**BBC Response to Ofcom Consultation on Freedom4's Licence Variation Application**

**Question 1: Are there any reasonable grounds why Ofcom should not grant Freedom4's request to vary its licence as soon as practicable? If so, please explain your reasoning for this.**

(Paragraph 1.4 of Ofcom consultation document: "Our initial view is that the variation should be made as soon as practicable, subject to the outcome of this consultation")

The BBC welcomes the opportunity to comment on Freedom4's request to vary its licence. As Ofcom is already aware, BBC Monitoring operates from Caversham and already suffers from significant interference problems to the C-band downlinks. Whilst the BBC fully accepts that Freedom4 Fixed Wireless Operator should be allowed to enjoy the rights and privileges of its current licence, it believes that the variation requested will cause further problems and jeopardise BBC Monitoring's ability to fulfill its public service duties, on behalf of its Government clients.
We would therefore urge Ofcom not to grant the requested amendment to Freedom4's licence without further consideration, and in particular of the points made by BBC Monitoring in this response.

Increased power levels

In Annex 5 Impact Assessment, Table A2 details the stakeholder impacts of granting variation. For satellite Earth station users it is noted that *"Coordination process will protect existing use"*.

Section 5, paragraph 5.12 states that: *"An increase in power at the central station or other high power fixed terminal stations will impact other services sharing the spectrum however the co-ordination requirement on these stations will remain unchanged and therefore the current level of protection to sharing services will be maintained."*

However, BBC Monitoring believes that increased power levels will result in an overall increase in noise floor and add further difficulties to the reception of signals and services already at the margins of acceptable performance. The 9dB increase is significant in the opinion of BBC Monitoring, and increases the area of potential interference and overload. In terms of these receive-only operations, the effect of this higher-power in-band signal will be three-fold: causing both co-channel and adjacent interference together with overloading/swamping.

Therefore, we would argue that overall levels of interference will be increased and have a very significant impact on reception of key services. It is noteworthy that such reception is already only achievable utilising large dishes of 10m or more which are highly susceptible to adjacent (in frequency and geography) signals which in effect swamp the desired service. Whilst we would investigate whether some of these the issues could be mitigated through the use of higher power levels, it is likely that such coordination will be very difficult since it will have to cover larger geographic areas

and involve greater numbers of interested parties with potentially diverse and conflicting needs.

Current experience of operating in C band with other terrestrial users on adjacent frequencies exposes all of the issues above and effectively renders C band spectrum and particular dish elevations unusable.

The BBC notes that the upper limit of ECC/DEC/(07)02 is 3.8GHz, that the Freedom4 Fixed Wireless Access Licence is from 3.6 - 4.2 GHz and that Ofcom is considering Freedom4's request for the 2.2GHz not covered by the EC Decision. We accept that the existing licence has been granted and that we must try to find a way to co-ordinate our operations, However, the fact remains that our engagement in the current coordination process has not fully resolved the interference issues (indeed largely cannot do so).

We would therefore argue that the requested licence amendment and increase in power will have a further adverse effect on our operations, which it might not be possible to mitigate.

<u>Removal of the requirement to co-ordinate and maintain records of the location for terminal stations</u>

Section 5, paragraph 5.16 states that*:" In relation to co-ordination with satellite earth stations sharing the band we believe that as long as central stations and other high power terminal stations are coordinated there is no requirement for the co-ordination of terminal stations with a power spectral density not exceeding 25dBm/MHz and a total EIRP not exceeding 30dBm."*

In the executive summary of Freedom4's request for the licence variation, it states that: *"Freedom4 (and Ofcom) have produced studies showing the dominance of central station emissions over low power terminals in terms of potential interference to other users of the band. Under these circumstances, the removal of the requirement to coordinate low power mobile devices does not increase the risk of co-channel interference in the band."*

The BBC would challenge the conclusions drawn from the studies and analysis supplied by Freedom 4. Further to this, as far as we are aware, all the existing studies which have been submitted to the ITU, the CEPT and the EC are based on studies of fixed rather than mobile applications of BWA. We do not consider that these studies can be used to assess the impact of interference for mobile applications for the following reasons.

Unless the mobile portion of the link can be proved to work within a few meters of the satellite receive station, it cannot be possible to ensure interference to the satellite service will not occur. This because the interference potential of the terminal station in relation to the satellite earth station is a product of its distance from that earth station and will change as that distance changes.

The Aegis study (Appendix 7 of Freedom4's request) assesses the impact of user terminals which may be randomly distributed but are still fixed and none of which

appear to be in close proximity to the earth station. Section 4 of the UK document to ITU-R WP 4A (Appendix 6 of Freedom4's request) asserts that *"provided the BWA base stations and terminal stations have been coordinated with registered earth stations, the probability of interference from nomadic BWA devices to the earth station is negligible"*. We dispute the application of these conclusions in Freedom4's request.

For receive-only stations, the levels of interference must be considered with respect to the signal levels of the wanted satellite. If the sites can be successfully coordinated then the base station interference is taken out of the equation. Then, however, the effect of the terminal station's interference becomes dominant.

Signals received from satellites are significantly smaller than the levels proposed for use by mobile terminal operating to Freedom4's fixed base station. Satellite signals at C band are often of the order of -162dBm. This is hundreds of dB lower than the terrestrial signal. The BBC accepts that the satellite antenna has some off-axis discrimination. However, the sensitivity of the receive systems (LNB's and LNA's) is such that any signal in the power range suggested as part of Freedom4's proposed mobile terminal will cause the entire satellite spectrum to be unusable, even if the mobile terminal is operating at frequencies outside of those wanted for the satellite service. This is due to the power from the mobile terminal causing intermodulation products in the amplifier stages of the LNB that will extend across the whole of the received C-band. It may be possible to fit filters in front of the LNB that will give further protection, but no such studies have been carried out.

The BBC believes that the relaxation of the licence to allow mobile services means, in effect, the uncontrolled and uncoordinated use of C band and offers the existing user no means of seeking relief from interfering users. The sporadic and random impact on the usability of C band for low level services has significant potential to render existing equipment and facilities largely useless, with the operators unable to take planned measures to counter the impact.

The BBC would welcome further discussions with Ofcom on the matter, and would strongly argue that, in the light of the risks for BBC Monitoring's operations, further analysis should be made before responding to Freedom 4's request.