

# About Arqiva

Arqiva is a media infrastructure and technology company operating at the heart of the broadcast and mobile communications industry and at the forefront of network solutions and services in an increasingly digital world.

Arqiva provides much of the infrastructure behind television, radio and wireless communications in the UK. In this role it has almost completed implementing UK Digital Switch-Over from analogue television to Freeview – a huge logistical exercise requiring an investment by Arqiva of some £700m and which is successfully being delivered to time and budget.

Arqiva is also a founder member and shareholder of Freeview, and operates two of the UK's three Freeview commercial multiplexes, providing over 40 services on Freeview to 20 million homes.

In addition Arqiva provides end-to-end capability for broadcasters, media companies and corporate enterprises, with services including:

- outside broadcasts (10 trucks including HD, used for such popular programmes as *Question Time* and *Antiques Roadshow*);
- satellite newsgathering (30 international broadcast SNG trucks);
- 10 TV studios;
- spectrum services for Programme-Making & Special Events (PMSE)<sup>1</sup>; and
- satellite distribution (over 1200 services delivered).

Specifically in respect of the Digital Terrestrial Television (DTT) platform:

1. The “TransCo” team within Arqiva Broadcast & Media is contracted to all current DTT multiplex operators to provide their transmission networks, where access to Arqiva’s broadcast sites and Managed Transmission Services is regulated by Ofcom;
2. Arqiva Digital Platforms represents the Multiplex Licence operations of Arqiva, and has a contract for Managed Transmission Services with Arqiva Broadcast & Media; and
3. Arqiva’s spectrum planning and antenna design team provides a consultancy service to Ofcom.

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<sup>1</sup> Such as the wireless cameras operated by the BBC and Sky News, and the radio mics used in virtually all television production and many West End shows.

## Executive Summary

Arqiva welcomes the opportunity to respond to this consultation. It is critical that the mitigation regime adopted in the UK minimises interference from LTE services into DTT to meet the needs and expectations of TV viewers. It is equally critical that the regime reflects the consumer commitment to the DTT platform and the investment that they, and the television industry, have made. This submission examines some of the more technical aspects of mitigation including filter performance and needs to be considered in conjunction with the more policy orientated joint response from the Public Sector Broadcasters (PSB) / Multiplex Licence Operators of which Arqiva is a co-signatory.

### ***Observations on Government decisions underpinning the proposals for MitCo.***

The Government commitment to the setting-up and funding of MitCo is welcomed but it is clear that the proposed protection regime and funding are inadequate:

- It does not conform with the principle that the 'polluter pays' for interference caused. Ofcom's own figures show that 83% of affected homes will have an installation cost of £156 to £224<sup>2</sup> to ensure that interference is successfully removed but this is not provided for.
- It leaves the consumer with a potential additional costs of in-excess of £161m when the total installation costs of filters for non standard aerial installations and the purchase of filters for non-primary sets are combined
- We remain very concerned that disruptions to secondary set users and households that depend on set-top or loft mounted aerials for their reception have been completely ignored.
- Even for those households / television sets where MitCo has an obligation to take action, it places no requirement on MitCo to **ensure** that interference is prevented, only a requirement to deliver filters which may or may not be successfully installed by the consumer (at their own cost)

In the light of the significant investment which consumers and the terrestrial broadcasting industry have made to achieve digital switchover (an investment which has been essential to enable the release of spectrum to allow the delivery of LTE services), Arqiva believes that the above short-comings of the Government's proposals with respect to mitigation represent an unacceptable outcome in terms of their likely negative impact on the future prospects of the DTT platform.

### ***Priorities for MitCo.***

There are a number of significant issues with Ofcom's proposals for MitCo and the regime for interference mitigation and Arqiva offer proposals to strengthen DTT protection once LTE services are introduced in 800 MHz. It is important that Ofcom's preferred option to form MitCo ahead of the auction is implemented. This is necessary to allow both Government and Industry sufficient time to optimise the mitigation regime and MitCo's systems / processes ahead of LTE service introduction. In addition to this critical first step Ofcom should

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<sup>2</sup> MitCo. Design Advice – A report to Ofcom (Deloitte), November 2011, table A. 2, p 81, <http://stakeholders.ofcom.org.uk/binaries/consultations/949731/annexes/Deloitte.PDF>

implement the following measures to ensure that the mitigation regime for DTT consumers is fit for purpose:

- There should be a greater role for the Supervisory Board in:
  - setting objectives and direction for the mitigation authority; and
  - measuring and auditing KPI compliance by MitCo.
- There should be a single model for interference analysis. This could be the model developed by Ofcom on which the proposals are based (suitably modified to reflect the actual parameters used by DTT). However, this model should be subject to ongoing audit and development with its effectiveness tested and validated through external validation including drive testing and field based market research.
- Ofcom should increase the proposed KPI for affected households that will be provided a filter on a pro-active basis from 90% to 100%. The purpose of the exercise is to protect DTT households and this is a key metric to deliver this objective.
- Ofcom should include more effective obligations for the licensed operators to implement network based mitigation solutions to those areas where they will be most effective. Ofcom's current approach is unlikely to result in the implementation of network mitigation as the planned incentives will be ineffective. Ofcom's own analysis suggests that there are 150 locations where network mitigation would lead to a significant reduction in the number of households affected. In light of this it is clear that a direct obligation should be placed on the 800 MHz licensees to implement network based mitigation.
- The proposed gain share mechanism provides little incentive to the licensees to optimise the protection of DTT households. In fact it is more likely to focus their efforts on cost saving which is not the fundamental objective of MitCo. Ofcom should re-align this mechanism to optimise its role in delivering DTT protection or exclude it from its plans.
- There should be pro-active field based market research to test the effectiveness of production filters and their provision. This will also mitigate the risk that consumers experience disruption but are unable, or unwilling, to complain
- Ofcom should ensure that all communications associated with the interference issue are directly attributable to the 800 MHz licensees rather than the body MitCo. This will be critical to ensuring that the MNOs have real reputational accountability with regard to minimising interference.
- Whilst the campaign plan described above will be targeted to those areas of the country where base station interference will be prevalent, it is also worth recognising that handset based interference can occur anywhere. MitCo should therefore also be required to undertake periodic national campaigns to raise awareness of this type of interference and how it can be remedied.
- The obligation to operate MitCo should continue for 12 months **after** the completion of network roll-out to the required coverage obligation as a minimum. This should also apply particularly if the completion of roll-out were to be delayed beyond the end of 2017 under agreement with Ofcom. In addition, it should be possible for MitCo to continue beyond any pre-defined end date provided the licence holders were willing to fully fund as there will be clear advantages to this as interference events will persist over the life of the 800 MHz service.

- The obligations on the licensed operators to continue to provide interference mitigation activities beyond the closure of MitCo needs to be clearly defined ahead of the auction and included in the licences.

If Ofcom were to implement these, and the more detailed actions, below, then the mitigation regime is more likely to meet the needs of DTT consumers.

### ***Filter Performance Testing***

Ofcom's updated estimate of potential households affected has risen significantly when compared to previous estimates, whilst the predicted number of post consumer mitigation households affected is considerably lower. This is a function of the assumed enhanced filter performance achieved by new prototype filters.

It is therefore critically important that the production versions of these new filters (a) deliver the level of claimed performance of the prototypes and (b) if they do, are installed correctly in order to achieve these performance levels.

We have tested a single prototype filter and our findings are summarised below.

The detailed methodology and results of our testing is described in Annex 1. The key conclusions are:

- The prototype filter is broadly as effective at blocking adjacent channel interference with "Domestic Installations with Amplifiers" as it is with "Standard Domestic Installations".
- However, in the case of "Domestic Installations with Amplifiers", filter performance is only effective when it is installed on the input side of the distribution amplifier – this will generally require access to lofts or rooftops with significant resultant installation costs for consumers as noted by Deloitte<sup>10</sup>.

Installation on the output side of the distribution amplifier provides either reduced protection or no protection at all and is therefore an unacceptable solution. Ofcom's analysis shows that "Domestic Installations with Amplifiers" account for 41% of affected households – a total of over 378,000 homes. Arqiva believes that this represents an unacceptably high number of homes where there is a real risk that either (a) filters will be incorrectly installed and therefore ineffective or (b) there is a significant consumer cost which could result in platform-switching behaviour. To avoid both of these real risks, Arqiva believes that MitCo should be accountable for the installation costs of filters in these cases and ensuring that they are installed correctly.

# Part A – The Importance of Digital Terrestrial Television and the Implications of Government Decisions

## Introduction

In this section of Arqiva's response we reflect on:

- the importance of Digital Terrestrial Television (DTT) to the consumer and Broadcasting Industry;
- the Government's decisions and consequences relating to the protection of DTT services from LTE interference;

## DTT: the Success Story

In light of the Government proposed interference protection arrangements for DTT it is important to highlight the importance of the DTT platform to UK consumers and the broadcast industry investment that has made DTT the success story it is today;

- In less than 10 years DTT has become the most important TV platform in the UK. It is the largest by primary household (10.8M<sup>3</sup>), even larger by total TV sets used (20.9M<sup>4</sup>) and larger still by viewing (44% Total Television Viewing<sup>5</sup> with 50-60% of PSB viewing and up to 80% of commercial channel viewing occurring on DTT). Consumers have voted with their wallets to demonstrate the value and benefits that DTT delivers to them.
- DTT is the only universal Free-to-Air (FTA) platform – as such it is critical to fulfilling public policy goals with respect to broadcasting (which remains one of the UK government's most significant interventions, and is at the heart of Ofcom's statutory purposes) as it is the only platform which can deliver PSB output to every single TV set in the UK, and is thus an essential guarantor of the digital revolution in the UK. It remains one of Ofcom's most important policy tools and, as such, it should be considered central to the UK Government's digital strategy over the long term.
- DTT underpins the financial prospects of the UK's FTA PSBs. These broadcasters account for circa 90%<sup>6,7</sup> of all spend on UK originated content and, as such, underpin the UK creative production sector – one of the most internationally competitive and successful in the world. Without a strong, robust, competitive DTT platform, the ability of the PSBs to sustain this comes under severe jeopardy. This in turn will accelerate the pressures already facing PSB – with significant citizen disbenefits as a result.
- DTT has been central to the creation of a highly successful 'horizontal market' which is not, unlike the satellite and cable platforms, controlled by a dominant player. This has ensured the development of open and common standards for digital television

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<sup>3</sup> Freeview / BARB, Q4 2011.

