Chaltel's Response to Ofcom's Consultation

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Next Generation New Build

Promoting higher speed broadband in new build housing developments

Contents

Background and Context

Next Generation Access networks (NGA) offer the prospect of a rich set of new broadband services for all types of customers. However they also present the threat of removing some of the facilities provided by the existing telephone service, such as universal availability and guaranteed access to emergency services even if the local electricity supply fails.

The network operators and their shareholders want an incremental deployment strategy, in which frequent small investments in more advanced technology are rewarded with regular increases in income. However, the rapid world-wide growth of demand for broadband services, along with increasing evidence about their social and economic benefits, should convince all stakeholders, that NGA is the way forward in the United Kingdom, Europe and globally.

NGA is one of the most fundamental changes in the telecommunications infrastructure since the introduction of digitalisation, optical fibre deployment in core and international networks and competition. New-build fibre deployments allow providers to test new very high

bandwidth services and explore how customers react to them. Governments and regulators will also benefit from this experience and should use it to create a clear regulatory environment for the deployment of NGA.

A major barrier to the introduction of fibre-based NGA is the high up-front cost, which makes it almost impossible for network operators to deliver PATS profitably on day 1. Traditional twisted-copper networks, with already sunk investment and a lifetime of 25 years, appear as a much more attractive option. However, even with the advances that are being made in DSL technology, copper pairs will never deliver very high bandwidth services over the typical distances between customers and their local telephone exchange. This has forced most telecom and CATV operators to upgrade parts of the access network with optical fibre. It would therefore appear that the deployment of fibre-to-the-cabinet (FTTC) is lower risk option and financially a necessary precursor to the deployment of fibre to the premises. However, Fibre-to-The-Home (FTTH) solution, if the appropriate optical technology is implemented, should prove to result in a better return on investment and more future-proof network due to the virtually unlimited bandwidth of optical fibre. It should also offer similar risk levels. These conclusions apply to brown-field and new-build deployments when total ownership cost is considered. We understand that the UK Broadband Stakeholders Group has been asked by BERR to examine this issue.

Ofcom's consultation recognises the difference between brown-field deployments, where most of the existing utility infrastructure can be re-used, and new build deployment, where the utility infrastructure has to be built from scratch. In the latter case, the cost of digging, trenching and duct-laying is shared between the various utilities. Furthermore it can be done more cheaply, because it can be programmed ahead of the construction of the roads and buildings that it will serve.

Given that these civil engineering works contribute up to 80% of the cost of installing a telecoms infrastructure, it is almost irrelevant whether the actual cables contain copper pairs or optical fibres. This significantly reduces or even removes the key economic barrier to NGA deployment.

The scope of Ofcom's consultation is the deployment of new-build telecoms infrastructure for new-build housing developments and other areas where no infrastructure yet exists.

The consultation also addresses some technology dependent issues. The most important is the requirement that a Publicly Available Telephone Service (PATS), provided over a Public Telephone Network (PTN) under the Universal Service Directive, should use line powering to provide access to emergency services even if the local electricity supply fails. A second issue is the difficulty of applying the current local loop unbundling regulations, designed for a point-to-point (PtP) copper based network, to fibre-based networks using a Passive Optical Network (PON) architecture that shares the infrastructure amongst many customers. Although there are viable PtP optical approaches to NGA networks, incumbent operators tend to prefer PON, although new entrants are more likely to choose PtP.

The choice of technology has implications for all stakeholders. However, in its consultation on Future Broadband, Ofcom makes it clear that it is not the regulator's role to favour any particular technical solution. Any decisions on technology should reflect a broad consensus of stakeholders and, in this respect, Ofcom welcomes Openreach's proposals for consulting on its choice of technology and the implications of that choice.

Although this initiative by a major player is encouraging, the European Directives and the Telecommunication Act of 2003 make it clear that, within the UK, Ofcom is responsible for

specifying the important regulatory points, their interfaces and the associated technical standards.

We have only provided answers to those questions we feel most qualified to answer, namely Question 1and Question 3g.

To ensure that our answers are consistent with the European and UK regulatory frameworks, we have studied the current:

- Regulatory Framework for Telecoms in the European Union;
- Framework Directive (2002)
- Universal Service Directive (2002)
- Radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity (RTTE – 1999)
- Communications Act 2003– (UK)2003
- Ofcom's "Consolidated Version Of General Conditions As At 15 August 2007".

The text most relevant to the answers is presented in Annex 1 of this document.

Response to Question 1

Question 1: What can Ofcom do to encourage timely standards development for new build NGA wholesale access products and interfaces? Which industry body is best placed to undertake the standardisation of these products and interfaces? What action should Ofcom take if these standards fail to materialise?

Background to Answer 1:

Agreed architectures and standards are essential for complex technical systems such as computing, telecommunications and broadcasting networks. This is recognised by the Ofcom consultation document and by many European Commission Directives.

There are a number of official international organisations that formulate harmonised standards aimed at reducing market fragmentation and ensuring interoperability. At the global level they include the International Telecommunication Union (ITU), the International Organisation for Standardisation (ISO) and the International Electrotechnical Commission (IEC). Within Europe there are regional organisations, such as the European Committee for Standardisation (CEN), the European Committee for Electrotechnical Standardisation (CENELEC) and the European Telecommunications Standards Institute (ETSI).

Because these organisations operate by consensus or qualified majority voting, their processes are slow and their harmonised standards lag behind, and sometimes even ignore, what is actually happening in the marketplace.

Most commercially successful standards are *de-facto* standards created by a dominant player (e.g. the Microsoft Windows operating system), an industry interest group (e.g. the IEEE Local Area Network standards and the FSAN group's Optical Access Network standards) or a community of interest (e.g. the Internet Protocols and the LINUX operating system).

In addition there are *de-jure* standards mandated by law. These standards generally cover "essential requirements" relating to health, electromagnetic compatibility, network integrity, access to emergency services and support for people with disabilities. A significant number of these essential requirements are covered by the General Conditions of the Telecommunications Act 2003, and by Ofcom's General Conditions. *De-jure* standards can also specify a particular technical solution as a licence condition. Examples include the GSM and 3G cellular telephony standards.

