BT has SMP in asymmetric broadband origination in the UK exc. Hull; and
BT has SMP in broadband conveyance in the UK.

(5) Review: Review of the wholesale local access market[21]
Market(s): BT has SMP excluding Hull.

(6) Review: Review of fixed geographic call termination markets[22]
Market(s): All providers of fixed networks that terminate fixed geographic traffic have SMP in the provision of call termination on their network.

D.22 Ofcom has identified the following retail markets in which BT has been designated as having SMP:

(7) Review: Fixed Narrowband Retail Services Markets[23]
Market(s): BT has SMP in Residential analogue exchange line services in the UK exc. Hull;
BT has SMP in Residential ISDN2 exchange line services in the UK exc. Hull;
BT has SMP in Business analogue exchange line services in the UK exc. Hull;
BT has SMP in Business ISDN2 exchange line services in the UK exc. Hull;
BT has SMP in Business ISDN30 exchange line services in the UK exc. Hull;
BT has SMP in Residential local calls in the UK exc. Hull;
BT has SMP in Residential national calls in the UK exc. Hull;
BT has SMP in Residential calls to mobiles in the UK exc. Hull;
BT has SMP in Residential operator assisted calls in the UK exc. Hull;
BT has SMP in Residential IDD category A calls in the UK exc. Hull;
BT has SMP in Residential IDD category B calls (on a route-by-route basis) in the UK exc. Hull;

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19 http://www.ofcom.org.uk/consult/condocs/llmr/statement/; Ofcom, 24 Jun 2004
20 http://www.ofcom.org.uk/consult/condocs/wbamp/wholesalebroadbandreview/; Ofcom, 13 May 2004
21 http://www.ofcom.org.uk/consult/condocs/rwlam/statement/; Ofcom, 16 Dec 2004
22 http://www.ofcom.org.uk/consult/condocs/narrowband_mkt_rvw/Eureviewfinala1.pdf; Oftel, 28 Nov 2003
23 http://www.ofcom.org.uk/consult/condocs/narrowband_mkt_rvw/fixednarrowbandrsm.pdf; Oftel, 28 Nov 2003

		BT has SMP in Business local calls in the UK exc. Hull; BT has SMP in Business national calls in the UK exc. Hull; and BT has SMP in Business calls to mobiles in the UK exc. Hull.
(8)	Review:	Review of the retail leased lines, symmetric broadband origination and wholesale trunk segments markets[24]
	Market(s):	BT has SMP in retail low bandwidth traditional interface leased lines (up to and including 8Mbit/s) in the UK exc. Hull.

[24] http://www.ofcom.org.uk/consult/condocs/llmr/statement/; Ofcom, 24 Jun 2004

Annex E

The Undertakings offered by BT

WHEREAS:

(a) Ofcom considers that it has the power to make a reference to the Competition Commission under Section 131 of the Enterprise Act 2002;

(b) BT has offered undertakings to Ofcom; and

(c) Ofcom, instead of making a reference to the Competition Commission, has decided to accept BT's undertakings.

NOW THEREFORE:

BT hereby gives Ofcom the undertakings below (these "Undertakings") and shall act in the manner set out in this document.

1. **Scope**

1.1 These Undertakings shall be binding on BT and its subsidiaries in the United Kingdom except the Hull Area.

1.2 Subject to section 1.3 below these Undertakings shall apply in respect of the matters to which they relate in the whole of the United Kingdom except the Hull Area.

1.3 Save as specified elsewhere, sections 5 and 8 of these Undertakings shall not apply to Northern Ireland.

2. **Definitions and Interpretation**

2.1 In these Undertakings:

"Access Network" means the Electronic Communications Network which runs from a Local Access Node to a network termination point on an End-User's premise and which supports the provision of copper-based access services and fibre-based access services to End-Users.

"ASD" means the Access Services Division to be established by BT in accordance with section 5 of these Undertakings.

"ASD CEO" means the Chief Executive Officer of ASD.

"ASD Headquarter Management Team" comprises the ASD CEO and his London-based direct reports.

"ASD Management Board" means the management board of ASD, comprising the ASD CEO, his direct reports and any other person(s) appointed to that board from time to time.

"Associated Services" means those products and services supplied from time to time ancillary to the provision of Metallic Path Facility and Shared Metallic Path Facility. At the date these Undertakings take effect they are listed in section B6, part 6.03 of the BT Carrier Price List and include:

a) comingling space (variable exchange space footprints and rack space units);

b) power (AC & DC);

c) vent & cooling;

d) internal tie cabling;

e) external tie cabling (for distant location); and

f) cable link for Metallic Path Facility and Shared Metallic Path Facility (installation of third party backhaul).

"Backhaul Extension Service" means BT's product of that name existing at the date these Undertakings take effect and as it evolves from time to time.

"Backhaul Product" means a Network Access service which runs from a BT Local Access Node to:

(a) another BT Local Access Node; or

(b) a BT Core Node; or

(c) another Communications Provider's point of handover

provided that the straight line distance to any of the above is no more than the greater of

d) 15km (or such other distance as may be mutually agreed between BT and Ofcom);

e) or the straight line distance from BT's Local Access Node to the nearest BT Core Node.

For the avoidance of doubt this definition does not include backhaul services to nodes outside the UK.

"Bitstream Network Access" is a form of Network Access which provides transmission capacity between an End-User premise and a BT node or a point of handover to another Communications Provider, which allows a degree of control to Communications Providers (including BT) over how the service to the End-User is realised.

"BT" means British Telecommunications plc whose registered company number is 1800000, and including any of its subsidiaries or holding companies, or any subsidiary of such holding companies, all as defined

by section 736 of the Companies Act 1985, as amended by the Companies Act 1989.

"BT Group Operating Committee" means the committee, by that name, established by the BT Group plc Board resolution approved on 19 February 2002 and any successor to that committee.

"BT Group plc" means BT Group plc whose registered company number is 4190816.

"BT's Backhaul Network" means BT's Electronic Communications Network from BT's Local Access Nodes to:

(a) another BT Local Access Node; or

(b) a BT Core Node; or

(c) another Communications Provider's point of handover.

"BT Wholesale" is the current designation of the division (including any successors) within the BT organisation that predominantly manages upstream products and services, apart from those which will be provided by ASD, designed for use by other Communications Providers, as inputs to their own products.

"Carrier Pre-selection" means a facility which allows a subscriber to whom a publicly available telephone service is provided by means of a public telephone network to select which pre-selected provider of such services provided wholly or partly by means of that network, is the pre-selected provider the subscriber wishes to use to carry his calls by designating in advance the selection that is to apply on every occasion when there has been no selection of provider by use of a telephone number.

"Carrier Price List" means the price list having that name which contains charges for certain products and services provided by BT to Communications Providers and certain products and services provided by Communications Providers to BT, as such price list is amended from time to time, and which is published at www.btwholesale.com.

"Code of Practice" means the code or codes of practice drawn up and published in accordance with section 9 of these Undertakings.

"Commercial Information" means information of a commercially confidential nature relating to SMP Products or other products and services to which Equivalence of Inputs applies or, in the case of sections 6.10.3 and 6.13 and 6.14 relating to products and services described in section 6.1.2, and which relates to product development, pricing, marketing strategy and intelligence, product launch dates, cost or network coverage and capabilities, excluding any such information as agreed by Ofcom from time to time.

"Commercial Policy" means policies and plans in relation to SMP Products or, in the case of section 8.5, relating to products and services described in section 6.1.2, and which relate to product development,

pricing, marketing strategy and intelligence, product launch dates, cost, payment terms and forecasting or network coverage and capabilities, excluding any such policies and plans as agreed by Ofcom from time to time. For the avoidance of doubt this excludes commercial policy of general application across BT such as termination provisions.

“Communications Provider” means a person providing a Public Electronic Communications Service or a Public Electronic Communications Network, including BT where relevant and for the avoidance of doubt shall include any internet service provider.

“Core Node” is a node in an Electronic Communications Network whose primary function is not to support the provision of access services to End-Users but to switch or route traffic between other nodes in a network.

“Customer Confidential Information” means any information, in whatever form, which, in the case of written or electronic information, is clearly designated by a Communications Provider as commercially confidential and which, in the case of information disclosed orally, is identified at the time of disclosure as such or is by its nature commercially confidential, but excluding any information which:

a) enters the public domain otherwise than by reason of a breach of confidentiality;

b) is previously known to BT at the time of its receipt;

c) is independently generated or discovered at any time by BT; or

d) is subsequently received from a third party without any restriction on disclosure.

“DataStream” means an asynchronous transfer mode based Bitstream Network Access service offered under that name by BT at the date these Undertakings take effect.

“EAB” means the Equality of Access Board to be established by BT in accordance with these Undertakings.

“EAO” means the Equality of Access Office as established under section 10 of these Undertakings.

“End-User” has the same meaning as in the Communications Act 2003.

“Equivalence of Inputs” means the provision of the same products and services by BT to all Communications Providers (including BT) on the same timescales, terms and conditions (including price) by means of the same systems and processes, and includes the provision to all Communications Providers (including BT) of the same Commercial Information about such products, services, systems and processes. In particular, it includes the use by BT of such systems and processes in the same way as other Communications Providers and with the same degree of reliability and performance as experienced by other Communications Providers.

In this context “the same” means exactly the same subject only to:

a) trivial differences;

b) such other differences as may be agreed by Ofcom in writing;

c) differences relating to the following:

   i) credit vetting procedures;

   ii) payment procedures;

   iii) security requirements;

   iv) provisions relating to the termination of a contract; and

   v) contractual provisions relating to requirements for a safe working environment.

d) such other differences as are specified elsewhere in these Undertakings, including where Commercial Information is provided in accordance with these Undertakings to any of the nominated individuals, and individuals occupying the roles and functional areas (and their relevant external advisers, subcontractors and agents) listed in Annex 2.

“Ethernet” means the standard networking protocol defined under that name in IEEE 802.3.

“Exchange Line” means Apparatus comprised in BT’s Electronic Communications Network and installed for the purpose of connecting a telephone exchange run by BT to a network termination point comprised in network termination and testing apparatus installed by BT for the purpose of providing Electronic Communications Services at the premises at which the network termination and testing apparatus is located.

“Hull Area” means the area defined as the ‘Licensed Area’ in the licence granted on 30 November 1987 by the Secretary of State under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communications (Hull) plc.

“IBMC” means, in relation to any product or service, Installed Base Migration Complete, and is the date by which the migration of all of the relevant BT installed End-User base to the Equivalence of Inputs product is completed.

“IPStream” means the IP-based Bitstream Network Access service offered by BT at the date these Undertakings take effect and as it evolves from time to time.

“KPIs” means key performance indicators.

"Local Access Node" means a node in an Electronic Communications Network which supports the provision of services to End-Users. For the avoidance of doubt, such nodes include the following, namely a main distribution frame, an optical distribution frame, a digital local exchange, a digital subscriber line access multiplexer a remote concentrator unit and an MSAN.

"Management Information Systems" means those management information systems which hold Commercial Information or Customer Confidential Information.

"Metallic Path Facility" means a circuit comprising a pair of twisted metal wires between an End-User's premise and a main distribution frame that employs electric, magnetic, electro-magnetic, electro-chemical or electro-mechanical energy to convey Signals when connected by a tie cable to an Electronic Communications Network.

"Migration Process" means a process by which:

a) a Communications Provider transfers from using one product or service to another product or service;

b) an End-User transfers from using one product or service to another product or service;

c) an End-User transfers from using a product or service supplied by a Communications Provider to the same product or service supplied by another Communications Provider;

d) any combination of (a), (b) and (c) above;

e) any combination of (a), (b) and (c) above which involves more than one End-User or two Communications Providers and the transfer takes place within a single process; or

f) any combination of (a), (b) and (c) above which involves the synchronised transfer of multiple services or products.

"MSAN" means a multi-service access node, being a Local Access Node in BT's NGN which is capable of supporting the provision of multiple services to End-Users.

"Network Access" has the same meaning as is given to "network access" in section 151(3) of the Communications Act 2003.

"Network Layer" means the network layer of the International Standards Organisation seven layer model for communications protocols.

"NGN" means next generation network, a packet-based Electronic Communications Network which is able to provide Electronic Communications Services and to make use of multiple broadband and quality of service-enabled transport technologies, and in which service-related functions are independent of underlying transport-related technologies.

"Ofcom" means the Office of Communications as established by the Office of Communications Act 2002, or, where relevant, the Director General of Telecommunications as appointed under section 1 of the Telecommunications Act 1984.

"Operational Support Systems" means those support systems carrying out the functions and processes which help to run a network and business, including (but not limited to) pre-ordering, taking a customer's order, configuring network components, creating a bill and managing faults.

"Partial Private Circuit" means a circuit providing dedicated transmission capacity between an End-User's premise and another Communications Provider's point of handover, using a SDH interface, as defined at CCITT G703.

"Partial Private Circuit Access Product" is a Partial Private Circuit between an End-User's premise and a BT Local Access Node.

"Partial Private Circuit Backhaul Product" is a a Backhaul Product providing dedicated transmission capacity using a SDH interface, as defined at CCITT G703.

"Physical Layer" means the duct, fibre, copper, and other non-electronic assets in an Electronic Communications Network.

"RBS Backhaul Service" means a Network Access service providing transparent transmission capacity up to and including a bandwidth of 2mb/s between a radio base station and the nearest appropriate Core Node of a Communications Provider's Electronic Communications Network, which BT is obliged to offer by virtue of an SMP Condition.

"RFS" means the ready for service date from which an Equivalence of Inputs product is available for use by other Communications Providers and by BT (and is in use by BT) to handle all product or service events for New End-Users (being new after the RFS date) and the start of migration of the relevant installed base of End-Users. In this definition "New End-User" means either:

a) a customer who has not previously been directly supplied by BT for any BT product or service; or

b) a customer with no current service from BT but who is returning to BT;

and excludes for the avoidance of doubt:

c) an existing BT customer who is moving premises, and

d) an existing BT customer purchasing a new service.

"Scorecard" means a measure for setting targets in connection with the incentive remuneration of certain BT employees.

"SDH" means Synchronous Digital Hierarchy.

"Shared Metallic Path Facility" means access to the non-voiceband frequencies of the Metallic Path Facility.

"SLA" means service level agreement.

"SMP" means significant market power, where this is found pursuant to a market review under the relevant provisions of the Communications Act 2003.

"SMP Condition" has the same meaning as in the Communications Act 2003.

"SMP Product" means a product or service falling within a market for Network Access in which BT has been determined by Ofcom as having SMP (excluding international direct dial products based on interconnection directly to BT's international switching centres).

"Statement of Requirements Process" means a procedure whereby a Communications Provider submits a request for new or enhanced Network Access.

"Transmission Layer" means the electronic assets at and below the link layer of the International Standards Organisation seven layer model for communication protocols. For the avoidance of doubt this does not include Network Layer assets such as voice switches or data routers.

"UK Combined Code on Corporate Governance" means the document of that name dated July 2003 and published by the Financial Reporting Council.

"United Kingdom" has the meaning given to it in the Interpretation Act 1978.

"Wholesale Analogue Line Rental" is an Electronic Communications Service provided for the use and ordinary maintenance of an analogue Exchange Line.

"Wholesale Calls" means BT's Network Access product consisting of the provision of an end-to-end calls service on a BT maintained line that the Communications Provider in turn offers to its End-Users.

"Wholesale End-to-End Ethernet Service" means a Network Access service providing uncontended Ethernet bandwidth between an End-User premise and another End-User premise up to a maximum straight-line distance of 25km between each premise unless technical feasibility dictates otherwise

"Wholesale Extension Service" means BT's product of that name existing at the date these Undertakings take effect and as it evolves from time to time.

"Wholesale Extension Service Access Product" is a Network Access service that provides uncontended Ethernet bandwidth between an End-User's premise and a BT Local Access Node.

"Wholesale Extension Service Backhaul Product" means a Backhaul Product that provides uncontended Ethernet bandwidth.

"Wholesale ISDN2 Line Rental" is an Electronic Communications Service provided for the use and ordinary maintenance of an ISDN2 Exchange Line.

"Wholesale ISDN30 Line Rental" is an Electronic Communications Service provided for the use and ordinary maintenance of an ISDN30 Exchange Line.

"Wholesale Line Rental" means any or all of Wholesale Analogue Line Rental, Wholesale ISDN2 Line Rental and Wholesale ISDN30 Line Rental.

2.2 Words or expressions shall have the meaning assigned to them in these Undertakings and otherwise any word or expression shall have the same meaning as it has in the Communications Act 2003.

2.3 The Interpretation Act 1978 shall apply as if these Undertakings were an Act of Parliament.

2.4 Headings and titles shall be disregarded.

2.5 The Annexes shall form part of these Undertakings.

2.6 References to sections and Annexes shall mean sections of, and Annexes to, these Undertakings.

3. Provision of equivalent products and services

3.1 Equivalence of Inputs for certain products and services

3.1.1 BT shall apply Equivalence of Inputs for the following products and services in accordance with the timetable set out in Annex 1 to these Undertakings, and continue to apply it following the relevant IBMC dates:

a) Wholesale Analogue Line Rental;

b) Wholesale ISDN2 Line Rental;

c) Wholesale ISDN30 Line Rental;

d) Wholesale Extension Service;

e) Shared Metallic Path Facility;

f) Metallic Path Facility;

g) IPStream; and

h) Backhaul Extension Service.

3.1.2 When BT provides in the future the following products and services it will do so applying Equivalence of Inputs:

a) Wholesale Extension Service Access Product;

b) Wholesale Extension Service Backhaul Product;

c) Wholesale End-to-End Ethernet Service;

d) IP based Bitstream Network Access products or services that are the successors to IPStream or DataStream; and

e) A successor service to Wholesale Line Rental:

i) if such a service is provided using BT's NGN, based on MSAN access; and

ii) BT is determined by Ofcom to have SMP in a Network Access market or markets which includes that service.

3.1.3 Nothing in this section 3.1 shall require BT when providing Wholesale Line Rental either to itself or to other Communications Providers to use Metallic Path Facility as an input to that service.

3.2 Notwithstanding the dates specified in Annex 1, BT will as a gesture of good faith:

3.2.1 if it does not achieve an RFS date for Equivalence of Inputs for Wholesale Analogue Line Rental of 31 December 2006 (other than as a result of matters beyond its reasonable control), provide an allowance to Communications Providers of a monthly amount of 25 pence for each Wholesale Analogue Line Rental line that they respectively rent for each complete month from 1 January 2007 until the date that RFS for Equivalence of Inputs for Wholesale Analogue Line Rental is provided or 30 June 2007 whichever is the earlier. Such monthly allowance will not be made for any such line which the Communications Provider has ceased to rent in the month in question.

3.2.2 if it does not achieve an RFS date of 30 June 2006 for Metallic Path Facility and Shared Metallic Path Facility (other than as a result of matters beyond its reasonable control), BT will provide an allowance to Communications Providers of a monthly amount of 25 pence for each Metallic Path Facility and Shared Metallic Path Facility line that they respectively rent for each complete month from 1 July 2006 until the date that RFS for the respective Facility is provided. Such monthly allowance will not be made for any such line which the Communications Provider has ceased to rent in the month in question.

Provided that BT shall not be obliged to pay any allowances under sections 3.1.1 and 3.2.2 if the failure to achieve an RFS Date is the result of matters beyond its reasonable control, provided that if such failure is due in whole or in part to the acts or omissions of any Communications Provider, any dispute over the provision of any such allowances may be referred to Ofcom and BT agrees to be bound by Ofcom's decision as to what extent, if at all, any such allowance shall be made.

3.3 If BT and Ofcom agree an Equivalence of Inputs timetable in respect of any other service that does not use BT's NGN in addition to those in section 3.1 that timetable will apply.

3.4 BT shall, in order to reduce address matching failures, make available to Communications Providers by 31 December 2005 access to the postcode address file used by BT.

3.5 From 30 June 2006 BT will provide improved access to the engineering appointment books used by BT to enable Communications Providers to provide their End-User customers with a service better and faster than that which they are able to provide currently.

3.6 By end December 2006 BT employees and agents will use the Wholesale Line Rental service provider gateway to raise service transfer requests when BT takes over a customer of another Communications Provider, and where that customer is not already a BT customer for any other retail service.

Migration Processes

3.7 To the extent that the Migration Processes are either internal to BT or are otherwise within BT's control, BT shall apply Equivalence of Inputs to BT's Migration Processes where such processes involve at least one product or service for which BT must apply Equivalence of Inputs, and, where relevant, at the same time as BT is required to supply RFS for Equivalence of Inputs in accordance with the timetable in Annex 1.

3.8 BT shall comply with performance targets for the Migration Processes covered by section 3.7 as required in writing by Ofcom and following any consultation to be undertaken by Ofcom, provided that such targets are reasonable and practicable.