<sup>4</sup> 3 Reasons Autumn 2011 multichannel model.

<sup>5</sup> BARB/Attentional, 3 Dec. 2011.

<sup>6</sup> PSB Content Origination Spend 2010, Mediatique, June 2011.

<sup>7</sup> Second PSB Review, para 1.6, Ofcom, April 2008

resulting in healthy competition between consumer electronics companies and retailers. This in turn has ensured that consumers benefit from healthy price competition and growing choice and functionality whilst creating economic value in the sector.

- Arqiva is investing hundreds of millions of pounds secured against long term contracts with the licensed multiplex operators to build-out and operate the national multiplexes to facilitate the Digital Switchover (DSO) process.

### ***Background to Government Decisions underpinning MitCo***<sup>8</sup>

Arqiva summarises below what has been included and excluded as a result of the Government's decisions to date. These decisions provide an important context with respect to assessing the likely effectiveness of proposals in relation to MitCo's purpose of dealing effectively with interference.

#### ***Included***

- Support provided to DTT consumers
  - Pro-active provision of filters to the majority of primary DTT households that use roof-top aerials and are predicted to be affected by interference
  - Reactive supply of filters to those households that do not receive a filter but still suffer interference, provided they are primary DTT households using a roof top aerial.
  - One filter only per household
  - Installation support only to those consumers recognised as vulnerable as per the Digital Self Help Scheme criteria
  - Information and guidance on interference issues to be provided on a pro-active basis
  - Platform change for those consumers where mitigation solutions are unsuccessful
- Creation of mitigation body to administer mitigation activity
  - Funding of £180m to cover all cost of mitigation activities envisaged
  - Supervisory Board including breadth of industry stakeholders to oversee the mitigation authority
  - A limit to be set on the number of households that will be subject to platform change.

#### ***Not included***

- Support not provided to DTT consumers
  - Protection of non-primary DTT sets (the vast majority of active sets) is not provided for
  - Consumers that depend on set-top or loft mounted aerials
  - Installation support for households that depend on communal systems or distributed systems with amplifiers – estimated consumer cost of this c. £145m (see Table 1)
- No requirement for the successful licensed operators to undertake network mitigation to reduce interference

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<sup>8</sup> Ofcom conduc, "second consultation on coexistence of new services in the 800 MHz band with digital terrestrial television," Section 3, p 7 – 10.

## The Consequences of Government's Decisions

### *The Funding Gap – Installation Costs*

Government have emphasised their commitment to protection of the DTT consumer through the provision of £180m of funding to pay for the mitigation activities noted above. However the proposed funding is inadequate when you take account of the true cost to the consumer of just protecting primary DTT households. The government calculations do not include the installation costs for “Domestic installations with an amplifier” or “Communal aerial systems,” which represents 83% of households affected based on Ofcom’s analysis.<sup>9</sup> Clearly providing a filter without the means to install does not mitigate the interference if the filter remains un-installed. Using the estimates of installation costs provided by Deloitte<sup>10</sup> and the estimate of households affected we predict a further consumer cost of c. £144m. This additional cost also ignores the added complexity and disruption that will be experienced by these

	Standard Domestic Installations	Communal Aerial System	Domestic installation with amplifiers
Total Number of Households affected - No Mitigation	389,677	952,648	945,238
Number of DTT Primary Households (40% of Total households) - No Mitigation	155,871	381,059	378,095
Installation Costs	0	£224	£156
Consumer Costs - Primary DTT Households (£m)	0	£85.457	£58.982
<b>TOTAL Consumer Cost (£m)</b>		<b>£144.3</b>	

households.

Table 1 Estimated Filter Installation Costs for unsupported households

### *The Funding Gap – Non-Primary Devices*

The exclusion of 20.9M DTT Non-Primary TV Sets in the proposals (with only one filter to be issued per primary DTT household) results in an additional protection cost to the consumer of between £17m – £22m based on 10% of the affected televisions requiring a £8 filter for protection. (there are currently 20.9<sup>11</sup>million active non-primary DTT devices plus 6.4<sup>10</sup>million analogue devices yet to be converted).

### *Additional Factors*

Beyond the significant funding gap issues summarised above there are a number of further important issues that need to be addressed.

- The effect of interference from mobile handsets has previously been discounted by Ofcom despite increasing “two-screen” behaviour amongst consumers and the much anticipated future “internet of things” where the embedded wireless devices will not be obvious to the consumer. The pro-active communications plan for interference

<sup>9</sup> Technical analysis of interference from mobile network base stations in the 800 MHz band to digital terrestrial television – further modelling (Ofcom), February 2012, <http://stakeholders.ofcom.org.uk/binaries/consultations/949731/annexes/DTTCo-existence.pdf>

<sup>10</sup> MitCo. Design Advice – A report to Ofcom (Deloitte), November 2011, table A. 2, p 81, <http://stakeholders.ofcom.org.uk/binaries/consultations/949731/annexes/Deloitte.PDF>

<sup>11</sup> 3 Reasons Autumn 2011 multichannel model.

mitigation will be restricted to households in areas that will be known to be affected. To ensure that consumers become aware of the need to take action, a national campaign will be required to take account of mobile device interference. This has not been factored into Ofcom's proposals or the Government budget.