Returning to the process of producing *de-facto* standards, most of it is driven by industry players that hope to create standards that will offer them a strong market position and protect their Intellectual Property Rights (IPR). Notable successes of proprietary standards include the VHS video-recorder format and the IBM personal computer architecture. In contrast to proprietary standards, there are successful open standards; e.g. the GSM cellular telephony standard, which evolved from an EU mandated *de-jure* standard into a worldwide *de-facto* standard. These open standards are not controlled by a particular player or a small group of commercial players.

The EU has also had considerable success in helping European industry lead the development of agreed digital and high-definition TV standards, although the battle for high-definition video-recording standards has been dominated by the major Japanese players.

In the field of optical Next Generation Access, FSAN (Full Service Access Network) is an interest group created in 1995 by several network operators to develop standards for the optical access part of the public network. In parallel with this, the long-established IEEE

(Institute of Electronic and Electrical Engineers) has developed 10 gigabit Ethernet for Local Area Networks.

These bodies consist of industrial/academic players and are not part of the "official" standards making process. However they often make important contributions to it because their proposed standards have already been accepted by major players.

Historically, the success and universal adoption of a newly formulated standard is not guaranteed. In the 1980s the ITU and ISO agreed a comprehensive suite of harmonised standards (X.400) for exchanging and addressing electronic messages. However the marketplace rejected these in favour of the Internet approach to electronic mail (SMTP) which became the *de facto* standard over the public data network.

Even a *de jure* standard can fail if it is not supported by at least one industrial organisation or a non-commercial organisation funded by the government imposing the standard.

Answer to Question 1:

We agree that standards are fundamental to system architecture. They define the functionality and attributes of the various building blocks and specify the interfaces between those building blocks. They also have to evolve with time to ensure that the system continues to meet its requirements and objectives.

The commercial success of a particular system, along with its underpinning architecture and associated standards, is not guaranteed at the outset. This is particularly true for a nascent technology, market or in a transitional period when several architectures compete to prove their fitness-for-purpose.

Even though it normally takes years or even decades for a dominant architecture to become established, the commercial advantages of being on the 'winning' side are such that individual players will invest considerable time and effort to promote their preferred solution as the de-facto standard. This often results in a dominant standard emerging more quickly. This would be a positive outcome if it prevented market fragmentation and allowed economies of scale to deliver lower production costs. However it would be a negative outcome if it resulted in an effective monopoly, created higher prices, and prevented competition from smaller or more innovative players.

To ensure a positive outcome for the communications sector, Ofcom and the government should oversee the development of the architecture, and associated standards for new-build NGA.

Ofcom should take particular care to ensure that the standards related to essential requirements are clearly stated, formulated and implemented by the various players within the electronic communication market. It should also ensure that harmonised standards are defined for appropriate interfaces, in particular the network termination point. This is essential if the services covered by the European Universal Service Directive are to be made available at the specified level of quality and at an acceptable price to all customers, irrespective of their geographical location.

The Communications Act – 2003 provides Ofcom with:

- power to undertake research and development work in connection with any matter in relation to which they have functions;

- power to promote the carrying out of such research and development by others, or otherwise to arrange for it to be carried out by others;

Ofcom should use these powers to actively encourage the development of technologies and standards that meet the essential requirements better than solutions based on emerging or recently agreed standards. We recognise that it takes a long time to establish a successful architecture and related standards for a new technology, and that the process is expensive and risky. However, the cost should be compared with the impact of not developing the technology and the harm this could cause to customers. We believe that technological innovation is the best route, especially if technological solutions to satisfy the regulatory requirements are not currently available.

Ofcom can also provide requirements to the national and European Framework Research and Development programmes. However such programmes move slowly and tend to favour large organisations rather than innovative individuals or start-up companies.

It is particularly important that Ofcom provides clear regulatory requirements so that private investors can assess the risk of investing in technological solutions that satisfy those requirements, especially those relating to essential requirements and the General Conditions specified by national and European legislation.

Ofcom could make a major contribution by orchestrating the development of routemaps for services, technologies, architectures and standards, along with a routemap for regulatory frameworks. However it is important to recognise that routemaps are only useful if they chart a route that most of the players are prepared to follow. All players must therefore be involved in the routemap development.

Response to Question 2

Question 2: Do you agree with Ofcom's approach to promoting competition and consumer choice in new build fibre access deployments?

We agree with the general principles and approach followed by Ofcom. However, it is important that Ofcom provides leadership in providing regulatory and policy clarity to ensure that any route will not lead to mistakes that make the introduction of new innovative services very costly and impractical during the lifetime of the investment, or results in degradation of service quality or can cause harm to customers and citizens.

It is difficult to see why service providers with existing regulatory obligations are at disadvantage in comparison to new investors who have no such obligations at the point of deployment. Innovative emerging technologies should make return on investment in optical communication systems better than investment in old or exiting generation technologies. These providers should support the development of these optical technologies that are not yet standardised.

We agree that it is desirable that the new fibre based products offer the consumer the same CP experience as the existing copper based products. This would make it easier for consumers and CPs to migrate from the copper products to the fibre ones.

Response to Question 3

Question 3a

Question 3a: Do you believe that the existing obligations must be met by replicating the existing copper products, or that an alternative approach could be satisfactory? What are the implications of replicating existing products on fibre?

The set of universal services as defined by the Universal Service Directive defines the basic services offered across the UK and Europe. Optical technologies should be able to support all these services that are covered by the Universal Service Directive and have been delivered over copper infrastructure. However, the currently chosen technologies do have shortcomings and might have difficulty offering these services in a cost effective fashion, especially in a service unbundled environment where the customer might want voice or TV or broadband service individually rather than a bundled services.

Question 3b

Question 3b: Do you agree that SMP holders rolling out fibre do not need to roll out a copper network in parallel solely to meet their LLU obligation?

The response to this question will depend on the investment already committed by the communication provider in equipment that operates specifically over copper. The new build scenario might be different, as no legacy equipment exists in the field. However, the chosen architecture should ensure that standard access and interoperability interfaces are offered. This should minimise the risk of an operator changing the interfaces due to a change in deployed technology.

Question 3c

Question 3c: Do you agree with Ofcom's approach in relation to WBA and new build areas?

We do not feel fully qualified to offer a suitable answer, but we agree with Ofcom's approach.

