



Broadcast TV Technical Codes

Consultation on updates and amendments

	Consultation
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About this document

Ofcom sets technical standards for the digital terrestrial TV platform (also often known as Freeview¹). These standards specify the types of signal which should be used by broadcasters, and require minimum standards of reliability for the transmitters that broadcast digital TV services.

The terrestrial TV platform is continuing to change and evolve: for example, several new services have been launched since the digital TV switchover was completed in 2012. New legislation relating to the resilience of communications networks (including broadcast transmitters), has also been adopted since the broadcast TV technical codes were last revised.

We therefore propose to update and rationalise the TV technical codes to ensure that they are relevant, proportionate, and reflect current technology and broadcast industry practice.

¹ Freeview signals are also used by other TV providers such as YouView and BT TV to deliver conventional linear TV services to their customers

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Section 1

Executive Summary

- 1.1 Ofcom's *Television Technical Performance Code*² ('the Technical Code') and *accompanying Reference Parameters for Digital Terrestrial Television Transmissions in the United Kingdom*³ ('the Reference Parameters') set out the high-level technical requirements with which most digital terrestrial television (DTT) multiplex licensees, and certain services that are carried within the multiplexes, must comply.
- 1.2 The Technical Code and Reference Parameters ensure that the UK's main DTT services achieve minimum standards of technical quality, availability and coverage. They also seek to ensure that DTT multiplexes do not cause undue interference to other licensed services, and that the DTT multiplexes achieve basic technical interoperability with each other.
- 1.3 One of Ofcom's regulatory principles is to regulate only where necessary. The Technical Performance Code and the Reference Parameters were last revised in 2006 and 2009 respectively. Since that time, both the technical aspects and structure of the terrestrial broadcast television environment have changed considerably. Notably, analogue TV broadcasting ceased as part of the national digital TV switchover programme, and more recently several new DTT multiplexes have been launched.
- 1.4 It is therefore appropriate for us to review the requirements contained in the Technical Code and Reference Parameters (and associated documents) to take account of developments in technology and industry practices in the last few years. In doing so, we will ensure that we continue to fulfil our statutory duties and policy objectives. Most importantly, we will continue to seek to protect the interests of consumers and citizens.
- 1.5 This consultation sets out the changes that we propose to make to the Technical Performance Code and to the Reference Parameters. The main changes we propose are:
 - To modernise technical standards requirements, including the removal of specific subjective picture and sound 'grade' requirements for certain standard definition channels;
 - To re-focus and rationalise our requirements in relation to the monitoring and reporting of TV transmitter faults; and
 - To make other technical and editorial revisions to bring our Codes up to date.

² http://stakeholders.ofcom.org.uk/binaries/broadcast/guidance/tech-guidance/tv_tech_platform_code.pdf

³ http://stakeholders.ofcom.org.uk/binaries/broadcast/guidance/tech-guidance/dttt_uk.pdf

1.6 This consultation also considers two additional technical regulatory documents. These are:

- *UK Interface Requirement 2022: Broadcast transmitters operating in frequency bands administered by Ofcom*⁴ ('IR2022')
- *Rules of Operation for the use of ITU-R (CCIR) Teletext System B*⁵

⁴ <http://stakeholders.ofcom.org.uk/binaries/spectrum/spectrum-policy-area/spectrum-management/research-guidelines-tech-info/interface-requirements/ir2022.pdf>

⁵ http://stakeholders.ofcom.org.uk/binaries/broadcast/guidance/tech-guidance/itu_r_teletext.pdf

Section 2

Background and introduction

Legislative background

- 2.1 Ofcom's duties and powers in relation to licensing television multiplex services and DTT services are set out under Part 1 of the Broadcasting Act 1996 ("the 1996 Act"), as amended by the Communications Act 2003 ("the 2003 Act").
- 2.2 In particular, Ofcom is required to include such conditions in television multiplex licences as appear to be appropriate, having regard to any duties which are, or may be, imposed on Ofcom or the licensee under the Broadcasting Act 1990 ("the 1990 Act") and the 1996 Act, or the 2003 Act⁶.
- 2.3 In relation to the technical quality of services provided by multiplex licensees, Section 12 of the 1996 Act requires Ofcom to include conditions in multiplex service licences that are appropriate for securing that the signals carrying the service attain high standards of technical quality and reliability⁷. National multiplex licences issued under the 1996 Act therefore require licensees to observe Ofcom's Television Technical Performance Code.
- 2.4 Similarly, Section 66 of the 1990 Act requires Ofcom to include such conditions as are appropriate in the licences for Channel 3 (ITV, UTV and STV), Channel 4 and Channel 5 for requiring the signals carrying these services to attain high standards of technical quality and reliability⁸. The Channel 3, Channel 4, and Channel 5 licences therefore also require these licensees to observe Ofcom's Television Technical Performance Code.
- 2.5 Other TV multiplex services (specifically the '600 MHz', the 'Geographically Interleaved' and the 'Northern Ireland' multiplexes) operate under licences issued under the Wireless Telegraphy Act 2006 ("the 2006 Act") only. Under the 2006 Act, a wireless telegraphy licence may be granted subject to such terms, provisions and limitations as Ofcom thinks fit.⁹ These powers have been used, for example, to ensure that DTT services operating solely under the Wireless Telegraphy Act are technically compatible with those licensed under the Broadcasting Act. For example, the 600 MHz multiplex licences require licensees to comply with Ofcom's Technical Performance Code, and the Geographically Interleaved multiplex licences require the licensees not to use certain technical parameter values which would conflict with existing DTT multiplexes.
- 2.6 In addition to our specific duties and powers under the Broadcasting Act and the Wireless Telegraphy Act (which fall upon the licensed broadcasters in the form of licence conditions), additional legislative requirements on communications providers have come into force in recent years. In the case of television broadcasting, these requirements fall upon the transmission service provider rather than the broadcaster. Specific requirements relating to the resilience of communications networks are

⁶ Section 4(1)(a) of the 1996 Act

⁷ Section 12(1)(g) of the 1996 Act

⁸ Section 66(4) of the 1990 Act

⁹ Section 9 of the 2006 Act

contained in revisions to the 2003 Act¹⁰, which Ofcom most recently provided Guidance¹¹ on during 2014.

