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| Proposal: | | |
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DRAFT CEPT BRIEF ON AGENDA ITEM 1.16

1.16 to consider issues related to wireless access systems, including radio local area networks (WAS/RLAN), in the frequency bands between 5 150 MHz and 5 925 MHz, and take the appropriate regulatory actions, including additional spectrum allocations to the mobile service, in accordance with Resolution 239 (WRC-15);

# ISSUE

## Resolution 239 (WRC-15)

This agenda item will consider the results of studies concerning Wireless Access Systems including radio local area networks (WAS/RLAN) in the frequency bands between 5 150 MHz and 5 925 MHz and take appropriate actions. This will encompass the following elements, set out in full in Resolution 239 (WRC-15):

* WAS/RLAN technical characteristics and operational requirements in the 5 GHz frequency range;
* Sharing and compatibility studies between WAS/RLANs and existing primary services, in particular to look at suitable RLAN mitigation techniques to enable RLAN use in the following frequency bands: 5 350-5 470 MHz, 5 725-5 850 MHz and 5 850-5 925 MHz;
* Sharing and compatibility studies between WAS/RLAN applications and incumbent services in the frequency band 5 150-5 350 MHz with the possibility of enabling outdoor WAS/RLAN operations including possible associated conditions and additional mitigation techniques;

The agenda item also encompasses further sharing and compatibility studies between WAS/RLAN applications and incumbent services addressing:

* whether any additional mitigation techniques in the frequency band 5 350-5 470 MHz beyond those analysed in the studies referred to in recognizing a) Resolution 239 (WRC-15) would provide coexistence between WAS/RLAN systems and EESS (active) and SRS (active) systems;
* whether any mitigation techniques in the frequency band 5 350-5 470 MHz would provide compatibility between WAS/RLAN systems and radio determination systems;
* whether the results of studies under points i) and ii) would enable an allocation of the frequency band 5 350-5 470 MHz to the mobile service with a view to accommodating WAS/RLAN use;

In addition, detailed sharing and compatibility studies, including mitigation techniques, between WAS/RLAN and incumbent services in the frequency band 5 725-5 850 MHz with a view to enabling a mobile service allocation to accommodate WAS/RLAN use are to be performed.

Finally, this agenda item calls to conduct detailed sharing and compatibility studies, including mitigation techniques, between WAS/RLAN and incumbent services in the frequency band 5 850-5 925 MHz with a view to accommodating WAS/RLAN use under the existing primary mobile service allocation while not imposing any additional constraints on the existing services.

# Preliminary CEPT position

In the 5 150-5 250 MHz band, CEPT notes that an outdoor relaxation to WAS/RLAN would affect the operation of the MSS feeder links, aeronautical radionavigation and aeronautical telemetry (see No. 5.446C). However, CEPT is still studying usage restrictions (e.g. in vehicle use) combined with appropriate mitigation techniques to achieve co-existence with incumbent services to enable outdoor WAS/RLAN use in this band.

In the 5 250-5 350 MHz band, CEPT notes that the current studies have shown difficulties in achieving co-existence with incumbent services and therefore supports no change to the RR in this band.

In the 5 350-5 470 MHz band, CEPT supports no change to the RR in this band.

In the 5 725-5 850 MHz band, CEPT would support a new mobile allocation to accommodate WAS/RLANs use if sharing and compatibility studies can demonstrate the effectiveness of any new proposed interference mitigation techniques to ensure the protection of radars, fixed service (see No. 5.455) and FSS space station receivers. It is to be noted that CEPT will take into account compatibility studies between RLAN and specific applications within CEPT (e.g. road tolling systems). At this time, no effective mitigation techniques has been proposed to enable co-existence with certain modes of frequency hopping radars operated in this band in some CEPT countries.

In the 5 850-5 925 MHz band, CEPT notes that the current studies have shown difficulties in achieving co-existence with other incumbent services without imposing any additional constraints on existing services such as FSS (space station receivers) and existing applications under the mobile service such as ITS (including urban rail). Therefore, CEPT supports no change to the RR in this band.