Question 3d

Question 3d: Do you believe that the WLR obligation must be met by replicating the existing copper product, or that an alternative approach based on an ALA type product would be satisfactory?

The response to this question will depend on the investment already committed by communications provider in equipment to operate with copper. The new build scenario might be different, as no legacy equipment exists in the field. However, the chosen architecture should ensure that standard access and interoperability interfaces are offered. This should minimise the risk of an operator changing the interfaces due to a change in deployed technology.

Question 3e

Question 3e: Do you believe that the CPS obligation must be met by replicating the existing copper product or that an alternative approach based on an ALA type product would be satisfactory?

We do not feel fully qualified to offer a suitable answer.

Question 3f

Question 3f: Do you believe that the IA obligation must be met by replicating the existing copper product or that an alternative approach based on an ALA type product would be satisfactory?

We do not feel fully qualified to offer a suitable answer.

Question 3g

Question 3g: Do you agree with our proposal to interpret GC 3.1 (c) as being met through the provision and use of a battery backup facility to maintain uninterrupted access to emergency services in new build developments?

Background to Answer 3g

Next generation access networks will offer greater upstream and downstream bandwidth to customers and create opportunities for service innovation. However choosing a particular delivery technology may weaken the existing protection for customers.

The currently proposed optical approach to new build fibre access networks will provide PATS using Voice over IP (VoIP) technology. This can deliver new and innovative services such as video calling and conference calling, in addition to traditional services like call waiting, voice mail, call forwarding and call barring. However VoIP terminal equipment is dependent on the domestic power supply, whereas an essential feature of the traditional PATS is that it is line-powered from the telephone exchange and provides guaranteed access to emergency service even if the domestic electricity supply fails. Telephone exchange line-powering solution has provided low cost and resilient public telephone network (PTN), compared to customer premises battery backup solutions, over the last several decades.

In previous Ofcom consultations on VoIP regulation, Ofcom has concluded that requiring line powering for VoIP services is not a “reasonably practical” solution to the requirements of General Condition 3 “because of the power demands of the terminal equipment and the characteristics of the access technology typically used (for example, ADSL)”.

Ofcom’s view was that the appropriate solution was to require providers to give consumers information about the reliance of VoIP services on a power supply. It was thought that this would enable consumers to make an informed choice about whether or not to retain a traditional line-powered connection to the telephone service.

However, those consultations assumed that a switched telephone network would be available alongside broadband. In contrast, the currently proposed optical technology for a new build fibre access network will not offer that choice. VoIP will be the only option for PATS.

Given the importance of access to emergency services, Ofcom should consider the vulnerability of children, the disabled, the elderly, those on low incomes and others who need special protection, along with the desirability of preventing crime and disorder.

Ofcom has proposed that, where a VoIP service categorised as PATS is provided in such an environment, Ofcom would interpret the requirements of GC 3.1 (c) to be met through the provision of a secure uninterrupted battery backup facility. This battery backup facility would be required to provide a traditional telephone service in the event of a failure in the domestic supply, by powering the required network termination, adapter devices and terminal equipment. In Ofcom's view, battery backup is consistent with doing all that is "reasonably practical" to ensure uninterrupted access.

Without a battery backup facility customers would not have access to emergency services in the event of a domestic power outage. Ofcom does not consider this acceptable and its proposed amendment to guidelines reads "Where, with regards to new build fibre access networks, as described in Ofcom's consultation document of 16 April 2008, the only voice telephony service provided to end-users is one using VoIP technology, the VoIP service provider is expected to meet the requirements of its obligations under GC3 through the provision and use of a secure uninterrupted battery backup facility. This battery backup facility would be required to power the end-user's terminal equipment, any network termination at the end-user's premises and any adapter device that is used to support the VoIP services with a traditional telephone in the event of a failure in the domestic supply."

However the issue of battery backup has only arisen because of the choice of technical solution for new build NGA networks. Ofcom needs to consider the implications of regulating in a way that favours one technology over another; i.e. ensuring that regulation is "technology neutral".

Answer to Question 3g:

It is obvious from Ofcom's previous consultations that it does not consider line-powering of VoIP customer premises equipment to be practical, either over fibre or copper. However a line powered connection that ensures uninterrupted access to emergency service has been an essential feature of the PSTN for many decades. This shows the critical importance of the choice of technology to support the different services and their functionality.

We accept that customer premises equipment can not line-powered using optical fibre systems based on current standards. However, it is NOT obvious that a voice channel can NOT be remotely powered from the telephone exchange over an optical fibre. We believe, based on technical and engineering calculations, that it is possible to power the voice channel over optical fibre without exceeding the safe limits of exposure to laser radiation. Within those safe limits, it is possible to deliver enough optical power to generate the acoustic power required for acceptable levels of "lifeline" conversation and ringtone. The technology required is currently at the design stage but, once developed and mass produced, could deliver a "lifeline" voice channel as cheaply as a twisted copper pair.

It is therefore unnecessary to make a premature amendment to the current regulatory framework or General Conditions to accommodate the limitations of current optical fibre based technology.

We consider the proposed amendment to GC 3.1 (C) and the guidelines are technology and market specific as they only apply to a specific way of deploying new build NGA networks using fibre, VoIP and battery backup. This is inconsistent with Ofcom's "technology neutral" policy approach. Furthermore it proposes different regulatory approaches to brown-field and new-build developments.

Having said that, we agree that battery backup is the best way of providing telephony over any IP network and, in particular a VoIP fibre network. However, we do NOT agree with Ofcom's interpretation and its proposed amendments regarding delivery of PATS over optical networks using VoIP. Ofcom does not provide any information about the quality of service that can be delivered over VoIP. Important issues include how long the battery will last in the event of power failure and whether it can guarantee the 99.999% availability expected from the traditional PSTN line providing PATS.

The proposed changes are not based on a thorough assessment of the capabilities of optical technology. VoIP may require battery backup but there are non-VoIP optical solutions that can deliver voice over optical fibre without battery backup, using same the signalling protocols as a conventional PSTN line.