4. **Transparency**

4.1 BT shall, for Partial Private Circuits, Carrier Pre-Selection and DataStream:

4.1.1 within three months of these Undertakings taking effect, provide sufficient transparency to other Communications Providers to enable them to identify and understand any differences between the matters BT is required to list in its reference offer pursuant to the relevant SMP Condition in connection with products and services referred to above in this section 4.1 which it provides to other Communications

Providers, and the comparable products and services that it supplies to itself; and.

4.1.2 use its reasonable endeavours at all times to resolve any outstanding issues with any other Communications Provider concerning its provision of the products and services referred to in section 4.1 (including the systems and processes used to supply such products and services) to that Communications Provider.

5. **Access Services**

The establishment of Access Services Division

5.1 BT shall establish ASD within four months of these Undertakings taking effect, and shall thereafter operate ASD in accordance with these Undertakings.

5.2 BT shall, within five months of these Undertakings taking effect, satisfy Ofcom that it has established ASD in accordance with section 5.1.

5.3 ASD shall provide product management, sales (or equivalent internal supply between ASD and other parts of BT) and in-life service management for those SMP Products which are predominantly provided using the Physical Layer and/or Transmission Layer of BT's Access Network and/or BT's Backhaul Network, as set out in sections 5.4, 5.5 and 5.10. It shall specify the products and services and their functionality, develop new products and services, set prices, and sell (or internally supply within BT) its products and services to any Communications Provider.

5.4 Section 5.3 applies to the following existing SMP Products and enhancements to those SMP Products and their immediate successors:

a) Wholesale Analogue Line Rental;

b) Wholesale ISDN2 Line Rental;

c) Wholesale ISDN30 Line Rental;

d) Wholesale Extension Service;

e) Shared Metallic Path Facility and Associated Services;

f) Metallic Path Facility and Associated Services;

g) Partial Private Circuits, excluding those Partial Private Circuits containing a trunk segment, as referred to in the relevant market review documentation;

h) Backhaul Extension Service; and

i) RBS Backhaul Service excluding those circuits containing a trunk segment, as referred to in the relevant market review documentation.

5.5 ASD shall also offer to provide to any Communications Provider within a reasonable time of a request the following:

a) Partial Private Circuit Access Product;

b) Partial Private Circuit Backhaul Product;

c) Wholesale Extension Service Access Product;

d) Wholesale Extension Service Backhaul Product; and

e) Wholesale End-to-End Ethernet Service.

5.6 If a new Network Access product is provided using BT's NGN:

a) which is based on MSAN access; and

b) BT is determined by Ofcom to have SMP in a market containing the new Network Access product; and

c) MSANs do not contain any Network Layer functionality;

then if so required by Ofcom the new Network Access product will be provided by ASD.

5.7 As part of the establishment of ASD, the people and non-network capabilities used to provide fixed line number portability will be included in ASD.

5.8 ASD will develop its Backhaul Products in accordance with sections 5.14-5.16.

5.9 Where products and services are requested which are not products and services which BT is obliged to provide as a result of a finding of SMP, ASD will use a Statement of Requirements Process, and will remain subject to EAB oversight in its operation of that process. In these cases, however the ASD is free to treat those requests as would any other commercial organisation and to accept or reject them on the basis of, among other things:

a) fit with the assets, skills and resources and terms of reference of ASD;

b) commercial attractiveness to ASD; and

c) opportunity cost to ASD.

5.10 If so required by Ofcom, ASD shall provide product management, sales (or equivalent internal supply between ASD and other parts of BT) and in life service management for any new form of Network Access which BT is obliged to supply as a result of a market review carried out under the relevant provisions of the Communications Act 2003, if such a product or service would be predominantly provided using the Physical Layer or Transmission Layer of BT's Access Network or the Physical Layer or Transmission Layer of BT's Backhaul Network.

5.11 ASD shall control and operate the assets contained within the Physical Layer of BT's Access Network and the Physical Layer of BT's Backhaul Network including such items needed to support this, such as line testing and remote diagnostics. It shall determine which products and services these assets must support, and also determine any appropriate enhancements in the functionality of these assets, having full responsibility for any investment decisions relating to these assets and made within the annual operating plan to be created in accordance with section 5.25. It shall have full responsibility for building, maintaining and repairing these assets.

5.12 The ASD shall not control or operate the assets contained within the Transmission Layer of BT's Access Network and the Transmission Layer of BT's Backhaul Network, but it shall have influence over the way in which these assets are managed sufficient for it to be able adequately to discharge its responsibilities under section 5.3. This influence shall be provided using mechanisms including the following:

5.12.1 the ASD requirements for new SMP Products which determine platform requirements shall be set out in product roadmaps and volume forecasts which shall be agreed with relevant platform managers. This includes new ASD SMP Products delivered over BT's NGN, as well as new SMP Products delivered over the current network. Where backhaul platforms support products and services supplied by ASD and other products and services supplied elsewhere in BT, ASD will have the principal role in determining delivery requirements where it is the predominant user of the platform or where ASD provides the only SMP Product using that platform;

5.12.2 any investment decisions required in consequence of the product roadmaps and volume forecasts referred to in section 5.12.1 shall be considered solely on their own merits, and shall not take into consideration the potential impact on other products or services offered by BT's downstream businesses other than in as much as they affect aggregate demand forecasts;

5.12.3 when ASD makes use of assets from BT Wholesale it shall set standards for in-life service management, covering such matters as provisioning times, provisioning effectiveness, fault rates, repair times and repeat fault rates. The standards will be based upon its judgement of the needs of the customer base it serves, and will not simply replicate the standards prevailing for BT's downstream services. The

required standards shall be reasonably practicable and set out in SLAs between ASD and BT Wholesale; and

5.12.4 new requirements for SMP Products to be provided by ASD will be addressed by an ASD owned Statement of Requirements process.

5.13 ASD shall comprise:

5.13.1 all field engineers, (excluding some of the network planning, design and management engineers for BT's Backhaul Network) including their line management up to and including the ASD CEO, associated with the provision, installation, maintenance and repair of the Physical Layer of BT's Access Network and of the Physical Layer of BT's Backhaul Network;

5.13.2 those people involved in the design, planning, implementation and in-life service management of products and services based upon the Physical Layer and/or Transmission Layer of BT's Access Network or the Physical Layer and/or Transmission Layer of BT's Backhaul Network, including their line management up to and including the ASD CEO;

5.13.3 people who carry out activities which are ancillary to those described in section 5.13.1 and section 5.13.2 and those who support and manage them.

Backhaul principles

5.14 When ASD makes available Backhaul Products it shall do so in the following manner:

5.14.1 ASD shall ensure that the provision of Backhaul Products which are SMP Products is not conditional on the provision of another form of Network Access or another product or service unless agreed by Ofcom;

5.14.2 ASD shall ensure that Communications Providers can purchase Backhaul Products which are SMP Products in such a way that they can join together ("daisy-chain") multiple network nodes;

5.14.3 ASD shall develop solutions that provide the ability to pick-up aggregated traffic from smaller sites to a common handover point, including a managed transmission service. This section 5.14.3 shall apply to transmission services using either or both SDH and Ethernet technology in markets in which BT is determined by Ofcom to have SMP and any future technologies which enhance or replace these in Network Access Markets;

5.14.4 ASD shall provide space in accordance with sections 6.16-6.23 at BT's Local Access Node sites for other

Communications Providers to locate their own equipment which can be used to aggregate traffic from multiple services which originates or terminates on BT's Access Network, as well as traffic which originates or terminates on Communications Providers' own access networks. ASD shall provide Backhaul Products which are SMP Products which carry this aggregated traffic to a point of handover within the Communications Providers' own networks. Such Backhaul Products shall include products and services based on SDH technology and products and services based on Ethernet technology, and any future technologies which enhance or replace these;

5.14.5 ASD shall ensure that Backhaul Products which are SMP Products provided to other Communications Providers shall give those Providers the option to purchase the same degree of resilience as that offered to BT's downstream operations, and that levels of resilience offered will be backed by appropriate SLAs.

5.15 Where charges for Backhaul Products are required by an SMP Condition to be cost orientated (however that requirement is expressed) BT shall set charges:

5.15.1 using a distance related pricing gradient that accurately reflects the underlying costs of providing the product or service, so that Communications Providers purchasing these services benefit appropriately from extending their own network reach; and

5.15.2 using a bandwidth related pricing gradient that accurately reflects the underlying costs of providing the product or service.

5.16 Where charges for a Backhaul Product which is an SMP Product are not required to be cost orientated, ASD shall ensure that bandwidth related and distance related costs variations are among the factors taken into account in setting charges.

5.17 Where assets controlled and operated by ASD, as described in section 5.11 above, are not used in connection with any SMP Product, such assets may be re-allocated to another part of BT.

5.18 To the extent that a product or service supplied by ASD, which is an SMP Product ceases to be such, BT may provide product management, sales and in-life service management other than within ASD.

5.19 Products and services offered by ASD in accordance with section 5 will also be offered by BT in Northern Ireland.

The composition and duties of ASD

5.20 ASD shall be a separate division within BT.

5.21 In anticipation of section 5.1, BT shall appoint the ASD CEO within one month of the date that these Undertakings take effect.

5.22 The ASD CEO shall report to the BT Group plc CEO.

5.23 The ASD CEO shall not be a member of the BT Group Operating Committee but may attend where matters pertaining to ASD are discussed and where such attendance is appropriate. The EAO shall be notified of such attendances.

5.24 The ASD Management Board shall manage ASD in a way designed to secure compliance with those sections of these Undertakings applicable to ASD and shall operate to terms of reference agreed by the BT Group CEO following consultation with Ofcom. The terms of reference will be notified to Ofcom.

Governance of the Access Service Division

5.25 ASD shall establish an annual operating plan which shall be approved by the BT Group plc Board. Once agreed, execution of that plan shall be the responsibility of the ASD CEO and the ASD Management Board. The plan shall include plans and targets for implementing and applying those sections of these Undertakings applicable to ASD for the relevant year. Following each year of operation of ASD such plan shall include a commentary on the previous year's implementation and application of these Undertakings as they apply to ASD. The annual operating plan and commentary shall be shared with the EAB.

5.26 The ASD CEO shall have delegated authority from the BT Group plc Board to authorise capital expenditure of up to £75 million within the annual operating plan referred to in section 5.25. This limit may be varied from time to time at the discretion of the BT Group plc Board. Ofcom and EAB shall be notified of such variation within five working days.

5.27 With effect from the start of BT's financial year 2006/2007, the charging approach, management accounts and management information associated with ASD shall be prepared on the following basis:

a) charges will be calculated on the same basis for BT and other Communications Providers;

b) information relating to those charges shall be provided in the same way for BT and for other Communications Providers;

c) charges made for products and services which are a form of Electronic Communications Service provided to ASD from other parts of BT as inputs for SMP Products provided by ASD will be separately identified and cost orientated;

d) the accounts should include the relevant parts of BT's Access Network and BT's Backhaul Network assets; and

e) segmental financial information relating to ASD will be included in the audited BT Group plc accounts.

5.28 With effect from the start of BT's financial year 2006/2007, the regulatory financial statements of BT will also separately present the results of ASD.

5.29 With effect from the start of BT's financial year 2006/2007:

5.29.1 BT shall begin to report ASD's financial performance in BT Group plc's annual and quarterly reports in the same format as is used for BT's existing divisions; and

5.29.2 ASD annual financial accounts shall be reconciled with the relevant parts of BT's annual regulatory accounts.

5.30 The ASD Headquarter Management Team shall move to:

5.30.1 access controlled accommodation which is separately secured from BT businesses downstream of the ASD and shall have completed this move within 6 months of the date that these Undertakings take effect; and

5.30.2 accommodation which is separately located from BT businesses downstream of the ASD and shall have completed this move within 18 months of the date that these Undertakings take effect.

5.31 Once the ASD Headquarter Management Team is established the ASD CEO will review with the EAB the adequacy of planned moves to access controlled accommodation, and make appropriate changes.

5.32 None of the people described in section 5.13 may, whilst employed within part of ASD, work for the upstream division or any of the downstream divisions, as both are described in Section 8.1, save as agreed in writing by Ofcom.

5.33 All incentive remuneration of ASD people shall reflect solely the objectives of ASD. ASD will operate to a Scorecard which reflects its responsibilities to deliver Equivalence of Inputs and fair access to its products and services. The principles of that Scorecard will be cascaded to all employees working in ASD who have currently, or may have in the future, bonus payments. Bonus payments based on Scorecard performance shall relate solely to the performance of ASD and to any other relevant obligations under these Undertakings. Such bonus payments shall not be denominated in BT Group plc ("BT Group") shares, but ASD people remain eligible to participate in BT's ongoing and future general all-employee share plans and benefits arrangements.

5.34 BT shall as soon as reasonably practicable:

5.34.1 introduce new long term incentive plans for relevant ASD people including a deferred bonus plan ('new plans');

5.34.2 where a person has been granted an option over shares under the BT Group Global Share Option Plan or an award of shares under the BT Group Incentive Share Plan, the BT

Group Retention Share Plan or the BT Group Deferred Bonus Plan and subsequently moves to ASD, use its reasonable endeavours to replace those options or share awards with share awards under the new plans;

5.34.3 ensure that, where a performance condition applies to the granting or vesting of an award under the new plans, that performance condition shall relate to the performance of ASD or some other appropriate index related to the objectives of ASD; and

5.34.4 ensure that no such awards in respect of BT Group shares shall be made to people at a time they are working for ASD except that BT Group shares may be part of an appropriately weighted basket of shares or some other appropriate index.

5.35 Save as set out in section 5.36, no employee or agent of BT (including its external advisers and subcontractors), who is not working for ASD shall:

5.35.1 directly or indirectly participate in the formulation or making of, or influence or attempt to influence, the Commercial Policy of ASD except through such mechanisms and processes that are also available to other Communications Providers; or

5.35.2 have access to Commercial Information of ASD held by any employee or agent of BT working for ASD unless it is of the nature that would be provided to other Communications Providers in the ordinary course of business.

5.36 As referred to in section 5.35:

5.36.1 sections 5.35.1 and 5.35.2 shall not apply to the nominated individuals, and individuals occupying the roles and functional areas (and their relevant external advisers, sub-contractors and agents) listed in Part A of Annex 2;

5.36.2 section 5.35.2 shall not apply to the nominated individuals, and individuals occupying the roles and functional areas (and their relevant external advisers, sub-contractors and agents) listed in Part B of Annex 2;

5.36.3 for the avoidance of doubt the nominated individuals and individuals occupying the roles and functional areas referred to in sections 5.36.1 and 5.36.2 shall not abuse their positions to circumvent the intent of these Undertakings;

5.36.4 any nominated individuals and individuals occupying the roles and functional areas listed in Annex 2 shall be subject to dedicated training on the receipt and sharing of information relating to ASD and on the restrictions on the exercise of influence required by these Undertakings. The EAB may review both the training and its efficacy in securing adherence with these Undertakings; and

5.36.5 BT and Ofcom may agree from time to time to modify the lists in Annex 2. If no agreement is reached the list will remain unchanged.

5.37 ASD may draw upon support services from any part of BT or BT's agents and contractors and may use BT's centres of excellence (including billing), provided that doing so will not require the disclosure of Commercial Information of ASD, except where such support services or centres of excellence are included in either Part A or Part B of Annex 2.

5.38 ASD shall ensure that the way in which new product and service requests are received and evaluated and Commercial Information of ASD is made available is on a non-discriminatory basis in relation to products and services where Equivalence of Inputs applies and on a not unduly discriminatory basis where other SMP Products are involved.

5.39 BT shall:

5.39.1 ensure that all its Operational Support Systems designed for ASD are designed on the principle of separation from the rest of BT systems;

5.39.2 ensure that ASD will have a logically separate systems capability that supports Wholesale Analogue Line Rental, Shared Metallic Path Facility and Metallic Path Facility by 30 June 2007, Wholesale ISDN2 Line Rental by 30 September 2007 and Wholesale ISDN30 Line Rental by 31 December 2007. The rigour of such separation shall be tested through an external audit;

5.39.3 physically separate its Operational Support Systems such that these systems are run physically separately for the ASD and the rest of BT by 30 June 2010; and

5.39.4 review on a regular basis with Ofcom achievement on a roadmap for the separation referred to in sections 5.39.1 and 5.39.2.

5.40 Within 12 months of these Undertakings taking effect, BT shall logically partition its Management Information Systems such that these systems are run separately for ASD and the rest of BT such that they do not lead to undue discrimination against other Communications Providers. For the avoidance of doubt this section does not apply to BT's Operational Support Systems.

The products and services supplied by the Access Service Division

5.41 ASD will not generally supply any product or service to any other part of BT unless it also offers that product or service to other Communications Providers on an Equivalence of Inputs basis. This requirement does not apply to:

5.41.1 Partial Private Circuits;

5.41.2 such Associated Services as may be agreed with Ofcom;

5.41.3 any product or service where Ofcom agrees that for reasons of practicability or otherwise Equivalence of Inputs is not required;

5.41.4 products or services relating to duct, fibre and transmission between Core Nodes; and

5.41.5 any other product or service or class of product or service that Ofcom and BT agree does not need to be supplied externally.

ASD brand

5.42 BT shall develop a separate brand name for ASD which does not incorporate the elements "BT" or "British Telecom" and which will be used in proximity to an endorsement containing the words "Part of the BT (and Corporate Device) Group". Such endorsement shall be secondary to the ASD brand. The programme of moving to the new brand will be progressive. The brand will be deployed on stationery and relevant buildings during the first 16 months from the date these Undertakings take effect. Clothing and vehicle branding will be introduced progressively as assets are replaced, completing within 5 years of the date of establishment of ASD.

6. **Management and structure of BT Wholesale**

6.1 Within four months of the date that these Undertakings take effect, BT shall separate from each other and create the following two product management organisations within BT Wholesale each of which will be separately responsible for:

6.1.1 the product management of SMP Products other than those to be managed by ASD in accordance with these Undertakings (referred to herein as BTWS); and

6.1.2 the product management of other products of significance to other Communications Providers (referred to herein as BTS) namely:

a) Wholesale Calls and IPStream;

b) any leased lines product variants of the types of leased line listed in paragraph 1 of Annex 3 created to meet the needs of Communications Providers in accordance with paragraph 3 of Annex 3; and

c) any products or services added or removed in accordance with sections 6.4.2 or 6.4.3

where 'product management' describes the activities referred

to in section 6.5.

6.2 A BT Wholesale Board member will have responsibility for the performance of BTWS and BTS.

6.3 For the avoidance of doubt both BTWS and BTS may at any time product manage products and services which are not otherwise required to be product managed within either BTWS or BTS as provided for in section 6.1.

6.4 Products and services may be added to or removed from the scope of activity of BTWS or BTS on the following basis:

6.4.1 any new SMP Product which is not required to be provided by ASD in accordance with section 5 shall be product managed within BTWS;

6.4.2 BT and Ofcom may agree to add existing or new products or services to the list of products or services required to be managed by BTS. Such products or services will generally only be added:

a) if they are new products or services that are successors to the existing BTS portfolio; or

b) where:

(i) a BT downstream managed product or service receives 55% or more of product revenue, from other Communications Providers, and there is not an upstream managed product that provides equivalent functionality; and

(ii) there is reasonable demand from Communications Providers for an equivalent product managed and supplied from BT's upstream business.

For the avoidance of doubt if BT and Ofcom are not able to agree the list will not be changed.

6.4.3 BT and Ofcom may agree to remove any product or service from the list of products or services required to be managed by BTS. For the avoidance of doubt if BT and Ofcom are not able to agree the list will not be changed.

6.4.4 BT shall manage leased lines products in BTS in accordance with its obligations in Annex 3.

6.5 BTWS and BTS people shall have responsibility and control in relation to their respective products and services as follows:

a) product management, including product specific terms and conditions and pricing;

b) product specification; and

c) product related procurement processes.

Incentive arrangements

6.6 The Scorecard for the BT Wholesale Board member referred to in section 6.2 shall not include measures related to overall BT Group plc performance.

6.7 All incentive remuneration of BTWS people shall reflect solely the objectives of BTWS. BTWS will operate to a Scorecard which reflects its responsibilities to deliver fair access to its SMP Products. The principles of that Scorecard will be cascaded to all employees working in BTWS who have currently, or may in the future have, bonus payments. Bonus payments based on Scorecard performance shall relate solely to the performance of BTWS and to any other relevant obligations under these Undertakings. Such bonus payments shall not be denominated in BT Group shares but BTWS people remain eligible to participate in BT's ongoing and future general all-employee share plans and benefits arrangements.