# Background

The 5 GHz frequency range is attractive for WAS/RLAN implementation. However, the considerable part of the frequency bands studied under this agenda item is allocated to several incumbent services (including radio determination services, FSS and EESS (active)) on a primary basis. Hence, studies have been performed to address the relevant sharing and compatibility issues identified under this Agenda Item.

Some the bands in this the Agenda item were already studied during the last study period under WRC-15 Agenda item 1.1 and some of the bands already have a mobile allocation for RLAN use under Resolution 229 (5 150-5 350 MHz).

## 5 150- 5 250 MHz

The agenda item is to look at possible outdoor WAS/RLAN use under the existing primary mobile allocation in this band in which currently, in Europe and elsewhere in the world, there are indoor only restrictions. In the US and Canada usage with higher power and outdoor usage (with directional antennas) is allowed in this band. Previous ITU studies carried out for WRC-03 assumed that there was up to 1% of outdoor accidental WAS/RLAN use up to 200 mW so other primary services should have taken account of this usage in any new studies post WRC-03. Other incumbent primary services in the band 5 150-5 250 MHz are MSS feeder links (Earth-space) operating in the FSS and aeronautical radionavigation. In some countries the band is also allocated to the aeronautical mobile service, limited to aeronautical telemetry (see No 5.446C).

Results of one compatibility study using an MCL analysis showed that the usage of outdoor WAS/RLAN systems in the frequency band 5 150-5 250 MHz has a more adverse impact on the operation of air-borne search and avoid systems than the usage of indoor WAS/RLAN systems. It should be noted that the characteristics for the air-borne search and avoid systems used in this analysis are taken from ITU-R Recommendation M.2007 which was first published in 2012 after WAS/RLAN systems first operated under the primary mobile allocation in the band. These and other studies carried out internationally have shown that to allow any introduction of outdoor WAS/RLAN systems additional steps would have to implement usage restrictions in addition to mitigation techniques that will limit the impact to MSS feeder links and air-borne search and avoid systems.

Some CEPT countries are considering the possibility of allowing controlled outdoor usage in this band using an e.i.r.p. mask to be managed in a similar way to the Canadian model presented to ITU-R WP 5A for RLAN use in this band.

One sharing study considering RLAN outdoor access restricted to in-vehicle only usage associated with low e.i.r.p. up to 40 mW, showed that on average the extra attenuation due the vehicle structure allows ensuring the same protection level for the incumbent services as the one ensured by the WAS/RLAN indoor usage.

## 5 250-5 350 MHz

The agenda item is to look at possible outdoor WAS/RLAN use under the existing primary mobile allocation in this band in which currently in Europe and elsewhere in the world there are indoor only restrictions. In the US, Canada and in some other countries outdoor usage (with directional antennas) is allowed in this band. Other incumbent primary services in the band 5 250-5 350 MHz are EESS (active) and radiolocation.

A number of altimeter and scatterometer sensors are currently operated, and planned to operate in the future, under the EESS allocation in the band 5 250-5 350 MHz. This band represents a key spectrum resource for Europe’s policy on Earth exploration through the GMES/Copernicus programme with Sentinel and EUMETSAT satellites. Recent compatibility studies between EESS (active) and RLAN systems in the 5 250-5 350 MHz frequency range using similar RLAN parameters as agreed pre-WRC-15 within JTG 4-5-6-7 (see Annex 27 to Document 5A/298-E, Nov 2016) and based on some of the predicted future RLAN deployment levels give negative results with the current CEPT indoor-only WAS/RLAN regulations. Further studies are needed with altimeters (operating across 5 250 – 5 570 MHz range)

Results of one compatibility study show that providing usage of outdoor WAS/RLAN systems in the frequency band 5 250-5 350 MHz would require development of effective measures for reducing interference to operation of air-borne and ground-based radars. The effect of DFS (Dynamic Frequency Selection) as a mitigation technique has not been taken into account in this study. Previous ITU studies carried out when the original mobile allocation was made showed that DFS would ensure acceptable protection to radar from RLANs operating indoor and outdoor in the 5 250 – 5 350 MHz band.