Overview of licensed DTT multiplexes

- 2.7 Multiplexes licensed under the Broadcasting Act 1996 must also hold Wireless Telegraphy Act (WT Act) licences in relation to their use of the radio spectrum. Some multiplexes are authorised to operate under a Wireless Telegraphy Act licence only, but no DTT multiplex can operate under a Broadcasting Act licence alone.
- 2.8 The main purpose of a Wireless Telegraphy Act licence is to authorise the use of radio frequency spectrum for a particular application or applications. Ofcom also has discretion to include certain other conditions in Wireless Telegraphy Act licences: for example particular technologies may be mandated, or compliance with existing Codes and technical standards can be required.
- 2.9 DTT services began broadcasting in 1998. The platform originally comprised six multiplexes, and these six multiplexes are still in operation (although they are not all still operated by the original licence holder). Five of the original six multiplexes operate under Broadcasting Act licences issued by Ofcom, and the remaining multiplex is 'gifted' to the BBC under its Royal Charter and Agreement.
- 2.10 These six multiplexes are sometimes known as the digital switchover, or DSO, multiplexes, as they are the multiplexes which were operational, and whose coverage was enhanced, during the digital TV switchover process.
- 2.11 In addition to the six DSO multiplexes, four further DTT multiplexes have been launched since the completion of digital switchover. These are COM7 and COM8 (which occupy the 600 MHz spectrum band, and which operate under Wireless Telegraphy Act Licences only); a local TV multiplex (which operates under a Broadcasting Act Licence); and the 'Northern Ireland multiplex' (which provides RTÉ and TG4 services to Northern Ireland, and which operates under a Wireless Telegraphy Act Licence only).
- 2.12 Spectrum licences for two further location-specific services – the 'geographically interleaved' multiplexes – were awarded in 2009 for the Manchester and Cardiff areas. Only the Manchester service is currently providing a DTT service. The geographically interleaved multiplexes are licensed under the Wireless Telegraphy Act only.

¹⁰ Sections 105(a) to 105(d) of the Communications Act 2003

¹¹ <http://stakeholders.ofcom.org.uk/telecoms/policy/security-resilience/>

2.13 The table below summarises the current licensed and operational multiplexes.

Licence Name	Multiplex Name	Designation	Operator	Licence type	Notes
Multiplex 1	BBC A	PSB1	BBC	Gifted & WT Act	DSO
Multiplex 2	D3&4	PSB2	Digital 3&4	B Act & WT Act	DSO
Multiplex A	SDN	COM4	SDN	B Act & WT Act	DSO
Multiplex B	BBC B	PSB3	BBC	B Act & WT Act	DSO
Multiplex C	Arqiva A	COM5	Arqiva	B Act & WT Act	DSO
Multiplex D	Arqiva B	COM6	Arqiva	B Act & WT Act	DSO
Multiplex E	Interim 600 MHz multiplexes	COM7, COM8	Arqiva	WT Act	
Multiplex L	Local	Local	Comux	B Act & WT Act	
GI Multiplex	Manchester GI	G-MAN	Entertainment Media Group	WT Act	
NI Multiplex	Northern Ireland Multiplex	RNI-1	Multiplex Services (NI) Ltd.	WT Act	

Table 1: Overview of current DTT multiplexes

Applicability of the Technical Codes to different multiplexes

- 2.14 The DSO multiplexes, which operate under Broadcasting Act and WT Act licences, are required to observe both the Technical Code and the Reference Parameters.
- 2.15 The 600 MHz WT Act licences also require licensees to observe both the Technical Code and the Reference Parameters.
- 2.16 The Local Multiplex Broadcasting Act licence requires the licensee to observe only the Reference Parameters. This requirement seeks to ensure technical interoperability of the local multiplex with existing DTT multiplexes, but means that the licensee is not subject to the more general technical quality and performance requirements which are contained in the Technical Performance Code.
- 2.17 The WT Act licences for the Geographic Interleaved and Northern Ireland multiplexes require the licensees to ensure that certain technical aspects of their services (specifically the labelling of transport stream components including logical channel numbers, service identification and network identification) do not conflict with other DTT services. This requirement is intended to ensure a basic level of interoperability with existing DTT services. However, there is no explicit requirement for these multiplexes to observe the Reference Parameters or Technical Code.

Structure of this consultation

- 2.18 We have identified a number of areas within the existing Codes and related documents that we consider should be revised, and we invite comments from stakeholders on our proposals. The proposed revisions are set out in this document as follows:
- Section 3 contains our proposals for revising the Television Technical Performance Code. These include proposals to revise the technical quality standards which apply to the commercial PSB channels on DTT, as well as introducing new DTT fault reporting requirements to align the Code with new duties that have been placed on Ofcom since the Code was last revised;

- Section 4 contains our proposals for changes to the DTT Reference Parameters to reflect current usage and to make other amendments;
- Section 5 is an informative section which describes revisions to the Interface Requirements for broadcast TV and radio transmitters, on which we have previously consulted, and which were approved by European Commission during 2015.

Section 3

Revisions to the Television Technical Performance Code

Background

- 3.1 The Television Technical Performance Code¹² ('the Technical Code') contains requirements which apply to both DTT multiplex operators and to certain Public Service Broadcaster channels on DTT (these are the 'qualifying services'). The Technical Code sets out the basic technical standards and parameters for DTT signals (more detailed parameters are contained in the Reference Parameters document, observance of which is required within the Technical Code), minimum standards of picture, sound, and re-broadcast link quality, transmitter reliability standards and reporting requirements, and definitions of the signal coverage which should be achieved.
- 3.2 Our proposed modifications to the substantive sections of the Technical Code are detailed below

Proposed changes to *Section 2 of the Technical Code* ('The Television Signal')

General

- 3.3 We propose to retain Sections 2.1 and 2.2 of the Technical Code, with a minor editorial amendment to reflect the technical characteristics of multiplexed digital television signals more closely. These sections of the Technical Code will now simply refer to the DTT Reference Parameters for details of permissible DTT transmission standards, modulation modes, and baseband transport stream characteristics.

Removal of analogue TV and associated requirements

- 3.4 The Technical Code was last revised in December 2006, before the national Digital TV Switchover process began. It therefore still contains a number of provisions relating to analogue TV broadcasting which are now redundant and which we propose to remove.

Removal of Rules of Operation for Teletext

- 3.5 As a consequence of the proposed removal of the references to analogue TV in in Section 2.2 of the Code, the 'Ofcom Rules of Operation for the use of ITU-R Teletext System B'¹³ would also cease to have formal regulatory status and should be withdrawn.
- 3.6 There are no longer any analogue TV services or any associated teletext services broadcasting in the UK. We do not anticipate, therefore, that the removal of the Rules

¹² http://stakeholders.ofcom.org.uk/binaries/broadcast/guidance/tech-guidance/tv_tech_platform_code.pdf

¹³ http://stakeholders.ofcom.org.uk/binaries/broadcast/guidance/tech-guidance/itu_r_teletext.pdf

of Operation for Teletext would have any impact on consumers or broadcast stakeholders.