6.8 BT shall as soon as reasonably practicable:

6.8.1 introduce new long term incentive plans for relevant BTWS people including a deferred bonus plan ('new plans');

6.8.2 where a person has been granted an option over shares under the BT Group Global Share Option Plan or an award of shares under the BT Group Incentive Share Plan, the BT Group Retention Share Plan or the BT Group Deferred Bonus Plan and subsequently moves to BTWS, use its reasonable endeavours to replace those options or share awards with share awards under the new plans;

6.8.3 ensure that, where a performance condition applies to the granting or vesting of an award under the new plans, that performance condition shall relate to the performance of BTWS or some other appropriate index related to the objectives of BTWS; and

6.8.4 ensure that no such awards in respect of BT Group shares shall be made to people at a time they are working for BTWS except that BT Group shares may be part of an appropriately weighted basket of shares or some other appropriate index.

6.9 People working within BTWS may not work at the same time for any of the downstream divisions as referred to in section 8.1, save as agreed in writing by Ofcom.

Non-discrimination provisions

6.10 Except for the nominated individuals, and individuals occupying the roles and functional areas (and their relevant external advisers, sub-contractors and agents) listed in Part A and Part B of Annex 2:

6.10.1 BT Wholesale will not disclose its Customer Confidential Information to ASD or to the downstream divisions as referred to in section 8.1, except, in all cases, with the relevant customer's consent;

6.10.2 people in BTWS will not disclose its Customer Confidential Information to BTS except in all cases with the relevant customer's consent; and

6.10.3 people in BTWS and BTS shall not disclose their respective BTWS or BTS Commercial Information to people in the downstream divisions as described in section 8.1 other than through mechanisms and processes identical or similar to those available to other Communication Providers.

For the avoidance of doubt the nominated individuals and individuals occupying the roles and functional areas set out in Annex 2 shall not abuse their positions to circumvent the intent of these Undertakings.

6.11 Where BTWS decides to, or is required to, add new functionality or capabilities to existing products or services and such changes require changes to the assets delivering SMP Products within BTWS, such changes shall occur such as to ensure that other Communications Providers do not suffer material competitive disadvantage in relation to BT.

6.12 In circumstances where demands for product or service enhancement from ASD, BTWS or BTS create a situation which requires prioritisation by BT of its capital expenditure, BT will not unduly discriminate in its prioritisation. BT will seek the view of the EAB on the best means of avoiding such undue discrimination.

Other provisions

6.13 As soon as is reasonably practicable BT shall secure the Management Information Systems which hold BTWS and BTS Commercial Information such that such systems are not available to BT people outside BT Wholesale.

6.14 For the avoidance of doubt, nothing in this section 6 precludes BTWS or BTS or any other part of BT Wholesale from being provided with support services from across BT or from using BT's centres of excellence, provided that doing so will not require the disclosure of BTWS or BTS Commercial Information except in the case of those nominated individuals, and individuals occupying the roles and functional areas (and their relevant external advisers, sub-contractors and agents) listed in Part A and Part B of Annex 2.

6.15 Where a product or service supplied by BTWS no longer falls within a market which Ofcom has notified as having SMP then to that extent, this section 6 of these Undertakings shall cease to apply in respect of those products or services, unless that product or service is then added to BTS in accordance with section 6.4.2.

Equipment location

6.16 Sections 6.16-6.23 apply to the location of Equipment in Exchanges.

6.16.1 For the purpose of these sections 6.16 – 6.23:

"Alternative Communications Provider Operational Area" means a Communications Provider Operational Area at another Exchange other than that requested by the Communications Provider so that the Communications Provider has the same ability to provide electronic communications services that make use of Network Access at no greater cost to the Communications Provider than that which it would have paid had it occupied a Communications Provider Operational Area at the Exchange named within its request;

"Communications Provider Operational Area" means any part of an Exchange which is:

(a) capable of independent use and occupation by a Communications Provider (including the use of the common areas) but which will not adversely affect the use or value of the remaining part of that property;

(b) is not bona fide reasonably required by BT at any time for the purposes of BT's business;

"Communications Provider Property Users Group" means a group representing Communications Providers made up of 3 representatives appointed by the Communications Providers;

"Equipment" means equipment listed in Annex 4, owned by the Communications Provider (but not its customers or any other third party) used to provide Electronic Communications Services that make use of Network Access and which is connected to the BT network;

"Estimated Space Availability Details" means details of estimated space availability within the Exchanges annually notified to the Communications Provider Property Users Group in accordance with sections 6.16.3;

"Exchange" means a BT site containing a main distribution frame with access to the metallic path; and

"Vacation Exchanges" means any Exchange identified on the list delivered to Ofcom under section 6.22.

6.16.2 The Undertakings in these sections 6.16-6.23 are given on the basis that BT will be deemed to be acting reasonably if its actions are materially consistent with its corporate property strategy and its objectives for NGN deployment.

6.16.3 The Estimated Space Availability Details will be provided by BT by the November 1st preceding the next BT financial year for which the BT corporate property strategy applies.

6.16.4 BT may invite the Communications Providers Property Users Group to submit by the 1 January preceding the next BT financial year for which the BT corporate property strategy applies, written observations to BT concerning the Estimated Space Availability Details.

6.16.5 BT will consider reasonable observations provided under section 6.16.4 as part of the BT corporate property strategy, when planning future use of Exchanges, provided that the effect of the observations would not materially affect BT's right to carry out its bona fide business requirements or its right to reduce its bona fide costs of managing and maintaining the Exchanges.

6.17 Within six months of these Undertakings taking effect and on an on-going basis thereafter and subject to sections 6.18-6.23 below, BT shall provide other Communications Providers with the facility to occupy on reasonable commercial terms a Communications Provider Operational Area within any Exchange for the purpose of locating their Equipment, provided that:

6.17.1 the request of the Communications Provider:

a) is made in proper written form and identifies the relevant Exchange in which the Communications Provider wishes to locate its equipment;

b) identifies the Equipment to be located in the Communications Provider Operational Area;

c) is made on reasonable notice prior to the date of proposed occupation having regard to any work that BT must reasonably carry out to provide the Communications Provider Operational Area; and

6.17.2 there is:-

a) sufficient space available at the relevant Exchange at the date of that request (including any future plans that BT has for use of the Exchange in connection with its business);

b) sufficient electrical power available at the relevant Exchange at the date of that request (including any

future plans that BT has for use of the Exchange in connection with its business); and

In any event BT may provide an Alternative Communications Provider Operational Area to the Communications Provider if it is reasonable to do so.

This section 6.17 does not apply to co-location as defined for the purposes of Metallic Path Facility and Shared Metallic Path Facility.

6.18 On receipt of the Communications Provider's request under section 6.17, BT will adopt a process similar to that used for co-location for the purposes of Metallic Path Facility and Shared Metallic Path Facility save that it will carry out a site survey to identify whether or not there is sufficient space at the Exchange including having regard to any future plans that BT has for use of the Exchange in connection with its business.

6.19 BT will seek to enter into an agreement with other Communications Providers on reasonable commercial terms that safeguard the operational integrity of the relevant Exchange including but not limited to obligations to comply with BT's standards on security, health and safety, access to buildings and non interference with either BT's equipment or equipment of other Communications Providers. The agreement may, at BT's discretion, provide for a Communications Provider to acknowledge that its rights to occupy the Communications Provider Operational Area do not amount to a tenancy and that there is no intention to create a lease. If the Communications Provider does not contract to locate its equipment at the BT site with one month of BT offering reasonable commercial terms under sections 6.19 and 6.23 the Communications Provider's request under section 6.17 will be deemed withdrawn.

6.20 BT may at its discretion charge a Communications Provider a sum equivalent to the amount that BT would charge per square metre to another part of BT plus all reasonable costs in creating and in providing the Communications Provider Operational Area.

6.21 BT may require that any Equipment must meet appropriate standards including, but not limited to, ETSI and ISO 14001 standards.

6.22 Within six months of these Undertakings taking effect, BT will deliver to Ofcom a list of Exchanges that it intends to vacate in accordance with its property strategy (such list will not be published). BT will inform any Communications Provider requesting to occupy a Vacation Site before the Communications Provider deploys its equipment at the site that it is a Vacation Site and the proposed date of vacation. Subject to BT complying with its obligations under this section 6.22, the Communications Provider will vacate that site on or before the proposed vacation date and will not be entitled to any compensation from BT, except where existing SMP Conditions, directions or contractual terms apply. BT will have the right to amend that list once every six months during the period of these Undertakings and such amended list shall be sent to Ofcom.

6.23 It will be part of the reasonable commercial terms offered by BT under section 6.19 that if any Communications Provider seeks to remain in an Exchange after BT has vacated the Exchange then the Communications Provider will fully indemnify BT against all compensation, damages, actions, costs and claims howsoever arising under the terms of the BT and Telereal property transaction completed on 13th December 2001.

7. Contract management mechanism

7.1 BT will work with Ofcom and other Communications Providers to set up, within 6 months from the date these Undertakings take effect, an effective mechanism to deal with issues surrounding terms and conditions relating to SMP Products, it being noted that the mechanism will not apply to certain types of contractual provision.

8. Separation of upstream and downstream businesses

8.1 BT shall maintain an organisational separation between a division other than ASD which is predominantly concerned with providing upstream products and services ("the upstream division") and divisions which are predominantly concerned with providing End-Users with downstream products and services ("the downstream divisions"). BT will maintain a strong organisational separation of people, Commercial Information and Management Information Systems, between the sales functions of the upstream division and the sales functions of the downstream divisions so that:

8.1.1 the sales functions of the downstream divisions are not in a position to influence the Commercial Policy of the upstream division otherwise than through mechanisms and processes identical or similar to those available to other Communications Providers;

8.1.2 Customer Confidential Information of the upstream division is not disclosed by its sales function to sales functions of the downstream divisions other than with the customer's consent; or

8.1.3 Commercial Information of the upstream division is not disclosed by its sales function to the sales functions of the downstream divisions otherwise than through mechanisms and processes identical or similar to those available to other Communications Providers.

8.2 Communications Providers who are eligible to be account-managed by BT in accordance with eligibility criteria to be published by BT shall be account managed by either BT's upstream division or downstream divisions as referred to in section 8.1 according to their choice and they will experience no disadvantage, in terms of price, service, or quality, or product range by being managed by BT's upstream division.

8.3 BT shall ensure that other Communications Providers, wishing to purchase products and services from BT, are not obliged to deal with the downstream divisions as referred to in section 8.1 in relation to such

purchases, where such products or services are inputs to products or services that they shall offer to End-Users in competition with the downstream divisions. In such circumstances BT shall ensure that other Communications Providers shall be able, in dealing with the upstream division as referred to in section 8.1 in relation to the purchase of products or services, to purchase them on exactly the same terms and conditions (including price) as offered by the downstream divisions, save where differences are trivial or where there are material differences between the products and services that the downstream divisions supply and the products and services that the upstream division supplies. For the avoidance of doubt, nothing in this section 8 shall of itself require BT to supply products or services which are not within a market in which BT has been determined by Ofcom as having SMP.

8.4 BT shall logically separate its systems which hold Commercial Information and Customer Confidential Information between ASD and BT's upstream and downstream divisions as referred to in section 8.1, by the IBMC date for Wholesale Analogue Line Rental given in Annex 1. BT will use its reasonable endeavours to achieve such logical separation earlier.

8.5 Except in the case of those nominated individuals, and individuals occupying the roles and functional areas set out in Part A of Annex 2, BT employees in the downstream divisions as referred to in section 8.1 may not directly or indirectly unduly influence or attempt to unduly influence the Commercial Policy of BTWS or BTS, except through mechanisms and processes identical or similar to those available to other Communication Providers. This shall not exclude the provision of information to or provision of expert advice to BTWS or BTS where these are so required.

8.6 Where BT's downstream divisions require changes or enhancements in SMP Products or BTS products described in section 6.1.2, these requirements will be addressed by a Statement of Requirements Process, as used by other Communications Providers. BTWS and BTS will ensure this operates without undue discrimination.

9. Code of Practice

9.1 Within three months of the date these Undertakings take effect, BT shall draw up and publish a Code of Practice, to be made available to all BT employees, which sets out how BT employees must act to ensure compliance with these Undertakings.

9.2 The Code of Practice shall include specific guidance for the BT employees in the following areas:

a) ASD;

b) BTWS;

c) BTS;

d) rest of BT Wholesale; and

e) Northern Ireland.

and those nominated individuals, and individuals occupying the roles and functional areas listed in Annex 2.

9.3 The Code of Practice shall make plain the rules set out in these Undertakings for access to, and dissemination of, Customer Confidential Information and Commercial Information, and the restrictions on influencing Commercial Policy of ASD, BTWS, BT Wholesale and BTS and, following appropriate union consultation in accordance with current agreements, make clear the disciplinary consequences of non-compliance. The Code of Practice shall also draw attention to BT's confidential telephone number and other access routes, established for general purposes and in accordance with the UK Combined Code on Corporate Governance, for reporting any concerns about BT's compliance with these Undertakings.

9.4 A programme of briefing and training shall be introduced on the launch of the Code of Practice, ensuring that all people in ASD, BT Wholesale, BTWS and BTS are aware of their responsibilities in ensuring that BT comply with these Undertakings.

9.5 BT's mandatory compliance and regulatory training for all its employees shall cover compliance with these Undertakings and the Code of Practice.

10. The establishment of an Equality of Access Board

10.1 BT shall, within six months of these Undertakings taking effect, establish an EAB, consisting of five people, namely three independent members, one BT Group plc non-executive Director and one BT senior manager. The independent members shall be appointed once BT, having consulted Ofcom, is satisfied there is no material conflict of interest, having taken into account whether such person is:

10.1.1 an employee or former employee of BT;

10.1.2 a director or senior executive of any other Communications Provider;

10.1.3 a partner or senior executive of any firm, company or other organisation providing consultancy services to BT or any other Communications Provider;

10.1.4 an employee of Ofcom; or

10.1.5 a material shareholder in BT Group plc or in any other Communications Provider.

10.2 The BT Group plc Chairman shall appoint the BT Group plc non-executive Director and the BT senior manager to the EAB, the BT senior manager being someone who is not within the ASD, the upstream division referred to in section 8.1 or the downstream divisions referred to in section 8.1.

10.3 The EAB shall be chaired by the BT Group plc non-executive Director.

10.4 Subject to receiving confirmation from BT that there is no material conflict of interest as referred to in section 10.1, the Chairman of the EAB shall appoint the three independent members following agreement with the BT Group plc Chairman (on behalf of the BT Group plc Board) and consultation with Ofcom.

10.5 BT shall consult Ofcom on any terms of reference for each EAB member and on the terms of appointment of each independent member.

10.6 The Chairman of the EAB, following agreement with BT Group plc Chairman and consultation with Ofcom, may remove the independent members of the EAB.

10.7 The BT Group plc Chairman, in consultation with Ofcom, may remove the Chairman of the EAB or the BT senior manager.

10.8 In the first 12 months of operation the EAB shall have between six and ten meetings. Thereafter the EAB shall meet as frequently as the EAB determines from time to time.

10.9 The role of the EAB is a general one of monitoring, reporting and advising BT on BT's compliance with these Undertakings and the Code of Practice, with a specific focus on the provision of products and services on an Equivalence of Inputs basis and the operation of ASD. It is not one of executive policy making for BT or any part thereof.

10.10 The minutes of each meeting of the EAB shall be sent to Ofcom within a reasonable time of each such meeting. Such minutes shall be a fair, true and accurate summary of each EAB meeting.

10.11 The EAB:

10.11.1 shall review the content of the Code of Practice;

10.11.2 shall review BT's performance against KPIs which relate to these Undertakings;

10.11.3 shall review reports of the EAO on complaints and complaint handling concerning BT's compliance with these Undertakings, including the conclusions of investigations into those complaints;

10.11.4 shall review complaints regarding these Undertakings made by BT employees to BT's confidential helpline and access routes established for general purposes in accordance with the UK Combined Code on Corporate Governance;

10.11.5 shall have the right to review any reports produced by the EAO;

10.11.6 may, of its own initiative, review any aspect of BT's compliance with these Undertakings; and

10.11.7 may, of its own initiative, review, or request the EAO to investigate, any other issue concerning these Undertakings.

10.12 The EAB shall be responsible for monitoring and reviewing the product roadmaps and volume forecasts, as well as the associated investment decisions, as they relate to ASD and SMP Products.

10.13 The EAB will be informed of the SLAs set by ASD and may call for reports on performance against them. The EAB shall have oversight of compliance with these SLAs and may use its mechanisms for raising and progressing concerns to comment on the subject matter of SLAs, the levels at which SLAs are set or on performance delivered against them.

10.14 The EAB will review ASD's supply of products or services to other parts of BT in accordance with these Undertakings.

10.15 In respect of any of the activities described in sections 10.11 to 10.14 the EAB:

10.15.1 may suggest to BT remedial action to ensure compliance with these Undertakings. BT shall take due account of any suggestions or comments the EAB may have;

10.15.2 shall be informed of any action that BT has taken in relation to section 10.15.1 above. BT shall explain its conclusions and approach to the EAB;

10.15.3 may comment on any action BT has taken, comment on whether such action was appropriate in ensuring compliance and suggest further remedial action if necessary; and

10.15.4 shall record its view in the minutes of the appropriate EAB meeting. The EAB's annual report shall show summary details of such minutes, subject to commercial confidentiality.

10.16 BT shall inform the EAB of any breaches of these Undertakings that it identifies and the EAB secretary shall record such breaches in the minutes of the next meeting of the EAB.

10.17 The EAB shall inform Ofcom, within ten working days, when it comes to its attention that there has been a non-trivial breach of these Undertakings.

10.18 The EAB shall report regularly to the BT Group plc Board on BT's compliance with these Undertakings, with a particular focus on those sections of these Undertakings which concern the provision of products and services on an Equivalence of Inputs basis, the operation of ASD and the adequacy of existing reporting controls, including the scope of proposed KPIs.

10.19 BT shall report performance on appropriate KPIs. The EAB may review, from time to time, the matters which the KPIs shall cover. BT shall provide information on such KPIs to the EAB in a timely manner unless it has a reasonable reason for not doing so. The EAB shall pay

particular attention to proposed KPIs for migrations and for behavioural measures and may for these activities propose target performance levels. The ASD shall publish its performance against the KPIs on a quarterly basis. The first such publication shall be within three months of the establishment of the EAB.

10.20 In the event that there is a serious concern shared by some or all of the members of the EAB, the EAB shall have an escalation route via the EAB Chairman, ultimately to the BT Group plc Board. The EAB's annual report shall show summary details of any such escalations to the BT Group plc Board, subject to commercial confidentiality.

10.21 BT shall apply to the operation of the EAB those principles of the UK Combined Code on Corporate Governance which it considers appropriate and relevant.

10.22 The EAB shall be supported by the EAO, the resource for which shall be supplied by BT. The role of the EAO shall be to:

10.22.1 support the EAB on matters within the EAB's remit by analysing and reporting on the data provided on performance, by commissioning reviews, and conducting such other inquiries as the EAB may from time to time require;

10.22.2 consider any complaint brought to it by a Communications Provider that these Undertakings have been breached and report its decision to the EAB;

10.22.3 publish guidelines for dealing with such complaints. It shall inform Ofcom of any such complaints within a reasonable time of their receipt;

10.22.4 produce reports to the EAB on the nature, type and pattern of complaints from Communications Providers relating to these Undertakings; and

10.22.5 track and follow-up any complaints of breaches of these Undertakings made by BT people to BT's confidential helpline. It shall report any relevant findings to the EAB.

10.23 BT shall ensure that the EAO has reasonable access to information held by BT that it needs to fulfil its role, regardless of where such information may be held by, or within, BT.

10.24 The EAO shall be able to draw upon the expertise of functions within BT including from BT's Internal Audit and Compliance team and the office of BT's Company Secretary.

10.25 BT shall ensure that the EAO is resourced commensurate with the demands placed upon it and is able to operate with the level of independence required.

10.26 The EAB shall have no remit in respect of:

10.26.1 actions and activities conducted in respect of the Regulation of Investigatory Powers Act 2000 and any other legislation relating to national security or relations with a foreign government;

10.26.2 conduct of claims or litigation; and

10.26.3 for the avoidance of doubt, matters outside these Undertakings.

10.27 The EAB shall conduct an annual review of compliance with these Undertakings in their entirety in relation to BT's financial year, commencing with the relevant months of the BT financial year 2005/2006. Upon completion of such a review the EAB shall send a report to Ofcom, which shall include a detailed, accurate and complete account of:

10.27.1 performance against KPIs;

10.27.2 instances where a material breach of these Undertakings has been identified, and any steps taken as a consequence and including a summary of non-material breaches;

10.27.3 areas where it has a concern with regards to possible future breaches of these Undertakings, and the EAB considers that such concerns have not been addressed by BT;

10.27.4 steps BT has taken or is taking to ensure compliance with these Undertakings;

10.27.5 the adequacy of the governance measures in place to ensure compliance with these Undertakings;

10.27.6 how the report was compiled;

10.27.7 a summary of any documents (excluding any internal audit reports, legal advice or legally privileged documents) prepared for the EAO for the purposes of preparing the report that substantiate significant conclusions of the report. Such documents shall be supplied to Ofcom if so requested; and

10.27.8 whether the EAB had adequate resources at its disposal to discharge its duties pursuant to these Undertakings.