In our opinion, the "Proposed modification of the Guidelines on the application of PATS obligations to VoIP service providers" presented in Annex 5 of the consultation document "Next Generation New Build – Promoting higher speed broadband in new build housing developments" provides detailed, and very useful clarifications of the legal terms and its applicability. However, it does not cover in depth, if at all, the important aspect of Quality of Service under Article 22 of the Universal Service Directive which states that:

- Member States shall ensure that national regulatory authorities are, after taking account of the views of interested parties, able to require undertakings that provide publicly available electronic communications services to publish comparable, adequate and up-to-date information for end- users on the quality of their services. The information shall, on request, also be supplied to the national regulatory authority in advance of its publication.
- National regulatory authorities may specify, inter alia, the quality of service parameters to be measured, and the content, form and manner of information to be published, in order to ensure that end-users have access to comprehensive, comparable and user-friendly information. Where appropriate, the parameters, definitions and measurement methods given in Annex III [of the Directive] could be used."

This article applies to "publicly available electronic communications services" and almost certainly to "publicly available telephone services".

This raises the question of whether Ofcom's proposal to interpret GC 3.1 (c) as being met through the provision and use of a battery backup facility to maintain uninterrupted access to emergency services in new build developments, satisfies the gating criteria given in the guidelines, and also whether the quality of services that result from this are acceptable. We find it impossible to agree with Ofcom's interpretation, as given in the consultation document and the guidelines, without having full information on quality of service that is offered by the proposed technological solutions.

The decisions should be based on proper analysis and considered judgements, especially as they impact on customers' lives and safety.

Ofcom should take the opportunity of experiments with next generation access technology to collect real data regarding quality of service and conduct a formal assessment of the impact and risk of deploying a particular technology to deliver PATS and other universal services. Such a formal assessment is expected to include, in exactly the same way as Ofcom demands from a provider of 999 and/or 112 services:

- producing a model of the network elements used to provide that service;

- defining a set of performance parameters which characterise the end to end performance of that service (e.g.MTBF);
- identifying which of the elements are most likely to fail, or suffer from degraded performance, and what the consequence would be for the performance parameters;
- determining which elements are critical in relation to the end-to-end service performance, and what risk mitigation strategy might reasonably be adopted in relation to those elements; and
- determining and implementing a risk mitigation strategy that might reasonably be adopted in relation to those critical elements.

Ofcom should also conduct a proper cost analysis of the different technological solutions especially those related to regulatory interfaces; such as the network termination point, and network resilience and integrity. The analysis should cover the cost (capital and operating cost) to network operators, and more importantly, to customers over the lifetime of the system.

It will only be possible to agree or disagree with Ofcom's interpretation of GC 3.1 on the use of battery backup to provide PATS service over VoIP in new build premises after this information is collected and published.

Ofcom should also support new innovative technological solutions that satisfy the essential requirements better than existing technologies. This should include the development of the appropriate standards for these solutions. We believe that technological innovations will offer customers a better choice of services and products.

We have discussed alternative optical solutions with BT, BT Openreach, Ofcom and other network poperators, but the network operators' response was "they can not support solutions that are not based on standards, and they currently have the optimum technology and architecture especially for reducing their cost." We hope that they will reconsider their position and support more innovative and lower cost solutions that protect customers better than current solutions based on standards. This also emphasises the important role the regulator must play to influence, determine and encourage the development of the technical standards related to the regulatory interfaces, in particular those related to essential requirements, network termination point, interconnection points and network integrity and resilience.

Response to Question 4

Question 4: Do you think access to the duct network, including non telecoms duct, is a potentially feasible means of promoting competition in new build? If so what types of commercial and operational models could successfully support such access arrangements in the UK?

The answer to the first part of the question is yes. However, we are not to offer an answer to the second part.

Annex 1 Relevant European and United Kingdom Legislation

United Kingdom Legislation

Communications Act - 2003: United Kingdom

1 Functions and general powers of OFCOM

(5) OFCOM's powers under subsection (3) include, in particular—

(a) power to undertake research and development work in connection with any matter in relation to which they have functions;

(b) power to promote the carrying out of such research and development by others, or otherwise to arrange for it to be carried out by others;

3 General duties of OFCOM

(1) It shall be the duty of OFCOM, in carrying out their functions—

- (a) to further the interests of consumers in relevant markets, where appropriate by promoting competition; and
- (b) to further the interests of the community as a whole in relation to communications matters.

4 Duties for the purpose of fulfilling Community obligations

(6) The fourth Community requirement is a requirement to take account of the desirability of OFCOM's carrying out their functions in a manner which, so far as practicable, does not favour—

(a) one form of electronic communications network, electronic communications service or associated facility; or

(b) one means of providing or making available such a network, service or facility, over another.

(9) The sixth Community requirement is a requirement to encourage such compliance with the standards mentioned in subsection (10) as is necessary for—

(a) facilitating service interoperability, and

(b) securing freedom of choice for the customers of communications providers.

(10) Those standards are—

(a) standards or specifications from time to time drawn up and published in accordance with Article 17 of the Framework Directive;

(b) the standards and specifications from time to time adopted by—

(i) the European Committee for Standardisation,

(ii) the European Committee for Electrotechnical Standardisation; or

(iii) the European Telecommunications Standards Institute; and

(c) the international standards and recommendations from time to time adopted by—

(i) the International Telecommunication Union;

(ii) the International Organisation for Standardisation; or

(iii) the International Electrotechnical Committee.

Conditions of entitlement to provide network or service etc.

45 Power of OFCOM to set conditions

(1) OFCOM shall have the power to set conditions under this section binding the persons to whom they are applied in accordance with section 46.

(2) A condition set by OFCOM under this section must be either—

(a) a general condition; or

(b) a condition of one of the following descriptions—

(i) a universal service condition;
(ii) an access-related condition;
(iii) a privileged supplier condition;
(iv) a significant market power condition (an “SMP condition”).

46 Persons to whom conditions may apply

47 Test for setting or modifying conditions

51 Matters to which general conditions may relate

(1) Subject to sections 52 to 64, the only conditions that may be set under section 45 as general conditions are conditions falling within one or more of the following paragraphs—

(a) conditions making such provision as OFCOM consider appropriate for protecting the interests of the end-users of public electronic communications services;

(b) conditions making such provision as OFCOM consider appropriate for securing service interoperability and for securing, or otherwise relating to, network access;

(c) conditions making such provision as OFCOM consider appropriate for securing the proper and effective functioning of public electronic communications networks;

(d) conditions for giving effect to determinations or regulations made under section 71;

(e) conditions requiring or regulating the provision, availability and use, in the event of a disaster, of electronic communications networks, electronic communications services and associated facilities;

(f) conditions making such provision as OFCOM consider appropriate for securing the protection of public health by the prevention or avoidance of the exposure of individuals to electro-magnetic fields created in connection with the operation of electronic communications networks;

(g) conditions requiring compliance with relevant international standards.

