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GSC Lunchtime Sessions

CITEL

WRC-19 Agenda Items:
1.5, 1.13, 10

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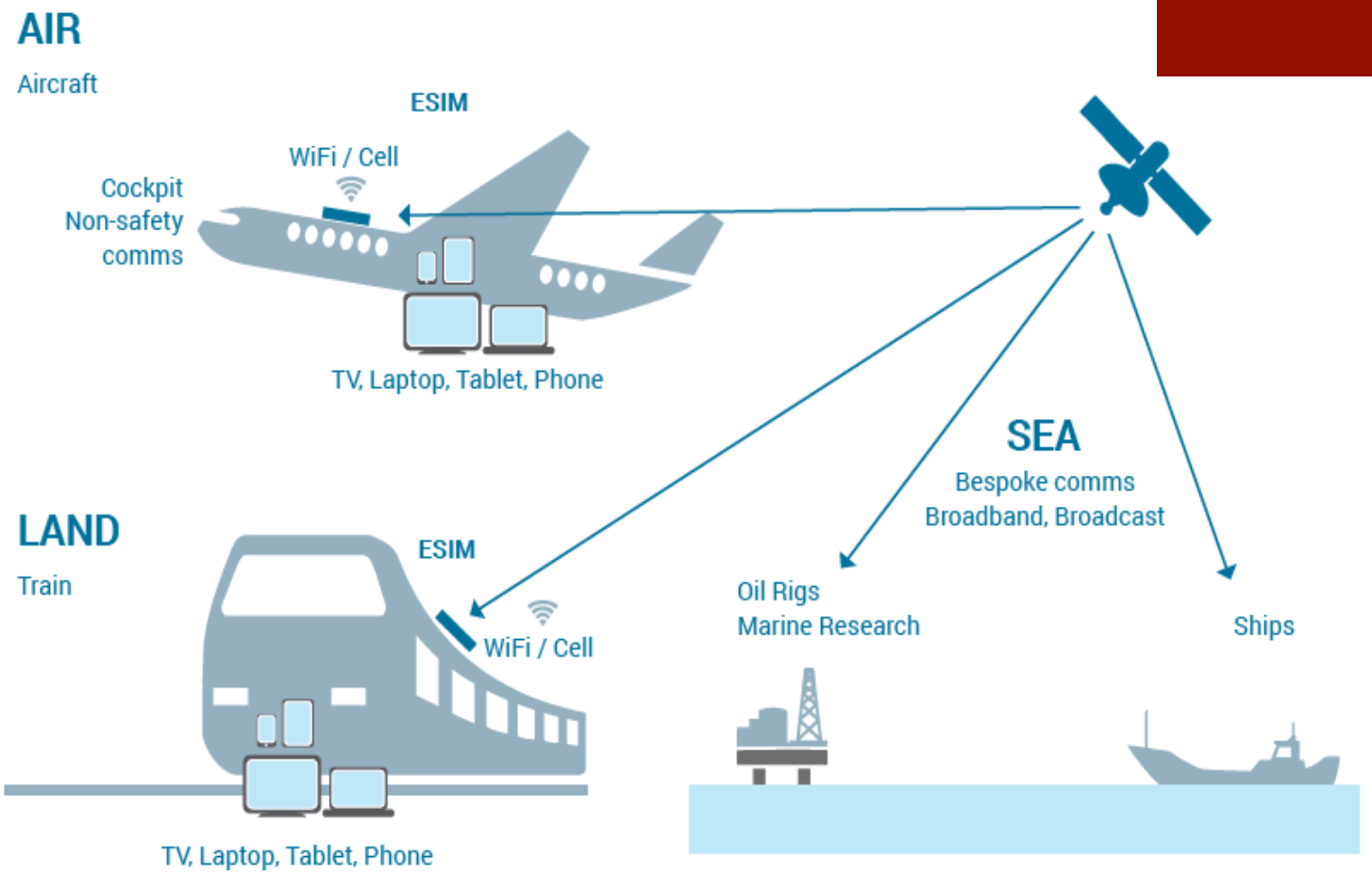
GSC Position
Agenda Item 1.5
ESIMs



