

**Auction of Radio Spectrum in the 2.3 GHz Band**  
**for the Provision of Broadband Wireless Access Services**  
**Questions and Answers**

*The Telecommunications Authority (the “Authority”) has received questions in relation to the Information Memorandum published on 11 November 2011. The Authority now under paragraph F.2.1 of the Information Memorandum sets out his responses to the questions.*

*Terms not otherwise defined herein shall have the same meaning ascribed thereto in the Notice issued by the Authority on 11 November 2011 (the “Notice”), or as the case may be, in Annex D “Glossary of Terms” of the Information Memorandum.*

**LICENSING (LG)**

**LG.1 Regarding paragraph C.4.3(a) of the Information Memorandum, the 2280 MHz to 2290 MHz band is presently assigned to a broadcaster for the operation of ENG / OB link(s) in Hong Kong.**

**(i) Can OFTA provide the technical details of ENG / OB link(s) to facilitate an evaluation on the use of Frequency Band A1? The technical details may include:**

- ◆ **Modulation type**
- ◆ **RF output power**
- ◆ **Channel bandwidth**
- ◆ **Emission mask**
- ◆ **Adjacent channel sensitivity**
- ◆ **Receiver sensitivity**
- ◆ **Duplex mode (FDD/ TDD)**
- ◆ **Antenna type**
- ◆ **Antenna height**
- ◆ **Physical location**

**(ii) Can OFTA advise and explain whether any guidelines would be applied on ENG / OB operator(s) to prevent Frequency Band A1 from interference?**

Ans. An ENG link is essentially a temporary fixed link between a transportable transmitter and a roof-top or hilltop receiver. At present, the ENG network operating in the 2280-2290 MHz band covers a roof-top receiving station and a number of hilltop receiving stations. The ENG transmitters may be used at any location. The

current ENG transmitter operating in the 2280-2290 MHz band uses digital modulation and has the following technical characteristics:

- ♦ RF output power : + 27 dBm
- ♦ transmit antenna gain : 19 dBi
- ♦ emission bandwidth : 10 MHz.

To meet its future operational needs, the broadcaster concerned may seek to change the locations of the ENG receiving stations, as well as the ENG transmitter equipment. Where necessary, the Authority may issue guidelines requiring the Licensees and/or the broadcaster concerned to take reasonable measures (e.g. signal filtering) to prevent interference.

**LG.2** **Regarding paragraph C.4.3(c) of the Information Memorandum, as analyzed by leading telecom suppliers, in case of neither synchronization alignment nor guard band allocation adopted between each of the two adjacent bands to be assigned in the auction, the BTS at each band would, due to mutual interference, suffer drastically Rx sensitivity downgrade (up to 20 dB) and consequently cause significantly cell coverage shrinkage (up to 70%) and capacity reduction (up to 90%). Without provision of the Authority's guideline policy for synchronization alignment between Licensees, or allocation of guard band (at least 5 MHz) between each of the two adjacent bands to be assigned in the auction, the available spectrum bandwidth per Frequency Band for practical use would be reduced and varied considerably, which may largely obstruct the potential Licensees to evaluate the value of each Frequency Band. Moreover, it may even cause inefficient use of the spectrum bandwidth in the future and disordered operation market at 2.3 GHz band in Hong Kong.**

**Before the auction, can OFTA provide:**

- (i) **guideline of synchronization alignment, and / or**
- (ii) **guideline of spurious emission to the neighbor bands, and / or**
- (iii) **guard band (at least 5 MHz) allocation accordingly?**

Ans. As stated in paragraph C.4.3(c) of the Information Memorandum, if the Licensees deploy Time Division Duplex (“TDD”) technologies in their service platforms, they may be directed by the Authority to adopt necessary measures (such as synchronizing their networks with one another) to optimize the performance and minimize the mutual

interference of the TDD networks. As the technologies to be selected by the Licensees for deployment are not yet known, it is premature for OFTA to specify any technical details or guidelines on synchronization or set any guard band requirement.

For TDD systems deploying the same TDD technologies in Frequency Bands A1, A2 and A3, synchronization may ameliorate the chance of mutual interference between the networks. If different TDD technologies are deployed or synchronization is not technically feasible, a guard band may be required between adjacent Frequency Bands in order to prevent mutual interference.

The Authority expects the Licensees to resolve among themselves the need for synchronization or guard band and work out the technical solutions to address the potential interference problems. If the Licensees cannot resolve the issues among themselves, OFTA may provide assistance and guidance. Where necessary the Authority may direct the Licensees to adopt measures as he thinks fit in order to prevent harmful interference and to optimise the use of the Frequency Bands.

**LG.3** **Regarding paragraph C.4.4 of the Information Memorandum, as noticed from public industrial resources, the 2300-2400 MHz spectrum has been used by both MNO and Military in the Mainland. This may cause intra-frequency interference, which is very severe and may significantly increase the interference tolerant level. In order to have the Licensee comply with OFTA requirement, i.e. at all time to ensure no harmful interference to users of the spectrum in the Mainland, can OFTA describe the following items:**

- (i) The spectrum development and deployment status in Mainland, especially the coverage along the border between HK & Mainland;**
- (ii) The technical characteristic requirements (e.g. max cross-boundary signal level) shall be imposed on the spectrum holders in both HK and Mainland;**
- (iii) The guideline with clearly instruction of measurements approach and necessary alignment (e.g. synchronization) with Mainland to prevent each operation from mutual interference.**
- (iv) Any restriction / limitation on the deployment of 2.3 GHz**

**band in Hong Kong, e.g. any locations / areas in Hong Kong, especially along the border between Hong Kong & the Mainland, can NOT have this band deployed in Hong Kong.**

Ans. In the Mainland, the 2.3 GHz band is allocated for fixed, mobile and radiolocation services. OFTA has duly notified its Mainland counterpart that the 2.3 GHz band will be deployed for territory-wide BWA services in Hong Kong. While there is currently no specific coordination requirement for the band, both OFTA and its Mainland counterpart have agreed to follow the normal coordination process to facilitate the shared use of the band. OFTA, in collaboration with the Licensees, will coordinate with the relevant Mainland authorities the use of frequencies in the boundary areas between Hong Kong and the Mainland. The Licensees shall be required to comply with the requirements which the Authority may impose as a result of the frequency coordination from time to time.

**Office of the Telecommunications Authority  
23 December 2011**