Proposed changes to Section 3 of the Technical Code ('Technical Quality Standards')

General

- 3.7 Section 3 of the Technical Code contains general requirements for multiplex and qualifying service licensees to provide Ofcom with a description of their procedures for ensuring high standards of technical quality, and requires licensees to make their own assessment of their services' technical quality.
- 3.8 Section 3 of the Technical Code also currently requires Channels 3, 4, & 5 (the commercial public service broadcasters) to maintain specific levels of subjective picture and sound quality ('grades') on their standard definition services on DTT.
- 3.9 Requirements for relative timing of sound and vision (lip-sync), the technical quality of re-broadcast links, and a provision relating to the effects of digital compression on picture quality are also contained in this Section of the Technical Code.
- 3.10 Some provisions in Section 3 of the Technical Code do not reflect current industry practice; some are only relevant to analogue broadcasting; and in some cases the scope of the provision's applicability requires clarification. Therefore we propose to update Section 3 of the Technical Code as discussed below.

Technical Quality procedures

- 3.11 Sections 3.1 and 3.2 of the Technical Code require multiplex and Qualifying Services licensees to provide Ofcom with descriptions of the procedures they have in place for ensuring high standards of technical quality. We propose to retain this general requirement, but as it only falls on those national multiplexes that are licensed under the Broadcasting Act or are separately required to comply with the Technical Code, we will clarify its applicability.

Subjective sound and picture grades for PSB channels

- 3.12 Section 3.3 of the Technical Code sets specific subjective picture and sound quality ('picture grade') requirements for the terrestrially-delivered commercial public service channels licensed by Ofcom (Channels 3, 4 & 5).
- 3.13 These picture grade requirements only apply to the standard-definition (SD) versions of Channels 3, 4, and 5 on DTT. While high-definition (HD) simulcasts of some of these services are also available on DTT, the HD simulcasts are not currently classed as 'qualifying services' as defined in the Broadcasting Acts. The HD simulcasts on DTT have never been required to meet particular subjective picture grade requirements.
- 3.14 Similarly, in common with the rest of the Technical Code, the picture grade requirements do not apply to services delivered on non-DTT platforms such as satellite, cable, and IPTV. This is because the Broadcasting Acts do not set out any requirements in relation to technical standards for these platforms or the services carried on them.

- 3.15 Complaints to Ofcom relating to the transmitted subjective picture and sound grades of the main SD PSB channels on DTT, and related regulatory interventions, have been extremely rare in recent years: in fact no complaints on this subject have been received in the last three years.
- 3.16 The modern TV production and distribution chain (where production, playout, distribution and transmission are entirely in the digital domain), mean that many of the system performance limitations which could often adversely affect analogue TV broadcasting do not affect current digital TV systems.
- 3.17 That is not to say that the digital pictures necessarily always achieve high quality: compromises or sub-optimal practice in the original production or post-production processes, as well as various stages of digital compression (particularly transmission encoding) can limit picture quality and/or cause visible artefacts on the picture.
- 3.18 However, our view is that the commercial PSBs who operate a simulcast HD service on DTT (ITV/STV/UTV and Channel 4) are currently achieving generally good picture quality on both the HD and SD versions of their services. The fact that they are doing so in the absence of specific picture grade regulation on their HD services suggests that these broadcasters are likely to continue to deliver generally good technical quality on their SD services even in the absence of specific picture grade requirements on these channels.
- 3.19 We therefore believe that specifying minimum SD picture grade requirements is no longer necessary or proportionate, and we propose to remove this requirement from the Technical Code.
- 3.20 It is important to note that the commercial PSB services on DTT would still be subject to a requirement to demonstrate that they have procedures in place for maintaining high standards of technical quality, and Ofcom would retain the ability to investigate complaints or emerging issues relating to technical quality matters as necessary.

Lip-sync

- 3.21 For similar reasons to those set out above, we also propose to remove the explicit requirement for sound and vision synchronisation ('lip-sync'): Lip-sync is a basic characteristic of the TV signal (though it may be deliberately manipulated in production for creative reasons). Many other similar fundamental aspects of the TV signal are not subject to specific regulation, and therefore the current requirement appears to be anomalous. As with picture quality, Ofcom would retain backstop requirements meaning we could still intervene in the case of significant or persistent lip-sync errors.
- 3.22 We further note that the majority of lip-sync errors experienced by viewers are in fact caused by the domestic television receiver itself failing to maintain correct synchronisation, rather an intrinsic fault with the broadcast signal.

RBL performance

- 3.23 We propose to remove the provision in Section 3.6 of the Technical Code which sets minimum performance standards for re-broadcast (RBL) links. The specific requirement in this section is only relevant to analogue TV broadcasting networks, specifically where analogue 'transposer' relay transmitters were used. Such relays pick up signals from another (usually larger) transmitter and then re-transmit the

signals on a different frequency to provide coverage to an otherwise un-served community.

- 3.24 In the analogue environment, the re-transmitted picture quality could be affected by imperfections in the frequency transposition and amplifier circuitry – but was mainly influenced by the available signal strength at the input to the relay equipment.
- 3.25 While transposer relays are still in use for digital broadcasting (and operate on the same basic principle as analogue relays), a significant difference is that when a digital relay re-transmits a degraded signal, the picture quality received by viewers will not generally be affected. An exception is where the degradation is so severe that reception of the whole multiplex is no longer possible (this will tend to be noticed first at the edge of the transmitter's coverage area). Therefore specifying the overall performance of relay transmitters in terms of picture degradation is no longer appropriate.
- 3.26 Instead, broadcasters specify minimum signal quality metrics (for example modulation error ratio, or MER) for their relay transmitters to ensure reliable operation of the equipment, and to ensure its signals can be received across the intended coverage area.
- 3.27 In cases where the incoming feed to a relay transmitter is poor, alternative technical solutions are now used. For example, re-transmitters which demodulate and then re-modulate the received signal before re-transmitting it (in effect 'refreshing' the signal) are sometimes used. Upgrading the transmitter's receiving antenna installation, or using an alternative direct programme feed such a telecoms circuit or satellite are also sometimes used.
- 3.28 A digital relay transmitter will fail completely, or its effective coverage area will reduce, when its RBL performance falls below a certain level. These conditions would be classed as a service outage and would count against the availability targets specified for the transmitter in Section 4 of the Code, discussed below. Therefore we do not anticipate that removing the RBL performance target will have an impact on standards of transmitter reliability.