Optimizing the Use of Existing Satellite Spectrum to meet growing demand for new satellite services

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AI 1.5 ESIMs in the FSS Ka-band

Resolution 156 adopted at WRC-15
Recognizes the need for global broadband mobile-satellite communications

→ ESIMs communicating with FSS space stations →

AI 1.5 (Resolution 158)
Regulated operation of ESIMs to meet increasing demand for mobility applications

GSC Position:

Establish provisions for aeronautical, maritime, land ESIM operations within GSO FSS networks at 17.7-19.7 GHz & 27.5-29.5 GHz, with technical & regulatory protection mechanisms for the FSS, FS, MSS & EESS operations

AI 1.5: ESIMs in the FSS Ka-Band

Market demand for satellite mobility applications is booming!

Aeronautical Market:

- 100+ commercial airlines offer IFC = a $40B opportunity for airlines by 2035
- 8200+ commercial aircraft connected
- Connecting passengers. Reducing fuel consumption & delays. Improving route planning

Maritime Market:

- 20000 VSAT enabled vessels (75000 by 2028)
- Drivers: crew & passenger connectivity, more sensors/applications for operational vessel monitoring, route planning & vessel tracking, autonomous vessels

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AI 1.5 ESIMs in the FSS Ka-band

- **Proposals from regional groups: CITEL (doc 11); RCC (doc 12); CEPT (doc 16); APT (doc 24); ATU (doc 46); ASMG (doc 29) + various multi-country and individual country proposals**
- **Common elements:**
  - ⇒ General support for new Resolution to address ESIM in 17.7-19.7 GHz & 27.5-29.5 GHz
  - ⇒ Operation of ESIM within envelope of GSO FSS network characteristics & verification of compliance with envelope by BR (based on CR/C or notified network data)
  - ⇒ 70km off-shore distance for maritime ESIM in which prior agreement from coastal state is needed to operate
  - ⇒ Sharing between GSO ESIMs & non-GSO FSS or non-GSO MSS feeder links to be based on existing coordination procedures

Some elements still need to be resolved

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AI 1.5 - ESIMs
Elements to be resolved, 1

1/ Technical requirements for A-ESIM (pfd limit values, possible altitude limit)

- GSC supports “Option 1” pfd limits (based on results of sharing studies with terrestrial services, including 5G)
- Altitude limit is not necessary, provided Option 1 pfd limits are adopted & notifying administrations provide a commitment of compliance.
- **GSC has major concerns with feasibility for BR to run compliance check with pfd limit. Compliance should be a condition of ESIM authorization.**

2/ Reference bandwidth for ESIM EIRP limits (1 MHz reference bandwidth or 14 MHz reference bandwidth)

- GSC supports 14 MHz reference bandwidth: smallest bandwidth for terrestrial service receivers. Hence the EIRP limit towards the horizon for M-ESIM is 24.44 dB(W/14 MHz). A-ESIM pfd limit should be expressed in 14 MHz reference bandwidth to avoid unnecessarily restrictive limits on A-ESIM operation.

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AI 1.5 - ESIMs
Elements to be resolved, 2

3/ Conditions for sharing with non-GSO FSS and non-GSO MSS feeder links

- GSC supports inclusion ESIM power limits only in 27.5-28.6 GHz, coordination under 9.11A in 28.6-29.5 GHz

4/ Annex 3 guidelines (possible inclusion of guidelines to the Resolution)

- Annex 3 is unnecessary: ideas already clearly defined in main body of Resolution.

