



a business unit of
Brocade Communications Systems, Inc.

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Office of the Communications Authority
29/F Wu Chung House
213 Queen's Road East
Wanchai, Hong Kong

Attention: Senior Telecommunications Engineer (Spectrum Planning) 1

Re: "Proposed Change in the Allocation of the 3.4 – 3.7 GHz Band from Fixed Satellite Service to Mobile Service".

About Ruckus Wireless

Beginning operations in June 2004, Ruckus Wireless, Inc. is one of the world's fastest growing wireless technology companies. Ruckus offers a broad range of advanced indoor and outdoor "Smart Wi-Fi" systems for service providers and enterprises. The company is credited with developing the first adaptive antenna (Smart Wi-Fi) technology that improves the reliability, performance and capacity of Wi-Fi networks. Ruckus recently announced its line of "OpenG" LTE products, which bring the simplicity and economics of Wi-Fi to the market for in-building cellular services.

According to Dell'Oro's Q3 2015 report, Ruckus is #1 in the Service Provider Wi-Fi market with 38% marketshare and #3 in the Enterprise Wireless LAN market. With approximately 61,000 end customers

and more than 10,000 channel partners worldwide, Ruckus sells its Wi-Fi systems directly to broadband providers and indirectly to enterprise customers through a global network of value-added partners.

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Responses to consultation questions

Question 1:

What are your views on the above Proposed Re-Allocation?

Ruckus believes that the proposed re-allocation is appropriate for outdoor (macro cell) coverage given the competing demands for spectrum to support new 5G services and continued use by the FSS. However, Ruckus also believes that consideration for permissive use indoors should be considered whereby lower power base stations can be utilized to provide in building coverage with a lower interference potential on existing FSS usage.

Ruckus also believes that the 3400-3700 MHz band provides an opportunity to integrate permissive use into the cellular eco-system. This permissive use will be critical in providing the necessary in building coverage that will be required for seamless 5G coverage for subscribers moving from the street into their offices, shopping malls etc, where building penetration losses will hamper the ability of the traditional macro cell deployment models to provide the required bandwidth and coverage for ubiquitous 5G operation. Such permissive use would be at lower power levels than the more usual macro cell usage as it would be intended to provide coverage within a limited area and would be ideal for consideration in the 3600 – 3700 MHz sub-band.

Question 2:

Do you agree with the principle of protecting existing SMATV/EFTNS/SPETS systems operating in the adjacent band of 3.7 – 4.2 GHz with the implementation of the mitigating measures?

Ruckus fully accepts that existing services need to be protected. However, given the ever-increasing demands on spectrum utilization, some consideration should be given to improving receiver performance in order to improve sharing possibilities. This factor has been already recognized in Europe with the introduction of the Radio Equipment Directive, with renewed emphasis on receiver parameters with a view to improving performance over time.

Question 3:

For implementation of the Proposed Re-Allocation, please suggest or give your views about any mitigating measures to be implemented for the existing systems and services as well as any precautions to be taken for the operation of the new mobile base stations to be operating in the 3.4 – 3.6 GHz band.

Ruckus believes that the 100MHz guard band (3600 – 3700 MHz) is potentially very wasteful of spectrum within the overall 3.4-3.8 GHz band. As a consequence, we would encourage the

Communications Authority to look at mandating improved receiver performance for FSS over time with a view of reducing the size of this guard band.

In addition, to the mitigation measures described in the consultation document, Ruckus would also like to encourage the Communications Authority to consider permissive use within the whole 3400 -3700 MHz range for low power, small cell, indoor only use, where building losses act as an additional mitigation measure. This would enable consumer to continue to enjoy the benefits of 5G services when they move from an outdoor environment to their office, shopping mall and hotel environment

Question 4:

What are your views on effecting the Proposed Re-Allocation in the early 2020, giving an advance notice period of two years if the relevant decision of the CA is made in early 2018?

Ruckus believe that this is an appropriate timescale especially considering moves in other regions and will enable Hong Kong citizens and visitors to be able to use these services at the same time as their global counterparts.

Question 5:

What are your views on the need to protect the TT&C channels of the licensed satellite networks at their specific locations from any harmful interference to be caused by public mobile services?

Ruckus agrees with the need to protect the TT&C channels.

Question 6:

Do you have any views on other aspects of or issues relevant to this consultation?

Ruckus recommends that the Communications Authority consider the need for vertical industry access to spectrum within the 3400-3700 MHz range to realize the goals of 5G. Such access is recognized within the CBRS framework in the United States and has been one aspect of recent inquiries from NRA's around the globe.

Conclusion

Thank you for the opportunity to provide Ruckus' input to the Office of the Communications Authority of Hong Kong on these matters. If you have any questions, or require additional information, please let me know.

Sincerely,

Ian Marshall