4G/DTT co-existence mitigation programme - operational since 2013

4G mobile services in the 800 MHz band have the potential to cause interference to the reception of existing digital terrestrial television (DTT) services in the adjacent band.

The 4G and 800MHz DTT interference issue is not unique to the UK. Other European countries, which have DTT services in bands adjacent to the 800 MHz band and face the same issue, are adopting a variety of approaches to mitigate the interference risk. The UK, France and Spain all offer a dedicated scheme to assist in resolving interference issues with other countries supporting their DTT viewers directly via the relevant mobile network operator or national regulator.

The initial modelling by Ofcom indicated that up to 2.3 million households could experience 4G interference to their DTT service, of which around 900,000 households would rely on DTT for their primary television viewing. The Government decided that an interference mitigation scheme, set up and funded by the 800 MHz licensees, should resolve interference only for these primary DTT households and that an Oversight Board of mobile operators and broadcasters, together with DCMS and Ofcom, two independent members and an independent chairman, would track the mitigation company's operations against key performance indicators.

Digital Mobile Spectrum Limited (DMSL) is the company set-up and funded by the 800 MHz licensees to provide mitigation support to primary DTT viewers. It has been operational since April 2013 and provides its service to viewers under the brand name "at800". After pilot trials in the West Midlands, London and Brighton in spring 2013, at800's view was that the number of households experiencing 4G interference and reliant on DTT for their primary viewing was likely to be in the region of 90,000; as of March 2016, at800 still consider this figure to be a reasonable prediction.

Digital UK manages the DTT platform and supports its viewers. On behalf of the broadcasters, the company provides an operational interface with DMSL on technical work, communications and viewer support.

The spirit of co-operation and close working across the mobile operators, broadcasters, DMSL and Digital UK has been a unique and effective example of cross-industry working to achieve the programme's objectives.

Changes to the operation

The operational rollout of 4G masts began in July 2013 and based on the levels of interference (772 confirmed cases) and operational experience by the end of that year, at800 recommended that the Oversight Board consider that the original requirements of the assistance scheme were disproportionate to the size of the problem and that at800's resources might be used more effectively to the advantage of viewers if there were a review of the scheme. The Board agreed and proposed that a more flexible and targeted assistance scheme would improve the level of assistance provided to affected consumers whilst reducing the amount of time and money spent targeting support to viewers unlikely to experience interference.

With the agreement of Ofcom, at800 adapted the mitigation scheme with a more targeted and risk-based approach to mailings and a presumption towards installer visits to solve interference issues with the provision of a filter for self-installation should the viewer prefer that option (i.e. a reactive rather than proactive filter policy).

To support these changes, the original Key Performance Indicators (KPI) were reviewed with a single overarching KPI focused on Service Restoration for primary DTT viewers affected by 4G interference (99% within 10 working days) implemented and underpinned by a number of sub-KPIs measuring installer visits, the provision of filters and support for vulnerable viewers with Operational Conditions (OC) to slow the rollout of 4G in specific locations applying if there were breaches of the overarching KPI and sub-KPIs in those areas.

In addition, the company committed to agreed service levels relating to mailings within strict time targets, viewer complaints and the proportionality of its communications. Ofcom agreed to forbear from enforcing the original KPIs and OCs with the option to resume those should circumstances dictate.

Also, and at its own cost, at800 extended its support beyond the minimum requirements of Government policy with the provision of: more than one free filter per household; free filters to those with cable or satellite services whose DTT viewing is affected by 4G interference; installation support to all households (irrespective of cable and satellite services) occupied by anyone aged 75 or over, or registered blind or partially sighted, or on employment and support allowance; support available for longer than 28 days after nearby mobile mast activation; and installation support to communal households without property management or maintenance arrangements.

For the purposes of its operation, at800 defines a primary Freeview household as one that does not receive cable and satellite services on any television.