Proposed changes to Section 4 of the Technical Code ('Reliability')

General

- 3.29 The 1996 Act requires multiplex services to attain high standards of technical reliability. The primary purpose of Section 4 of the Technical Code is therefore to set minimum standards of DTT transmitter network reliability for national multiplexes operating under Broadcasting Act licences.
- 3.30 Section 4 specifies minimum 'availability' requirements which should be met at individual transmitter sites. The actual level of minimum availability required depends on the type of transmitter: in the case of larger transmitter sites the availability target is 99.8%, and in the case of smaller transmitters the target is 99.0%. Performance against these minimum levels is averaged over a 6 month period and reported to Ofcom annually as part of an annual reporting process.
- 3.31 These distinct levels of minimum availability reflect the fact that smaller relay transmitters generally serve relatively small communities that are located outside of the coverage area of a larger transmitter. In many cases, the small geographical coverage area of a relay transmitter means that it is not proportionate or cost-

effective for the transmitter infrastructure to incorporate the same type of resilience-enhancement measures which are often used at main transmitters (for example, dual diverse mains electricity supplies, reserve antenna systems, or duplicated programme feed arrangements). Relay transmitters are also often located in remote rural areas with challenging access requirements, which can lengthen the time needed to access the site in case repairs are required.

- 3.32 We have considered whether there is a need to retain specific transmitter availability requirements. In our view, the availability requirements provide an important regulatory tool which ensures a minimum standard of service to DTT viewers, and allows Ofcom to monitor trends in transmitter network performance over time. We believe that this protection is particularly valuable in the case of smaller or more geographically remote transmitter sites, where relying solely on commercial or market incentives to maintain high levels of transmitter availability may not deliver an optimal outcome for viewers.

Developments since 2006

- 3.33 Since the Technical Code was last revised in 2006, additional legislative requirements¹⁴ relating to the security and resilience of national communications infrastructure have been placed on communications providers. Ofcom has provided Guidance¹⁵ on how these requirements should be interpreted. This Guidance details the circumstances in which incidents leading to a loss of the core functionality of a network should be reported to Ofcom. In the case of broadcasting networks, the thresholds for reporting incidents are where more than 100,000 viewers are affected for 12 hours or more.
- 3.34 These reporting requirements fall on the communications provider (the transmission service provider in the case of DTT), whereas the reliability requirements contained in the Technical Code fall on the Broadcasting Act licensees (i.e. multiplex licensees themselves).
- 3.35 Separately, the Digital Economy Act 2010¹⁶ introduced a requirement for Ofcom to produce regular Infrastructure Reports, now known as the 'Connected Nations' report¹⁷. When preparing these reports, Ofcom gathers data on the performance of communications networks, including broadcasting networks.

Rationalising the DTT reliability and fault reporting requirements

- 3.36 In light of the increased reporting duties on terrestrial broadcasting networks and services since 2006, Ofcom recognises that it would be desirable for the separate DTT fault reporting and availability requirements under the Technical Performance Code, the Communications Act, and the Digital Economy Act, to be aligned and rationalised as far as possible. Aligning reporting requirements will also improve Ofcom's visibility of emerging transmission issues, enhancing our ability to engage with broadcasters on specific fault trends as necessary.
- 3.37 We are also seeking to eliminate any unnecessary duplication of reporting paths, and therefore minimise the reporting burden on broadcasters and their transmission providers. We have therefore held informal discussions with the broadcasters and

¹⁴ 2011 revisions to the Communications Act 2003 (Sections 105A to 105D).

¹⁵ <http://stakeholders.ofcom.org.uk/telecoms/policy/security-resilience/>

¹⁶ Section 143B, <http://www.legislation.gov.uk/ukpga/2010/24/contents>

¹⁷ <http://stakeholders.ofcom.org.uk/market-data-research/market-data/infrastructure/>

their transmission providers on possible changes to the current arrangements for fault reporting. We have explored ways in which a reporting system could be implemented without introducing undue new burdens on the broadcasters or their transmission providers (for example, by ensuring that the revised fault reporting arrangements integrate and are aligned with existing monitoring systems and contractual fault reporting arrangements).

- 3.38 We propose to retain the Technical Code's current minimum transmitter availability requirements of 99.8% and 99.0% for primary transmitters and relays respectively, but will clarify that these targets apply only to multiplex operators. Performance against these targets would be reported by the multiplex operators in their annual technical reports
- 3.39 We also propose to re-introduce a requirement into the Technical Code for the multiplex operators to notify Ofcom of significant transmitter faults as and when they occur (the Code contained similar 'live' fault reporting provisions prior to its last revision in 2006).
- 3.40 Submitting fault reports to Ofcom will formally be the responsibility of the multiplex operators, though individual licensees may wish to nominate a third-party to submit reports on their behalf.
- 3.41 We will also seek to explore practical ways of exploiting any synergies between the new DTT fault reporting requirement and the separate existing DTT 'breach notification' requirement under S105(B) of the Communications Act.
- 3.42 In the case of DTT broadcasting, responsibility for submitting S105(B) breach notifications rests with the transmitter operator (the 'Electronic Communications Network' or ECN). Reporting thresholds for broadcasting 'incidents' in Ofcom's current S105(B) guidance¹⁵ are set at relatively high levels: only incidents with a duration of 12 hours or more, and which affect 100,000 or more users, need to be reported. Because broadcast networks achieve generally high levels of reliability, relatively few incidents are currently captured by this reporting requirement.
- 3.43 Due to the relatively high population threshold, outages at most of the UK's smaller 'relay' transmitters do not need to be reported to Ofcom under S105(B). Similarly, outages of less than 12 hours at larger transmitters – which could potentially affect several million homes – also do not need to be reported.
- 3.44 We believe it is desirable for Ofcom to have a more granular overview of emerging transmitter issues than the current S105(B) reporting thresholds currently allow on their own. In particular, we wish to improve our visibility of incidents which affect smaller communities of viewers, as well as incidents at larger transmitter sites which last less than 12 hours.
- 3.45 In light of these considerations, we propose to re-introduce live fault reporting requirements into the DTT Technical Performance Code
- 3.46 We are also seeking to ensure that the new fault reporting system is aligned as closely as possible with any existing fault reporting arrangements that the broadcasters already have in place with their transmission providers, so as to minimise the burden of providing fault information to Ofcom. However, because each multiplex operator has their own unique contractual reporting arrangements with their transmission provider, the contractual thresholds and fault reporting processes do vary to some extent between multiplex operators