10.28 Once the review referred to in section 10.27 of compliance with these Undertakings has been approved by the EAB, the EAB shall offer a briefing on the report's findings to Ofcom.

10.29 Once the briefing on the report has been made to Ofcom, EAB shall publish in June each year a summary report (the 'EAB annual report') on its activities as a distinct part of BT's annual regulatory compliance report. It shall be made available on the BT website.

10.30 The EAB annual report shall be audited by independent external auditors.

10.31 BT shall use reasonable endeavours to include in its letter of engagement appointing the external auditors referred to in section 10.30, provisions acknowledging the acceptance by the external auditors of duties and responsibilities to Ofcom in respect of its audit work, audit report and audit opinion, subject to a liability limit to be agreed with Ofcom.

10.32 Nothing in these Undertakings shall require BT to publish confidential information.

10.33 The EAO shall report to the EAB on matters within the terms of reference of the EAB. Otherwise the EAO shall report as appropriate to the BT senior manager on the EAB and/or the BT Group plc Company Secretary.

10.34 The most senior person of the EAO and the EAB Secretary shall be appointed with the agreement of the EAB, save where the first such appointments occur before the establishment of the EAB and hence are made by BT.

10.35 The EAB will aim to reach decisions on a unanimous basis. Where it is unable to do so decisions will be made on a majority basis with the Chairman of the EAB having a casting vote and any dissent in relation to such a decision by an EAB member shall be noted in the minutes.

10.36 The EAB shall be quorate with 3 members present, one of which must be the Chairman of the EAB or his nominee. The BT senior manager shall also be entitled to nominate a replacement for him or her if he or she is unable to attend a meeting of the EAB.

10.37 BT shall review with Ofcom the operation of the EAB within 12 months of its establishment and thereafter as agreed in writing by Ofcom.

10.38 The EAB shall determine how best to engage with representatives of industry in order to understand their issues and concerns.

11. Next Generation Networks

No foreclosure of network access

11.1 BT shall supply other Communications Providers with Network Access using its NGN in Network Access markets in which, from time to time, BT is determined by Ofcom to have SMP. Such provision of Network Access shall not be conditional on the provision of another form of Network Access or another product or service, unless agreed by Ofcom.

11.2 The supply of Network Access covered by section 11.1 shall be on terms and conditions which allow other Communications Providers to compete effectively with end-to-end services which BT provides over its NGN.

11.3 Whilst constructing its NGN BT shall not make any network design decisions on network architecture the effect of which would be to prevent the provision of Network Access as described in section 11.1 to other Communications Providers, without first consulting with other Communications Providers. If such consultations suggest that demand may exist for a specific form of Network Access, BT shall enter into commercial negotiations with those Communications Providers interested in such Network Access and shall continue such negotiations for a period of up to three months, during which period BT will not implement any such design decisions to its NGN which would prejudice the outcome of these negotiations.

11.4 Section 11.3 shall not apply where:

11.4.1 the subject of the proposed design decision has previously been the subject of a consultation in accordance with section 11.3;

11.4.2 BT consulted with other Communications Providers and Ofcom but such consultations did not suggest demand existed for such Network Access; or

11.4.3 BT consulted with other Communications Providers and Ofcom, such consultations did suggest such demand existed for the particular form of Network Access, BT entered into commercial negotiations with other Communications Providers, but BT did not supply the particular form of Network Access and was not required to do so by Ofcom as a result of regulatory action initiated by Ofcom within two months of Ofcom receiving notice from BT that the relevant commercial negotiations with other Communications Providers had ceased; or

11.4.4 any request for Network Access made before or during the consultation referred to in section 11.3 is evidently frivolous or disingenuous.

Charges for SMP Products to be based on efficient design

11.5 Where charges for Network Access are required by an SMP Condition to be on a cost-orientated basis (however that requirement is expressed), and BT provides such Network Access using its NGN, BT shall set its charges for such Network Access on the basis of the costs it would have incurred in designing and building its NGN in the most efficient manner that could reasonably have been employed in order to provide such Network Access. This section shall not apply where:

11.5.1 section 11.4 applied and BT has complied with that section 11.4; or

11.5.2 BT consulted with other Communications Providers and Ofcom but such consultations did not suggest demand existed for the particular form of Network Access; or

11.5.3 BT consulted with other Communications Providers and Ofcom, such consultations did suggest such demand existed for the particular form of Network Access, BT entered into commercial negotiations with other Communications Providers, but BT did not supply the particular form of Network Access and was not required to do so by Ofcom as a result of regulatory action initiated by Ofcom within two months of Ofcom receiving notice from BT that the relevant commercial negotiations with the other Communications Providers had ceased; or

11.5.4 Ofcom sets a charge or charge control for the relevant form of Network Access pursuant to the Communications Act 2003.

Provision of Network Access on an Equivalence of Inputs basis

11.6 BT shall build its NGN and associated systems in such a manner as to ensure that other Communications Providers can purchase from BT Network Access on an Equivalence of Inputs basis.

11.7 Where BT provides Network Access using its NGN, it shall do so on an Equivalence of Inputs basis.

11.8 Sections 11.6 and 11.7 shall apply only to Network Access in markets in which;

11.8.1 from time to time Ofcom has determined that BT has SMP; or

11.8.2 BT may reasonably expect to be determined that BT has SMP because:

a) the market is the immediate successor to a market or markets in which BT has previously been determined by Ofcom to have SMP; and

b) the SMP which Ofcom has previously determined BT to have is of an enduring nature.

11.9 Sections 11.6 and 11.7 shall not apply where it would not be reasonably practicable to provide Network Access on an Equivalence of Inputs basis.

No retail services to be launched without associated wholesale inputs

11.10 Where BT launches a new product or service for End-Users which makes use of its Network Access provided by means of BT's NGN, it shall ensure that such Network Access is made available to other Communications Providers sufficiently in advance of the launch of such new product or service so that such other Communications Providers are able to launch competing products or services to End-Users at the same time as BT. For the avoidance of doubt, except where BT undertakes to provide products or services on an Equivalence of Inputs basis, the ASD or the upstream division referred to in section 8.1 can

deliver Network Access using BT's NGN to the downstream businesses referred to in that section as they see fit, provided that those downstream businesses experience the same charging regime and functionality as experienced by other Communications Providers.

11.11 Section 11.10 shall apply only to Network Access in markets in which:

11.11.1 from time to time Ofcom has determined that BT has SMP; or

11.11.2 BT may reasonably expect to be determined that BT has SMP because:

a) the market is the immediate successor to a market or markets in which BT has previously been determined by Ofcom to have SMP; and

b) the SMP which Ofcom has previously determined BT to have is of an enduring nature.

Industry group

11.12 Insofar as a multilateral industry group is established to agree key aspects of the transition from existing public switched telephone networks (PSTN) to NGN networks, and this industry group is endorsed by Ofcom, BT agrees to participate in that group. Subject to agreement by other industry participants, BT agrees that the group may have authority to do the following:

11.12.1 Produce a reference interconnection architecture, setting out the manner in which NGN networks are expected to interconnect with each other;

11.12.2 Produce a transition plan setting out the detailed process for managing the transition from PSTN to NGN networks, including the process for migrating PSTN interconnection to NGN interconnection;

11.12.3 Produce a communications plan setting out how this transition will be communicated to End-Users; and

11.12.4 Oversee the actual transition, taking any such action as may be necessary in order to ensure that the above plans are achieved.

11.13 For the avoidance of doubt, the group referred to in section 11.12 will not be responsible for, nor have authority over, managing the deployment by BT of its NGN, nor can its actions have the effect of materially delaying such deployment, except with the agreement of BT.

11.14 In the absence of such a new industry-agreed group, issues related to SMP Products impacted by BT's NGN, will continue to be managed through the existing Consult21 process and technical standards issues will continue to be managed through the Network Interoperability Consultative Committee.

Operational dispute adjudicator

11.15 Insofar as an operational dispute adjudicator scheme is established by Ofcom following consultation with BT and other Communications Providers as to his terms of reference, for fast-track binding adjudication of operational disputes in relation to BT's NGN as a form of alternative dispute resolution (ADR), BT agrees to participate.

11.16 Such operational dispute adjudicator shall not deal with:

11.16.1 disputes which materially affect the initiating operator's business case associated with specific products, markets, or providers, including:

a) pricing; and

b) contractual terms; or

11.16.2 matters which materially affect the policy framework established by Ofcom; or

11.16.3 disputes whose outcome is likely to result in significant operational disruption or financial expenditure.

11.17 Such operational dispute adjudicator scheme will enable any Communications Provider, including BT, within two months of an operational issue arising in the context of BT's NGN implementation plan, including transition, relating to that Communications Provider to refer operational disputes to this adjudicator for a time-limited binding decision. The nature of the time-limited decision shall be such that only the directly affected parties may file a dispute and all disputes must be resolved within 4 weeks. Following the resolution of a dispute, if further disputes are submitted addressing the same or similar points, BT can elect to bypass the operational dispute adjudicator scheme and refer directly to Ofcom.

Compensation arrangements

11.18 The principles BT will use in making compensation to a Communications Provider taking Network Access from BT as part of BT's implementation of NGN for network costs necessarily borne by such Communications Provider taking Network Access as a result of notified planned changes to access and interconnection arrangements will take into account:

a) the extent to which these changes are unilaterally decided by BT without industry agreement;

b) the distribution of benefits that accrue from these changes;

c) the asset life of any legacy interconnect equipment employed at the time of the change;

d) the extent to which new investment of assets which cannot be re-employed is reasonably and justifiably made by a Communications

Provider after it has been made aware of forthcoming changes; and

e) the additional cost necessarily and directly incurred as a result of having to bring forward investment in new interconnect equipment.

"**Broadband dialtone"**

11.19 BT shall ensure that no Communications Provider, to which it supplies Metallic Path Facilities or Shared Metallic Path Facilities, suffers a material competitive disadvantage to its products or services based on such Metallic Path Facilities or Shared Metallic Path Facilities solely as a result of BT's software-controlled migration between products or services made possible by its NGN.

NGN implementation

11.20 This section 11 contains all BT's specific obligations by virtue of these Undertakings in relation to the development and deployment of its NGN. Subject to the provisions of this section 11, nothing in these Undertakings shall impede the flow of information reasonably required to enable BT to design, build and operate its NGN or the decision-making process relating thereto.

12. Information requests

12.1 Where, following consultation with BT on the draft of such a request, Ofcom make a proportionate request in writing for information reasonably necessary for Ofcom to monitor these Undertakings, BT shall provide such information to Ofcom within a reasonable period, being not less than 15 working days, and which is reasonable having regard to the seriousness and urgency of the matter, of the request being received.

13. Co-operation

13.1 Where a request for information is received by BT under section 12 the reckless or deliberate provision to Ofcom of false or misleading information shall be deemed to be a breach of these Undertakings.

14. Directions

14.1 Where Ofcom:

14.1.1 has given BT a notification that it has reasonable grounds for believing that BT has breached any of these Undertakings, which specifies the Undertaking or Undertakings concerned and setting out its reasons and enclosed a draft of a direction which may specify or describe steps to be taken by BT for the purpose of securing compliance with the Undertaking or Undertakings concerned;

14.1.2 has allowed BT a reasonable period, being a period of at least one month, to make representations to Ofcom following receipt of such notification; and

14.1.3 having considered any representations BT has made, is satisfied that BT is in breach of one or more of these Undertakings and has given BT a direction with reasons which may specify or describe steps to be taken by BT for the purpose of securing compliance with the Undertaking or Undertakings referred to in that section,

BT shall within two weeks of receipt of the direction give notice to Ofcom that it either:-

a) accepts the direction; or

b) declines to accept the direction and for the avoidance of doubt in such case the direction shall be of no effect.

14.2 Where under section 14.1 BT accepts a direction it shall comply with the same. For the avoidance of doubt, if BT fails to comply with a direction it has accepted, it shall be in breach of these Undertakings.

14.3 For the avoidance of doubt, no prior finding, or direction under section 14.1 above, is required by Ofcom for BT to be in breach of these Undertakings.

15. **Breach of these Undertakings**

15.1 For the avoidance of doubt, where in these Undertakings BT must obtain Ofcom's agreement before acting in a particular manner, but fails to do so, it shall be in breach of these Undertakings.

15.2 Where in these Undertakings there is any matter which requires Ofcom's consent or agreement such consent or agreement shall not be unreasonably withheld or delayed.

16. **Compliance with other legal requirements**

16.1 Compliance with these Undertakings does not affect the duty on BT and its respective directors and officers to comply with any of its obligations under:

a) the Competition Act 1998;

b) the Communications Act 2003;

c) the Companies Act 1985, as amended,

d) the Companies (Audit, Investigations and Community Enterprise) Act 2004; and

e) any other law or enactment in any jurisdiction.

17. Variation of these Undertakings

17.1 BT and Ofcom may, from time to time, vary and amend these Undertakings by mutual agreement.

18. Expiry and termination

18.1 These Undertakings will automatically terminate in the event that a market investigation reference is made to the Competition Commission under the Enterprise Act 2002 and the Competition Commission determines remedies to address any findings by it in respect of the reference, unless the reference relates wholly or mainly to features of the market other than those addressed by these Undertakings.

18.2 Subject to sections 6.4.3 and 6.15 any commitments made under these Undertakings in respect of any SMP Products apply only for such time and to the extent that such SMP Products are required to be supplied as a result of a finding of SMP.

18.3 The entirety of these Undertakings shall no longer apply if, at at any point in time, BT is not the subject of any determination by Ofcom that it has SMP in any market connected with Network Access. These Undertakings will cease to apply to the extent that, in the case of any geographical area, BT is not the subject of any determination by Ofcom that it has SMP in any market connected with Network Access in relation to that area. In either case, BT will give Ofcom notice that the Undertakings have ceased to have effect, or the extent to which this is the case, as the case maybe.

18.4 BT shall be entitled at any time to make representations to Ofcom with a view to Ofcom undertaking a review of these Undertakings to determine whether and if so to what extent they should cease to apply.

19. General

19.1 For the avoidance of doubt nothing in these Undertakings shall automatically amend BT's contracts with other Communications Providers.

19.2 Nothing in these Undertakings shall prevent BT from complying with applicable laws and regulations and in particular nothing shall inhibit the provision of information to any person in BT who requires that information for the purpose of matters relating to the Regulation of Investigatory Powers Act 2000 or any other matters relating to national security, or otherwise prevent BT from doing anything necessary in connection with national security.

19.3 These Undertakings apply in so far as BT is not prevented from complying owing to a matter outside its reasonable control.

19.4 For the avoidance of doubt nothing in these Undertakings affects the participation of BT people in the various BT pension schemes.

20. **Effective date of these Undertakings**

20.1 These Undertakings take effect on the date that, having been signed by BT, they are accepted and dated by Ofcom.

Signed for and on behalf of British Telecommunications plc:

Signature: - - - - - - - - - - - - - - - - - -

Name: - - - - - - - - - - - - - - - - - -

Position: - - - - - - - - - - - - - - - - - -

Date: - - - - - - - - - - - - - - - - - -

Accepted for and on behalf of Ofcom:

Signature: - - - - - - - - - - - - - - - - - -

Name: - - - - - - - - - - - - - - - - - -

Position: - - - - - - - - - - - - - - - - - -

Date: - - - - - - - - - - - - - - - - - -

Annex 1

Equivalence of Inputs Timetable

1. For Wholesale Analogue Line Rental, the RFS date will be 30 June 2007 and the IBMC date in relation to BT's retail analogue line rental service will be 30 June 2010. The following intermediate staged milestones between the RFS date and that IBMC date will apply in respect of Wholesale Analogue Line Rental:

    a) 30% of BT's relevant installed End-User base will have been migrated to the Equivalence of Inputs product by 30 June 2008;

    b) 70% of BT's relevant installed End-User base will have been migrated to the Equivalence of Inputs product by 30 June 2009.

2. For Wholesale ISDN2 Line Rental, the RFS date will be 30 September 2007 and the IBMC date in relation to BT's retail ISDN2 line rental service will be 31 March 2009.

3. For Wholesale ISDN30 Line Rental, the RFS date will be 31 December 2007 and the IBMC date in relation to BT's retail ISDN 30 line rental service will be 31 December 2009.

4. For Wholesale Extension Service, the RFS date will be 30 September 2006, and the IBMC date in relation to BT's relevant retail Ethernet-based local area network extension service will be 31 March 2007.

5. The RFS date for Shared Metallic Path Facility will be 30 June 2006. The IBMC date in relation to asymmetric IPStream will be 31 December 2006.

6. The RFS date for Metallic Path Facility will be 30 June 2006. The IBMC date in relation to symmetric IPStream will be 31 December 2006.

7. For IPStream the RFS date will be 31 December 2005 and the IBMC date in relation to BT's relevant retail broadband service will be 31 December 2006.

8. For Backhaul Extension Service BT will have Equivalence of Inputs capable systems in place by 30 September 2006.

9. BT shall by 30 September 2006 launch a Wholesale Extension Service Backhaul Product which shall be offered on an Equivalence of Inputs basis with 30 September 2006 as its RFS date. Once that product is more fully defined BT will agree an IBMC date with Ofcom.

Annex 2

PART A

Any member of the board of directors of BT Group plc, and British Telecommunications plc, or the Company Secretary of either Company.

Any member of a committee of the Board of BT Group plc including the BT Group Operating Committee

Group General Counsel

Legal and Regulatory

Group Strategy

Group Risk & Insurance

Head of Ethics/Business Practices

Group Portfolio

Group Commercial Policy Forum

Procurement

The following areas in Group Finance:

- Group Financial Control
- Group Treasury
- Group Tax
- Group Reporting, Planning and Analysis, and Controller BT Group
- Group Corporate Finance
- Commercial and Regulatory Finance

And in all cases their equivalents in BT Northern Ireland.
And in all cases their relevant external advisers, subcontractors and agents.

PART B

Any member of the EAB and the EAO, including the EAB secretary

External Auditors

External Quality Assurance

Finance

Internal Audit

Compliance

Human Resources

Group Information

BT Property

Group Technology (including development)

Any Assistant Company Secretary & Board Secretariat

Press, communications, media and investor relations

Billing Centre of Excellence

Security

And in all cases their equivalents in BT Northern Ireland.

And in all cases their relevant external advisers, subcontractors and agents.

Annex 3

Leased lines

1. The leased lines products to which paragraphs 2 to 8 below will apply are the following products offered by BT at the date these Undertakings take effect:

   1.1 Netstream private circuits;

   1.2 Analogue private circuits;

   1.3 Kilostream private circuits;

   1.4 Megastream digital private circuits, up to and including 45Mb/s; and

   1.5 Variants of the above which are used to provide enhanced resilience.

2. BTS will appoint a senior product manager who will be responsible for ensuring that BTS complies with paragraphs 3 to 8 below of this Annex 3.

3. It will be the responsibility of BTS to develop, manage and offer variants of the leased lines products set out in paragraph 1 above which are intended to meet the reasonable requirements of its customers who are Communications Providers.

4. BT will proactively consult and engage with its customers who are Communications Providers in order to seek out their requirements in relation to leased line products. BT shall ensure that within 4 months of the coming into force of these Undertakings BT has identified if and how those Communications Providers' customers consider that the current leased lines products offered by BT do not adequately meet their reasonable needs, and the enhancements they would consider appropriate.

5. Communications Providers will remain free to purchase the variants of BT's leased lines products which are offered by BT's downstream divisions as referred to in section 8.1 should they so wish.

6. Communications Providers will be eligible to migrate leased lines described in paragraph 1 of this Annex 3 which they have purchased, prior to BTS offering new leased lines variants, through BT's downstream divisions as referred to in section 8.1 to any new leased lines variants offered by BTS without charge or penalty. For the avoidance of doubt, if, after a Communications Provider has migrated a leased line purchased from BT's downstream divisions as referred to in Section 8.1 into a leased line variant offered by BTS, and prior to the termination of the contract period, it then migrates that BTS supplied leased line product to another leased line product, BT will be entitled to charge a reasonable fee both for the migration to the other leased line product and for the prior migration to the leased line product offered by BTS.

7. It is not BT's intention that any leased lines product variants to be offered by BTS should be any form of intermediate product between Partial Private Circuits and retail leased lines.

8. BTS will undertake a review of the progress it has made towards development of leased lines product variants that meet the reasonable needs of Communications Providers approximately six months after the creation of BTS and shall share the findings of its review both with Ofcom and with those Communications Providers who were consulted in accordance with paragraph 4 of this Annex 3.

