Issue 1

BT's response to:

Ofcom consultation on "Variation of the Spectrum Access Licence for 1452-1492 MHz and changes for fixed link use in the paired bands 1350-1375 MHz and 1492-1517 MHz"

(*Issued by Ofcom on 30 September 2014*)

(BT response dated 9 December 2014)

1. SUMMARY OF BT VIEWS

- BT welcomes the opportunity to comment on these proposals from Ofcom regarding the variation of the spectrum access licence for 1452 – 1492 MHz, particularly in view of our extensive use of fixed links in the adjacent 1492 – 1517 MHz band.

- Whilst welcoming the opportunity for this currently unused spectrum to be brought into use for mobile services in the near future, BT considers it extremely important that the process for doing so is managed properly. As Ofcom is aware, BT operates a significant number of important fixed radio links in the 1492 – 1517 MHz band and we need to be confident that all efforts will be made to ensure that these existing links can continue to operate without the risk of interference from any new SDL use.

- We welcome the study and proposals submitted by Qualcomm, which show that it could be possible to develop filters to enable compatibility between mobile SDL Base Stations (BSs). However, we believe that it will be necessary to use notch filters, rather than band pass filters, to remove the interference into fixed link receivers.

- Furthermore, we believe that Ofcom may in some cases need to consider licence variations for affected fixed links, without penalty for the fixed link licensee, in order to accommodate these proposals.

2. RESPONSES TO THE SPECIFIC QUESTIONS RAISED

Question 1:
Do you agree with:
a) the technical analysis prepared by Qualcomm?

We are generally happy with the technical analysis prepared by Qualcomm, which seems to have made a reasonable assessment of the current situation[1], and made some initial proposals.

However, we are concerned that the proposals from Qualcomm may not be feasible to implement as proposed. The problem is that the fixed link transceivers operated in this band by BT are fully contained and have an *internal* duplexer. The only convenient means to insert a band pass filter as proposed by Qualcomm would be between the output port of the transceiver and the antenna, however, that would also completely filter out the transmit signal in the paired duplex frequencies as they are not in the filter pass band, which is clearly unacceptable. The manufacturer of our equipment has advised that any attempt to insert the band pass filter in the receive chain (between the duplex and the front end of the receiver) would compromise the integrity of the equipment case and hence the equipment screening, and

[1] We do note that (in Qualcomm's MCL analysis) consideration has been made of the SDL BS antenna height (h1) in section 5.3.1, and subsequently in section 5.3.3 it was concluded that in the urban case the fixed link antenna is outside the SDL's main beam for separations of interest. However, there doesn't appear to be any indication of what value has been taken for h1. Furthermore, there doesn't appear to be any consideration that SDL BSs in urban areas are likely to be on rooftops, and hence the antenna height could vary greatly. It is not clear whether any such factor is included, but we would be sceptical of any assumed loss due to a presumption of the absence of antenna coupling in elevation.

would also change the calibration of the equipment. As a consequence the transceiver would inevitably lose its compliance to the Harmonised Standard.

We therefore propose that instead of a band pass filter, Qualcomm should investigate the feasibility of developing a notch filter to fit between the transceiver output port and the antenna, which would remove the LTE SDL signal, whilst allowing the transmit signal (at 1350 – 1375 MHz) to pass through. However, we note that even such a notch filter would still not be a perfect solution. Qualcomm have stated that their filter designs have an insertion loss of about 1 dB. Whilst this may sound insignificant, this loss would degrade the link budget accordingly, and would apply to the transmit as well as the receive path. Many of these links carry "critical infrastructure" traffic, and have been designed and installed to meet a particular non-availability threshold. Initial studies indicate that even a 1 dB reduction in link margin could typically increase the non-availability of the link by between 50% and 150%. We would need to consider the implications of this further.

Clearly if problems are identified then an obvious solution to this would be for Ofcom to amend the fixed licence to (either) increase the permitted EIRP by 1 dB, or to identify a new channel of operation for the fixed link. However, under Ofcom's proposals it is stated (Section 5.7.2) that "… if part of the means of avoiding undue interference is to retrofit the receivers of new (or varied) fixed links with additional filtering, then the 1452-1492 MHz band licensee would not be responsible for the associated costs of this". From this we would conclude that any variation of the fixed link licence (e.g. a 1dB increase in EIRP to overcome the insertion loss of the filter) would absolve the mobile licence holder from the obligation to pay for the receiver filter which we are trying to accommodate.

Consequently we propose that any variations to the fixed link licences which are incurred as a consequence of trying to accommodate the mobile SDL base stations (e.g. a change of channel, or a necessary increase in fixed link EIRP) should not be considered as grounds for absolving the mobile licensee from the associated costs referred to.

Do you agree with:
b) our assessment of the Qualcomm study and our resulting conclusions?
If not, please explain why and support your answer with detailed evidence.

We believe that Ofcom has made a reasonable assessment of the Qualcomm study.

Question 2:
a) Do you agree with our proposal to grant the variation request as set out in this consultation?

Given that ECC Decision (13)03 has concluded that the band 1452 – 1492 MHz should be harmonised for SDL for mobile base stations, we are generally content with the proposal for the existing licence to be varied accordingly, subject to the application of appropriate measures to protect existing fixed service links, and also enable the continued installation of new fixed service links in the adjacent band.

b) Do you agree with our proposal to continue the use of the adjacent 1492-1517 MHz and 1350-1375 MHz for legacy fixed links and retain 1356.5-1375 MHz and 1498.5 -1517 MHz for new fixed links from the date of the licence variation?

We believe that it is very important that the existing fixed links should be permitted to operate unhindered from interference from the new mobile networks. Furthermore, given the importance of this fixed service band for a range of applications, we believe that it is essential that new assignments should continue to be made in as much of the fixed link band as possible.

Considering our existing deployment of fixed service links in the 1492 – 1517 MHz band, about a third of the links receiving in the range 1492 – 1498.5 MHz are sited in urban areas; it is our presumption that SDL are also most likely to be sited in urban areas. And furthermore, we are currently operating 3 links receiving in the first channel (centred 0.75 MHz from the top of the SDL channel) in urban areas; these are all sited on Telephone Exchanges, at least two of which are also used by MNOs. We understand from Figure 56 of the Qualcomm study that it is claimed that it would be possible to develop high performance filters (for both the SDL transmitter and the fixed link receiver) which would provide sufficient isolation even at short range. As noted above, these filters would have to be re-designed as notch filters (to block out 1452 – 1492 MHz), rather than band pass filters, however we presume that a similar filter performance would be possible.

This is clearly going to be very challenging, but we would be happy to work with Qualcomm/ mobile licence holder to install receiver filters, provided at their expense, to our existing fixed links. We would also be looking to Ofcom for reassurance that appropriate measures would be applied to the mobile SDL base stations (and in particular adequate filtering) to protect our existing fixed links.

c) Are the technical parameters listed in Annex 9 sufficient to enable the 1452-1492 MHz licensee to assess and manage the interference potential from base stations operating in the 1452-1492 MHz band to fixed point to point links? Should Ofcom consider presenting additional parameters? If so, which parameters and why?

The list of technical parameters given in Annex 9 seems to be comprehensive, and we have not identified any additional parameters that we believe would be required for co-ordination of mobile SDL base stations.

END