- 3.47 Therefore we do not currently propose to set 'hard' thresholds for reporting transmitter faults in the Technical Code. Instead, we propose to require that 'significant' faults should be reported to us. As guidance, we would expect to be informed of outages of 30 minutes or more at larger 'reference' transmitters, and of outages of 2 hours or more at other smaller transmitters. We would expect to receive such notifications within 24 hours of a fault occurring during the working week, or by the next working day for faults occurring at weekends. Under this proposal we would agree specific thresholds with individual multiplex operators separately.
- 3.48 These 'live' fault reporting requirements would only apply to the Ofcom Multiplex licensees who are required to comply with the Technical Code, including the BBC's PSB3 multiplex (BBC B). While the BBC's PSB1 multiplex (BBC A) is not required to observe the Technical Code, should the BBC wish to submit similar data in relation to PSB1 on a voluntary basis we would welcome this.
- 3.49 The Technical Code currently contains technical thresholds which are used for the purposes of annual availability reporting. These state that a digital transmitter outage is considered to occur when there is a loss of transport stream, or when the power (ERP) of the transmitter is reduced by more than 3dB (half-power working). We propose to modify this section of the Technical Code to remove references to analogue TV transmissions, and to clarify that these same technical thresholds should be used for the purposes of 'live' fault reporting.

Annual Technical Reports from Broadcasters

- 3.50 We propose to retain the requirement for the PSB broadcasters and national multiplex operators to submit an Annual Technical Report, but propose to change the reporting cycle to align more closely with our Infrastructure Report publication schedule.
- 3.51 We propose to clarify that the multiplex operators' reports should include an overview of any notable technical changes and developments on the multiplex, as well as performance against the transmitter availability requirements.
- 3.52 For the commercial PSBs, we propose that they should submit a brief annual technical report outlining any notable network architecture, playout, or distribution developments during the preceding 12 months. The reports should also include a description of any playout or studio faults that had a significant impact on service to DTT viewers.

Definition of Reference Transmitters

- 3.53 Currently the two levels of transmitter availability targets (99.8% and 99.0%) apply to larger 'reference' transmitters and to other transmitters respectively. For analogue TV, lists of reference transmitters were agreed with the individual broadcasters, and consisted of between 35 and 51 transmitters (depending on the licensee).
- 3.54 We propose that the higher availability target should apply to the 80 DTT transmitters which carry all six DSO multiplexes, and that the 99% availability requirement and fault reporting threshold should apply to all remaining transmitters.

Access Services

- 3.55 The Technical Code currently contains a passage stating that broadcasters should pay particular attention to the reliability of access services (subtitling, signing and audio description).

- 3.56 Ofcom now issues separate Guidelines on the provision of television access services¹⁸. These Guidelines include more detailed guidance on best practice in the delivery of subtitles, as well as guidance on the circumstances in which an apology should be transmitted in case of failures or other problems with the delivery of access services.
- 3.57 Because the text in the Technical Code essentially duplicates – in a much more limited form - guidance which is published separately by Ofcom, we propose to remove the access services passage from the Technical Code.

Other matters

- 3.58 In addition to removing references to analogue TV from the Technical Code, we propose to remove the reference to a separate availability requirement for the national Channel 3 licensee (the ITV breakfast time service). The national Channel 3 service is now carried on the same multiplex as the regional Channel 3 service (along with other services including Channel 4 and Channel 5). As detailed above, we propose that the availability reporting requirements should fall on the multiplex operators rather than individual channels in future, therefore there would no longer be a rationale for a separate availability requirement for the national Channel 3 service.

Proposed changes to Section 5 of the Technical Code ('Coverage')

- 3.59 This section is largely informative in that it defines the coverage of the DTT transmitter networks in terms of licence requirements and national frequency plans. We propose to make minor editorial amendments to this section in order to reflect the current situation, and to remove references to analogue TV.

Draft Television Technical Performance Code

- 3.60 A draft version of the revised Television Technical Performance Code is available on the Ofcom website as Annex 6 to this consultation

Question 1: *Do you agree with the proposed amendments to the Television Technical Performance Code?*

¹⁸ http://stakeholders.ofcom.org.uk/broadcasting/guidance/other-guidance/tv_access_serv/guidelines/

Section 4

Revisions to the DTT Reference Parameters

Background

- 4.1 DTT services in the UK use the internationally standardised DVB-T and DVB-T2 standards. DVB-T and DVB-T2 services have also been adopted by many other countries - in Europe and more widely¹⁹. A key feature of these standards is that they offer scope for implementation flexibility, allowing individual broadcasters, networks or territories to select detailed technical implementations which suit their own circumstances.
- 4.2 Specifically, the DVB standards permit various technical aspects of the signal to be selected from a range of possible values or implementation techniques. For example, a multiplex's data capacity (which influences the number of channels that it can carry) can be traded against signal coverage (the geographic area which is able to reliably receive the multiplex). The DVB standards also allow alternative technical approaches to be used for the delivery of services such as subtitling and text information services.
- 4.3 This flexibility allows broadcasters with different technical or commercial requirements - for example those in different countries - to select the most suitable or efficient transmission mode for their own circumstances.
- 4.4 The consumer DTT receiver market in the UK is predominantly a 'horizontal' one which means that manufacturers are free to place DTT reception equipment on the market with no direct input from a central platform operator. This is in contrast to, for example, subscription satellite and cable services, where the platform operators exercise much more direct control of the hardware used by their subscribers (a 'vertical' market model).
- 4.5 Given the large number of transmission modes available within the DVB-T and DVB-T2 specifications, it is often impractical for manufacturers to fully test the detailed performance of their receiver equipment against all possible combinations of transmission parameters.
- 4.6 Horizontal receiver markets can potentially affect consumers in a number of ways. For example, consumers who are considering buying a receiver will generally want to have confidence that the basic standards implemented in receivers – such as the video encoding format, or way that subtitles are transmitted and displayed – should be relatively stable over time.
- 4.7 Ofcom also has clear policy objectives in relation to the coverage which should be achieved by certain DTT multiplexes. In particular the PSB multiplexes should cover an equivalent population as could formerly receive the analogue TV services (which we estimate to be 98.5% of the UK population). The transmission modes adopted by multiplex operators has a direct effect on whether this objective can be met.