Annex 4

Equipment

a) Access network termination equipment

b) Broadband servers

c) Video servers

d) Aggregation equipment for backhaul

e) Any additional equipment identified following consultation with the Communications Providers Property Users Group and agreed in writing with Ofcom

Save that no equipment may be located at any Exchange that would cause BT to breach the restrictions contained in Clause 3 of the Master Site Agreement dated 15 November 2000 made between (1) BT and (2) Crown Castle UK Limited.

Annex F

Structural features and BT's incentives

F.1 This Annex examines in more detail the key structural features that are shared by each of the relevant markets identified in Annex D that in Ofcom's opinion provide BT with the incentive and ability to discriminate against its downstream competitors.

F.2 The Annex is organised as follows:

- firstly, we explain why we believe BT to have upstream market power in the provision of certain fixed infrastructure or network services, and why we consider that this market power is likely to be enduring;
- secondly, we describe BT's vertically integrated structure and why we consider that BT is likely to retain this structure for the foreseeable future; and
- thirdly, we discuss why we believe the combination of these features gives BT the ability and incentive to discriminate against its downstream competitors.

BT's persistent market power in upstream services

F.3 Since BT's privatisation in 1984 and the subsequent pro-competitive policies by Oftel and Ofcom, an increasing number of fixed telecom downstream markets have been opened up to competition, such as retail call services and internet access. However, most new competitors still heavily rely on upstream inputs provided by BT, and in particular on access and backhaul services.

F.4 Ofcom considers that BT retains a substantial degree of market power in all of the upstream markets mentioned in Annex D. For example, in all the wholesale markets listed in Annex D for which market reviews for the purpose of considering the need for ex ante regulation have been undertaken, BT has been found to have Significant Market Power (SMP).

F.5 Ofcom considers that the degree of market power currently enjoyed by BT in the provision of access and backhaul network services is not, and will not in the foreseeable future be sufficiently constrained by changes in demand and supply conditions related to:

- existing technologies; or
- new technologies.

F.6 We consider each of these below.

Existing technologies

F.7 There are a number of network operators who do not rely on BT for the provision of upstream inputs. These include cable, mobile, Metropolitan Access Network (MAN) providers and fixed wireless network operators. We discuss each of these below.

F.8 Cable companies have rolled out their own access network infrastructure to about half of the UK population. This network rollout has predominantly focused on the large and densely populated areas of the country, and Ofcom does not believe it is likely to be extended further in any significant way in the forseeable future. As a result, cable networks are not likely to come anywhere near to the current degree of geographical coverage of BT. We discuss in Annex D the reasons why cable is unlikely to be a sufficient demand or supply side constraint to BT's upstream market power in access and backhaul services.

F.9 Mobile networks could in principle provide a substitute to fixed access networks for some fixed narrowband services. However, when defining markets for the purpose of assessing the need for ex ante regulation, Ofcom considered that mobile networks pose an insufficient competitive constraint on fixed services, and that fixed and mobile access services are in separate economic markets. We further believe that these products are not yet close to being economic substitutes to fixed access networks.

F.10 Future competition by suppliers using similar technologies to BT is also unlikely to constrain BT's upstream market power in the foreseeable future. There are large fixed and sunk costs in installation of such networks, such as putting up poles, digging trenches, building ducts, or laying conduit, and servicing or maintaining network facilities. This is particularly the case for local access networks, which are the most difficult facility for any potential competitive operator profitably to replicate. There are also substantial fixed costs associated with the Main Distribution Frame (MDF) sites in terms of building and property costs. These costs are largely sunk and could pose a significant barrier to entry for a new entrant trying to find building space in dense areas and with a small share of the market.

F.11 A number of BT's competitors have deployed their own infrastructure to provide telecoms services to business customers in some locations. These operators use a variety of access technologies including fibre and fixed wireless technologies. However, none of these networks have come anywhere near to the current degree of geographical coverage of BT; many being restricted to central business districts in large metropolitan areas.

F.12 A similar picture emerges for the provision of backhaul services. While BT supplies services reaching all 5,500 of its own local exchanges, Ofcom estimates that competing providers currently only reach around 5% of BT's access sites. These sites are typically the major urban sites where the concentration of traffic is such that it is economically viable for a network operator to build a new connection.

New technologies

F.13 Ofcom also believes that new technological developments are unlikely in the foreseeable future to change the conclusions reached above. Below we

set out our reasons for this by examining the prospects for technological developments relating to access and backhaul networks.

Access networks

F.14 Ofcom considers that any new technology whose introduction constrained BT's upstream market power would be most likely to be a broadband technology. Most, if not all, broadband technologies are expected to support also narrowband retail services. Furthermore, with the ability to carry voice traffic over broadband networks using technology such as voice over IP, new narrowband access technologies do not typically appear commercially attractive.

F.15 In a number of market reviews related to access markets, and in particular the Review of Wholesale Broadband[25], Ofcom identified a number of alternative access technologies which could deliver broadband Internet access and at the same time narrowband services. These were:

- broadband fixed wireless access (BFWA);
- broadband satellite access (BSA);
- fibre to the home (FTTH);
- 3G and other mobile wireless systems; and
- other technologies.

F.16 Ofcom's conclusion was that, even in aggregate, these technologies did not offer, nor were they likely to offer, a sufficient potential constraint on BT's market power in the foreseeable future.

Backhaul networks

F.17 While the economies of scale and perhaps the proportion of sunk costs may be slightly less marked in backhaul services than for the access network, the homogeneous nature of backhaul services could influence the type of competition post entry. In particular, with very limited scope for product differentiation, competition is likely to largely focus on price, even in the presence of a limited number of firms. In the presence of an incumbent with significant economies of scale and lower costs, this is thus likely to make the profit opportunity and the likelihood of entry slim.

F.18 Ofcom considers that there is little prospect for technological developments to change this conclusion.

F.19 Most technology developments in backhaul networks are related to delivering ever higher data rates over a fibre infrastructure. Whilst the cost per bit carried is likely to continue to fall rapidly, the cost to install the fibre infrastructure itself is not likely to, and will be largely similar to that of existing technologies. The level of sunk costs required is likely therefore to continue to discourage entry.

[25] http://www.ofcom.org.uk/consult/condocs/wbamp/wholesalebroadbandreview/.

F.20 The only realistic alternative to fibre for building a large scale backhaul network are wireless technologies; in most cases using a point-to-point architecture. Such wireless systems are already used extensively by BT, most notably to backhaul traffic from mobile base station sites too remote to be connected to its wired infrastructure. Some mobile operators have used the same technology to build their own backhaul networks so it is clearly viable, at least for some applications. However, compared with fibre backhaul, wireless systems become capacity-constrained at lower levels of traffic. While this is not a concern for the relatively low amounts of traffic from mobile base stations catering mainly for voice traffic, it is likely to be a limiting factor for conveying larger amounts of data for broadband and leased line customers.

BT's vertically integrated structure

F.21 BT is a vertically integrated group. It provides services in both the upstream markets identified in Annex D in which it has market power, and also in those directly related downstream markets in which it competes with rivals which have to rely on upstream inputs supplied by BT.

F.22 Ofcom believes that there is nothing to suggest that BT's current structure will change in the foreseeable future. As we discuss below, in the absence of the undertakings discussed in this document, Ofcom considers that this structure provides BT with the ability profitably to discriminate against downstream competitors.

BT's incentives and ability to discriminate

F.23 Ofcom believes that the combination of BT's enduring upstream market power and its vertically integrated structure give it the incentive and the ability to discriminate against competitors in downstream markets. This is because a vertically integrated firm will seek to maximise the profits of its combined upstream and downstream businesses. Under many circumstances, a vertically integrated firm with upstream market power will achieve this by discriminating against downstream competitors in this way. Were BT to act on this incentive, it would put its downstream competitors at a disadvantage and ultimately harm final consumers.

F.24 In theory, discriminating against downstream competitors will under most circumstances[26] deliver two benefits to a vertically integrated firm with upstream market power:

- capturing downstream profits. Discriminating against downstream competitors is likely to reduce the intensity of competition from downstream competitors, allowing the vertically integrated firm to earn higher profits downstream by raising prices, or increasing market share, or both; and

[26] The economic literature (Chicago School) suggests that when the downstream market is perfectly competitive the incentive to behave anticompetitively and leverage upstream market power disappears. This is because under the theoretical assumption of perfect downstream competition (and other assumptions such as strict complementarity between upstream and downstream inputs) there are no supra normal profits or rents to be gained by leverage. This result, however, no longer holds when these assumptions and in particular that of the theoretical model of perfect competition is relinquished.

- protecting upstream market power. Discriminating against downstream competitors could prevent the emergence of strong downstream competitors which could in future enter the upstream market, threatening at least in part the position of market power of the vertically integrated firm in upstream markets.

F.25 As we explain below, these incentives are particularly strong where a vertically integrated firm has tight price controls on its upstream inputs.

F.26 The term "discrimination" is used here to cover all types of discriminatory behaviour: price discrimination as well as non-price discrimination. It is often difficult to distinguish between the two, as is noted in general terms in the OFT Draft Guidelines on Assessment of conduct. For example, the OFT concludes that the same anticompetitive effect could be obtained by discriminating either by raising the price of a service of a given quality, or by reducing the quality of a service for a given price.[27]

F.27 Ofcom recognises that price and non-price discrimination are not *per se* anticompetitive. This is in line with the OFT Draft Guidelines on Assessment of conduct which conclude that an assessment of whether or not discriminatory behaviour could be anticompetitive should be undertaken on a case-by-case basis[28]. In some instances, it could be beneficial if, for example, it leads to a sufficiently large increase in output in relation to the output level that would have arisen in the absence of price discrimination. Indeed, in some cases, price discrimination may allow a new market or market segment to emerge. However, when it is used anti-competitively to reduce existing or potential competition (exclusionary abuses), then it is of considerable concern. In particular, Ofcom believes that when discrimination takes place in intermediate or upstream markets by a supplier which is vertically integrated and has operations in downstream markets, the anticompetitive effects of discrimination are heightened.

F.28 Ofcom's concerns focus in particular on non-price discrimination, which involves downstream competitors being supplied with lower quality upstream inputs than are provided to the downstream divisions of a vertically integrated firm. This is because the concerns relating to price discrimination may be dealt with by Ofcom's ex ante powers, which allow it to set price levels charged by suppliers who have SMP in particular markets. In most cases, Ofcom can relatively easily monitor whether these prices are being charged, and therefore whether the ex ante regulation is

[27] OFT, Assessment of conduct - Draft competition law guidelines for consultation, OFT414a, April 2004, paras 3.1 to 3.10.

[28] "When considering whether price discrimination is an abuse, it is often relevant to consider whether the pricing structure in question allows the efficient recovery of fixed costs and expands demand substantially or opens up new market segments. For example, undertakings often have fixed costs of production (costs which do not vary directly with output, at least in the short run). This means that they will usually need to set at least some prices above their average variable costs to generate sufficient revenues to break even (i.e. earn normal profit). In this case, price discrimination can be beneficial if it leads to a sufficiently large increase in output in relation to the output level that would have pertained if there was no price discrimination. Indeed, in some cases price discrimination may allow a new market segment to emerge. This might occur, for example, in industries characterised by relatively high fixed costs, where customers can be split up into groups according to their willingness to pay, and where groups with low willingness to pay would not buy in the absence of price discrimination. Just because price discrimination can be beneficial does not mean that the chosen form of price discrimination adopted by a dominant undertaking in that industry is presumed beneficial. Price discrimination will be assessed on a case-by-case basis." OFT, op. cit., paras 3.6 to 3.8.

being complied with. Ofcom can in principle also use its ex ante powers to put in place a non-discrimination obligation designed to restrict non-price discrimination. However, as we illustrate in Annexes G to K, it has proved much harder for Ofcom to identify, and subsequently to verify, whether non-price discrimination is taking place.

F.29 In addition, a vertically integrated firm with upstream market power may have more incentive to engage in non-price discrimination than price discrimination, as price discrimination may involve it forgoing short term profits. The incentives for a vertically integrated firm with market power to engage in discrimination are present even when engaging in non-price discrimination is costly for the firm. Moreover, Ofcom notes that these incentives would be even stronger for BT if by engaging in discriminatory behaviour, it was to save rather than incur costs.

F.30 Therefore, Ofcom considers that, under most circumstances, a vertically integrated firm with upstream market power has an incentive to discriminate against its downstream competitors, and were it to act on this incentive, it is likely that non-price discrimination would be an anti-competitive and welfare-reducing activity.

F.31 Ofcom is aware that at times non-price discrimination might occur without an explicit intent to harm or hamper competitors. For example, BT's systems or procedures might have in the past been set up or designed without the ability to cater for third party use or access. However, Ofcom believes that even when discriminatory behaviour does not originate from intentional behaviour, it has the effect of hampering downstream competitors' ability to compete, and therefore leads to a detriment for final consumers.

Factors strengthening BT's incentives to discriminate

F.32 Ofcom has identified a number of factors that could strengthen the incentives of a firm in BT's position to discriminate against downstream competitors. Taking the example of a vertically integrated monopolist, who sells wholesale inputs also to a number of downstream competitors and is subject to price controls and an obligation not to discriminate, the incentive to engage in non-price discrimination increases if a number of factors exists:

- if price regulation of the upstream input is tight;
- the higher the downstream profit opportunity;
- the higher the degree of substitutability between the vertically integrated and the competitors' downstream products; and
- the more efficient and the less capacity constrained the vertically integrated firm's downstream division is.

F.33 Below we examine the extent to which each of these applies to a firm in BT's position.

F.34 First, when upstream margins are kept low by regulation, the negative impact on profits caused by the loss of upstream sales, as a result of a

vertically integrated firm discriminating against downstream competitors, will be small. A vertically integrated firm may lose some of its upstream sales were it to discriminate against its downstream competitors, but this would have limited impact on overall profits if upstream margins are kept low by regulation. Ofcom notes that BT's profitability in most upstream markets is kept at competitive levels by remedial measures, including cost-based price controls, mandated by Ofcom.

F.35 Second, the higher the downstream profit opportunity, the more likely that discriminating against downstream competitors will increase a vertically integrated firm's overall profits. In theory, only when the downstream market is perfectly competitive would a vertically integrated firm be indifferent between discriminating or not. Ofcom considers that BT's profitability in the supply of downstream services is not as constrained by regulation as the profitability of its upstream services. While Ofcom is aware of the difficulties in measuring profitability, it notes that both BT's annual and regulatory accounts suggest that BT's profitability in downstream services has increased in the last few years.

F.36 Third, the higher the degree of substitutability between the vertically integrated and competitors' downstream products, the more effective discriminatory behaviour would be in distorting downstream competition. When products are homogeneous (i.e. there is a high degree of substitutability), the reduction of competitors' sales caused by discriminatory behaviour would be largely captured by the vertically integrated firm's downstream division[29]. Though there is scope for product differentiation in some of the relevant downstream markets in which BT operates, Ofcom does not consider that this is likely to prevent the BT's products and those of its downstream competitors being very close substitutes.

F.37 Fourth, the more efficient and the less capacity-constrained the vertically integrated firm's downstream division is, the greater the incentive to discriminate. If by discriminating, a vertically integrated firm could gain sales at little incremental cost, the incentive to gain customers or sales by discriminating downstream would be stronger. In other words, the larger the economies of scale that exist in the downstream activities, the stronger the incentive to engage in discriminatory behaviour. Ofcom considers that there are economies of scale in the activities related to the provision of services in the downstream markets in which BT operates. This appears to be especially the case for newer services where BT's more limited customer base means that there might still be unexploited economies of scale.

F.38 For these reasons, Ofcom considers that the combination of BT's vertical integration and upstream market power, in the particular markets and

[29] In some circumstances a vertically integrated firm might also have an incentive to discriminate when downstream products were highly differentiated. This is particularly relevant in a dynamic context in relation to product innovation. This could be the case of a competitor launching a new service which is not a substitute for any of a vertically integrated firm's existing services. The latter might still have an incentive to discriminate if the profit opportunity from doing so and capturing a larger share of the new market by launching the product itself in the future is larger than the profit from limiting itself to supply the upstream input to the provider of the innovative product. Therefore, there are also incentives for a vertically integrated firm to discriminate against more innovative and dynamic competitors providing products which are not necessarily close substitutes to its existing products.

regulatory environment in which it operates, give it the incentive and the ability to discriminate against downstream competitors.

Annex G

An analysis of the deployment of Wholesale Line Rental (WLR)

The introduction of WLR

G.1 During the course of 2001, Oftel carried out a review of the fixed telephony market.

G.2 In June 2002, this review concluded that BT had significant market power in the provision of both calls and access. One reason for this was BT's ability to provide a bundled calls and access service, which provided it with a significant competitive advantage over alternative service providers.

G.3 In August 2002, Oftel modified BT's licence to require it to provide a new Wholesale Line Rental (WLR) product which would allow alternative suppliers to rent access lines on wholesale terms (with charges set by Oftel) from BT, and resell the access lines to the end-user, enabling alternative suppliers to provide a single bill covering both line rental and telephone calls.

G.4 WLR was an important component of Oftel's drive to encourage greater competition in the residential and business retail markets, where BT accounted for over 80 per cent of the access lines for households and businesses in the UK. WLR has a wide-ranging impact on a number of retail markets, specifically:

- residential analogue exchange line services;
- residential ISDN2 exchange line services;
- business analogue exchange line services;
- business ISDN2 exchange line services;
- ISDN30 exchange line services;
- call origination on fixed public narrowband networks;
- local-tandem conveyance and transit on fixed public narrowband networks;
- inter-tandem conveyance and transit on fixed public narrowband networks; and
- single transit on fixed public narrowband networks.

G.5 Despite significant regulatory activity since 2002, the WLR product has still not been deemed fit-for-purpose in mid 2005. The combination of BT's enduring upstream market power and its vertical integration has not given

BT the incentive to develop a fit-for-purpose product. This lack of incentive has resulted in the following problems with the introduction of the product:

- reluctance by BT to supply WLR;
- supply of inferior products by BT;
- difficulties in Ofcom detecting problems, designing and enforcing remedies; and
- significant time taken to introduce products and resolve problems.

G.6 These issues are discussed in turn below.

Reluctance by BT to supply WLR

G.7 In a competitive wholesale market, a fit-for-purpose wholesale line rental product could be expected to be supplied. However, the combination of BT's upstream market power and its vertical integration has given it little incentive to offer such a product. As a result, BT has been reluctant to supply such a product, and did not do so before it was mandated as a regulatory remedy.

G.8 BT first launched a Calls and Access resale product in October 1998, partly under pressure from Oftel. However, take up of this product was very limited, largely seen to be due to the product's high price and poor in-life processing. Indeed, Calls and Access failed to attract any major branded service providers to the market and a number of issues were raised with Oftel in the year following its introduction.

G.9 Before Oftel introduced WLR as a remedy, BT maintained that issues such as ensuring scalability on this product could be dealt with by co-operation, and without the need for regulatory action[30].

G.10 The evolution of the product since that time has highlighted the difficulty of resolving these issues even with significant regulatory action. However, the growth in the market for calls and access since the introduction and refinement of WLR2 has shown that there was demand for such a product.

Supply of inferior products by BT

G.11 BT's vertical integration, combined with its upstream market power, meant that it had little incentive to provide a fit-for-purpose WLR product, even though such a product had been required by regulation. At the same time, introducing the product involved a large number of complex technical issues to be resolved, which has required the co-operation of BT and service providers.

G.12 The combination of these two factors has led to a pattern of features of the WLR product supplied by BT to service providers not being fit-for-purpose, in contrast to the features of the product supplied by BT to its own downstream divisions.

[30] BT's response to Oftel's Review of the Fixed Telephony market, 31 January 2002.