- 1-3% of affected households will lose their TV service and be subject to platform change. This represents up to 27,000 households that will lose DTT forever. This is an unjustifiable number of dis-enfranchised households and more needs to be done to protect these DTT citizen consumers, i.e. the inclusion of targeted network mitigation obligations.

In conclusion, we believe that the consequences of Government's decisions and limited commitments proposed to the protection of DTT pose a real threat to the long term prospects of the DTT platform. Given the investment made in DTT by both UK consumers and the terrestrial broadcasting industry alike – an investment without which the roll-out of LTE services would not be possible – we believe that the consequences of the proposed mitigation plans are not acceptable and that under the “polluter pays” principle that the successful Mobile licence operators or the Government should cover all the cost of mitigation not just some of it..

## Overall

***DTT has been a genuine success story. In less than 10 years DTT has become the most important TV platform in the UK. It is the largest by primary household (10.8M<sup>12</sup>) and even larger by total TV sets used (20.9M).***

***The current plans for mitigation fail to address the following areas;***

- ***DTT is the only means by which UK households enjoy television on non-primary sets free at the point of consumption. As a consequence of the current proposals to provide filters only to primary DTT sets up to 67% of affected DTT devices will not be protected and will cost the UK consumer £17m - £22m to remedy.***
- ***DTT primary sets fed from set top and loft mounted aerials will not qualify for a free consumer filter, this is estimated to represent 15% of Primary DTT households in the UK.***
- ***Installation support for households relying on communal distribution amplifiers where filtering has to occur ahead of the amplifier and not on the back of the Television set. We have estimated that the installation costs not included in the current proposals is c. £144m.***
- ***A specific obligation on the LTE license holders to undertake network based mitigation despite Ofcom's analysis indicating that network based mitigation solutions will reduce the number of households impacted when used in conjunction with consumer mitigation, from c. 38,500 to c. 3,300, i.e. a reduction in households affected by greater than 90%.***

***Government's decisions which underpin Ofcom's plans for the formation of MitCo and the operational regime under which it will protect DTT will lead to unnecessary disruption to DTT and considerable extra cost to the consumer beyond that provided for by Government in its £180m of funding. Therefore we ask Government to provide***

<sup>12</sup> Freeview / BARB, Q4 2011.

***the minimum additional funding of >£161m required to ensure that its stated policy objectives are met alongside the specific enhancements proposed in terms of the operational regime for MitCo and the Supervisory Board.***

## Part B - Detailed response to consultation questions

Arqiva has worked closely with Ofcom during this process to ensure that the impact of LTE services on DTT is minimised however on the basis of the latest proposals there is still much that needs to be done. In this section we provide responses to the specific questions raised. We should be clear that we wish to continue to work with Ofcom and to take an active role to ensure the outcome is optimised for all stakeholders.

*Question 7.1: Do you agree that it is best to seek to establish MitCo in advance of the auction for later transferral to 800 MHz licensees?*

### Response 7.1

Arqiva supports Ofcom's proposals that MitCo be set-up by Government ahead of the auction. This approach offers greater potential to minimise the impact of LTE services in 800 MHz on DTT viewers. In particular we believe that this approach offers several key benefits;

- Greater scope for stakeholders, in particular those that will be subject to interference, to take an active role in the creation of MitCo's operational capability.
- Time to learn from and exploit the expertise that exists within Digital UK.
- Scope to run simulations of KPI performance and test systems ahead of real interference events
- Early preparation of information and briefing material and the potential to trial the material with the consumer
- Testing the governance arrangements associated with the Supervisory Board and examination of the responsiveness of MitCo's actions, as well as trialling any escalation and subsequent actions considered necessary by the Supervisory Board
- The role of and approach to network based mitigation may also be considered as part of the set-up procedure of MitCo to offer clarity to all stakeholders.

Notwithstanding the desire to progress to LTE service introduction in the 800 MHz band as quickly as possible it is also important that no LTE services are allowed to be turned on until MitCo is sufficiently operationally ready (and a suitable level of operational readiness is still to be defined). Ofcom should commit to this in the statement that follows this consultation.

*Question 7.2: Do you agree with our initial views on MitCo's constitution and governance?*

### **Response 7.2.**

It is vital to ensure that the constitution and governance structure of MitCo effectively protects DTT services. In particular an efficient KPI environment will only be developed and implemented if the appropriate incentive and penalty regime is in place and the Supervisory Board have sufficient powers to discharge their duties. However, the information that Ofcom has made available to stakeholders at present is limited and does not make it possible to judge whether the above requirements will be suitably covered. Nevertheless, on the basis of the information provided, Arqiva endorses the proposal that MitCo should have an independent Chair with a casting vote, and that the Chair should be appointed by the Supervisory Board. In addition, we believe that the Supervisory Board should have a leading role in setting the objectives and incentives for the management of MitCo and have oversight and input into the procurement processes for supporting activities. Finally, due to the breadth of expertise represented on the Supervisory Board we believe that the Supervisory Board should play an important role in setting policy and strategy for MitCo to ensure the interference mitigation arrangements are optimised.