To meet its revised operational objectives, and in conjunction with its approach to constantly review and refresh its operation for the benefit of viewers whilst ensuring value for money, at800 has implemented a number of supporting operational improvements including the introduction of regional contractors to provide installer support on its behalf, (supplemented with a bespoke training course on identifying 4G signals for 'accreditation' as an at800 engineer); conduct of routine audits on installer visits to evaluate the work undertaken and ensure that the correct diagnosis was reached and any subsequent resolution work was appropriate and data capture was accurate; and the increased and focused use of social media to effectively raise awareness in areas where mast activations are planned and/or occurring.

at800 has also worked closely with the mobile operators to ensure that any changes to the network, to optimise usage and capacity in areas where 4G masts had previously been activated, are taken into account so appropriate support might be available should the need arise.

Before the operational regime was modified, at800 sent approximately 980,000 filters to households proactively. As of March 2016 and under the modified operational regime, at800 has: handled over 350,000 calls and more than 35,000 online enquiries; sent out 66,000 filters in response to viewer requests; carried out 42,800 engineer visits resolving over 14,000 cases of 4G interference in individual households. In addition, the company has provided over 5000 communal filters for use in DTT distribution systems in multiple residency blocks.

Modifications to the prediction model

During 2015, the Co-existence Technical Working Group (CTWG), a technical sub group of the Oversight Board comprised of representatives from at800, broadcasters, Digital UK and Ofcom, worked on refining the computer modelling to predict which homes are at risk of 4G interference.

By doing so, it is anticipated that this will assist in better understanding the possible factors affecting real-life experience, accounting for the disparity to the prediction levels in the 800 MHz programme, and also to inform future spectrum clearance programmes where DTT viewers may be adversely affected by mobile signals e.g. 700 MHz

Following extensive analysis and testing, including comparisons between predicted and real-life numbers for validation, the group proposed to the Oversight Board a number of refinements to the prediction model parameters. These include taking account of the low likelihood of aerial amplifiers at households in high DTT signal strength areas. It is expected these refinements will improve predication accuracy.

In addition, at800 is evaluating the potential to reduce the time between its postcards landing in households and the activation of nearby masts. The purpose of the change is to reduce the risk that viewers will discard the postcards and be unaware of the potential interference to DTT caused by 4G mobile signals in 800 MHz and whom to contact if interference occurs.

Once at800 has assessed the impact to its operation for both major changes and planned possible implementation, including any operational procedural and process adjustments needed, the Board will consider any proposals before making recommendations for change to Ofcom.

The future - 2016 and onwards

Early 2016 marks the halfway point for the 4G/DTT co-existence support programme, which is due to complete by 31 December 2018.

Whilst commercial sensitivities mean that even within at800, the total number of outstanding 4G mast activations is unknown, there are indications that the mobile network operators are on track to meet this target..

Aside from the current proposal to reduce the timing of postcard receipt and mast activation, at800 continues to work to improve: the awareness and comprehension of the support it provides in areas where masts may cause interference; its contact centre triage to ensure that viewers with DTT reception problems are handled as effectively as possible; the provision of engineer visit slots in as timely a way as possible in areas of likely 4G-DTT interference; the accuracy of engineer diagnosis and data capture during household visits.

With these factors in mind and the potential adjustments to improve prediction accuracy, the Oversight Board remains committed to its objective to effectively monitor the 4G TV mitigation scheme.

Further background and information on at800's strategy

The current position (at the end of March 2016)

- Conducted 42,800 visits to UK households by at800-accredited engineers
- On these visits, more than 14,000 cases of 4G disruption identified and resolved
- 1,043,800[1] free filters, designed to block 4G at 800 MHz signals, have been supplied to non-communal households
- 5,000 communal aerial system filters have been supplied to residential blocks containing multiple households
- 18,760,000 postcards have been sent to properties at risk of experiencing Freeview disruption as a result of 4G masts going live in their area
- 350,000 calls have been handled by the at800 contact centre
- Over 35,000 enquiries have been handled online

[1] This number is the total combined number for proactive and reactive filters. Separately the numbers are 977,800 proactive and 66,000 reactive.