G.13 There have been a number of examples of such product features not being fit-for-purpose. Each of these issues has been important to service providers purchasing WLR, and collectively they resulted in WLR being materially not fit-for-purpose. Below we set out some examples of these features, and explain their importance:

- **non-integrated systems**. Service providers interface with BT's systems using a Service Provider Gateway (SPG), which is connected to BT's systems using middleware. As a result the SPG's capabilities on a range of issues are inferior to the integrated systems used by BT's downstream divisions;
- **call sign transfer**. Customers who had this feature, where a telephone line is allocated several different numbers, could only transfer one of these numbers to a service provider using WLR, and the other numbers had to change;
- **levels of rejections**. A higher proportion of WLR orders are rejected[31] first time around than orders by BT's own downstream divisions;
- **systems availability**. The IT systems that service providers use when they interface with BT have been unavailable for significant periods of time. These systems are not used by BT's downstream divisions;
- **change of address**. Service providers had to rely on a manual system to change customers' addresses, which allowed them to access significantly less information about the customer than the integrated system used by BT's downstream divisions;
- **real time appointment for new provides**. Service providers were unable to make appointments for new orders in real time; BT's downstream divisions were able to do so;
- **change of appointment**. The only mechanism available for service providers to change appointments was a manual system; BT's downstream divisions had access to a system which allowed them to change appointments in real time, since they used systems which were integrated with BT's wholesale divisions;
- **Saturday working**. BT has a range of residential services, such as change of address and other orders, operating on Saturdays. In contrast, service providers using WLR were not able even to place orders on Saturdays;
- **broadband separate account**. BT's systems rejected orders from service providers for WLR lines when the customer also purchased broadband through BT Retail;
- **remote call forwarding and call number intercept**. These call forwarding services were initially unavailable to service providers using WLR; later they were available but only for new customers and not for existing ones; and

[31] For example, 11% of service provider orders were rejected first time around in April 2005, and 18% in November 2004

- **forecasting and Service Provider Gateway queue implementation**. Service providers using WLR were required to forecast order volumes, because BT's gateway was capacity-constrained, and service providers faced the possibility of operational penalties if the forecasts were not accurate. BT's retail divisions were not required to forecast in this way.

G.14 The process of resolving each of these issues has followed a pattern. First, the issue has been raised by service providers using WLR. Typically these issues have been technical problems relating to BT's internal systems, which require BT's co-operation to address. However, because of the combination of BT's upstream market power and vertical integration, BT has had little incentive to resolve these issues. The result has been that resolution of each of these issues has taken very considerable time, and some of them are yet to be resolved.

G.15 As an example, we have illustrated below two areas in which WLR has not been fit-for-purpose; Remote Call Forwarding and Call Number Intercept, and forecasting and SPG queue implementation.

Remote Call Forwarding (RCF) and Call Number Intercept (CNI)

G.16 Remote call forwarding is a service which automatically forwards a call from one number (typically an end-user's old number) to another (typically the customer's new number). Call Number Intercept (CNI) is a service which gives callers a message if they call a certain number, directing them to call another number – again perhaps directing callers from an old number to a new number.

G.17 BT did not initially offer RCF to service providers, although BT Retail offered it to its retail customers. This issue was first raised in April 2003. Because Ofcom did not have knowledge of BT's internal systems, it could not know on what timescale it was reasonable to require these features to be provided. Ofcom required BT offer these features to service providers, and this was done in June 2003.

G.18 However, once BT made RCF and CNI available, they were only available to newly provided lines, not to transfers (i.e. customers of service providers could not have their calls forwarded to the new line if their line was transferred, rather than being a newly provided line). This issue was raised by service providers in August 2004. After discussion, it was resolved in principle in April 2005, when Ofcom required BT offer RCF and CNI for transfers as well as new provides. However, this will not be implemented until a release of WLR which is due in 2006.

G.19 Both of these problems created barriers to transfer of customers to rival service providers: some customers would not transfer if they could not have a system where calls to their old number were diverted to their new number until everyone had the new number. This meant that BT's downstream divisions retained, at least temporarily, customers who would otherwise have transferred to other service providers.

Forecasting and SPG queue implementation

G.20 When purchasing WLR, service providers have to forecast orders, whereas BT's retail divisions do not (although BT Retail may have some internal

business planning, it does not have to do forecasts in the same way as service providers).

G.21 This system was implemented for service providers because the Service Provider Gateway has a finite capacity. As many of its processes require manual inputs or work, BT needs to know likely staffing requirements for its operations. BT Retail processes are automated and so do not need staffing, and therefore BT Retail is not required to forecast its order levels.

G.22 Forecasting is a disadvantage to service providers relative to BT Retail as it represents a greater operational burden (i.e. having actually to do the forecasting). In addition, the system also introduces the possibility of operational penalties on service providers should the forecasts not be met, to which BT Retail is not subject.

G.23 The way BT's systems are designed means that service providers are sometimes unable to submit orders, even when there is spare capacity on the system. This is a feature of the system design, as service providers' forecasts, which are done on a monthly basis, are translated by BT into daily order limits. This has caused a number of complaints, particularly from smaller players, who have the lumpiest daily and monthly order volumes. This problem does not apply to BT Retail, which does not rely on the capacity of the Service Provider Gateway.

G.24 Having to forecast has been an on-going issue for service providers. It was first raised in responses to the WLR consultation of 14 November 2002. The problems with system design limiting orders came up in August 2004.

G.25 Ofcom has sought to ensure non-discriminatory forecasting by either changing systems so that either BT Retail is obliged to submit forecasts in a similar manner, or so that no forecasts are necessary as capacity sufficient for there no longer to be a constraint. However, in the absence of the undertakings being offered by BT, this would be unlikely to happen until 21CN is put in place over the next years. The problem with the system design limiting orders is currently being addressed.

Difficulties in Ofcom detecting problems, designing and enforcing remedies

G.26 There is also a pattern of Ofcom having difficulty using its Communications Act powers to detect problems, and to design and enforce remedies on highly complex and technical issues.

G.27 Because of the features of the market that give BT little incentive to introduce a fit-for-purpose product, Ofcom has had to monitor the service levels offered on WLR in order to ascertain whether the product is in fact fit-for-purpose. However, Ofcom has had difficulty getting the information necessary to do this, and difficulty using this information to ascertain the performance of WLR relative to the product supplied to BT's downstream divisions.

G.28 Many of areas in which WLR has not been fit-for-purpose have been the result of highly technical issues relating to BT's internal systems. The structural features of the market have given BT little incentive to address these problems itself. However, because Ofcom does not have knowledge

of BT's systems, it has been difficult for Ofcom to ascertain what remedial action it would be possible, or reasonable, to require BT to take.

G.29 Three examples of these difficulties are listed below.

- **problems getting key performance indicators (KPIs) from BT**. Though Oftel's WLR statement in September 2003 stated that BT should publish KPIs, the first data were delivered only in September 2004. It later became apparent that some of the KPIs were incorrectly defined, and therefore could not be used for comparison;

- **'5Rs' table and 'a-codes'**. Ofcom and service providers did not have sufficient understanding of BT's internal systems to understand the codes that different products should be allocated on BT's systems; and in particular the circumstances that led to orders being allocated a reject code on BT's systems. For example, for a time all orders were rejected for NHS lines, or where the customer had an access reward tariff; and

- **priority fault repair service**. Because BT's internal systems were not transparent to Ofcom or service providers, it took a long time to identify whether a higher priority fault repair service was available to BT's downstream divisions, than was available to service providers.

G.30 As an example, the issues around the priority fault repair service are examined in more detail below.

Priority fault repair / Priority Service

G.31 There were three care levels offered to service providers by BT: standard care, prompt care and total care. These had different levels of service (e.g. total care would have an engineer on call 24/7, whereas standard care only had engineer visits from Monday to Friday).

G.32 It took a long time both before and after the WLR2 Statement to analyse what characteristics of the priority service were. The sequence of events was:

- the issue was raised in April 2003 by service providers wanting to know whether the three service levels available to them were the same as those offered to BT Retail;

- in September 2003, BT stated that the priority service that BT Retail offered was the same as care level 3 offered to service providers;

- in November 2003 however, BT stated that it was not the same; the priority service provided to BT Retail was a fourth care level;

- Service providers asked BT how it was different. BT reported that BT Retail's priority service does have priority sometimes, for example it goes to the front of the queue of appointments. BT agreed that, since this level of care was available to BT Retail, it should also be available to service providers; and

- most recently, BT reported that the priority service provided to BT Retail was in fact the same as care level 3 offered to service providers. In Jan

2005, it was resolved that the same care levels are offered to service providers as to BT Retail.

G.33 There remains a problem because priority service is shown in BT contracts in several different ways (for example, it could be contained in footnotes to the contract, or it could be represented only by a code in BT's systems). If the system recognises that the priority service is on a line when it is transferred, BT then provides the same service to the service provider, so the line keeps the same care level. However, the system does not always recognise when a line has this priority service due to the different ways of it being flagged on BT's systems.

Time taken to introduce products and resolve problems

G.34 The net result of these difficulties has been delay in the introduction of a fit-for-purpose product. Oftel first amended BT's licence to require it to provide a fit-for-purpose WLR product in August 2002. Almost four years later, the WLR product has not yet been designated fit-for-purpose.

G.35 The second release of WLR (WLR2) was launched on 30 March 2004. This timing was a compromise between BT, who had originally said it could launch it by November 2004, and Oftel, who wanted it in place by August 2003. WLR1 had suffered from a low take up, particularly amongst service providers wishing to address the residential market. This was partly because the margins were too low to encourage market entry (in fact they were negative) and partly because of non-price issues discussed above.

G.36 WLR1 take up was very limited, particularly amongst service providers wishing to address the residential market. By the time WLR2 was introduced in March 2004, there were only 274,230 WLR lines, of which only 25,205 were residential.

G.37 There are signs that take up is increasing. For example, the first major branded service providers have entered the market. First to enter was Caudwell Communications, which trades using WLR as HomeCall. Centrica entered the market in April 2005 using the One-tel brand and, more recently, the Post Office has also launched services using WLR. As at April 2005 there were over one million lines and channels using WLR, comprising 891,883 analogue lines, of which 237,620 were residential and 654,263 business, and 265,634 ISDN channels.

Conclusions

G.38 The introduction of WLR provides a good example of the difficulties Ofcom has had using the Communications Act to prevent non-price discrimination when:

- the combination of BT's vertical structure and its upstream market power have not given it an incentive to introduce a fit-for-purpose; and when
- the product is complex.

G.39 BT was initially reluctant to supply WLR. When it was mandated as a regulatory remedy, the wholesale product was not fit-for-purpose in a wide variety of ways which were collectively very material to service providers who wished to use the product. Identification of these problems has been

difficult. Once they have been identified, BT has had little incentive to overcome them, and Ofcom lacks the detailed knowledge of BT's systems to know what solution would be possible or reasonable.

G.40 As a result, a regulatory remedy first introduced in 2002 has yet to be designated by Ofcom as fit-for-purpose.

Annex H

An analysis of the deployment of Carrier pre-Selection (CPS)

The introduction of CPS

H.1 Carrier Pre-Selection (CPS) was required by European Directive to be made available throughout the European Community from 1 January 2000. To fulfil this requirement a new condition was added to the licences of all fixed Public Telephony Operators in the UK.

H.2 For historical reasons, many of BT's switches had no inherent capacity for CPS, and major software development therefore had to be undertaken. As a result, the European Commission granted a deferment of three months to the UK for the introduction of CPS. The UK committed to the provision on CPS on BT's network using autodiallers, a solution known as 'Interim CPS'.

H.3 As a result of the new EU regulatory framework entering into force on in July 2003, Oftel carried out a review of the fixed narrowband wholesale exchange line, call origination, conveyance and transit markets. The conclusion to this market review, published on 28 November 2003, included the findings that BT has SMP in the fixed call origination market.

H.4 As a consequence of the market review, an SMP service condition was imposed on BT requiring it to provide CPS. Specifically, the service condition stated that BT should provide CPS to any of its subscribers upon request, as soon as it was reasonably practicable, on reasonable terms and in accordance with the CPS functional specification. It further provided that the charges for such interconnection facilities be reasonably derived from the costs of providing those services, and that the costs be calculated using a forward-looking long run incremental cost approach.

H.5 CPS allows end-users to select, in advance, alternative communications providers to carry their calls without having to dial a prefix or install special equipment at their premises. The call is handed to the alternative service provider by BT via the nearest point of interconnect with the alternative carrier. The end-user is billed for these calls by alternative communications provider, but the end-user continues to be billed for their line rental by BT.

H.6 The aim of CPS was to stimulate competition in call markets and to enhance competition in areas with only limited direct access competition. CPS has a wide-ranging impact on a number of retail markets, specifically:

- residential analogue exchange line services;
- residential ISDN2 exchange line services;
- business analogue exchange line services;
- business ISDN2 exchange line services;

- ISDN30 exchange line services;
- call origination on fixed public narrowband networks;
- local-tandem conveyance and transit on fixed public narrowband networks;
- inter-tandem conveyance and transit on fixed public narrowband networks; and
- single transit on fixed public narrowband networks.

H.7 The introduction of CPS as a regulatory remedy was followed by a significant amount of regulatory activity by Oftel to address problems with its implementation on an issue-by-issue basis. Many of these problems resulted from the fact that BT had little incentive to introduce the product, as a result of the combination of BT's upstream market power and vertical integration. These led to the following problems with the introduction of CPS:

- reluctance by BT to supply CPS, and significant time taken to introduce the product; and
- supply of inferior products by BT.

H.8 These issues are discussed in turn below.

Reluctance on the part of BT to supply CPS

H.9 In a competitive wholesale market, a fit-for-purpose carrier pre-selection product could be expected to be supplied. However, the combination of BT's upstream market power and vertical integration has given it little incentive to supply such a product, and it did not do so before the product was required by regulation.

H.10 It is important to note that the introduction of CPS represented a change in regulatory approach by Oftel, partly brought about by the adoption of the European Framework. In the 1990s, Oftel's approach had been to encourage competition based upon infrastructure.

H.11 The current demand for CPS – 4.5 million lines in December 2004 – indicates that there is strong demand for such a product.

Supply of inferior products by BT

H.12 BT's vertical integration, combined with its upstream market power, meant that it had little incentive to provide a fit-for-purpose CPS product. In addition, introducing such a product involved a large number of complex technical issues to be resolved. The combination of these two factors has led to a number of features of the CPS product being inferior to the product that BT supplies to its own downstream divisions, and has led to these issues taking a long time to be resolved.

H.13 Each of these issues has been important to service providers, and collectively they have resulted in material constraints on service providers'

ability to compete using the CPS product. Below we set out some examples of these issues, and explain their importance.

- **ordering processes**. The ordering processes for CPS were manual and error-prone. Problems with these processes included problems with post code matching of customers' addresses with BT's databases, and customers being mis-advised on the compatibility of CPS if they had broadband. BT's downstream divisions did not experience many of these problems because the IT systems it used were integrated with BT's upstream divisions;

- **transaction charges**. Service providers using CPS had to pay charges for a range of activities associated with their orders (for example if an order was rejected, or an option was changed). However, some of these were necessitated due to errors on BT's systems, and other factors within BT's control;

- **local call disadvantage**. Service providers using CPS suffered from 'tromboning' on local calls, where local calls were unnecessarily routed further up in the network, and then back down again to the same local switch, thereby incurring additional cost. This was a result of fundamental network design. Nonetheless, it had the effect of causing CPS operators to incur an additional cost, which BT's downstream divisions did not incur;

- **call forecasting**. CPS operators are required by BT to forecast the level of CPS calls they expect to carry. If a CPS operator under-estimates the level of orders it will make, an operational penalty is imposed; if it over-estimates a financial penalty is imposed. These forecasts helped BT to dimension its network and operations. Nonetheless, they had the effect of disadvantaging BT's downstream competitors, because BT's downstream divisions were not subject to them; and

- **application of consumer protection rules**. There was a concern in the industry that the introduction of CPS would result in 'slamming', where consumers had their supplier changed without their consent. The application and use of this consumer protection process by BT had the effect of increasing barriers to switching by consumers, thereby disadvantaging service providers.

H.14 As an example, we have illustrated in more detail below one area where BT's downstream competitors have been disadvantaged as compared to BT's own downstream divisions: the application of consumer protection rules.

Application of consumer protection rules

H.15 Because of the concerns about slamming, explained above, an opt-in process was introduced, where consumers wishing to change to a CPS supplier had to send a reply card to BT requesting their move.

H.16 However, there were allegations that the application and use of the consumer protection process sometimes exceeded what could be reasonably interpreted as conduct to protect consumers. One such practice was the use of the 'cancel other' function. 'Cancel other' is a functionality

that allows BT to cancel a customer's order for CPS during the 10 day period between the confirmation of an order for CPS and the switch over-date of the service. It was introduced to enable BT to cancel a CPS order if a customer had been slammed. However, there were a number of allegations to Oftel about instances of the 'cancel other' function being used when customers had not been slammed.

H.17 Another barrier to competitors was the introduction of 'save' activity. The save facility allowed the losing service provider to make a call to the customer during the CPS transfer process in an attempt to win back their services. As the incumbent service provider, BT benefited more from this activity than did its nascent competitors.

H.18 Oftel circulated a position paper to industry on CPS 'save' and 'cancel other' activity in November 2002, and sought voluntary agreement on the changes to the CPS process identified by Oftel. There was very little agreement between BT and the CPS operators about what changes should be made to the process. Oftel therefore opened an own-initiative investigation to resolve these issues in January 2003.

H.19 Following the publication of the Cancel Other Direction in July 2003, BT initiated discussions with the industry to address industry concerns surrounding BT's use of 'cancel other' and to negotiate an alternative process for managing customer complaints and cancellations during the CPS transfer process. BT subsequently indicated to the industry that it was not willing to implement the proposed alternative process, and declined to negotiate further.

H.20 Oftel therefore addressed the issue once again in its November 2003 market review determination, Oftel considered that BT's use of 'cancel other' in conjunction with save activity gave rise to increased mistrust between BT and CPS operators, damaged the reputation of CPS, and created increased reluctance by consumers to try alternative operators.

H.21 Cauldwell Communications Ltd then submitted a dispute on behalf of a number of providers for resolution under the Communications Act following the breakdown of negotiations. Ofcom accepted representations and evidence and published its proposals to resolve the dispute in November 2004. This dispute is still ongoing.

Conclusions

H.22 The resolution of the above issues surrounding the introduction of CPS has followed a pattern. Legitimate issues have arisen; for example around consumer protection, a need for network capacity forecasting, or fundamental issues around network design. Oftel could not reasonably have anticipated and ruled on all of these individual issues in its first direction that CPS should be introduced. However, the combination of BT's upstream market power and vertical integration has given BT little incentive to resolve these issues. The result has been that negotiations between industry and BT have stalled; Oftel and later Ofcom have instead had to rule on these matters on an issue-by-issue basis. This has taken considerable time, during which CPS operators have been disadvantaged in downstream markets.

H.23 Once the resolution of these issues was underway, demand grew strongly for CPS. As of 31 December 2004, there were 4,571,131 CPS lines in the UK. In the full year to mid 2004, CPS operators added some 2 million new subscribers.

Annex I

An analysis of the deployment of Local Loop Unbundling (LLU)

The introduction of LLU

I.1 Local Loop Unbundling ("LLU") was required by Oftel to be offered by BT in November 1999, in Oftel's policy statement "Access to Bandwidth: Delivering Competition for the Information Age". This followed a consultation period which had begun with an exploratory document published by Oftel in December 1998.

I.2 Oftel's determination in November 1999 required that:

- local access lines or "unbundled loops" and co-location[32] (collectively known as LLU) be available to operators with interconnection rights and obligations;
- loops should be made available at a cost-based price, allowing for a reasonable element of profit. An indicative price would be published by April 2000;
- Oftel would set out clearly the requirements on BT through a new condition in BT's licence by April 2000 (Condition 83);
- the service would be introduced by July 2001 (in 18 months' time) and earlier if possible. BT and industry groups had agreed a timetable that would allow the delivery of unbundled loops by this date; and
- Oftel would conduct a review of its policy on access to bandwidth four years after the introduction of unbundling and every two years thereafter.

I.3 LLU enables BT's downstream customers to connect their own equipment to the end of the copper line running from BT's local exchange to the customer. This can be used for offering retail voice and data (typically broadband data) services.

I.4 Altnets or ISPs can choose between two options for gaining access to the local loop:

- full unbundling - where the altnet leases the line to a customer in its entirety; or
- shared access – where BT and the altnet share the line allowing the former to continue to provide voice while the latter provides data access.

[32] Where operators rent space at a site to install equipment and make use of centralised facilities, enabling the operator to interconnect with the PBLC

I.5 The importance of LLU is that, short of providing their own access network, it allows suppliers to compete with BT based upon the deepest level of alternative infrastructure. It therefore offers the greatest scope for innovation in fixed retail broadband and narrowband markets. It also offers the potential for suppliers who have invested in LLU to provide wholesale services to other retail providers, in competition with BT's downstream wholesale products.

I.6 LLU is a regulatory remedy in the wholesale local access market. It has a wide ranging impact on a number of markets on the wholesale and retail side, specifically:

- asymmetric broadband origination;
- fixed narrowband wholesale exchange line;
- call origination;
- conveyance and transit markets; and
- fixed narrowband retail services.

I.7 Despite significant regulatory activity by Oftel and Ofcom, the LLU product has still not been deemed fit-for-purpose in mid 2005. In June 2005, there were only 63,000 unbundled lines, compared with 5.5 million DSL lines supplied by BT's downstream wholesale divisions.