¹⁹ <https://www.dvb.org/news/worldwide>

- 4.8 These two goals – ensuring basic receiver interoperability, and maintaining coverage – are the main reasons that Ofcom publishes the DTT Reference Parameters. The document contains basic sub-sets of permissible DVB transmission modes and aspects of the baseband signal which should be used in by UK DTT services.
- 4.9 While the interoperability requirements in the DTT Reference Parameters provide a basic ‘baseline’ set of UK transmission modes, they do not (and are not intended to) cover all aspects of interoperability. The Digital Television Group (DTG) publishes a more comprehensive set of technical standards and interoperability requirements for the UK DTT platform in their ‘D-Book’²⁰.

Applicability

- 4.10 Because the Reference Parameters are directly referred to in the Technical Performance Code, any licensee who is required to comply with the Technical Performance Code must also observe the Reference Parameters.
- 4.11 Certain other DTT services are also required to observe the Reference Parameters. For example, the local TV multiplex is required to comply with the Reference Parameters, but is not required to observe the Technical Performance Code.

Proposed changes to the DTT Reference Parameters

Updating the DTT Transmission Modes

- 4.12 We propose to remove details of the DVB-T transmission modes which were in use before digital switchover (known as the ‘2K’ modes) from Sections 2.1 to 2.4 of the Reference Parameters. These modes are no longer used in the UK.
- 4.13 We also propose to add details of transmission modes used by multiplexes which have come into use since the document was last revised in 2009. These are the local TV multiplex and (on an informative basis) the Northern Ireland multiplex. We will also add the variant of the transmission mode now used by the DVB-T commercial multiplexes (SDN’s Multiplex A [COM4], and Arqiva’s Multiplexes C & D [COM5 & COM6]).
- 4.14 Minor editorial changes will also be made to clarify the applicability of the basic transmission modes to specific multiplexes.

Rationalising standard definition picture resolution and audio bitrate requirements on Qualifying Services

- 4.15 Section 2.5 of the Reference Parameters requires Qualifying Services (the standard definition versions of Channels 3, 4, and 5) on DTT to be encoded with a picture resolution of either 720 x 576 pixels or 704 x 576 pixels. These are the maximum resolutions supported by European standard definition (SD) digital TV systems.
- 4.16 In order to use available bandwidth more efficiently, the DVB standards allow the horizontal resolution of SD pictures to be ‘sub-sampled’ to lower values. In the UK and Europe, the horizontal resolution is most commonly sub-sampled to 544 pixels (‘¾ resolution’). This lower horizontal resolution reduces the instantaneous bitrate required by an individual TV service by approximately 25% but will lead to a picture that is subjectively less sharp (‘softer’) than one with full horizontal resolution.

²⁰ <http://www.dtg.org.uk/work/dbook.html>

Conversely, where the available transmission bandwidth is constrained, sub-sampled pictures will tend to suffer from fewer visible MPEG picture artefacts (which are generally seen as 'blockiness'). Therefore broadcasters can effectively choose to trade-off between picture sharpness and artefacts in bandwidth-constrained situations.

- 4.17 As of March 2016, approximately 75 standard definition channels on the UK DTT platform are encoded at $\frac{3}{4}$ resolution. Approximately 20 standard definition channels are encoded at full resolution.
- 4.18 We note that the overall subjective picture quality achieved by an individual TV service is in practice influenced by a large number of factors (e.g. bandwidth, encoder and multiplexing efficiency, as well as the nature of the source material). Picture resolution is the only one of these factors which is currently subject to specific regulation, and the requirement itself only applies to the PSB broadcasters on the DTT platform.
- 4.19 Therefore, as with our proposal to remove the subjective picture grade requirements on Qualifying Services detailed in Sections 3.12 to 3.20 of this document, we also propose to remove the minimum picture resolution requirement from these services in the Reference Parameters.
- 4.20 This is a de-regulatory change which is consistent with Ofcom's principle of regulating only where necessary. The rationale, impact, and risks identified in relation to removing the minimum picture quality requirements also apply to the removal of the resolution requirement.
- 4.21 We believe that the PSB broadcasters are best-placed to make their own judgements about the picture quality they achieve on DTT, as they already do on other distribution platforms. While removing the resolution requirement will provide more consistency with these other distribution platforms, we expect that the PSBs will continue to be mindful of audience expectations of the quality their services.
- 4.22 For similar reasons, we propose to remove the recommended minimum audio bitrates specified for standard definition TV services in the *Source Coding of Audio Signals* section of the Reference Parameters. These values have always been non-binding, and we believe that their presence in the Reference Parameters is no longer relevant.
- 4.23 We note that similar minimum suggested bitrates have never been included in the Reference Parameters in relation to the audio components of high definition TV services. More generally, we note that audio bitrate is only one of the factors which influence subjective audio quality, and in practice many broadcasters achieve satisfactory audio quality at lower bitrates than those suggested in this section.

New Video Encoding Standards and Ultra High Definition TV

- 4.24 The Reference Parameters specify the video encoding standards as well as the broad classes of picture resolutions and associated parameters ('profiles') which should be used by UK DTT broadcasters. Currently, the Reference Parameters include the MPEG2 (H.262) and MPEG4 AVC (H.264) video encoding standards, which are used to deliver most SD and all HD DTT services respectively.
- 4.25 Since the Reference Parameters document was last revised, more efficient video encoding standards such as HEVC (H.265) have become available. These standards

have made the delivery of video services at resolutions greater than HD (known as 'ultra-high definition' or UHD) technically practical within some traditional broadcasting networks, as well as via the internet.

- 4.26 The relevant international DVB standards have already been extended to include options for broadcasters to use HEVC for delivering UHD as well as HD services. The DVB is currently working to standardise further enhancements to UHD such as higher frame rates and higher dynamic range.
- 4.27 While we do not propose to extend the range of video encoding standards and profiles in the Reference Parameters to include HEVC encoding or UHD resolutions at this stage, we will keep technical and market developments under review, and will consider revising the Reference Parameters if required. Multiplex operators will remain free to propose use of HEVC for specific services. When considering any such request, Ofcom would take into account the potential benefits and impact on viewers and the DTT platform more widely.

Other matters

- 4.28 Other editorial changes have been made in the draft Reference Parameters. These changes are primarily to update the international standards referred to in the Reference Parameters to the current versions.