(7) In this section “disaster” includes any major incident having a significant effect on the general public; and for this purpose a major incident includes any incident of contamination involving radioactive substances or other toxic materials.

52- 55 General conditions: consumer interest

56- 63 General conditions: telephone numbers

64 General conditions: must-carry obligations

65-72 Universal service conditions

73-76 Access-related conditions

77 Privileged supplier conditions

78- 86 SMP conditions: procedure

87- 92 SMP services conditions: subject-matter

93 SMP apparatus conditions: subject matter

94-104 Enforcement of conditions

Part 1: Definitions And Interpretation Relating To The Conditions In This Schedule

"Network Termination Point" means the physical point at which a Subscriber is provided with access to a Public Electronic Communications Network and, where it concerns Electronic Communications Networks involving switching or routing, that physical point is identified by means of a specific network address, which may be linked to the Telephone Number or name of a Subscriber. A Network Termination Point provided at a fixed position on Served Premises shall be within an item of Network Termination and Testing Apparatus;

"Network Termination and Testing Apparatus" means an item of Apparatus comprised in an Electronic Communications Network installed in a fixed position on Served Premises which enables:

(a) Approved Apparatus to be readily connected to, and disconnected from, the network;

(b) the conveyance of Signals between such Approved Apparatus and the network; and

(c) the due functioning of the network to be tested, but the only other functions of which, if any, are:

(i) to supply energy between such Approved Apparatus and the network;

(ii) to protect the safety or security of the operation of the network; or

(iii) to enable other operations exclusively related to the running of the network to be performed or the due functioning of any system to which the network is or is to be connected to be tested (separately or together with the network);

"Public Electronic Communications Network" means an Electronic Communications Network provided wholly or mainly for the purpose of making Electronic Communications Services available to members of the public;

"Public Electronic Communications Service" means any Electronic Communications Service that is provided so as to be available for use by members of the public;

"Publicly Available Telephone Service" means a service available to the public for originating and receiving national and international calls and access to Emergency Organisations through a number or numbers in a national or international telephone numbering plan, and in addition may, where relevant, include one or more of the following services: the provision of operator assistance services, Directory Enquiry Facilities, Directories, provision of Public Pay Telephones, provision of service under special terms, provision of specific facilities for End-Users with disabilities or with special social needs and/or the provision of nongeographic services;

"Public Telephone Network" means an Electronic Communications Network which is used to provide Publicly Available Telephone Services; it supports the transfer between Network Termination Points of speech communications, and also other forms of communication, such as facsimile and data;

General Conditions

1. General access and interconnection obligations

2. Standardisation and specified interfaces

3. Proper and effective functioning of the network

3. Proper and effective functioning of the network

> 3.1 the communications provider shall take all reasonably practicable steps to maintain, to the greatest extent possible:
>
> (a) the proper and effective functioning of the public telephone network provided by it at fixed locations at all times, and
>
> (b) in the event of catastrophic network breakdown or in cases of *force majeure* the availability of the public telephone network and publicly available telephone services provided by it at fixed locations, and
>
> (c) uninterrupted access to emergency organisations as part of any publicly available telephone services offered at fixed locations.

4. Emergency call numbers

5. Emergency planning

6. Public pay telephones

7. Must-carry obligations

8. Operator assistance, directories and directory enquiry facilities

9. Requirement to offer contracts with minimum terms

10. Transparency and publication of information

11. Metering and billing

12. Itemised bills

13. Non-payment of bills

14. Codes of practice and dispute resolution

15. Special measures for end-users with disabilities

16. Provision of additional facilities

17. Allocation, adoption and use of telephone numbers

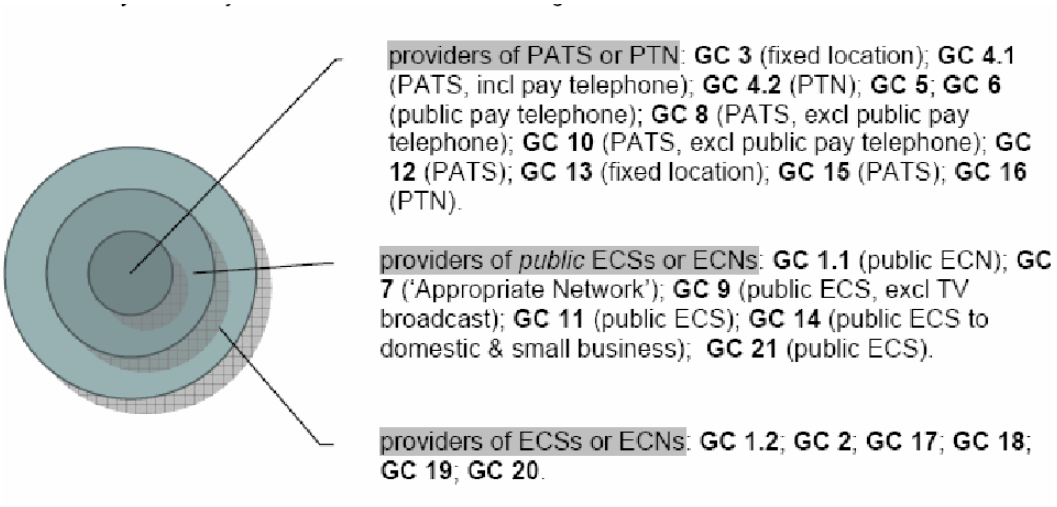
18. Number portability

19. Provision of directory information

20. Non-geographic numbers

21. Quality of service

22. Service migrations



Types of providers and the GCs

Source: Ofcom

<u>European Union Directives/Legislation</u>

DIRECTIVE 2002/…/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of
on a common regulatory framework
for electronic communications networks and services
(Framework Directive)