5/ Status of the protection limits for terrestrial services (Annex 2 of the Resolution)

- Maritime & aeronautical ESIMs meet pfd limits/minimum off-shore distance, to avoid unacceptable interference to the terrestrial services operating in accordance with the Radio Regulations within line-of-sight and on a co-frequency basis
- Compliance with these limits should be a necessary and sufficient condition for ESIM to meet its requirements with respect to terrestrial services

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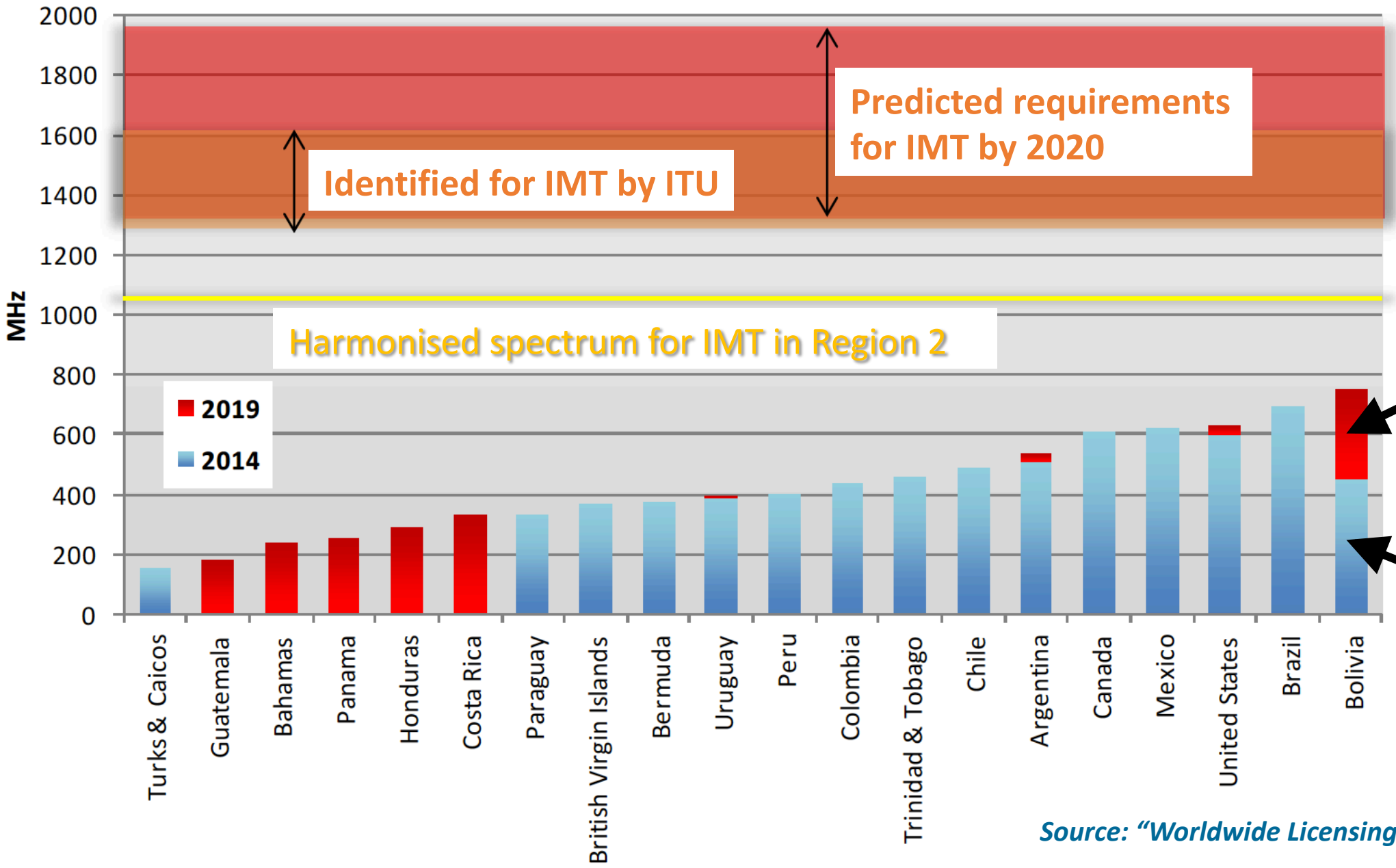
GSC Position
Agenda Item 1.13 - IMT

ISSUE

Identification of frequency bands, among candidate bands listed in Resolution 238, for future development of IMT