## 5 350-5 470 MHz

The agenda item is to look at a possible new mobile allocation to accommodate WAS/RLAN in this band. Studies carried out previously under WRC-15 Agenda item 1.1 indicated that sharing would only be feasible if additional mitigation techniques could be applied. The incumbent primary services in the band are EESS (active, all types of sensors) and radiodetermination (including aeronautical).

SAR (Synthetic Aperture Radars), altimeter and scatterometer sensors are currently operated, and planned to operate in the future, under the EESS allocation in the band 5 350-5 470 MHz. The band represents a key spectrum source for Europe’s policy on Earth exploration through the GMES/Copernicus programme with Sentinel and EUMETSAT satellites. Sharing studies performed prior WRC-15 which take into account current available mitigation measures, showed that there is significantly enough negative margin to conclude that sharing between RLAN and the EESS (active) SARs systems in the 5 350-5 470 MHz frequency band would not be feasible. Additional sharing studies provided similar conclusions for both altimeters and scatterometers. Finally, further studies showed that there are currently no feasible mitigation techniques to facilitate sharing between RLAN and EESS (active) in this band.

With respect of radiodetermination service, allocated in the 5 250-5 850 MHz frequency band, it has to be noted that some radars (such as advanced and fast frequency hopping plus bistatic) operate throughout the whole frequency range. Studies have shown the regulatory provisions in the 5 150-5 350 MHz and 5 470‑5 725 MHz frequency ranges contained in Resolution 229 (Rev.WRC-12) would be insufficient to ensure protection of these defence radar types. Additionally, after further study of possible additional mitigation measures, results showed that there are no feasible mitigation techniques to facilitate sharing between RLAN and the different radar systems in the 5 350-5 470 MHz frequency band. Therefore, any potential new mobile allocation in 5 350-5 470 MHz band would leave no spectrum in the operating range of these types of radar without the potential of interference from mobile operations.

Overall, in the 5 350-5 470 MHz band, the situation is that no solution has been identified to adequately ensure the protection of EESS (active) systems and radars that operate in this band.

Therefore, CEPT opposes any new allocation to the mobile service with a view to accommodating WAS/RLAN use in the 5 350-5 470 MHz band.

## 5 725-5 850 MHz

The agenda item is to look at possible new mobile allocation (limited to WAS/including RLAN) in the band. The incumbent primary services in the bands are FSS (E-S) and Radiolocation. In addition, throughout CEPT countries there are regulations that authorise the use of several type of applications at various power levels such as Short Range Devices (SRD), Road Tolling, WIA (Wireless Industrial Applications) and BFWA (Broadband Fixed Wireless Access). There are also plans to introduce smart tachograph and weights and dimensions technologies in this band in some CEPT countries.

Regarding sharing with FSS, studies have shown that, if WAS/RLAN Access Points were limited to indoor usage with a maximum e.i.r.p. level of 200 mW as well as implementing suitable mitigation techniques such as TPC to make sharing possible with the Fixed Satellite Service (E-s) operating in Region 1 only, noting also the limited deployment of FSS in this band.

With respect to radiodetermination service in the 5725 - 5850 MHz:

* It should be noted that they are allocated in the whole 5 250-5 850 MHz frequency range and some defence radars (such as advanced and frequency hopping) operate throughout the whole frequency range;
* One compatibility study looking at an MCL analysis showed that in the frequency band 5 725-5 850 MHz additional measures for reducing interference need to be developed to ensure compatibility of RLAN with the radiodetermination radars operating in the indicated frequency bands. The effect of DFS as a mitigation technique has not been considered in this study;
* In the case of advanced and frequency hopping radars, frequency agility and adaptive hopping technologies have been specifically developed as a mitigation technique against intentional jamming and to avoid detection. However, their effectiveness relies on suitable amount of available frequencies for the radar to use across their operating range;
* The existing DFS techniques at 5 GHz have not been designed to protect all of the operating modes of frequency hopping radars in the 5 725-5 850 MHz band. At this stage, current DFS requirements contained in both EN 301 893 and EN 302 502 as well as the parameters contained in ITU-R Recommendation M.1652 for DFS are not sufficient to protect all FH radar operating modes, although other modes used by these frequency hopping radars are covered by implementations of DFS in current ETSI standards;
* It should also be noted that no new elements have been presented in ITU-R WP 5A, CPG PTD or standardisation organisations (e.g. ETSI) on any additional mitigation techniques that could be envisaged to provide co-existence with all the frequency hopping radars operating modes used across the 5 250 – 5 850 MHz;
* It should be noted that some CEPT countries are of the view that the anticipated BFWA density of deployment compared to that expected for RLANs and this means that interference to radars from BFWA, including those operating in all FH radar operating modes, can be managed, which is different from RLAN deployment scenario in their view;
* In the view of some CEPT countries operating these radars, there is already a difficult electromagnetic environment in 5 725-5 850 MHz band, due its designation as an ISM band and the existing applications they already have to share with e.g. BFWA, SRD 25 mW, Road tolling and WIA (Wireless Industrial Applications);
* In some CEPT countries, the operating range of frequency hopping radar is 5 400-5 850 MHz. Thus, these radars currently need to use a combination of frequencies in the 5 400-5 470 MHz and the 5 725‑5‑850 MHz band. In some other CEPT countries having the 5 350 – 5 470 MHz available for use without sharing with mobile services, as a fall back option when the 5 725 – 5 850 MHz band has other users in the vicinity of radar operations, as well as some frequency hopping modes being covered by DFS, enables feasible deployment strategies for these types of radars;
* In addition, in the view of some CEPT countries, the whole sharing and compatibility environment between RLANs and other services and applications currently using the band within CEPT should be considered in the results of the sharing studies and that there should be no more restrictions placed on RLAN use than those currently placed on other similar services and/or applications using the band;
* Some countries are of the view that conclusions on sharing should also take into account the fact that the 5 725-5 850 MHz frequency band is designated for Industrial, Scientific, and Medical (ISM) applications under RR No. 5.150 and Radiocommunication services operating within these bands must accept harmful interference which may be caused by these applications;
* Sharing studies have shown that when looking at the single interference case, applications already operating in CEPT countries today under current or proposed ECC/EC Deliverables (e.g. TTT, BFWA, WIA etc.) could cause up to 17 dB more interference to Frequency Hopping type radars operating in the band than RLANs with a max e.i.r.p. of 200 mW, the effect of aggregate interference was not studied;
* Some other countries are of the view that a list of registered outdoor access points of WAS/RLANs based on e.g. light touch licensing could be an additional information tool for management of military radars deployment.

Regarding sharing with road tolling:-

* MCL analysis showed that mitigation techniques would be needed to ensure compatibility between RLANs and RTTT;
* Studies have shown that the interference range of a single 200 mW RLAN operating indoor would be half of the interference range of a single non-specific SRD already operating in this band.
* One proposed mitigation technique is outlined in ETSI TR 103 319; this indicates that a similar mitigation technique recommended for ITS vs Road Tolling sharing may also be sufficient to provide additional protection for Road Tolling services from WAS/RLAN use in CEPT countries with heavy road tolling usage. The mitigation uses a combination of device geo-location with pre-set exclusion zones to protect fixed road tolling stations. Further work would be necessary to assess the efficiency and parameters needed to implement this mitigation technique;
* LBT mitigation technique would be required at detection levels of -105 dBm, when considering the theoretical minimum sensitivity level. If road tolling is working with a certain margin above its sensitivity, then the detection threshold could be increased accordingly (see ECC Report 244).
* Other CEPT studies have also shown that the current LBT mechanism used in RLANs can cause an exclusion zone around road tolling equipment where RLANs may not be able to operate. The size of this exclusion zone will be dependent upon several factors with respect to the Road tolling and RLAN set-up. Further work is required to evaluate the both effectiveness of the CSMA/CA protocol and the different deployment scenarios of Road Tolling equipment to analyse sharing between RLANs with mobile road tolling and possible future E-tachograph/weights and dimensions use.