*Question 7.3: Do you have any views on the proposed approach to the Supervisory Board.*

### **Response 7.3.**

Arqiva is supportive of the proposals to have an independent body to oversee the performance of MitCo. However, we have concerns that the current proposals do not go far enough in terms of affording the Supervisory Board sufficient influence over the strategic objectives of MitCo. Specifically:

- There will need to be adequate funding to ensure that the Supervisory Board has enough resource of a sufficiently high quality to discharge its duties over the duration of the service. We believe that the Supervisory Board in-house resource should be able to review MitCo's finances and any aspects of MitCo's work and be able to contract with third party financial, technical and audit advice as necessary. Furthermore, it is important that the Supervisory Board is able to commission its own independent consumer research to underpin its duties.
- If as is planned MitCo is to be wound up at a point in time then the Supervisory Board and its in-house resource will need some form of incentive arrangements in place for its resources to stay to the end of the Supervisory Board's term.
- Ofcom's current proposals leave open the possibility that three discrete interference models will be developed, i.e. Ofcom's, MitCo's and the Supervisory Board's. Whilst there is merit in having the scope to check and verify independently there is also the need to minimise the amount of duplication and excess cost. It would therefore seem sensible for the current Ofcom model (suitably modified to reflect the actual

parameters used by DTT) which forms the basis of the decisions reached to be the basis of the interference modelling activity for all three parties, subject to ongoing audit of its effectiveness (see also our response to question 7.5).

- The senior membership structure for the Supervisory Board as summarised in Table 7.1 of the Ofcom consultation should be clarified. In particular, it is unclear why the role Technical / audit adviser would have voting status and whether they are responsible for leading the technical audit activities of the Supervisory Board or truly independent of the Supervisory Board. In our view, it may be preferable if this voting position is taken by the Head of the Secretariat for the Supervisory Board – as that individual will have overall responsibility for managing and overseeing the technical and audit activity. However, if this vote was taken out then the Chair would no longer have the casting vote.
- We note that Ofcom has proposed that the MNOs and the broadcast industry will each have three representatives on the Supervisory Board – with the three 800 MHz licensees all represented, and respective representatives for the Multiplex Operators, the PSBs and the Commercial broadcasters. We believe that the three representatives from the broadcast industry should be represented by the PSB and Commercial Multiplex Operators.
- The Supervisory Board should have the power to ensure that research is undertaken to establish whether received complaints in relation to LTE interference provide an effective measure of the actual levels of interference experienced by consumers. During a recent technical enhancement of the Commercial Multiplexes on the DTT platform the Commercial Multiplex Operators were required by Ofcom to undertake field based market research. This research was to test the extent to which platform changes had led to a service loss that potentially had gone un-reported due to consumer inertia and / or lack of awareness. In the context of LTE interference, it will be vital that the Supervisory Board can hold MitCo to account to ensure that it is tackling all interference, not just consumer-reported interference.
- In order to ensure that the MitCo management activities are correctly aligned to the objective of interference mitigation there is merit in the Supervisory Board being able to approve their employment terms, bonus arrangements and performance objectives.
- Under Ofcom's proposals the Supervisory Board has the scope to offer informal advice to MitCo. Arqiva believes that the Supervisory Board should have additional powers to set the strategic and policy objectives for MitCo against the principal objective of minimising interference to DTT households. Furthermore, within these objective-setting powers it should have the scope to require network based mitigation solutions where justifiable.
- The Supervisory Board Chairperson should be a Government Official. This will ensure that the Government are directly engaged in the process of interference mitigation.

- The appointed 800 MHz licensee representatives should be a UK board member or UK registered company official. This will ensure that MitCo has the necessary focus on interference mitigation.
- The voting rules have not yet been determined, however Ofcom should consult with all of the Supervisory Board stakeholders when developing the voting protocol which defines when votes will need to be unanimous or passed as a majority.

*Question 7.4: We propose that the 50% gain share be split between 800 MHz licensees based on the volume of spectrum they hold in the 800 MHz band. Do you have any comments on this proposal?*

#### **Response 7.4**

Arqiva is concerned that a gain share mechanism risks confusing the objectives of MitCo by introducing an incentive to save money, potentially at the expense of the DTT viewing public.

Regardless of whether or not Ofcom persists with such an approach (which has significant pragmatic and practical issues) it must ensure that MitCo's principle objective is to protect DTT reception.

One practical issue facing the proposed gain share mechanism is that filter provision is required to be pro-active hence network mitigation would always result in the mobile operators being unable to avoid the initial filter distribution costs to such areas. Without this potential trade there would be no real commercial benefit to network mitigation except where it were to have an impact on the number of platform changes required.