… while preserving access to satellite spectrum for existing & future users

LS Telcom: Region 2 Analysis



Amount of spectrum licensed since 2014

Amount of spectrum licensed in 2014

Source: "Worldwide Licensing and Use of IMT Spectrum" LS telcom

Less than 50% of licensed spectrum is actually being used by IMT today

Frequency band(s)	Band(s) CPM Report
24.25-27.5 GHz	A
31.8-33.4 GHz	B
37-40.5 GHz	C
40.5-43.5 GHz	D & E
45.5-47.2 GHz	F & G
47.2-50.2 GHz & 50.4-52.6 GHz	H & I
66-71 GHz	J
71-76 GHz & 81-86 GHz	K & L

Total: 33.25 GHz

AI 1.13
Additional spectrum for IMT

- **A huge amount of spectrum has been studied**
- **More than enough to find 'more spectrum' for IMT**
- **New identifications should only be made against certain key principles**

GSC Principles

- Consider ONLY bands of Res. 238 (WRC-15)
- Harmonisation of spectrum is key
- IMT identification with reasonable sharing conditions between IMT & satellite services

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AI 1.13: Additional spectrum for IMT

The GSC recommends IMT identifications at WRC-19 stay within:

- **26 GHz:** 24.25-27.5 GHz globally (3.25 GHz)
- **40 GHz:** 37-40 GHz in Region 2 and 40.5-43.5 GHz in Regions 1 and 3 (3 GHz)
- **66 GHz:** 66-71 GHz globally (5 GHz)

⇒ with reasonable sharing conditions & measures to ensure co-existence between IMT & satellite services:

- Power / pointing conditions on IMT base stations to protect FSS receivers, with no undue constraints on IMT
- Assistance to administrations in defining measures for future FSS earth station deployment

<u>11.25 GHz</u> above 24 GHz for IMT in each ITU-R Region

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AI 1.13: Additional spectrum for IMT

IMT argues that multiple bands should be harmonized to benefit from the 'tuning range' argument

According to the "European Union's 5G Observatory" Latest Report:

Qualcomm's first complete 5G solution only supports the 26 GHz mm-wave band - "that will be used in Europe notably." → **Not 28 GHz!**

Samsung's Galaxy S10 5G only supports 28 & 39 GHz band "on the Verizon network" (US) → **Not 26 GHz!**

According to iDate:

"the time has not yet come for worldwide 5G devices supporting all the 5G frequency bands."

The "Tuning Range" Argument is a fallacy

Devices do not exist that can work across 26 & 28 GHz

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AI 1.13: Additional spectrum for IMT

	37-39.5 GHz	39.5-40 GHz	40-40.5 GHz	40.5-42 GHz	42-43.5 GHz
Region 1		HDFSS			
Region 2			HDFSS		
Region 3			HDFSS		

	37-39.5 GHz	39.5-40 GHz	40-40.5 GHz	40.5-42 GHz	42-43.5 GHz
Region 1	No Change			IMT	
Region 2	IMT			No Change	
Region 3	No Change			IMT	

⇒ Bands should not be identified for IMT in a Region where it is not intended for use by IMT

⇒ Global economies of scale for IMT equipment can be achieved through identification of 3 GHz of spectrum for IMT in each ITU Region

⇒ There is no need for a global 6 GHz wide band for IMT

Handsets used today are can already support multiple frequency bands AND can accommodate regional band differences

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GSC Position
Agenda Item 10
(C-Band)

Crucial Issue

- **Can IMT replace the services that will be displaced?**
- **Do alternatives exist to provide these services?**