Up to date, some CEPT countries have made regulations nationally allowing RLAN services with up to 200 mw/4 W e.i.r.p. in combination with usage restrictions and other appropriate mitigation techniques such as DFS.

Conclusions on the results of sharing and compatibility studies carried out so far have not been agreed and apart from sharing with Road tolling there are no further studies on-going. As a result, there are currently different views in CEPT with some countries who favour the No Change option to the Radio Regulations and some countries who would support an allocation to the mobile service to facilitate RLAN use being recognised in Article 5 of the Radio Regulations in the 5 725-5 850 MHz band.

## 5 850-5 925 MHz

The agenda item is to look at possible outdoor WAS/RLAN use under the existing primary mobile allocation in the band. Other primary services in the band 5 850-5 925 MHz are fixed services and FSS (E-s).

Studies carried out by CEPT previously under EC mandate presented an agreed methodology and a large number of calculations. These provided some relevant results, showing the requirement for suitable mitigation techniques (such as usage restrictions or lower max e.i.r.p.) to solve the incompatible operations of FSS and RLAN for most of the cases studied.

There is an EC spectrum Decision for non-exclusive ITS use under the existing primary mobile allocation in this band and CEPT studies also looked at sharing between ITS and RLAN. The current outcome of the TR 103 319 shows that none of the presented mitigation techniques is individually sufficient to protect ITS from WAS/RLAN and needs further investigation. In addition, CEPT is considering the principle of equal access to shared spectrum for Urban Rail systems in a portion of this band, in relation to ITS. The 5 725-  
5 875 MHz band is also designated as an ISM band in the Radio Regulations so services using this band would be expected to be robust enough to operate in a challenging environment.

There are co-primary allocations to FSS (E-s), Fixed and Mobile in this band. When assessing mitigation techniques, care should be taken on typical deployment scenarios of RLAN operations, particularly noting cases of licence-exempt conditions and the requirements to ensure enforcement of any potential deployment restrictions.

# List of relevant documents

ITU-Documentation (Recommendations, Reports, other)

* Recommendation ITU-R M.1652-1, Dynamic frequency selection in wireless access systems including radio local area networks for the purpose of protecting the radiodetermination service in the 5 GHz band
* Report ITU-R M.2115-1, Testing procedures for implementation of dynamic frequency selection
* Recommendation ITU-R М.1461-1 Procedures for determining the potential for interference between radars operating in the radiodetermination service and systems in other services.
* Recommendation ITU-R М.1632 Sharing in the band 5 250-5 350 MHz between the Earth exploration-satellite service (active) and wireless access systems (including radio local area networks) in the mobile service
* Recommendation ITU-R М.1638-1 Characteristics of and protection criteria for sharing studies for radiolocation (except ground based meteorological radars) and aeronautical radionavigation radars operating in the frequency bands between 5 250 and 5 850 MHz
* Recommendation ITU-R М.1849-1 Technical and operational aspects of ground-based meteorological radars
* Recommendation ITU-R М.1450-5 Characteristics of broadband radio local area networks
* Recommendation ITU-R M.1739 Protection criteria for wireless access systems, including radio local area networks, operating in the mobile service in accordance with Resolution 229 (WRC-03) in the bands 5 150-5 250 MHz, 5 250-5 350 MHz and 5 470-5 725 MHz
* Chairman’s Report WP 5A in Document 5A/844:

Annex 10: Draft CPM text for WRC-19 agenda item 1.16

Annex 24: Preliminary draft new Report ITU-R M.[RLAN SHARING 5 150-5 250 MHz] - Sharing and compatibility studies of WAS/RLAN in the 5 150-5 250 MHz frequency range

Annex 25: Working document towards a preliminary draft new Report ITU-R M.[RLAN SHARING 5 350-5 470 MHz] - Sharing and compatibility studies of WAS/RLAN in the 5 350-5 470 MHz frequency range