Ofcom's detailed interference modelling shows that the implementation of network based mitigation in conjunction with consumer based mitigation is predicted to reduce the number of affected households from c. 38,500 to c. 3,300, this represents a significant reduction and worthy of consideration if the purpose of the exercise is to protect DTT. Unfortunately it is difficult to comprehend how the gain share mechanism will deliver the efficiencies envisaged by Ofcom in paragraph 7.61 where separate commercial entities roll out their networks to different performance and coverage objectives. This makes it unlikely that the savings envisaged in paragraph 6.19, where it is assumed that commercial entities collectively choose to undertake location specific network mitigation, will be achieved.

Finally, pragmatically, the likely scale of funds that may remain at the end of the MitCo process is unlikely to be a sufficient incentive to drive efficient mitigation outcomes. For example, if £30m remained at the end of the four year period this would represent a potential gain of £5m per licensee which is not material in the context of UK mobile annual revenues of £15.1bn<sup>13</sup>.

In conclusion Arqiva believes that the gain share proposals as currently structured are unlikely to drive any real efficiencies and risk creating a confused dynamic centred on cost savings. Therefore if the key purpose of the gain share mechanism is to encourage network based mitigation then the current gain share proposal should be dropped and stronger incentives need to be considered or specific obligations included to ensure that network mitigation is undertaken as part of an optimised protection solution.

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<sup>13</sup> Ofcom UK mobile operator-reported retail revenue figures: <http://stakeholders.ofcom.org.uk/market-data-research/market-data/communications-market-reports/cmr11/uk/1.17>

*Question 7.5: Are the information parameters defined above and in Annex 5 sufficient to allow MitCo to accurately and reliably forecast the scale and scope of households affected by DTT interference?*

### **Response 7.5.**

As the proposed interference model sits at the centre of MitCo's mitigation planning activities and forms the basis on which the Supervisory Board is able to check MitCo's performance, it is critical that it is as representative as possible of the 'real world' situation. However no consideration is currently given to the efficiency of the model in predicting 'real world' performance. Therefore the pro-active consumer research proposed in response to 7.3 above should be a key metric that is used to measure performance alongside the use of drive testing to measure actual LTE signal levels.

Ofcom has invested heavily and undertaken considerable technical analysis to create a model that attempts to predict the potential interference issues associated with the introduction of LTE services in the 800 MHz band. Given the confidence that it has in this model it should be provided to MitCo to aid it in undertaking its mitigation duties rather than requiring MitCo. to effectively start from scratch. Furthermore, there is no sense in MitCo creating a new model to undertake its duties and deliver upon its KPIs when its objectives have been set on the basis of a completely separate model. Using this model the Supervisory Board should also be able to identify areas where interference is forecast to affect a significant number of households and where network based mitigation should be required.

Arqiva note that the modelling has assumed that all six DTT multiplexes will be operating at DVB-T 64QAM FEC 2/3 whereas only two DTT multiplexes operate with these parameters, with all three commercial multiplexes using DVB-T 64QAM FEC3/4 and the HD multiplex operating DVB-T2 128QAM. Arqiva urges Ofcom to modify their model to take the actual DTT operating parameters into account. We anticipate that the impact of the alternative FEC will increase the number of households affected by LTE interference and result in a subsequent increase in the cost of mitigation. We encourage Government to revisit its decisions in light of results of this further analysis.

Whilst, the Supervisory Board will have a duty to validate the interference model. If the model is found to be flawed the Supervisory Board does not have the power to ensure that the necessary changes are made. Furthermore, in terms of the need to validate the model it is unclear how this duty will be discharged, as noted in our response to 7.3 the undertaking of pro-active market research, aligned with drive testing and other field based measurements should be used to prove the accuracy of the model.

On the subject of information requirements Ofcom should include the need to gather the following information;

- The actual number of habitable units per a communal dwelling
- The actual number of households with a standard roof top aerial
- The actual number of domestic installations with amplifiers.

Clearly, the lack of any detailed information on active DTT households and the type of antenna installation in place poses a considerable challenge to MitCo's ability to effectively

manage the mitigation process and Arqiva encourage Ofcom to address this point as a matter of urgency.

*Question 7.6: Do you agree the KPIs related to MitCo's activities are appropriate and robust?*

## Response 7.6

Whilst the KPIs as proposed may be aligned to the Government's decisions its is important to acknowledge that insufficient consideration and support is being given to those DTT households with complex installations, without roof top aerials or in communal dwellings and we urge Government to reconsider its position. In particular, 15%<sup>14</sup> of primary DTT households depend on some form of internal aerial either set-top or loft mounted for reception and would not be covered under Government's proposals.

For the objectives proposed the KPIs are not sufficiently robust and do not go far enough to optimise the mitigation arrangements currently envisaged and we provide options to improve the KPIs below that Ofcom will need to make to the KPIs in order to achieve its objectives.