"electronic communications network" means transmission systems and, where applicable, switching or routing equipment and other resources which permit the conveyance of signals by wire, by radio, by optical or by other electromagnetic means, including satellite networks, fixed (circuit- and packet-switched, including Internet) and mobile terrestrial networks, electricity cable systems, to the extent that they are used for the purpose of transmitting signals, networks used for radio and television broadcasting, and cable TV networks, irrespective of the type of information conveyed;

"electronic communications service" means a service normally provided for remuneration which consists wholly or mainly in the conveyance of signals on electronic communications networks, including telecommunications services and transmission services in networks used for broadcasting, but exclude services providing, or exercising editorial control over, content transmitted using electronic communications networks and services; it does not include Information Society services, as defined in Article 1 of Directive 98/34/EC, which do not consist wholly or mainly in the conveyance of signals on electronic communications networks;

"public communications network" means an electronic communications network used wholly or mainly for the provision of publicly available electronic communications services;

"associated facilities" means those facilities associated with an electronic communications network and/or an electronic communications service which enable and/or support the provision of services via that network and/or service. It includes conditional access systems

and electronic programme guides;

Article 8 **- Policy Objectives and Regulatory Principles**
4. The national regulatory authorities shall promote the interests of the citizens of the European Union by inter alia:
(a) ensuring all citizens have access to a universal service specified in Directive 2002/.../EC (Universal Service Directive);
(b) ensuring a high level of protection for consumers in their dealings with suppliers, in particular by ensuring the availability of simple and inexpensive dispute resolution procedures carried out by a body that is independent of the parties involved;
(c) contributing to ensuring a high level of protection of personal data and privacy;
(d) promoting the provision of clear information, in particular requiring transparency of tariffs and conditions for using publicly available electronic communications services;
(e) addressing the needs of specific social groups, in particular disabled users; and
(f) ensuring that the integrity and security of public communications networks are maintained.

Article 17**- Standardisation**
1. The Commission, acting in accordance with the procedure referred to in Article 22(2), shall draw up and publish in the Official Journal of the European Communities a List of standards and/or specifications to serve as a basis for encouraging the harmonised provision of electronic communications networks, electronic communications services and associated facilities and services. Where necessary, the Commission may, acting in accordance with the procedure referred to in Article 22(2) and following consultation of the Committee established by Directive 98/34/EC, request that standards be drawn up by the European Standards Organisations (European Committee for Standardisation (CEN), European Committee for Electrotechnical Standardisation (CENELEC), and European Telecommunications Standards Institute (ETSI)).

2. Member States shall encourage the use of the standards and/or specifications referred to in paragraph 1, for the provision of services, technical interfaces and/or network functions, to the extent strictly necessary to ensure interoperability of services and to improve freedom of choice for users.
As long as standards and/or specifications have not been published in accordance with paragraph 1, Member States shall encourage the implementation of standards and/or specifications adopted by the European Standards Organisations.
In the absence of such standards and/or specifications, Member States shall encourage the implementation of international standards or recommendations adopted by the International Telecommunication Union (ITU), the International Organisation for Standardisation (ISO) or the International Electrotechnical Commission (IEC).
Where international standards exist, Member States shall encourage the European Standards Organisations to use them, or the relevant parts of them, as a basis for the standards they develop, except where such international standards or relevant parts would be ineffective.

3. If the standards and/or specifications referred to in paragraph 1 have not been adequately implemented so that interoperability of services in one or more Member States cannot be ensured, the implementation of such standards and/or specifications may be made compulsory under the procedure laid down in paragraph 4, to the extent strictly necessary to ensure such interoperability and to improve freedom of choice for users.

4. Where the Commission intends to make the implementation of certain standards and/or specifications compulsory, it shall publish a notice in the Official Journal of the European Communities and invite public comment by all parties concerned. The Commission,

acting in accordance with the procedure referred to in Article 22(3), shall make implementation of the relevant standards compulsory by making reference to them as compulsory standards in the List of standards and/or specifications published in the Official Journal of the European Communities.

5. Where the Commission considers that standards and/or specifications referred to in paragraph 1 no longer contribute to the provision of harmonised electronic communications services, or that they no longer meet consumers' needs or are hampering technological development, it shall, acting in accordance with the procedure referred to in Article 22(2), remove them from the List of standards and/or specifications referred to in paragraph 1.

6. Where the Commission considers that standards and/or specifications referred to in paragraph 4 no longer contribute to the provision of harmonised electronic communications services, or that they no longer meet consumers' needs or are hampering technological development, it shall, acting in accordance with the procedure referred to in Article 22(3), remove them from this List of standards and/or specifications referred to in paragraph 1.

7. This Article does not apply in respect of any of the essential requirements, interface specifications or harmonised standards to which the provisions of Directive 1999/5/EC apply.

DIRECTIVE 2002/.../EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of
on universal service and users' rights relating to electronic communications networks and services (Universal Service Directive)

Ensuring universal service (that is to say, the provision of a defined minimum set of services to all end-users at an affordable price) may involve the provision of some services to some end-users at prices that depart from those resulting from normal market conditions.

The ‘network termination point’ represents a boundary for regulatory purposes between the regulatory framework for electronic communication networks and services and the regulation of telecommunication terminal equipment. Defining the location of the network termination point is the responsibility of the national regulatory authority, where necessary on the basis of a proposal by the relevant undertakings.

Member States should continue to ensure that the services set out in Chapter II are made available with the quality specified to all end-users in their territory, irrespective of their geographical location, and, in the light of specific national conditions, at an affordable price.

A fundamental requirement of universal service is to provide users on request with a connection to the public telephone network at a fixed location, at an affordable price. The requirement is limited to a single narrowband network connection, the provision of which may be restricted by Member States to the end-user's primary location/residence, and does not extend to the Integrated Services Digital Network (ISDN) which provides two or more connections capable of being used simultaneously. There should be no constraints on the technical means by which the connection is provided, allowing for wired or wireless technologies, nor any constraints on which operators provide part or all of universal service obligations.

The provisions of this Directive do not preclude Member States from designating different undertakings to provide the network and service elements of universal service. Designated

undertakings providing network elements may be required to ensure such construction and maintenance as are necessary and proportionate to meet all reasonable requests for connection at a fixed location to the public telephone network and for access to publicly available telephone services at a fixed location.

It is likewise important that universal service operators maintain the integrity of the network as well as service continuity and quality.