Annex 26: Working document towards a preliminary draft new Report ITU-R M.[RLAN SHARING 5 725-5 850 MHz] - Sharing and compatibility studies of WAS/RLAN in the 5 725-5 850 MHz frequency range

1. These references will have to be updated after each of the WP5A meetings.

CEPT and/or ECC Documentation (Decisions, Recommendations, Reports)

* CEPT Report 57 Report A from CEPT to the European Commission in response to the Mandate. To study and identify harmonised compatibility and sharing conditions for Wireless Access Systems including Radio Local Area Networks in the bands 5350-5470 MHz and 5725-5925 MHz ('WAS/RLAN extension bands') for the provision of wireless broadband services
* CEPT Report 64 To study and identify harmonised compatibility and sharing conditions for Wireless Access Systems including Radio Local Area Networks in the bands 5350-5470 MHz and 5725-5925 MHz ('WAS/RLAN extension bands') for the provision of wireless broadband services
* ECC Report 244 Compatibility studies related to RLANs in 5725-5925 MHz
* ECC Report 192 The Current Status of DFS (Dynamic Frequency Selection) in the 5 GHz frequency range
* ECC Report 68 Compatibility studies in the band 5725-5875 MHz between Fixed Wireless Access (FWA) systems and other systems
* ECC Decision of 12 November 2004 (ECC/DEC/(04)08) on “The harmonised use of the 5 GHz frequency bands for the implementation of Wireless Access Systems including Radio Local Area Networks (WAS/RLANs)”
* ECC Report 277 Use of SRD applications in cars in the band 5725-5875 MHz
* ECC Recommendation (06)04 Use of the band 5725-5875 MHz for Broadband Fixed Wireless Access (BFWA)

EU Documentation (Directives, Decisions, Recommendations, other), if applicable

* EC Decision 2005/513/EC of 11 July 2005 on “on the harmonised use of radio spectrum in the 5 GHz frequency band for the implementation of wireless access systems including radio local area networks (WAS/RLANs)”
* EC Decision 2007/90/EC of 12 February 2007 amending Decision 2005/513/EC “on the harmonised use of radio spectrum in the 5 GHz frequency band for the implementation of Wireless Access Systems including Radio Local Area Networks (WAS/RLANs)”

ETSI Documentation

* ETSI EN 301 893 (V1.8.1), Broadband Radio Access Networks (BRAN); 5 GHz high performance RLAN; Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

1. Add newer version of EN 301893(v2.1.1), EN 302 502 and TR 103 319

# Actions to be taken

To propose mitigation techniques to ensure potential compatibility of RLAN with the incumbent services and applications currently identified in ECC Report 244;

To review and investigate the applicability of any of these mitigation techniques;

In case the study results show that compatibility of RLAN with the incumbent services is feasible to develop technical and regulatory provisions ensuring RLAN implementation in the relevant portions of the 5 GHz range;

CEPT studies between RLAN and ITS to be performed to ensure sharing and compatibility can be achieved between RLANs and ITS co-channel at 5 855-5 925 MHz and adjacent channel above 5 855 MHz.

# Relevant information from outside CEPT (examples of these are below)

## European Union (date of proposal)

## Regional telecommunication organisations

APT (March 2018)

Preliminary views

APT members support studies being conducted in ITU-R in accordance with Resolution 239 (WRC-15).

APT members are of the view that the protection of incumbent services including their current and planned use in the frequency bands 5 150-5 350 MHz, 5 350-5 470 MHz, 5 725-5 850 MHz and 5 850-5 925 MHz should be ensured, without any unacceptable constraints on these services.

In the frequency band 5 350-5 470 MHz, APT Members support NOC to the Radio Regulations for the use of WAS/RLAN to protect incumbent services.