- As noted in response to 7.4 MitCo's core objective is to mitigate against DTT interference. Therefore the KPI requiring pro-active provision of filters should be for 100% (not just 90%) of households affected. Otherwise the motivation becomes skewed towards cost.
- The effectiveness of filter distribution to households needs to be broken down to greater detail and be measured across the household criteria defined by Ofcom in their analysis in order to ensure that the filter distribution objective is being managed effectively, i.e.
  - Standard domestic installation
  - Domestic installation with amplifier
  - Communal aerial systems
- There should be a requirement for pro-active market research (with an associated KPI) to test the effectiveness of the consumer based mitigation solution and specifically to compare number of complaints with number of households affected.
- There should be a clear link in all information provision between the licensed operator causing the interference and the interference itself. There should not be a separate brand / identity for the mitigation solution in order to ensure that those who cause the harmful interference are incentivised to remedy it appropriately to avoid any reputational damage
- There needs to be the scope for MitCo's performance to be challenged on an ongoing basis. As a consequence there should be the scope to increase the performance levels rather than just the ability to reduce them back to take account of the 'real world' conditions.

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<sup>14</sup> Domestic Receiving Systems, Set top and loft aerial usage, Digital UK Technical Note, 21 November 2011.

- The Operational Conditions propose that the ‘Testing Phase’ be limited to the c. 50 main transmitter coverage areas. Whilst we accept that this approach relates to the majority of households served it seems to discount those DTT households that are served by the c.1000 broadcast sites delivering DTT to small communities and the Nations. These households are more likely to be on the edge of coverage and hence more susceptible to interference and typically only have satellite as a fall back option. This proposal oversimplifies the mitigation arrangement and does not provide a proportionate or appropriate solution. Therefore the “Testing Phase” as described should extend to all of the broadcast sites.
- Recognising the important role that network based mitigation has in conjunction with consumer based mitigation in minimising interference to DTT households. We are keen to see a specific reporting requirement whereby MitCo regularly updates the Supervisory Board on the number of network based mitigations deployed and their effectiveness.

Fundamentally there does not seem to be sufficient incentivisation for appropriate behaviours in the Operational Conditions proposed. In particular in the case of consistent and ongoing failure to meet the KPIs the sanction of licence revocation should be available.

*Question 7.7: Do you agree that the KPI for incentivising and measuring the proactive supply of DTT receiver filters to households affected by interference should be based on an assessment of the outcomes rather than the activities performed by MitCo?*

#### **Response 7.7.**

As per our response to question 7.6 we do not believe that the requirement goes far enough. The provision of filters pro-actively to 90% of households in the first instance does not achieve protection of all affected households and given that no DTT household should be left suffering from interference, pro-active mitigation should be required for 100% of those households predicted to be affected. Secondly the provision of filters as an act does not result in interference mitigation if the householder is provided the wrong filter type, and / or is unable to install it. It is also unclear on the basis of information provided what records will be kept to allow confirmation and potential audit that specific households have received filters and that funds have been spent efficiently.

In addition, and as noted in response to 7.6, we believe that the metric should have greater granularity and be split across the different household configurations that exist as defined by Ofcom. This will ensure that the appropriate funds and effort are targeted to deliver an efficient outcome.

*Question 7.8: Do you agree with the approach we have outlined for incentivising KPI achievement and managing cases of non-compliance with KPIs?*

#### **Response 7.8.**

KPI performance is central to effective management of the mitigation solution. It is imperative that the consequences of missing the targets incentivise the correct behaviour from MitCo and ultimately that the licensed operators deliver on their obligations. To this end we believe that there is further scope for Ofcom to have powers to act if the Mitigation Authority is not sufficiently responsive or effective and as noted in response to 7.6 to include the possibility of licence revocation.

*Question 7.9: Do you agree with our proposed approach for managing MitCo's performance against other elements of service delivery that are not captured by KPIs?*

### **Response 7.9.**

For demand forecasting, whilst we see merit in the interference model being shared between MitCo and the Supervisory Board there also needs to be a regular audit of the model to prove its effectiveness, i.e. to test forecast against actual performance. This should result in developments to the model and ultimately a high level of predictability of this key tool relatively early in the existence of MitCo to maximise MitCo's impact. To this end we propose the need for a high target of actual against predicted performance against which the model's performance will be checked.

There also needs to be an annual financial and operational audit of MitCo's performance with the output of this audit used to set objectives and management incentives for the subsequent period. The main consideration for the audit should be whether the funds and resources have been deployed effectively to achieve the aim of minimising DTT interference and to ensure that there is not an undue focus on cost saving at the expense of consumer protection.

*Question 7.10: Do you think a hard or soft limit should be set in relation to platform changes? Do you have any other comments in relation to the platform change cap?*

### **Response 7.10.**

As a point of principle any platform change is an unacceptable outcome for the DTT platform as it results in a DTT household lost forever and every effort should be taken to avoid such an event. However, if an aggregate national cap is to be set then it should be set as a binding limit at a sufficiently challenging level to minimise the impact of platform change. This binding limit should be set ahead of the 4G auctions and be based on the output of Ofcom's detailed modelling on which the Government's decisions and the mitigation regime are based. Furthermore, we are concerned that in paragraph 8.12.4 of the consultation platform change is considered appropriate in the case that a household loses one or more of the PSB or commercial multiplexes. If a household were to continue to receive five of the six multiplexes then a platform change would seem disproportionate and this is one reason why we believe that the cap should be set on the low side of impacts. The setting of a suitably low binding platform change cap is also expected to stimulate greater use of network based mitigation solutions which will further enhance the protection of DTT households which is the clear objective of the LTE interference mitigation regime.