I.8 The combination of BT's upstream market power and its vertical integration has given BT little incentive to introduce LLU, and to resolve the quite significant technical issues that have arisen as a result of its introduction. This lack of incentive has resulted in the following problems with the introduction of LLU:

- reluctance by BT to supply LLU;
- supply of inferior products by BT;
- difficulties in Ofcom detecting problems, designing and enforcing remedies;
- downstream response by BT to the supply of upstream products; and
- significant time taken to introduce products and resolve problems.

I.9 These issues are discussed in turn below.

Reluctance by BT to supply LLU

I.10 A trial of BT's ADSL services to deliver broadband Internet access was already underway in 1998, and BT announced its intention for a full launch of retail broadband services in March 2000, with an expectation of being able to deliver higher bandwidth access to 6 million households.

I.11 Because of its vertically integrated structure, BT did not require an LLU product in order to supply wholesale broadband services to its own retail

divisions; supplying them instead with a downstream, end-to-end wholesale product called IPStream.

I.12 A competitive upstream market could be expected to offer an LLU product. However, BT was reluctant to supply such a product. It sought instead to offer altnets a wholesale end-to-end broadband product managed by BT, and its response to Oftel's Access to Bandwidth consultation maintained that LLU would inhibit infrastructure competition.

Supply of inferior products by BT

I.13 LLU is a collection of a number of related wholesale components and is therefore a complicated product to configure, in terms of specification and charge-setting. Within industry working groups, BT and its wholesale customers covered a wide range of issues around the product specification and BT's respective charges. Whilst many issues were resolved within the industry working groups, the combination of BT's upstream market power and vertical integration meant that it had little incentive to resolve these complex issues.

I.14 As a result, a significant number of issues required Oftel's direction in order to bring about their resolution. Over the period from 2000 to 2003, in relation to LLU, Oftel was required to investigate 11 complaints or disputes and, as a result, issued over 25 directions and statements[33].

I.15 Below we provide a number of examples in which BT was found by Oftel to be providing an LLU product to its downstream competitors which was inferior compared to what would have been the best product or service potentially available and/or for which BT was charging excessively:

- **provision of information on the availability of space and power at BT exchanges**[34] (Sept 2000 to July 2001). BT's wholesale customers complained that BT was not providing adequate information on the availability of space and power at exchanges, which was necessary information for altnets in order to plan their roll-out. Oftel determined that BT had a duty to provide this information, and produced guidelines for its provision;

- **BT's reluctance to offer co-mingling**[35]. Oftel found that BT could not refuse a reasonable request for co-location unless technically justified or as a necessary precaution to maintain network integrity. Oftel then investigated further the issue of access to exchanges in relation to concerns over network integrity, and issued a further direction on this matter;

- **BT's criteria for rejection of co-mingling requests**[36] (Nov 2001 to Mar 2002). As part of the direction published above[37], BT was required to provide altnets with a list of criteria it applied when rejecting a request for co-mingling. Allegations were made that the criteria being applied

[33] see http://www.ofcom.org.uk/static/archive/oftel/publications/broadband/llu/index.htm
[34] CW/00297/11/00 CompBull Issue 22
[35] CW/00399/03/01
[36] CW/00492/01/02
[37] CW/00399/03/01

were inappropriate and unfair. Oftel concluded that a number of criteria were inappropriate, and BT amended its criteria as a result;

- **dispute relating to service levels for LLU**[38] *(*May 2001 to Dec 2001). Oftel had previously made a determination as to the reasonableness of a number of terms in BT's reference LLU offer. However, following this earlier determination, BT's wholesale customers requested Oftel to intervene to set service levels and compensation levels since they were unable to agree terms with BT. Oftel published a direction which required BT to amend the terms it offered these operators;

- **co-mingling product pricing**[39] (Feb 2002 to Feb 2003). Following Oftel's co-mingling direction, BT's wholesale customers complained that the charges set by BT were not cost-orientated. Oftel resolved some of the issues without formal intervention but issued a direction dealing with charges for power at BT exchanges;

- **charges for preparing co-location space***.*[40] (Jan 2001 to Jan 2002). A concern was raised by BT's wholesale customers that BT's cost estimates for building shared co-location space were excessive. Oftel concluded that BT could provide services more cheaply and produced a direction for BT;

- **allocation of costs between operators siting their equipment in BT exchanges**[41] (Jan 2001 to April 2001). Oftel found BT's approach disadvantaged certain operators over others, distorting competition between LLU operators. BT adopted Oftel's proposed costing methodology; and

- **charges for LLU distant location services** (Mar 2001 to Jan 2002). BT's wholesale customers complained that that these charges were excessive and did not reflect BT's costs[42]. Oftel concluded BT was over-recovering costs, and BT revised its charges downwards.

I.16 The introduction of LLU provides an interesting example of how delays resulted from the resolution of relatively complex technical issues which BT had little incentive to resolve. Below we examine in more detail one particular example of this; the terms upon which BT offered co-location and co-mingling in its exchanges.

Provision of co-location and co-mingling by BT

I.17 When LLU was initially envisaged it was proposed that altnets would be required to locate their equipment at BT exchanges (co-location) or outside of the exchange (distant co-location). Only in February 2003, following a number of complaints from altnets and significant regulatory intervention by Oftel, were altnets offered the least-cost option for co-location on reasonable terms, which was "co-mingling", where altnets' equipment is located side-by-side in local exchanges with BT's equipment.

[38] CW/00422/05/01
[39] CW/00505/02/02
[40] CW/00380/01/01
[41] CW/00379/01/01
[42] CW/00393/03/01

I.18 The altnets and BT worked together to develop co-location. However, the altnets lacked the information to know whether what BT was proposing to them was the most efficient solution from their perspective. Oftel received a complaint in June 2001 that BT's designs for one bay min-hostel co-location rooms[43] did not reflect the least cost for operators[44]. After four months investigating the complaint, Oftel found that BT was providing min-hostels at least cost.

I.19 However, during the same period Oftel was also investigating a complaint that BT appeared to be refusing to offer co-mingling[45]. As part of its investigation, Oftel found that co-mingling was a potentially more efficient alternative for altnets, and would result in a faster LLU turnaround for altnets. Oftel found that BT could not refuse a reasonable request for co-mingling unless it was technically justified, or as a necessary precaution to maintain network integrity.

I.20 A key justification for BT not offering co-mingling was the concern around the impact co-mingling (i.e. altnets' open access to exchanges) could have on network integrity. Therefore, Oftel investigated the issue of access and published a further direction dealing with the issue of access to exchanges.

I.21 Subsequently, Oftel received a further complaint that BT's criteria for rejecting co-mingling requests was inappropriate and therefore altnets were still not able to take advantage of co-mingling[46]. Oftel investigated the complaint and, after four months, concluded that a number of BT's criteria were inappropriate, and BT was required to amend them.

I.22 Furthermore, following this direction Oftel received another complaint that the charges for co-mingling were not cost-orientated[47]. Oftel investigated the complaint and after 12 months was able to resolve many of the issues within the industry working group. However, there were some charges that could not be resolved without Oftel issuing a direction.

Difficulties in Ofcom detecting problems, designing and enforcing remedies

I.23 There has been a pattern of Ofcom having difficulty using its Communications Act powers to detect problems, and to design and enforce remedies on highly complex and technical issues.

I.24 Because the combination of BT's vertical integration and upstream market power give it little incentive to resolve these issues, Oftel and Ofcom's attempts to use their available powers to the maximum effect have nonetheless not been successful in bringing about an LLU product which can be deemed fit-for-purpose.

I.25 There has been a pattern to the way disputes have emerged around features of the LLU product. Issues have typically arisen because:

[43] a room in the BT exchange large enough to accommodate one operator
[44] CW/00436/06/01
[45] CW/00399/03/01
[46] CW/00492/01/02
[47] CW/00505/02/02.

- the LLU product is complex; and
- the introduction of LLU gives rise to legitimate concerns on the part of BT, for example regarding the integrity of its network and security if altnets have access to its infrastructure.

I.26 Given the granularity of information required and the degree of technical know-how required in order to resolve these issues, Oftel used industry groups to lead on the process. These working groups would seek to set the requirements and specification for the product, and would only seek Oftel's involvement in the case of disputes or complaints that could not otherwise be resolved. However, technical issues are never competitively neutral, and the combination of BT's market power and vertically integrated structure gave it no incentive to facilitate agreement. As a result, Oftel was forced to intervene through making determinations on disputes and complaints, causing very substantial delay to the process.

I.27 There was a recurring theme to these disputes and complaints which is described below; the net result of which was substantial delay:

- within the industry working groups, BT would work with the altnets to come to an initial proposal for a product or process;
- the altnets would accept a modified proposal, but would not be well-informed as to whether the proposal (put forward by BT, given its superior information) was satisfactory;
- the altnets would use the product and find out that it seemed expensive to them and/or did not meet their actual requirement (which they only could appreciate fully in the context of real practice);
- they would seek to secure changes to the product or process from BT within the industry working group;
- they would not be able to reach an agreement with BT, and Oftel would be called upon to make a determination;
- as a result of regulatory due process and time spent gathering information, Oftel's investigations took from three months to over a year to conclude; and
- Oftel would make its direction, and BT would implement it. At times, the manner in which BT implemented the direction gave rise to further dispute.

I.28 In July 2004, Ofcom attempted to address these difficulties by establishing an independent Telecoms Adjudicator. The adjudicator was tasked with addressing the process and operational issues associated with delivering LLU, and BT and the altnets agreed voluntarily to abide by the adjudicator's findings.

I.29 Below we have illustrated the difficulties described above with the examples of two events during the introduction of LLU; the Bow Wave process and negotiation of service levels for LLU.

The bow wave process

I.30 When LLU was first mandated, demand from altnets was high. Therefore a lottery process by which altnets were allocated space at exchanges, known as the bow wave process, was introduced. At the same time, BT was following its own independent programme of rollout across its exchanges, and its downstream divisions were automatically allocated a space in each exchange.

I.31 Oftel received a complaint (Sept 2000) concerning BT's non-participation in the bow wave process[48]. The complaint alleged unfair discrimination against altnets who were forced to use the bow wave process and therefore had comparatively restricted opportunities to install equipment in BT's exchanges.

I.32 Oftel concluded that, in order to find unfair discrimination by BT, dominance would need to be investigated in the supply of space for co-location on an exchange-by-exchange basis. This would have been a burdensome and unduly lengthy investigation; Oftel concluded that it would not be reasonable to carry out such an investigation, and therefore that there was insufficient evidence that that BT was engaging in unfair discrimination.

I.33 Though BT's non-participation in the bow wave process is very likely to have had the effect of disadvantaging other operators, given BT's vertically integrated structure and market power, it was not reasonable for Oftel to use its powers to prevent this.

Negotiation of Service Levels for LLU

I.34 The combination of BT's vertical structure and upstream market power gave BT little incentive to offer the best service levels to its LLU customers that it reasonably could. However, it was very hard for Oftel to determine what service levels it would be reasonable for BT to provide, as Oftel unavoidably had less knowledge of the detailed technical issues that determined these levels than did BT.

I.35 The result was a very protracted process. In the summer 2000 BT entered into negotiation with the operators to produce a standard form of the agreement for the provision of LLU. BT's first offer published September 2000 took into account some (but not all) of the operators concerns. As a result, Oftel published a consultation November 2000, and BT published a revised agreement in December 2000 in light of the consultation. This took into account some, but not all of the changes proposed by Oftel. Therefore Oftel's final determination in February 2001 required BT to make further changes to the September 2000 offer.

Downstream response by BT to supply of upstream products

I.36 LLU is the most upstream of the three wholesale products provided by BT which can be used as inputs into retail fixed broadband services; the others being DataStream and IPStream. Whereas LLU requires significant investment by alternative operators, IPStream is a wholesale end-to-end product and requires significantly less investment.

[48] CW/00295/11/0

I.37 The relative prices of these wholesale products affects the relative competitiveness in downstream markets of the products that use these upstream inputs. For example, if IPStream prices go down, LLU and DataStream become less attractive investments for altnets.

I.38 In April 2005, BT reduced the price of IPStream in 561 of its largest exchanges. These exchanges were also the ones most likely to be targeted by prospective LLU investors. These price changes were unlikely to have been sufficiently large to cause a margin squeeze between BT's downstream wholesale products and its LLU product. However, they may have had the effect of creating uncertainty in the market. Prospective investors in LLU could not be sure that BT's response to a successful LLU deployment would not be further to reduce IPStream prices in specific locations.

I.39 In the event that BT reduced the price of its IPStream products to the point that LLU was no longer a viable option, Ofcom would be expected to take appropriate regulatory action. Due to the underlying economics of LLU it is likely that the regulatory remedy to this event would be an ex-ante requirement. However, the process necessary to introduce ex-ante requirements can be time consuming and thus damaging to an investor in LLU.

I.40 Therefore, Ofcom suspects that the credible prospect of further changes by BT in the price of its downstream wholesale products is likely to be having the effect of deterring investment by prospective LLU operators.

Time taken to introduce products and resolve problems

I.41 The net result of all of this process has been delay. In mid 2005, five and a half years after LLU was first mandated, the adjudicator is still resolving significant issues with the product which mean that it is yet to be fit-for-purpose.

I.42 As a result of this delay, BT has established a first-mover position in the market. At the same time as this process has been going on, BT has been providing IPStream; a downstream, end-to-end wholesale broadband access product. By June 2005, BT was providing 5.5 million wholesale DSL lines to customers using downstream wholesale products, whereas operators using LLU were providing only 63,000 lines.

Conclusions

I.43 The introduction of LLU provides a good example of the difficulties Oftel and Ofcom have had using their ex ante powers to prevent non-price discrimination when:

- the combination of BT's vertical structure and its upstream market power have given it little incentive to introduce a fit-for-purpose product; and when
- the product is complex.

I.44 BT initially was reluctant to supply LLU. When LLU was mandated as a regulatory remedy, its introduction required a large number of complex

technical issues to be resolved. Because it transpired that these issues could not be resolved through commercial negotiation, they required Oftel and later Ofcom to make directions on an issue-by-issue basis, sometimes making several directions on the same issue. It would not have been possible for Oftel to anticipate these issues when it originally introduced the LLU remedy; nor would have been reasonable to make directions on them at that stage. The net result of this process has been very substantial delay in an LLU product being available that can be deemed fit-for-purpose. At the same time, price changes to BT;s downstream wholesale products, and uncertainty over future price changes, is likely to have deterred competing investment in LLU. As a result of these factors, BT has gained a very significant first-mover advantage in the market.

Annex J

An analysis of the deployment of DataStream

The introduction of DataStream

J.1 Oftel required BT to offer a DataStream interconnection product in a June 2002 Direction, following an investigation opened 12 months previously.

J.2 Oftel had received a request for a determination on xDSL interconnection from Energis and Thus in September 2000 following the break down of commercial negotiations with BT for such a product. Oftel directed BT, Energis and Thus to work together to negotiate interconnect terms for xDSL products based around DataStream. It was a lack of progress in these negotiations that led to the investigation resulting in the June 2002 Direction.

J.3 DataStream, IPStream and Local Loop Unbundling (LLU) are three related wholesale products, all of which can be used as inputs to a broadband access retail product. The differentiating factor is the relative amounts of BT's and the altnets' equipment used in the provision of the retail broadband service, as explained below.

J.4 IPStream is BT's end-to-end wholesale product where all network equipment required to provide a retail broadband service is supplied by BT. It is therefore the most downstream of the three wholesale products. DataStream is the intermediate product where altnets provide some of their own equipment (the ATM network layer) and rely on BT for the rest. LLU involves the altnet using all of its own equipment, relying on BT only for access to the copper wire connecting the customer to the exchange. LLU is therefore the most upstream of the three wholesale products. Typically the less reliant an altnet is on BT, the greater the control over the service delivery to the end-user and the greater the opportunity for product differentiation.

J.5 The DataStream product is typically purchased by altnets. It affects a number of markets including:

- asymmetric broadband origination in the UK (exc. Hull);
- broadband conveyance in the UK; and
- wholesale local access in the UK (exc. Hull).

J.6 Despite regulatory activity since 2001, a number of issues remain unresolved with the supply of DataStream in mid 2005. The combination of BT's enduring upstream market power and its vertical integration has given BT little incentive to develop a fit-for-purpose product. This lack of incentive has resulted in the following problems with the introduction of the product:

- reluctance by BT to supply DataStream;
- supply of inferior products by BT;
- difficulties in Ofcom detecting problems, designing and enforcing remedies;
- downstream response by BT to supply of upstream products; and
- significant time taken to introduce products and resolve problems.

J.7 These issues are discussed in turn below.

Reluctance on the part of BT to supply DataStream

J.8 In a competitive wholesale market, a fit-for-purpose DataStream product could be expected to be supplied. However the features of the market identified in Annex F have given BT little incentive to offer a fit-for-purpose product. As a result, BT has been reluctant to supply such a product, and did not do so before it was mandated as a regulatory remedy.

J.9 In July 2000 Energis submitted a statement of requirements to BT regarding the negotiation of interconnect terms for xDSL interconnection products based around DataStream. Energis met with BT in August 2000 to discuss such products but little progress was made and in September 2000 Energis raised a request with Oftel for a determination regarding the failure to agree terms. A similar request was also received from Thus.

J.10 A direction was made by Oftel in March 2001 requiring BT to work with Energis and Thus to negotiate the terms of xDSL interconnection. Two months later a report on progress was received from Energis which indicated on-going areas of disagreement with BT. This resulted in Oftel opening an investigation in June 2001 into the remaining areas of disagreement. Finally a direction was issued in June 2002 directing BT to provide a reference offer for DataStream-level interconnection, and to enter into an agreement within 28 days.

Supply of inferior products by BT

J.11 BT's vertical integration, combined with its upstream market power, meant that it had little incentive to provide a fit-for-purpose DataStream product, even once such a product was required by regulation. At the same time, introducing the product involved a large number of complex issues to be resolved, which has required the co-operation of BT and altnets.

J.12 The combination of these two factors has led to a pattern of features of the DataStream product supplied by BT to altnets not being fit-for-purpose, in contrast to the features of the product supplied by BT to its own downstream divisions.

J.13 There have been a number of examples of such product features not being fit-for-purpose. The terms and conditions offered by BT to its wholesale customers have resulted in a number of complaints by those customers. Examples of where these terms and conditions resulted in delays and/or raised costs for altnets included:

- **electronic gateway for ordering**. The ordering mechanisms for DataStream were less automated than those for IPStream. Automation was only added gradually, and by Q1 2005 had still not been fully achieved;

- **delays in ordering on newly enabled exchanges**. DataStream end-users could not be allocated ports, or given an in-service date, until a virtual path had been provisioned on a DSLAM in a newly enabled exchange. This took time, and resulted in their being a window of opportunity in which IPStream orders could be taken but DataStream orders could not. Given the pent-up demand for broadband this resulted in a significant first-mover advantage for IPStream customers in newly enabled exchanges; and

- **migration.** The lack of an automated single and bulk migration method for migrating end users from IPStream to DataStream caused altnets operational difficulties and increased their costs when trying to consolidate their user base onto the new DataStream product. In particular, altnets using DataStream considered that the initial cost of migration was not cost-oriented and that process was inefficient.

J.14 The process of resolving each of these issues has followed a pattern. First, the issue has been raised by service providers using DataStream. Typically these issues have been technical problems relating to BT's internal systems, which require BT's co-operation to address. However, because of the combination of BT's upstream market power and vertical integration, BT has had little incentive to resolve these issues. The result has been that resolution of each of these issues has taken very considerable time, and some of them are yet to be resolved.

J.15 As an example, we have illustrated below one area in which DataStream has not been fit-for-purpose; delays in ordering on newly enabled exchanges.

Delays in ordering on newly enabled exchanges

J.16 A complaint was first raised about the discrepancy between the enabling of exchanges for IPStream, as compared to DataStream, and the ordering of end-user ports, in the second quarter of 2004. Its significance was that service providers whose offers were based upon DataStream were at a significant disadvantage to those – including BT's downstream divisions – who used IPStream. The reason for this was that they could not offer service dates to end users until a week after the exchange was enabled, whilst service providers using IPStream could be taking orders and offering service dates from the announcement of the exchange ready-for-service (RFS) date. To the end-user the perception would be likely to be that those ISPs who use DataStream had come to market later.

J.17 BT knows in advance when IPStream will be offered at an exchange. BT can therefore pre-provision Virtual Paths (VPs) to ensure that there is no ordering delay. However, no facility for the pre-provisioning of DataStream VPs was offered.

J.18 A further issue with recently enabled exchanges related to DSLAM port availability. When DataStream was launched BT provided information on

the available capacity, in terms of end user ports, on each DSLAM. A significant number of DSLAMs had no port availability for DataStream, although they did have port availability for IPStream as ports had been pre-allocated to IPStream. DataStream orders could therefore be delayed due to lack of capacity even though IPStream orders could be processed.