Other views

In the frequency band 5 150-5 250 MHz, some APT Members have a preference for Method A, no change, unless sharing and compatibility studies conclude that regulatory action to modify Resolution 229 (Rev.WRC-12) in the frequency band continues to ensure protection of incumbent services in accordance with invites ITU-R b) of Resolution 239 (WRC-15), while some other APT Members support sharing and compatibility studies being conducted in ITU-R with a view to enabling outdoor WAS/RLANs operations in this frequency band and to modify the Radio Regulations in this frequency band with associated conditions to protect the existing services.

In the frequency band 5 250-5 350 MHz, some APT Members support NOC to the Radio Regulations.

In the frequency band 5 725-5 850 MHz, some APT Members support NOC to the Radio Regulations, while some other APT Members support the worldwide use of the band for mobile service taking into account RR No.5.453.

In the frequency band 5 850-5 925 MHz, some APT Members support NOC to the Radio Regulations.

ATU (September 2017)

The APM19-2 agreed to:

* Take a preliminary view of No Change for all the bands (i.e. 5 150 - 5 350; 5 350 - 5 470; 5 725 – 5 850; 5 850 - 5 925 MHz) under this AI based on the previous study results which showed that co-existence is not feasible implying that the incumbent services would not be affected.
* Encourage administrations to contribute and actively participate in studies with a view to ensure protection of existing in-band and adjacent band primary services.
* Note that Côte d’Ivoire had proposed to consider footnote 5.453 of the RR which allocate the bands 5 725 – 5 850 MHz and 5 850 – 5 925 MHz to Fixed and Mobile Services at a primary basis for more than 47 countries worldwide and 18 African countries; so that it is premature to take a NOC as a preliminary view on all these bands

Arab Group (April 2018)

* Follow-up studies of this agenda item for wireless access systems including radio local area networks (WAS / RLAN).
* Do not support the identification of new bands for (WAS / RLAN), unless the studies show possibility of coexistence.
* Ensure protection of the existing services without adding any new restrictions on them.

CITEL (January 2018)

Preliminary Views

Brazil

The Brazilian Administration supports the necessity for studies to consider possible additional spectrum allocation to be mobile service, including radio local area networks (WAS/RLAN), while ensuring the protection of the C band uplink and of all existing services in the candidate bands.

Canada

Canada is of the view that only the specific frequency bands 5 150-5 350 MHz, 5 350-5 470 MHz, 5 725-5 850 MHz and 5 850-5 925 MHz listed in the resolves and invites ITU-R of Resolution 239 (WRC-15) are to be considered and/or studied under WRC-19 agenda item 1.16 and not the entire 5 GHz frequency range (5 150-5 925 MHz).

Canada is assessing and may contribute to studies listed under invites ITU-R of Resolution 239 (WRC-15).

Mexico

WAS/RLANs have promoted the development of broadband access and have been deployed license-exempt, pursuant to the provisions of CITEL and ITU-R, in the frequency bands 5150-5250 MHz, 5250-5350 MHz, 5470-5600 MHz, 5650-5725 MHz, and 5725-5850 MHz. However, it is considered that a potential additional allocation to the mobile service should be based on evidence of spectrum saturation in existing bands, growth projections, and the non-affectation/degradation of any existing services that might operate in the potential additional spectrum.

RCC (15 March 2018)

The RCC Administrations are in favour of necessary protection from potential WAS/RLAN interference for all the services having allocations in the considered frequency bands, first of all for systems in radiolocation and aeronautical radionavigation services used for the safety of flights.

The RCC Administrations consider that the use of WAS/RLAN in the frequency bands 5150-5250 MHz and 5250-5350 MHz is possible subject to maintaining existing conditions identified in Resolution 229 (WRC-12), since the conducted ITU-R studies did not reveal new efficient mitigation methods ensuring sharing between outdoor WAS/RLAN and the systems in existing services in the considered frequency bands.

The RCC Administrations do not support the use of WAS/RLAN in the frequency bands 5350−5470 MHz, 5725−5850 MHz and 5850−5925 MHz, since the studies conducted by ITU-R at the moment, showed that sharing between considered by the ITU-R WAS/RLAN and the systems in existing services in the considered frequency bands is not ensured.