Draft DTT Reference Parameters

- 4.29 A draft version of the revised DTT Reference Parameters is available on the Ofcom website as Annex 7 to this consultation

Question 2: Do you agree with the proposed modifications to the DTT Reference Parameters?

Question 3: Do you agree with our proposal not to include a UHD or HEVC profile in the Reference Parameters at this stage?

Section 5

Revisions to UK Interface Requirement 2022 (Informative)

- 5.1 The *UK Interface Requirement 2022*²¹ (IR2022) contains limits for the ‘out of band’ radio-frequency signals emitted by broadcast transmitters installed in the UK. Ofcom previously consulted on changes to IR2022 as part of our 2013 consultation on awarding a licence to operate DTT services on an interim basis in the 600 MHz spectrum band²².
- 5.2 A further draft version of IR2022, which contained the revisions proposed in 2013 as well as further minor editorial changes, was submitted to the European Commission in December 2014. Following a ‘standstill period’ which lasted until 12 March 2015²³ during which time other EU member states had the opportunity to comment on the proposed changes, the revised IR2022 has now been adopted by the UK.
- 5.3 The revisions to IR2022 were primarily required to reflect the current characteristics of DTT spectrum use following the completion of the 800 MHz clearance programme, and to clarify the out-of-band emission limits for DVB-T2 services.
- 5.4 Specifically, our previous consultation proposed to move the band edge mask specification from Channel 41 to Channel 39, and to move the band edge mask specification from Channel 62 to Channel 60. The channels over which a relaxed mask may be applied to were also revised to Channels 22 to 37 and channels 40 to 59 inclusive.
- 5.5 Changes to IR2022 were also required to make provision for the use of the DVB-T2 standard with the option of extended carrier mode of operation and to set conditions on the use of frequency offsets.
- 5.6 New DTT services in Channels 31-37 are required to have an out-of-band profile that does not exceed the relaxed mask given in IR 2022 for each 8 MHz channel. As there is a 2 MHz frequency gap between Channel 37 band edge (606 MHz) and the band edge of Radio Astronomy use in Channel 38 (608 – 614 MHz) there is no requirement for a critical filter. The mask requirement for Channel 39 is the same block edge mask as that defined in previous IR2022 because of the need to protect radio astronomy use outside the UK.
- 5.7 The specification of these masks for services in the 600 MHz band ensures that existing DTT and PMSE operations in the adjacent bands remain protected by a requirement to ensure that the new services do not contribute any additional interference than would be the case if they were to use other parts of the UHF TV broadcasting bands.
- 5.8 The current version of IR2022, including the revisions above, is available to on the Ofcom website²¹.

²¹ <http://stakeholders.ofcom.org.uk/binaries/spectrum/spectrum-policy-area/spectrum-management/research-guidelines-tech-info/interface-requirements/ir2022.pdf>

²² <http://stakeholders.ofcom.org.uk/consultations/600mhz-award>

²³ <http://ec.europa.eu/enterprise/tris/en/search/?trisaction=search.detail&year=2014&num=616>

Responding to this consultation

How to respond

- A1.1 Ofcom invites written views and comments on the issues raised in this document, to be made **by 5pm on 3 June 2016**.
- A1.2 Ofcom strongly prefers to receive responses using the online web form at <http://stakeholders.ofcom.org.uk/consultations/broadcast-tv-technical-codes/>, as this helps us to process the responses quickly and efficiently. We would also be grateful if you could assist us by completing a response cover sheet (see Annex 3), to indicate whether or not there are confidentiality issues. This response coversheet is incorporated into the online web form questionnaire.
- A1.3 For larger consultation responses - particularly those with supporting charts, tables or other data - please email broadcast.technical@ofcom.org.uk attaching your response in Microsoft Word format, together with a consultation response coversheet.
- A1.4 Responses may alternatively be posted or faxed to the address below, marked with the title of the consultation.
- Paul White
Ofcom
Spectrum Policy Group
3rd Floor, Riverside House
2A Southwark Bridge Road
London SE1 9HA
- A1.5 Note that we do not need a hard copy in addition to an electronic version. Ofcom will acknowledge receipt of responses if they are submitted using the online web form but not otherwise.
- A1.6 It would be helpful if your response could include direct answers to the questions asked in this document, which are listed together at Annex X. It would also help if you can explain why you hold your views and how Ofcom's proposals would impact on you.

Further information

- A1.7 If you want to discuss the issues and questions raised in this consultation, or need advice on the appropriate form of response, please contact Paul White on 020 7783 4324.

Confidentiality

- A1.8 We believe 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, ideally on receipt. If you think your response should be kept confidential, can you please specify what part or whether all of your response should be kept confidential, and specify why. Please also place such parts in a separate annex.

- A1.9 If someone asks us to keep part or all of a response confidential, we will treat this request seriously and will try to respect this. But sometimes we will need to publish all responses, including those that are marked as confidential, in order to meet legal obligations.
- A1.10 Please also note that copyright and all other intellectual property in responses will be assumed to be licensed to Ofcom to use. Ofcom's approach on intellectual property rights is explained further on its website at <http://www.ofcom.org.uk/terms-of-use/>

Next steps

- A1.11 Following the end of the consultation period, Ofcom intends to publish a statement in July 2016. We anticipate that the revised DTT technical codes will come into effect from the beginning of August 2016
- A1.12 Please note that you can register to receive free mail Updates alerting you to the publications of relevant Ofcom documents. For more details please see: <http://www.ofcom.org.uk/email-updates/>

Ofcom's consultation processes

- A1.13 Ofcom seeks to ensure that responding to a consultation is easy as possible. For more information please see our consultation principles in Annex 2.
- A1.14 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, who are less likely to give their opinions through a formal consultation.
- A1.15 If you would like to discuss these issues or Ofcom's consultation processes more generally you can alternatively contact Steve Gettings, Interim Secretary to the Corporation, who is Ofcom's consultation champion:

Steve Gettings
Ofcom
Riverside House
2a Southwark Bridge Road
London SE1 9HA

Tel: 020 7783 4652

Email: Steve.Gettings@ofcom.org.uk

Annex 2

Ofcom's consultation principles

A2.1 Ofcom has published the following seven principles that it will follow for each public written consultation:

Before the consultation

A2.2 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

A2.3 We will be clear about who we are consulting, why, on what questions and for how long.

A2.4 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 Plain English Guide for smaller organisations or individuals who would otherwise not be able to spare the time to share their views.

A2.5 We will consult for up to 10 weeks depending on the potential impact of our proposals.

A2.6 A person within Ofcom 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. Ofcom's 'Consultation Champion' will also be the main person to contact with views on the way we run our consultations.