To the extent that they are necessary, there should be ongoing monitoring and reporting of the number of platform changes. This will provide early visibility to MitCo and the Supervisory Board of a potential breach and allow for timely intervention and remedy. This requirement could be linked to KPI 4. This will also highlight particular 'hot spots' associated with platform changes. Where this occurs MitCo should be required to reconsider its interference mitigation strategy on a local basis perhaps with reduced power LTE operation in the interim.

The above observations relate to platform changes that have occurred through MitCo's actions and should be relatively easy to identify. However, we note that there is also the potential for platform changes independent of MitCo, i.e. a direct or indirect relationship between the 800 MHz licensed operators and other platform operators, which could be masked by general churn, enhanced service offering, etc., but the trigger for the event could be LTE interference. Against this issue there should be clear requirements for the licensed

800 MHz operators to disclose to Ofcom and the Supervisory Board any commercial deals that they have with Sky / Virgin Media for the joint selling / marketing of TV packages to TV households particularly when these activities are targeted to areas subject to high interference impacts.

*Question 7.11: Do you agree with the requirements we propose to place on licensees to address interference after MitCo closes?*

#### **Response 7.11.**

There is insufficient clarity with these proposals particularly as there is a good chance of new interference events after the envisaged closure date of MitCo. More specifically post MitCo we have the following questions;

- What will the process for mitigation be?
- How will consumers access information about interference?
- How will consumers obtain support and filters?
- Who will pay for support and filter provision?
- How will vulnerable consumers be dealt with?

In addition, there is an inconsistency between the proposed closure date for MitCo and the completion date for the 98% population coverage for the 800 MHz spectrum, as both proposals are coincident at the end of 2017. The obligation to operate MitCo should continue for 12 months **after** the completion of network roll-out to the required coverage obligation as a minimum. This should also apply particularly if the completion of roll-out were to be delayed beyond the end of 2017 under agreement with Ofcom.

Furthermore, as roll-out obligations only apply to one block of the 800 MHz spectrum there still remains considerable risk of new interference events after this roll-out obligation date and conceivably for the life of the service both network and handset. Ofcom's proposals provide insufficient clarity and hence comfort that there will be a sufficiently robust solution in place beyond the notional end of MitCo. It is imperative that Ofcom provide DTT households greater long term security over their TV services by placing clear obligations on the 800 MHz licences ahead of the award process or Ofcom / Government making commitments that all necessary steps will be taken post MitCo to afford DTT households the appropriate level of protection.

Finally, the MNOs have a history of delaying spectrum auctions through legal challenge and hence a hard back-stop date of end of 2017 for MitCo may prove unsatisfactory and counterproductive.

*Question 8.1: Do you have any views on the nature or detail of the requirements we propose may be necessary as set out in this Section?*

#### **Response 8.1**

We summarise our specific observations with regard to the requirements on new licensees below. In some cases this summarises and gathers together points that we have made in response to other questions;

- The MitCo management representative should be an official member of the UK board or registered company official of the successful licensees to ensure that sufficient emphasis and priority is attached to the mitigation process
- There should be a requirement for an annual financial and operational audit to ensure that funds are being deployed effectively. The results of this audit should be used to set MitCo management objectives and also highlight opportunities for continuous improvement.
- Ofcom should clarify the co-operation requirements between MitCo and the Supervisory Board, in particular the terms 'reasonably' and 'timely.'
- Day-to-day mitigation includes the provision of filters to DTT consumers and carrying out of platform changes. There should be greater granularity in terms of the targeted provision of appropriate filters to the household configurations identified. Furthermore, there should be a requirement for ongoing performance testing and certification of production filters to ensure that they meet the same or similar levels of performance as exhibited by the prototype filters on which Ofcom's interference modelling is based.
- Provision of information: Ofcom should clarify the level of and type of information provision anticipated to be provided to DTT consumers ahead of the launch of LTE services. In addition, there should be scope for national information campaigns to deal with the issues associated with handset generated interference.
- Provision of filters: Ofcom should be clear about what targets will be set to prove that the appropriate filters have been received and installed by the relevant households.
- Platform changes: Ofcom should clarify if the loss of one multiplex is an appropriate trigger to enable platform change.
- Compliance with directions given by Ofcom: Ofcom should have greater powers including licence revocation for persistent non-compliance with KPIs. Furthermore, Ofcom should provide greater clarity on the mechanism by which the proposed compliance requirements would be invoked and the relevant escalation process that would apply
- Closure of MitCo: As a minimum the closure of MitCo should be one year after the completion of the network coverage obligation and not the current proposed back stop date of the end of 2017. In any event, were the network coverage obligation to be delayed under agreement with Ofcom then MitCo should run for a minimum of 1 year after the completion of the network coverage obligation
- Following the dissolution of MitCo the licensed operators should be required to provide a regular and timely update to Ofcom detailing all active 800 MHz sites and the nature of services delivered. Furthermore, Ofcom needs to set out clear obligations on the licensees to manage interference events post MitCo. closure ahead of the auction.