## International organisations

IATA (date of proposal)

ICAO (date of proposal)

IMO (date of proposal)

SFCG (August 2018)

The primary SFCG frequency bands of interest under this agenda item are 5250-5350 MHz and 5350 -5470 MHz and SFCG has particular concerns with the identification of these bands due to the results of studies in WP 5A. SFCG members have been deeply involved in ITU-R studies related to the sharing studies between RLAN 5 GHz and EESS (active) in both the 5250-5350 MHz band and 5350-5470 MHz bands showing that a change of RLAN technical conditions in the first band and a new mobile service allocation for RLAN in the second band would not be compatible with all EESS(active) instrument types (altimeters, scatterometers and SAR).

Therefore, SFCG supports no change to Radio Regulations, which is the single method currently identified in the draf t CPM text for these two frequency bands, 5250-5350 MHz and 5350-5470 MHz.

WMO and EUMETNET (June 2018)

Due to potential for increasing interference to the EESS (active), WMO does not support relaxation of restrictions that would allow the outdoor use of RLAN devices in the 5250-5350 MHz frequency band.

WMO supports the conclusion that the frequency band 5350-5470 MHz is not suitable for operation of RLAN devices, and supports NOC with respect to the frequency band.

## Regional organisations

ESA(28/11/2016)

ESA supports the SFCG position

EUMETSAT (January 2017)

EUMETSAT supports the SFCG position

Eurocontrol (date of proposal)

## OTHER INTERNATIONAL AND REGIONAL ORGANISATIONS

NATO (June 2018)

NATO Military assesment

The 5 250 - 5 850 MHz frequency range is allocated to the radiolocation service. This entire band is used for a number of different tactical and weapon system radars, reflecting the NJFA that defines the 5 GHz range as an “essential requirement for land, airborne and naval radars”. Moreover, NATO has also released in 2005 a still valid policy document detailing the role and the importance of radiolocation radars that operate throughout the full range between 5250 and 5850 MHz. In parts of 5250 - 5850 MHz where regulation already authorize RLAN, military radars could not anymore operate in their most advanced operational modes (in particular frequency hopping) due to the lack of ability of the DFS mechanism to effectively detect and thus protect radars. From a military perspective, the extension of RLAN bands would thus require a demonstration of the effectiveness of mitigation techniques needed to ensure the protection of the radars. At this stage there is no evidence that an improved DFS is being developed that would ensure the protection of fast frequency hopping and bistatic radars.

NATO Position

NATO supports compatibility studies between incumbent services and RLANs in the 5150-5925 MHz frequency range. However, these studies must demonstrate that NATO military radar systems operating in the frequency band 5725-5850 MHz will be protected from interference caused by RLAN operations. NATO currently does not have a specific position for the frequency band 5725-5850 MHz. NATO opposes any change to the ITU Radio Regulations for the frequency bands 5250-5350 MHz and 5350-5470 MHz.

EBU (date of proposal)

GSMA (date of proposal)

CRAF (date of proposal)

This agenda item does not consider any frequency bands allocated to the RAS, and therefore CRAF has no position on this item.

IARU (25/11/2016)

The 5 GHz band is challenged by WRC-19 both by AI 1.12 and 1.16.

The frequency band 5 650 to 5 850 MHz (5 650 to 5 925 MHz in Region 2) is allocated to the amateur service on a secondary basis.

The frequency band 5 830 to 5 850 MHz is allocated to the amateur satellite service (space-to-Earth) on a secondary basis, and in the frequency band 5 650 to 5 670 MHz, the amateur-satellite service (Earth-to-space) may operate subject to not causing harmful interference to other services operating in accordance with the Table.

The frequency band 5 760 to 5 765 MHz is used for amateur weak-signal communication activity including terrestrial and Earth-Moon-Earth communications and propagation beacons.

There is growing interest among radio amateurs in experimentation, investigation of propagation phenomena, point-to-point communication and space communication in this band.

The IARU requests that existing and future amateur use in this band is protected with special attention to the bands 5 760 to 5 765 MHz and 5 830 to 5 850 MHz.