

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of:)	
)	
International Bureau Seeks Comment on)	IB Docket No. 16-185
Recommendations Approved by World)	
Radiocommunication Conference)	
Advisory Committee)	

COMMENTS OF INTEL CORPORATION

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Intel Corporation respectfully submits these comments in response to the Public Notice seeking comment on the Recommendations approved by the World Radiocommunication Conference Advisory Committee (“WAC”).¹ Intel is a leader in designing and building the essential technologies that serve as the foundation for the world’s computing and communications devices.

I. INTRODUCTION AND SUMMARY.

U.S. leadership in spectrum policy and the adoption of new technologies has long been based upon the ability to move quickly and decisively using flexible approaches. As the FCC considers proposals for the upcoming WRC-19, it will be crucial to retain the ability to act under a flexible approach. Consistent with this principle, Intel recommends that the U.S. adopt an approach that maximizes the ability to retain flexibility in the future. In particular, Intel recommends a consistent “radio tuning range” approach across various agenda items. Intel also recommends supporting proposals for additional access to spectrum for IMT under agenda item 1.13 and RLANs under agenda item 1.16. Finally, Intel recommends an approach that will facilitate the deployment of other technologies such as ESIM and HAPS under agenda items 1.5 and 1.14 respectively while providing adequate protection for mobile broadband systems.

II. THE U.S. SHOULD CONTINUE TO SEEK FLEXIBILITY IN THE RADIO REGULATIONS

A. Flexibility in the Radio Regulations is crucial to retaining FCC ability to move quickly domestically.

¹ *International Bureau Seeks Comment on Recommendations Approved by World Radiocommunication Conference Advisory Committee*, Public Notice, IB Docket No. 16-185, DA 18-1017 (rel. Oct. 3, 2018) (“Public Notice”).

The FCC (“the Commission”) has consistently been a world leader in spectrum policy. For decades, U.S. businesses and consumers have reaped the benefits of FCC decisions which facilitated early adoption and widespread deployments of new or enhanced technologies such as mobile broadband systems. Without flexibility in the Radio Regulations, the U.S. could be subject to lengthy delays or perhaps even denied the ability to implement decisions. For example, typically it takes 6 or more years to develop a proposal for a new agenda item, have the “study” of the agenda item approved by a WRC, followed by four years of study and another WRC decision. Given the decision making process at WRC, U.S. proposals could be rejected or in some cases denied even the ability to perform international studies/ consideration of proposals. The U.S. should continue to strive to maximize flexibility within the Radio Regulations in order to retain the ability to bring these benefits to our society in an expeditious manner.

B. Adopting tuning range approach at WRC-19 is an important mechanism to retain flexibility in the Radio Regulations.

International spectrum harmonization is a key component to enable introduction of mobile broadband services such as IMT. Spectrum harmonization facilitates global roaming, economies of scale and commonality of equipment, which is imperative given that mobile devices can be designed to operate only in a limited number of frequency bands. Harmonization is not limited to situations in which all regions have identical spectrum allocations. Consumers and businesses can also benefit from use of spectrum within harmonized “tuning range” solutions covering adjacent or nearly-adjacent bands in which equipment can be reconfigured to operate over multiple bands (i.e., they are within the same tuning range).

Yet harmonization of exact frequency bands for mobile broadband has become increasingly difficult over time as governments are unable to make spectrum available in the exact same frequency bands due to different existing uses and priorities. Fortunately, the

benefits of harmonization can still be achieved today through a “radio tuning range” approach: devices are capable of operating within the radio tuning range but only operate on the specific frequencies authorized in an individual country. A “radio tuning range” approach provides the benefits of harmonization while allowing regulators the flexibility to assign spectrum within this range for domestic use as appropriate.

C. The U.S. position on radio tuning ranges should be consistent across WRC-19 agenda items.

The benefits of a radio tuning range approach are not limited to mobile broadband technologies. In recognition of these benefits, Intel supports adopting a consistent position on radio tuning ranges to facilitate the deployment of various technologies including IMT under WRC-19 agenda item 1.13 and ESIMs under WRC-19 agenda item 1.5. If a radio tuning range is adopted for IMT (e.g. a global identification for 37-43.5 GHz), then similarly the same approach should be adopted for ESIMs (e.g. across 27.5-29.5 GHz). If the U.S. decides to only support IMT in the portion of the radio tuning range permitted domestically (e.g. 37-40 GHz) under agenda item 1.13, then the U.S. should similarly only support ESIMs in the 28.35-28.6 GHz and 29.25-29.5 GHz bands under agenda item 1.5.

III. WRC-19 AGENDA ITEM 1.13

The U.S. should, as a matter of urgency, begin submitting proposals on agenda item 1.13. Domestically, the U.S. has long recognized the importance of leadership on enabling 5G. However, to date there has been no corresponding activity internationally: the US has not submitted a single proposal on agenda item 1.13 yet. As a variety of countries and regions move forward to develop a framework for 5G internationally, the U.S. has remained on the sidelines: others are proposing 5G harmonized bands and regulatory procedures associated with the use of 5G systems. For example, Brazil has led the development of a draft Inter-Americas proposal for

37-43.5 GHz while the U.S. has continued internal deliberations. Yet we have now reached a critical stage in the development of proposals for the Americas region: if the US wishes to contribute to the development of regional positions, it must act decisively to enable a radio tuning range for IMT in 37-43.5 GHz. Furthermore, the U.S. is currently the only country in the world to open the 47.2-48.2 GHz band for UMFUS: if the U.S. wishes to facilitate economies of scale for this band, it must provide a proposal for the 47.2-50.2 GHz tuning range to the upcoming PCC II meeting in Brazil in December 2018. It should be noted that ITU-R studies show that sharing between FSS and IMT is feasible with a large interference margin in the 47.2-50.2 GHz range. Similarly the U.S. should propose “no change” under agenda item 1.13 for 66-71 GHz.