***Article 1* - Scope and aims**

1. Within the framework of Directive 2002/.../EC (Framework Directive), this Directive concerns the provision of electronic communications networks and services to end-users. The aim is to ensure the availability throughout the Community of good quality publicly available services through effective competition and choice and to deal with circumstances in which the needs of end-users are not satisfactorily met by the market.

2. This Directive establishes the rights of end-users and the corresponding obligations on undertakings providing publicly available electronic communications networks and services. With regard to ensuring provision of universal service within an environment of open and competitive markets, this Directive defines the minimum set of services of specified quality to which all end-users have access, at an affordable price in the light of specific national conditions, without distorting competition. This Directive also sets out obligations with regard to the provision of certain mandatory services such as the retail provision of leased lines.

***Article 2* - Definitions**

(b) "public telephone network" means an electronic communications network which is used to provide publicly available telephone services; it supports the transfer between network termination points of speech communications, and also other forms of communication, such as facsimile and data;

(c) "publicly available telephone service" means a service available to the public for originating and receiving national and international calls and access to emergency services through a number or numbers in a national or international telephone numbering plan, and in addition may, where relevant, include one or more of the following services: the provision of operator assistance, directory enquiry services, directories, provision of public pay phones, provision of service under special terms, provision of special facilities for customers with disabilities or with special social needs and/or the provision of non-geographic services;

(e) "network termination point" (NTP) means the physical point at which a subscriber is provided with access to a public communications network; in the case of networks involving switching or routing, the NTP is identified by means of a specific network address, which may be linked to a subscriber number or name;

***Article 3* - Availability of universal service**

1. Member States shall ensure that the services set out in this Chapter are made available at the quality specified to all end-users in their territory, independently of geographical location, and, in the light of specific national conditions, at an affordable price.

***Article 11*-Quality of service of designated undertakings**

1. National regulatory authorities shall ensure that all designated undertakings with obligations under Articles 4, 5, 6, 7 and 9(2) publish adequate and up-to-date information concerning their performance in the provision of universal service, based on the quality of

service parameters, definitions and measurement methods set out in Annex III. The published information shall also be supplied to the national regulatory authority.

2. National regulatory authorities may specify, inter alia, additional quality of service standards, where relevant parameters have been developed, to assess the performance of undertakings in the provision of services to disabled end-users and disabled consumers. National regulatory authorities shall ensure that information concerning the performance of undertakings in relation to these parameters is also published and made available to the national regulatory authority.

3. National regulatory authorities may, in addition, specify the content, form and manner of information to be published, in order to ensure that end-users and consumers have access to comprehensive, comparable and user-friendly information.

***Article 22*-Quality of service**

1. Member States shall ensure that national regulatory authorities are, after taking account of the views of interested parties, able to require undertakings that provide publicly available electronic communications services to publish comparable, adequate and up-to-date information for end-users on the quality of their services. The information shall, on request, also be supplied to the national regulatory authority in advance of its publication.

2. National regulatory authorities may specify, inter alia, the quality of service parameters to be measured, and the content, form and manner of information to be published, in order to ensure that end-users have access to comprehensive, comparable and user-friendly information. Where appropriate, the parameters, definitions and measurement methods given in Annex III could be used.

Article 23 - Integrity of the network

Member States shall take all necessary steps to ensure the integrity of the public telephone network at fixed locations and, in the event of catastrophic network breakdown or in cases of force majeure, the availability of the public telephone network and publicly available telephone services at fixed locations. Member States shall ensure that undertakings providing publicly available telephone services at fixed locations take all reasonable steps to ensure uninterrupted access to emergency services.

DIRECTIVE 1999/5/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 9 March 1999
on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity

`apparatus' means any equipment that is either radio equipment or telecommunications terminal equipment or both;

`telecommunications terminal equipment' means a product enabling communication or a relevant component thereof which is intended to be connected directly or indirectly by any means whatsoever to interfaces of public telecommunications networks (that is to say, telecommunications networks used wholly or partly for the provision of publicly available telecommunications services);

`interface' means

(i) a network termination point, which is a physical connection point at which a user is provided with access to public telecommunications network,

and/or

(ii) an air interface specifying the radio path between radio equipment and their technical specifications;

`harmonised standard' means a technical specification adopted by a recognised standards body under a mandate from the Commission in conformity with the procedures laid down in Directive 98/34/EC for the purpose of establishing a European requirement, compliance with which is not compulsory.

(1) Whereas the radio equipment and telecommunications terminal equipment sector is an essential part of the telecommunications market, which is a key element of the economy in the Community; whereas the directives applicable to the telecommunications terminal equipment sector are no longer capable of accommodating the expected changes in the sector caused by new technology, market developments and network legislation;

(23) Whereas harmonised interfaces between terminal equipment and telecommunications networks contribute to promoting competitive markets both for terminal equipment and network services;

(24) Whereas, however, operators of public telecommunications networks should be able to define the technical characteristics of their interfaces, subject to the competition rules of the Treaty; whereas, accordingly, they should publish accurate and adequate technical specifications of such interfaces so as to enable manufacturers to design telecommunications terminal equipment which satisfies the requirements of this Directive;

(26) Whereas it is the task of the European standardisation organisations, notably ETSI, to ensure that harmonised standards are appropriately updated and drafted in a way which allows for unambiguous interpretation; whereas maintenance, interpretation and implementation of harmonised standards constitute very specialised areas of increasing technical complexity; whereas those tasks require the active participation of experts drawn from amongst the economic players; whereas in some circumstances it may be necessary to provide more urgent interpretation of or corrections to harmonised standards than is possible through the normal procedures of the European standardisation organisations operating in conformity with Directive 98/34/EC of 22 June 1998 of the European Parliament and of the Council laying down a procedure for the provision of information in the field of technical standards and regulations and of rules on information society services (2);

(27) Whereas it is in the public interest to have harmonised standards at European level in connection with the design and manufacture of radio equipment and telecommunications terminal equipment; whereas compliance with such harmonised standards gives rise to a presumption of conformity to the essential requirements; whereas other means of demonstrating conformity to the essential requirements are permitted;

(h) `harmonised standard' means a technical specification adopted by a recognised standards body under a mandate from the Commission in conformity with the procedures laid down in Directive 98/34/EC for the purpose of establishing a European requirement, compliance with which is not compulsory.