Difficulties in Ofcom detecting problems, designing and enforcing remedies

J.19 There is also a pattern of Ofcom having difficulty using its Communications Act powers to detect problems, and to design and enforce remedies on highly complex and technical issues.

J.20 Because of the features of the market that give BT little incentive to introduce a fit-for-purpose product, Ofcom has had to monitor the service levels offered on DataStream in order to ascertain whether the product is in fact fit-for-purpose. However, Ofcom has had difficulty getting the information necessary to do this, and difficulty using this information to ascertain the performance of DataStream relative to the products supplied to BT's downstream divisions.

J.21 Many of areas in which DataStream has not been fit-for-purpose have been the result of difficult issues relating to BT's internal systems. The structural features of the market have given BT little incentive to address these problems itself. However, because Ofcom does not have knowledge of BT's systems, it has been difficult for Ofcom to ascertain what remedial action it would be possible, or reasonable, to require BT to take.

J.22 Only BT has the knowledge of its internal systems to know what is required to provide a suitable solution and what is technically possible. In light of this, prospective DataStream wholesale customers and Ofcom have been dependent on BT for information to design the appropriate solution.

J.23 Two examples of these difficulties are listed below:

- it was not possible for DataStream customers or Ofcom to know whether the delay in DataStream port allocation after the announcement of the RFS date was a necessary restriction; and

- information asymmetry issues arose in the determination of the cost of migration discussed previously in this annex. This investigation took Ofcom around eight months and required Ofcom to request detailed cost and network data from BT.

Downstream response by BT to supply of upstream products

J.24 As discussed in Annex I, DataStream is the wholesale broadband product between LLU (the most upstream product offered by BT), and IPStream (a downstream, end-to-end wholesale product).

J.25 Changes by BT in the prices of IPStream and LLU would affect the relative competitiveness of downstream products which used DataStream as inputs. In May 2004, Ofcom completed its market review of the Wholesale Broadband Access market, and found BT to have SMP in that market. As a remedy under that market review, Ofcom specified a rule that defined the

minimum permissible margin between DataStream and IPStream. This rule was designed to give prospective investors in DataStream greater confidence over their ability to compete with BT in downstream markets.

J.26 As a wholesale product which is upstream of IPStream, DataStream gave Altnets the opportunity to develop downstream products with different service attributes to IPStream. For example, IPStream did not allow ISPs to offer different contention ratios or qualities of service, and the charging dynamics that such features provide. Such services and charging dynamics could be developed using DataStream. The opportunity to differentiate by developing such service attributes is a potential source of competitive advantage to altnets purchasing DataStream.

J.27 However, following the introduction of an ex ante margin control, BT announced its intention to introduce alternative charging structures for IPStream. BT also substantially increased the network resources that it allocated to IPStream, without increasing the price of the product. This had the effect of raising the quality of service that DataStream users need to compete with, without a corresponding increase in the margin available.

J.28 These upgrades to the downstream wholesale product have had the effect of eroding the competitive advantage available to providers using DataStream. BT has been prohibited by ex ante regulation from eroding the price margin between the two products. However, the effect of the upgrades to IPStream's quality level and charging dynamics has been instead to erode the non-price factors differentiating the two products.

Time taken to introduce products and resolve problems

J.29 The net result of these difficulties has been delay in the introduction of a fit-for-purpose DataStream product. DataStream was originally requested in July 2000 and a direction for a reference offer was issued by Oftel in June 2002. As of the beginning of 2005 there are still, in the view of BT's wholesale customers who use it, problems with the product.

J.30 The delay in the introduction of DataStream means that the vast majority of the UK's more than 5 million ADSL users (more than 90 per cent) are supported on BT's IPStream product at the time of writing. Throughout this time, demand for broadband services continued to grow dramatically. DataStream growth has therefore been subdued during the highest growth phase of broadband, despite there being a clear desire for DataStream-based products.

Conclusions

J.31 The introduction of DataStream provides a good example of the difficulties that Oftel had using its ex ante powers, and Ofcom had using the Communications Act, to prevent non-price discrimination when:

- the combination of BT's vertical structure and its upstream market power have given it little incentive to supply a fit-for-purpose product; and
- the product is complex.

J.32 BT was initially reluctant to supply fit-for-purpose DataStream. When Oftel required it to do so as a regulatory remedy, Oftel could not forsee, in

designing the detailed terms of its direction, all the issues that would later arise. The result of this was a delay in a fit-for-purpose product suite being made available, in spite of regulatory activity. At the same time, wile Oftel used its ex ante powers to protect the price margin between IPStream and DataStream, BT improved the capability of the IPStream product. This had the effect of eroding the competitive advantage of altnets using DataStream, and created uncertainty which may have had the effect of deterring investment based upon DataStream.

Annex K

An analysis of the deployment of Partial Private Circuits (PPCs)

The introduction of PPCs

K.1 In November 1999, Oftel announced that it would undertake a review of the regulatory framework relating to national leased lines, the Leased Lines Market Review (LLMR).

K.2 In August 2000 Oftel concluded that the leased line market was not competitive and that regulatory intervention would be required. Oftel found that there were competition concerns relating to what were called termination segments: the connections from a customer's premises to an operator's trunk network. In this market BT had, and seemed likely to retain, market power. The review also noted that BT's market power in terminating segments had implications for the level of competition in the provision of services other than end-to-end leased lines, such as frame relay services, internet access services and ATM services, which also require local ends for their provision.

K.3 The following wholesale and retail markets are affected by competition concerns relating to termination segments:

- wholesale low bandwidth traditional interface symmetric broadband origination (up to and including 8Mbit/s);
- wholesale high bandwidth traditional interface symmetric broadband origination (above 8Mbit/s up to and including 155Mbit/s);
- wholesale alternative interface symmetric broadband origination at all bandwidths;
- wholesale trunk segments at all bandwidths; and
- retail low bandwidth traditional interface leased lines (up to and including 8Mbit/s).

K.4 In December 2000 Oftel issued a statement and draft direction regarding national leased lines in which it directed BT to negotiate with industry the terms and conditions of supply for a range of wholesale products called partial private circuits (PPCs). A PPC is an interconnecting leased line which provides a dedicated capacity connection from a customer's premises to an alternative network operator's point of connection with BT's leased line network.

K.5 This was followed by a permanent direction in March 2001. Under Condition 57 of its licence, BT was prohibited from unduly discriminating or unduly preferring its own business in respect of interconnection and was required to make its charges cost-orientated. The direction considered that a period

of eight weeks from the date of the final direction should be sufficient time for BT and the Altnets to conclude the outcome of the negotiations, with a further six weeks for implementation.

K.6 Subsequent to these negotiations, wholesale PPCs were introduced in August 2001.

K.7 However, almost immediately Oftel received complaints from BT's wholesale customers about the detailed terms upon which these products were offered. Despite significant intervention by Oftel and Ofcom subsequent to Oftel's original direction, resolving these issues has taken a significant time, and a number remain unresolved today. Many of these difficulties have been because the combination of BT's enduring upstream market power and its vertical integration has given BT little incentive to resolve issues that arise. This lack of incentive has resulted in the following problems with the introduction of PPCs:

- reluctance by BT to supply PPCs;
- supply of inferior products by BT;
- difficulties in Ofcom detecting problems, designing and enforcing remedies; and
- significant time taken to introduce products and resolve problems.

Reluctance by BT to supply PPCs

K.8 In a competitive wholesale market, a fit-for-purpose interconnect leased line product could be expected to be offered. However, the combination of BT's upstream market power and its vertical integration has given it little incentive to offer such a product. As a result, BT was reluctant to supply PPCs, and did not do so before they were mandated as a regulatory remedy. For example, for lower bandwidths BT argued[49] that the need for PPCs was addressed by LLU, and therefore that PPCs were unnecessary.

K.9 The rapid take-up of PPCs once they were introduced, at all bandwidths, illustrated the strength of demand for such a product.

Supply of inferior products by BT

K.10 There have been a number of examples of the PPC product set not being fit-for-purpose. In many cases, this was because BT initially did not supply a particular product feature that Altnets required. Each of these issues has been important to Altnets. Below we set out some examples of these issues:

- **provision of a PPC variant of Genus Circuits.** BT's *Genus* retail products provide higher resilience and higher availability for customers who use them for mission-critical activities. BT initially did not offer a PPC variant of these circuits; arguing that it was not technically possible to do so and that there was no market demand;

[49] BT's Response to Oftel's Further Statement of November 1999: National Leased Lines, reply to Question 5.

- **provision of a PPC variant of 1 Mbit/s private circuits**. BT replaced a 1024 kbit/s retail private circuit offering, for which a PPC equivalent was available, with a 1 Mbit/s retail private circuit for which no PPC equivalent was initially made available;

- **paper and technical migrations**. BT was required to charge a cost-oriented migration charge for Altnets migrating retail circuits to PPCs. However, this only applied to retail circuits ordered before August 2001. Some such circuits needed to be re-configured in order to fulfil the criteria for PPCs, and BT maintained that in doing so the brought-into-service date would be renewed, making it after August 2001. Oftel issued a direction that it was inappropriate for brought-into-service dates to be renewed in this way; and

- **provision of an In Span Handover extension**. BT did not supply an in span handover extension, where it would extend fibre from its premises to a footway box close to its exchange. Oftel issued a direction to BT to offer such a product.

K.11 The level of disputes regarding PPCs fell after Oftel's phase 2 direction was published in December 2003, however a number of issues prevail. These will be a subject of a forthcoming consultation on the 'replicability' of BT's retail services. Some of the outstanding issues raised by altnets that will be addressed are laid out below:

- **cost estimation**. PPC charges depend on a number of factors that are not known until late in the ordering process. Altnets have expressed concern that BT's retail divisions have better visibility of this information and are therefore in a better position to estimate the costs of supplying a new customer;

- **pricing differences**. BT's competitors have suggested that an operator using a PPC to deliver a trunk service may face not only a routing inefficiency, they may also face a higher cost per kilometre than is charged to BT's retail divisions;

- **reasonableness of contract terms**. For example, concerns have been raised in relation to BT's policies on credit vetting, payment terms, and the penalties for late payment;

- **higher equipment costs**. Altnets have expressed concerns that BT has the ability to terminate its leased lines on equipment that combines the requirements of several network layers (for example, an SDH port on an IP router) whereas operators using PPCs face the additional cost of an intermediate multiplexor; and

- **forecasting**. Operators using PPCs have to submit a forecast of the number of orders they expect to submit, and have to pay a financial penalty if they deviate from this forecast. BT's competitors have expressed concern that BT's retail divisions do not face a similar requirement.

K.12 As an example, we have illustrated in more detail below the issues around the provision of an in span handover extension product.

Provision of an In Span Handover (ISH) Extension

K.13 BT did not provide an ISH extension product which was requested by many of its wholesale customers, because it considered that such a product fell outside the explicit terms of the March 2001 PPC direction.

K.14 Under existing interconnection arrangements, BT provided an ISH extension. This was a piece of fibre running from BT's exchange to a footway box which was within 100m of BT's exchange building. Altnets would then build fibre from their own site to the footway box in order to interconnect with BT's network.

K.15 The altnets requested such an ISH extension product for PPCs. They argued that such a product was necessary to reduce the environmental impact and cost of having to dig up streets to get to BT's exchanges. In the absence of an ISH extension product, altnets would not be able to achieve efficient interconnection for the purchase of PPCs. In particular, it would take longer for them to purchase PPCs as they would need time and capital investment to dig to BT's exchanges.

K.16 BT argued that the ISH extension requirement fell outside the explicit terms of the March 2001 PPC direction. It stated that it had to prioritise various aspects of development work in order to meet the 1 August 2001 deadline for product launch, and that this involved focusing on the product set as defined in the March 2001 PPC direction, and where possible using existing processes, product descriptions, contract terms and so on.

K.17 Consequently, Oftel was required to intervene by obliging BT to provide to an ISH extension product to its wholesale customers. BT was required to offer this on a non-discriminatory basis and on cost-orientated terms.

Difficulties in Ofcom detecting problems, designing and enforcing remedies

K.18 Though a competitive wholesale market could be expected to supply PPCs, BT's vertical integration combined with its upstream market power provide it with little incentive to do so. The introduction of PPCs is a good example of the difficulties that result when a complex wholesale product is required by regulation, but BT is not incentivised to supply it.

K.19 The detailed information necessary to resolve technical complexities around PPCs meant that Oftel had no alternative but to rely on BT to develop technical solutions, and in some instances for BT and its wholesale customers/downstream competitors to agree the solution together. However, this meant that some of the product variants were unavailable, or have been delayed for technical reasons, as outlined above.

K.20 It has also been difficult for Oftel and Ofcom to secure satisfactory information in order to make the necessary determinations. A good example of this was the difficulty Oftel had in securing the information to make the assessment of whether capacity-based or service-based charging would be most appropriate for PPCs; the former having been proposed by the altnets and the latter by BT.

Time taken to introduce products and resolve problems

K.21 The net result of these difficulties has been delay in the introduction of a fit-for-purpose suite of PPC products.

K.22 BT was directed to negotiate the terms of PPC provision on a commercial basis in March 2001. Four years have passed since this time, and Ofcom continues to receive complaints (discussed above) that these products are still not fully fit-for-purpose.

Conclusions

K.23 The introduction of PPCs provides a good example of the difficulties Oftel had using its ex ante powers, and Ofcom had using the Communications Act to prevent non-price discrimination when:

- the combination of BT's vertical structure and its upstream market power have given it little incentive to supply a fit-for-purpose product; and
- the product is complex.

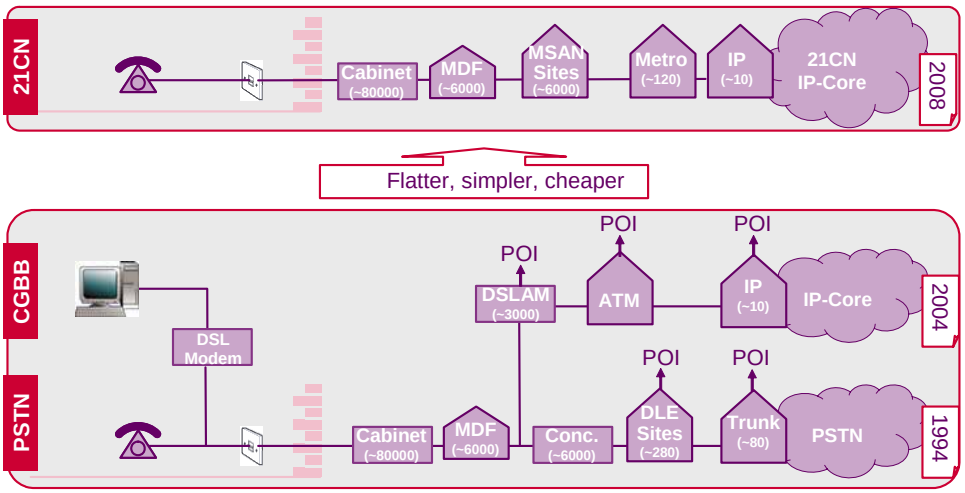
K.24 BT was initially reluctant to supply PPCs. When Oftel required it to do so as a regulatory remedy, Oftel could not forsee, in designing the detailed terms of its direction, all the technical issues that would later arise. When they arose, and because they were not covered explicitly by its earlier directions, Oftel had to issue subsequent directions on these, on an issue-by-issue basis. The result of this was a delay in a fit-for-purpose product suite being made available, in spite of a high level of regulatory activity.

Annex L

Impacts on competition of the evolution to next generation networks

L.1 In Annex F, we explained the sources of BT's market power in access and backhaul services. BT is currently planning the upgrade of its core and backhaul networks to use Next Generation Network (NGN) technology; this upgrade is called its 21st Century Network (21CN). Plans for 21CN will utilise converged technologies to carry multiple services (such as voice, video and data) over the same infrastructure, rather than separate networks in the core and backhaul network. Figure 2 provides a comparison of BT's existing networks with its 21CN.

Figure 2. Comparison of BT's existing voice and broadband networks with its plans for 21CN



Key:

POI	Point of Interconnection	Conc	Concentrator
PSTN	Public Switched Telephone Network	DSLAM	DSL Access Module
CGBB	Current generation broadband	DLE	Digital Local Exchange
21CN	BT's 21st Century Network	MSAN	Multi Service Access Node
MDF	Main distribution frame		

L.2 A number of BT's competitors are planning similar upgrades to their core networks. Unlike these altnets, however, BT's enduring market power in wholesale local access and backhaul markets means that the way in which BT upgrades its network will have significant implications for competition.

L.3 Whilst the 21CN proposed by BT uses different technology and has a slightly different topography, and the technical presentation of problems may change, the underlying features of the market will be the same as today. In particular, there is nothing in the evolution to the 21CN which is

likely to remove BT's enduring market power in access and backhaul services.

L.4 Annexes G to K show how the combination of structural features of the market which give BT little incentive to introduce fit-for-purpose wholesale products, combined with the complexities of those wholesale products, resulted in delays in the introduction of fit-for-purpose wholesale products which may have had the effect of restricting competition. Ofcom believes that the process of the introduction of the 21CN, and specifically BT's consultation on its 21CN to date, may have displayed many of these same features.

L.5 Specifically, BT's competitors may be being disadvantaged by the way in which BT's 21CN is being introduced, because:

- as a result of of BT's upstream market power, BT's wholesale customers face additional risks in investing in their own NGNs, until they know the design of BT's NGN. For example, it is risky for them to design their networks while there is uncertainty around the points of interconnect to BT's network, and the nature of the access to be provided. BT has an information asymmetry that works to its advantage, because BT always has more detail about its network design than anyone else. The delays in BT resolving the uncertainties about the specification of its new network and the protracted nature of the dialogue with other communications providers give Ofcom cause for concern that the competition concerns we have identified in the past will persist in future within the 21CN context. As a result, BT may gain a first mover advantage following the deployment of its NGN.

- BT's retail divisions may have had earlier and more complete information about the design of BT's NGN than do BT's downstream competitors. As a result, BT's retail division would be able to plan for the migration of its retail products, and the introduction of new ones, in advance of its competitors.

- BT's vertically integrated structure may have given BT's retail division more opportunities for influencing the design of 21CN than its competitors.

Potential impact of BT's 21CN on competition and innovation

L.6 Annexes G to K also show that many wholesale products offered by BT to third parties may have been inferior to those used by its own downstream divisions as a result of systems design. Systems developed by BT for third parties were in many cases less automated, and less integrated than those used by BT's downstream divisions. The design and implementation of 21CN represents a one-off opportunity for these issues to be addressed, as new systems are designed. These new systems could be designed so that the same system, with the same level of automation and functionality, was available to downstream customers as to BT's downstream divisions. Alternatively, they could be designed, as are many of BT's current systems, with a higher level of functionality and integration provided to BT's own downstream divisions than is available to its downstream competitors. For example, BT has designed its network to have the capability to identify the

location and profile of the end user, and this capability could be made unavailable to other communications providers.

L.7 BT's market power in access and backhaul services means that the interconnection arrangements to BT's 21CN will also affect the competitiveness of rival networks in a number of ways.

L.8 First, the points of interconnection to BT's 21CN may be in different locations to the points of interconnection to its current network. Other operators need to interconnect with BT at multiple points because of BT's market power in access and backhaul services. These operators may find that their existing assets (for example, fibre links to interconnection points) are stranded by these changes, and that they are required to invest in new infrastructure to access the new points of interconnection. Because of the features of the market, BT has little incentive to minimise these costs, which would be borne by other operators, when it plans its network.

L.9 Second, BT's vertical integration gives it an incentive to optimise its network for end-to-end services. However, other providers, with networks that replicate some, but not all of BT's network, will need access to unbundled network elements, in a manner which is competitively neutral. An example is where an altnet may wish to compete with BT in the provision of an end-to-end service, but do so using its own core network. In this case the altnet would need to interconnect to BT's network at the level of the Multi-Service Access Node (MSAN).

L.10 Third, interconnection and interoperability of next generation networks are likely to become more, rather than less complex. One example is where services provided on NGNs require Quality of Service (QoS) management on an end-to-end basis. In this case interconnection would need to be provided at the physical or conveyance layer of delivery[50].

L.11 Fourth, the 21CN may allow BT to upgrade customers' services, for to broadband, using a software switch. Conversely, competitors using LLU would have physically to disconnect a customer from BT's equipment, and connect a customer to their equipment, in order to provide such a service. This would take extra time, and therefore be likely to constitute a competitive constraint to downstream competitors.

L.12 For the reasons set out in Annex F, BT's upstream market power, combined with its vertical integration, provide it with little incentive to address these concerns in the design, procurement and implementation of its 21CN.

[50] Further details of these issues are available in Ofcom's consultation document, "NGN: further consultation", published 30 June 2005