A2.7 If we are not able to follow one of these principles, we will explain why.

After the consultation

A2.8 We think it is important for everyone interested in an issue to see the views of others during a consultation. We would usually publish all the responses we have received on our website. In our statement, we will give reasons for our decisions and will give an account of how the views of those concerned helped shape those decisions.

Annex 3

Consultation response cover sheet

- A3.1 In the interests of transparency and good regulatory practice, we will publish all consultation responses in full on our website, www.ofcom.org.uk.
- A3.2 We have produced a coversheet for responses (see below) and would be very grateful if you could send one with your response (this is incorporated into the online web form if you respond in this way). This will speed up our processing of responses, and help to maintain confidentiality where appropriate.
- A3.3 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 coversheet in a way that allows Ofcom to publish their responses upon receipt, rather than waiting until the consultation period has ended.
- A3.4 We strongly prefer to receive responses via the online web form which incorporates the coversheet. If you are responding via email, post or fax you can download an electronic copy of this coversheet in Word or RTF format from the 'Consultations' section of our website at <http://stakeholders.ofcom.org.uk/consultations/consultation-response-coversheet/>.
- A3.5 Please put any parts of your response you consider should be kept confidential in a separate annex to your response and include your reasons why this part of your response should not be published. 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 don't 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

Please tick below what part of your response you consider is confidential, giving your reasons why

Nothing	<input type="checkbox"/>	Name/contact details/job title	<input type="checkbox"/>
Whole response	<input type="checkbox"/>	Organisation	<input type="checkbox"/>
Part of the response	<input type="checkbox"/>	If there is no separate annex, which parts?	

If you want part of your response, your name or your organisation not to be published, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response that Ofcom can publish. However, in supplying this response, I understand that Ofcom may need to publish all responses, including those which are marked as confidential, in order to meet legal obligations. If I have sent my response by email, Ofcom can disregard any standard e-mail 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)

Annex 4

Consultation questions

Question 1: Do you agree with the proposed amendments to the Television Technical Performance Code?

Question 2: Do you agree with the proposed modifications to the DTT Reference Parameters?

Question 3: Do you agree with our proposal not to include an HEVC profile in the Reference Parameters at this stage?

Annex 5

Impact Assessment

Introduction

- A5.1 The analysis presented in this annex represents an impact assessment, as defined in section 7 of the 2003 Act.
- A5.2 You should send any comments on this impact assessment to us by the closing date for this consultation. We will consider all comments before deciding whether to implement our proposals.
- A5.3 Impact assessments provide a valuable way of assessing different options for regulation and showing why the preferred option was chosen. They form part of best practice policy-making. This is reflected in section 7 of the Act, which means that generally we have to carry out impact assessments where our proposals would be likely to have a significant effect on businesses or the general public, or when there is a major change in Ofcom's activities. However, as a matter of policy Ofcom is committed to carrying out and publishing impact assessments in relation to the great majority of our policy decisions. For further information about our approach to impact assessments, see the guidelines, Better policy-making: Ofcom's approach to impact assessment, which are on our website:
http://www.ofcom.org.uk/consult/policy_making/guidelines.pdf

The citizen and/or consumer interest

- A5.4 Many of the changes proposed in this consultation are intended to bring our TV regulation of the technical aspects of DTT up-to-date, and are not expected to have any impact on citizens or consumers.
- A5.5 However, two specific changes may potentially have an effect on consumers. These are the removal of subjective picture grade requirements on the three standard definition PSB DTT channels which each DTT transmitter carries, and the associated removal of minimum picture resolution and recommended audio bitrates requirements for these services.
- A5.6 It is possible that the removal of the minimum picture grade and associated requirements could lead to slightly lower technical quality being experienced by consumers on these three channels. However for the reasons set out in the body of the consultation, we do not believe that that this is a significant risk. These minimum picture grade standards apply only to a subset of DTT channels: they do not apply to either HD simulcasts of these channels (or to the versions of these services carried on other platforms). Removing the picture grade standards will, in our view, allow the SD PSB broadcasters on DTT the flexibility to make their own decisions about the technical quality they achieve, in line with the expectations of their audiences. We note there is no evidence of widespread consumer dissatisfaction with picture quality on other platforms such as satellite and cable (which are not subject to similar regulation). The change is also consistent with Ofcom's desire to only regulate where necessary.

Ofcom's policy objective

A5.7 The revisions proposed in this consultation are intended to modernise technical regulation of the DTT platform, to rationalise reporting requirements on broadcasters, and to improve Ofcom's visibility of emerging transmitter issues in line with new legislative requirements.

Analysis of the different options

Subjective Picture Grades: Remove Technical Quality requirements completely

A5.8 We have considered whether there should be full deregulation of technical quality matters, including subjective picture grade levels. However we do not believe that this option would be compatible with Ofcom's specific responsibilities for regulating the DTT platform, nor with the obligations on the PSB DTT licensees which derive from the Broadcasting Act.

Subjective Picture Grades: No change to current requirements

A5.9 We have considered retaining the current subjective picture grade requirements. While there is no direct evidence that the current requirement imposes undue burdens on the broadcasters, Ofcom seeks to regulate only where necessary, and we do not consider that retaining the requirements in their current form is desirable given there are no similar requirements on HD DTT channels, or on other platforms.

The preferred option

A5.10 We believe that the removal of specific subjective picture grades which we are proposing strikes the best balance between reducing specific regulation, while retaining backstop requirements on technical quality matters.

A5.11 Overall, this is a de-regulatory change which would simplify the regulatory regime, lessen the formal burden on broadcasters, and reduce the disparity in regulatory requirements which fall on the DTT platform compared to other platforms.

A5.12 As discussed above in the main body of this consultation, we do not anticipate that the removal of picture quality requirements would lead to a reduction in the quality of service experienced by viewers.

A5.13 Nonetheless, there is the possibility that removing picture quality requirements may subtly affect the broadcasters' incentives and future behaviour. For example, when planning upgrades to their infrastructure or changes in operational practices, it is possible that broadcasters could place less importance on maintaining high standards of technical quality in the future.

A5.14 However, we believe that the likelihood (and potential impact) of this risk is low. In the context of their other PSB privileges and responsibilities, as well as serving the established expectations of their audiences, we believe that the main PSB services will remain strongly incentivised to maintain generally high standards of technical quality. We further note that the PSBs which offer a simulcast HD service on DTT are achieving generally good technical quality in the absence of specific regulation.