***Article 3*- Essential requirements**

1. The following essential requirements are applicable to all apparatus:

(a) the protection of the health and the safety of the user and any other person, including the objectives with respect to safety requirements contained in Directive 73/23/EEC, but with no voltage limit applying;

(b) the protection requirements with respect to electromagnetic compatibility contained in Directive 89/336/EEC.

2. In addition, radio equipment shall be so constructed that it effectively uses the spectrum allocated to terrestrial/space radio communication and orbital resources so as to avoid harmful interference.

3. In accordance with the procedure laid down in Article 15, the Commission may decide that apparatus within certain equipment classes or apparatus of particular types shall be so constructed that:

(a) it interworks via networks with other apparatus and that it can be connected to interfaces of the appropriate type throughout the Community; and/or that

(b) it does not harm the network or its functioning nor misuse network resources, thereby causing an unacceptable degradation of service; and/or that

(c) it incorporates safeguards to ensure that the personal data and privacy of the user and of the subscriber are protected; and/or that

(d) it supports certain features ensuring avoidance of fraud; and/or that

(e) it supports certain features ensuring access to emergency services; and/or that

(f) it supports certain features in order to facilitate its use by users with a disability.

***Article 4*- Notification and publication of interface specifications**

1. Member States shall notify the interfaces which they have regulated to the Commission insofar as the said interfaces have not been notified under the provisions of Directive 98/34/EC. After consulting the committee in accordance with the procedure set out in Article 15, the Commission shall establish the equivalence between notified interfaces and assign an equipment class identifier, details of which shall be published in the *Official Journal of the European Communities*.

2. Each Member State shall notify to the Commission the types of interface offered in that State by operators of public telecommunications networks. Member States shall ensure that such operators publish accurate and adequate technical specifications of such interfaces before services provided through those interfaces are made publicly available, and regularly publish any updated specifications. The specifications shall be in sufficient detail to permit the design of telecommunications terminal equipment capable of utilising all services provided through the corresponding interface. The specifications shall include, *inter alia*, all the information necessary to allow manufacturers to carry out, at their choice, the relevant tests for the essential requirements applicable to the telecommunications terminal equipment. Member States shall ensure that those specifications are made readily available by the operators.

***Article 5*- Harmonised standards**

1. Where apparatus meets the relevant harmonised standards or parts thereof whose reference numbers have been published in the *Official Journal of the European Communities*, Member States shall presume compliance with those of the essential requirements referred to in Article 3 as are covered by the said harmonised standards or parts thereof.

2. Where a Member State or the Commission considers that conformity with a harmonised standard does not ensure compliance with the essential requirements referred to in Article 3 which the said standard is intended to cover, the Commission or the Member State concerned shall bring the matter before the committee.

3. In the case of shortcomings of harmonised standards with respect to the essential requirements, the Commission may, after consulting the committee and in accordance with the procedure laid down in Article 14, publish in the *Official Journal of the European Communities* guidelines on the interpretation of harmonised standards or the conditions under which compliance with that standard raises a presumption of conformity. After consultation of the committee and in accordance with the procedure laid down in Article 14, the Commission may withdraw harmonised standards by publication of a notice in the *Official Journal of the European Communities*.

Chapter IV - **The Committee**

***Article 13* - Constitution of the committee**

The Commission shall be assisted by a committee, the Telecommunication Conformity Assessment and Market Surveillance Committee (TCAM), composed of representatives of the Member States and chaired by a representative of the Commission.

***Article 14*- Advisory committee procedure**

1. The committee shall be consulted on the matters covered by Articles 5, 6(2), 7(4), 9(4) and Annex VII(5).

2. The Commission shall consult the committee periodically on the surveillance tasks related to the application of this Directive, and, where appropriate, issue guidelines on this matter. 3. The representative of the Commission shall submit to the committee a draft of the measures to be taken. The committee shall deliver its opinion on the draft within a time limit which the chairman may lay down according to the urgency of the matter, if necessary by taking a vote. The opinion shall be recorded in the minutes; in addition, each Member State shall have the right to ask to have its position recorded in the minutes. The Commission shall take the utmost account of the opinion delivered by the committee. It shall inform the committee of the manner in which its opinion has been taken into account and decide within one month after having received the opinion of the committee.

4. The Commission shall periodically consult the representatives of the telecommunications networks providers, the consumers and the manufacturers. It shall keep the committee regularly informed of the outcome of such consultations.

***Article 15* - Regulatory committee procedure**

1. Notwithstanding the provisions of Article 14, the following procedure shall apply in respect of the matters covered by Articles 3(3) and 4(1).

2. The representative of the Commission shall submit to the committee a draft of the measures to be taken. The committee shall deliver its opinion on the draft within a time limit which the chairman may lay down according to the urgency of the matter. The opinion shall be delivered by the majority laid down in Article 148(2) of the Treaty in the case of decisions which the Council is required to adopt on a proposal from the Commission. The votes of the representatives of the Member States within the committee shall be weighted in the manner set out in that Article. The chairman shall not vote.

3. The Commission shall adopt the measures envisaged if they are in accordance with the opinion of the committee. If the measures envisaged are not in accordance with the opinion of the committee, or if no opinion is delivered, the Commission shall, without delay, submit to the Council a proposal relating to the measures to be taken. The Council shall act by a qualified majority. If, on the expiry of a period of three months from the date of referral to the Council, the Council has not acted, the proposed measures shall be adopted by the Commission.

Article 18 **- Transitional provisions**

3. Apart from the essential requirements referred to in Article 3(1), the Member States may request to continue, for a period of up to 30 months following the date referred to in the first sentence of Article 19(1), and in conformity with the provisions of the Treaty, to require telecommunications terminal equipment not to be capable of causing unacceptable deterioration of a voice telephony service accessible within the framework of the universal service as defined in Directive 98/10/EC.

The Member State shall inform the Commission of the reasons for requesting a continuation of such a requirement, the date by which the service concerned will no longer need the requirement, and the measures envisaged in order to meet this deadline. The Commission shall consider the request taking into account the particular situation in the Member State and the need to ensure a coherent regulatory environment at Community level, and shall inform the Member State whether it deems that the particular situation in that Member State justifies a continuation and, if so, until which date such continuation is justified.