Therefore, Intel supports the proposal for identification of the 37-43.5 GHz for IMT (view A) and 47.2-50.2 GHz for IMT (view B) under agenda item 1.13 for submission to the upcoming CITEL PCC II meeting in December 2018.

IV. WRC-19 AGENDA ITEM 1.16

A. The U.S. should provide a proposal to expand operation in 5150-5250 MHz under agenda item 1.16.

In 2003, a decision by WRC-03 to allocate the bands 5150-5350 MHz and 5470-5725 MHz on a primary basis to the mobile service for the implementation of wireless access systems (WAS), including radio local area networks (RLANs) spurred the growth of Wi-Fi networks worldwide. This action marks the only WRC decision to make spectrum available for RLANs even though RLANs have consistently provided an important form of access for mobile broadband systems. However, as part of WRC-19 preparations the decision was made to not make additional spectrum available in 5350-5470 MHz. During the WRC-15 cycle, industry expended significant resources to obtain access to additional spectrum: yet no additional spectrum

was made available. As part of the WRC-19 cycle, the only additional spectrum under consideration for anything other than “no change” is to expand existing indoor operations to allow outdoor use in 5150-5250 MHz. In other words, despite playing a crucial role in the delivery of ever-increasing internet traffic, there have been no regulatory actions at WRC to make additional spectrum available for RLANs since 2003. In order to help meet the demand for traffic over RLAN networks, the U.S. should propose outdoor operations consistent with U.S. rules for 5150-5250 MHz under agenda item 1.16.

Therefore Intel supports View A under WRC-19 agenda item 1.16 for submission to the upcoming CITEL PCC II meeting.

V. PROTECTION OF FIXED AND MOBILE SYSTEMS UNDER WRC-19 AGENDA ITEMS 1.5 AND 1.14

A. Any regulatory action under WRC-19 agenda items 1.5 and 1.14 must ensure protection of fixed and mobile services.

As the U.S. develops proposals for the WRC-19 on ESIM and HAPS under agenda items 1.5 and 1.14 respectively, it is important to ensure that the fixed and mobile services are protected if regulatory actions to facilitate ESIMs and HAPS under agenda items 1.5 and 1.14 are undertaken. The Power Flux Density (pfd) mask for the protection of mobile and fixed services should be based upon the formula and technical characteristics as provided by the ITU-R expert groups.

With respect to agenda item 1.5, the pfd mask provided in View A is based upon a mask developed in Europe for the protection of fixed services rather than the mobile service characteristics provided by ITU-R Working Party 5A: this pfd mask does not include various pointing angles for one system and does not take the other mobile system characteristics into account at all. It is crucial to ensure the protection of both systems rather than creating a precedent in the ITU where a service disregard protection of specific systems of other services:

adopting the pfd mask in View A would set a precedence of refusing to offer protection for some systems. In addition, View A incorporates the idea of attenuation loss from aircraft fuselage into the pfd mask: but there is no guidance on how or which values would be utilized. The appropriate mask to utilize would be the pfd mask provided in View B.

With respect to agenda item 1.14, the pfd mask provided in View B for the protection of mobile systems should be utilized if any regulatory action is taken to facilitate HAPS in any specific band(s). Furthermore, the pfd mask levels should not include any factors such as rain fade or percentage of deployments in which the pfd mask could be exceeded.

B. The U.S. should not set a new precedence of incorporating compliance masks into the Radio Regulations.

With respect to both agenda items 1.5 and 1.14, compliance with the pfd values for the protection of mobile and fixed services should continue to be done at the national level rather than setting a new precedence of incorporating compliance masks into the Radio Regulations. In addition, specific details and values for various losses to be in compliance should be utilized at the national level to determine compliance rather than incorporated into the Radio Regulations.

C. Procedures for authorization and operation of ESIM must address concerns arising from the ability of ESIM to cross international borders.

As noted in section 2 above, Intel supports the concept of a radio tuning range to realize the benefits of economies of scale and roaming. This would facilitate service for various technologies across different countries and/or regions. Care must be taken with respect to the authorization and operation of ESIM, which are capable of travelling across international borders, to provide protection from interference to any stations in the terrestrial services or any assignments to stations of terrestrial services. For example, an aeronautical ESIM authorized in Europe may land at an airport in the United States. In Europe, uncoordinated FSS earth stations

are limited to operation in 27.5-27.8285 GHz, 28.4445-28.9485 GHz and 29.4525-29.5² while in the U.S. ESIM may operate in 28.35-28.6 GHz and 29.25-29.5 GHz. The Commission should ensure that the procedures regarding the authorization and operation of ESIM would prevent the situation whereby an aeronautical ESIM authorized to operate in 27.5-27.8285 GHz in Europe lands at an airport in the U.S. and interferes with UMFUS services operating within 27.5-28.35 GHz. Land ESIM, in which vehicles or trains may cross international borders, may prove to be especially challenging. The Commission should ensure that any proposals for WRC-19 agenda item 1.5 address these concerns regarding the authorization and operation of ESIM.

Therefore, Intel supports View B under agenda items 1.5 and 1.14 respectively.

VI. CONCLUSIONS

The U.S. has long been a world leader in spectrum policy due in large part to the flexibility to act quickly and decisively on policy decisions which provide broad benefits to our society. Therefore, the U.S. should support a tuning range approach for IMT under agenda item 1.13 and other technologies. In addition, the U.S. should ensure adequate protection for mobile broadband systems as part of any proposed regulatory actions under agenda items 1.5 and 1.14. Finally, the U.S. should also support expanded outdoor operations under agenda item 1.16.

² See ECC Decision (05) 01.