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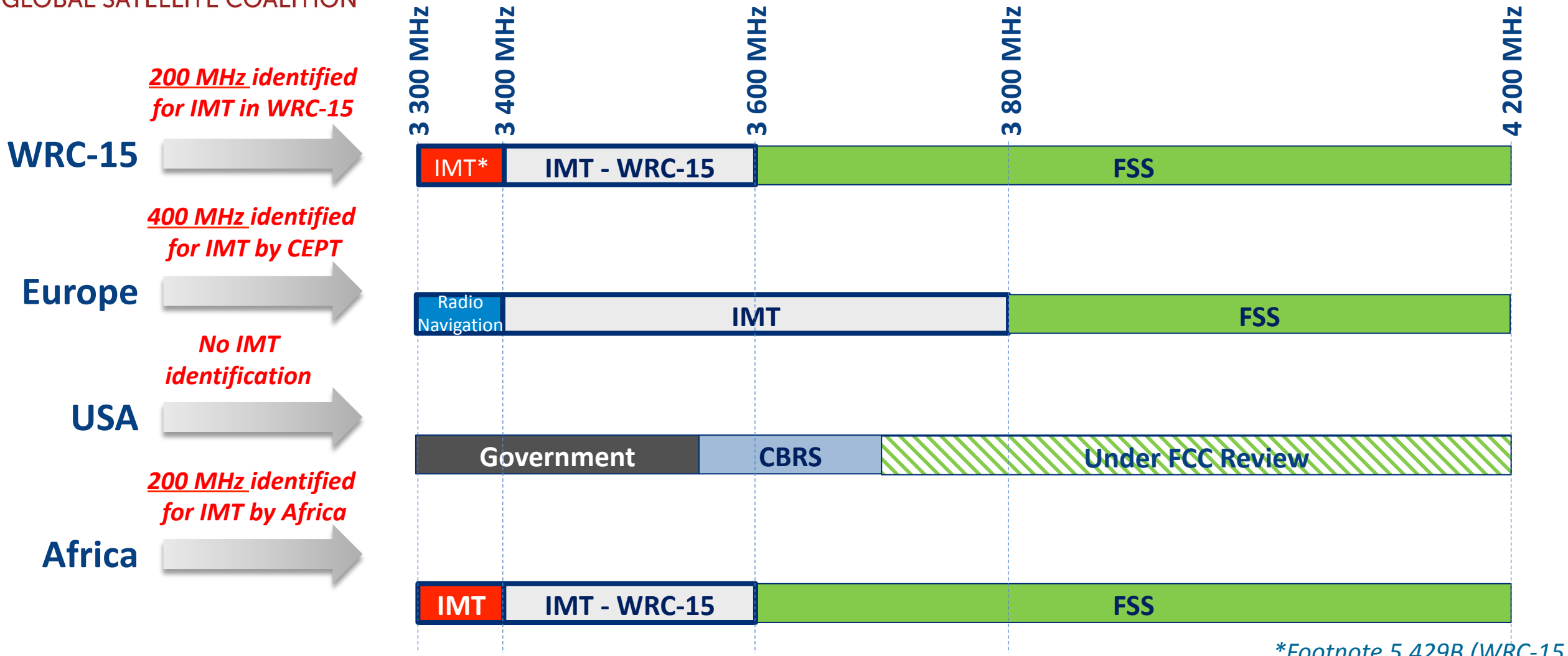
C-band usage varies around the world



*Footnote 5.429B (WRC-15)

Every region has unique needs ⇒ One size does not fit all

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C-band satellite applications

Video Distribution

C-band is used to deliver high quality content via cable and other distribution networks to hundreds of millions of viewers and directly to tens of millions

Banking

C-band is crucial where service level agreements set high reliability requirements.

75,000 antennas use C-band to dispense $400 million per day from Indonesian ATMs alone

Oil & Gas, Mining and Resources

C-band supports mission-critical operations in remote areas

Mobile Networks

C-band offers reliable backhaul for mobile networks in remote areas and provides capacity for large regions.

In Indonesia between 6 and 15 million mobile subscribers are served via C-band, representing a total market value of up to $558 million

Air Navigation, Flight Tracking, Meteorology

C-band is used for networks which require wide coverage and very high reliability

Maritime

Global C-band coverage is crucial for vessels operating in remote regions or on long routes and for Safety of Life at Sea services. C-band is also of increasing importance for large vessels

Telemedicine

C-band supports the remote delivery of healthcare services, reaching otherwise underserved rural populations.

150,000 people a year are treated with the support of C-band in India alone

E-government

C-band solutions facilitate efficient delivery of services to underserved and unserved areas across Asia Pacific

Humanitarian Programmes

C-band offers connectivity for field offices, programme deployment and disaster management in remote areas

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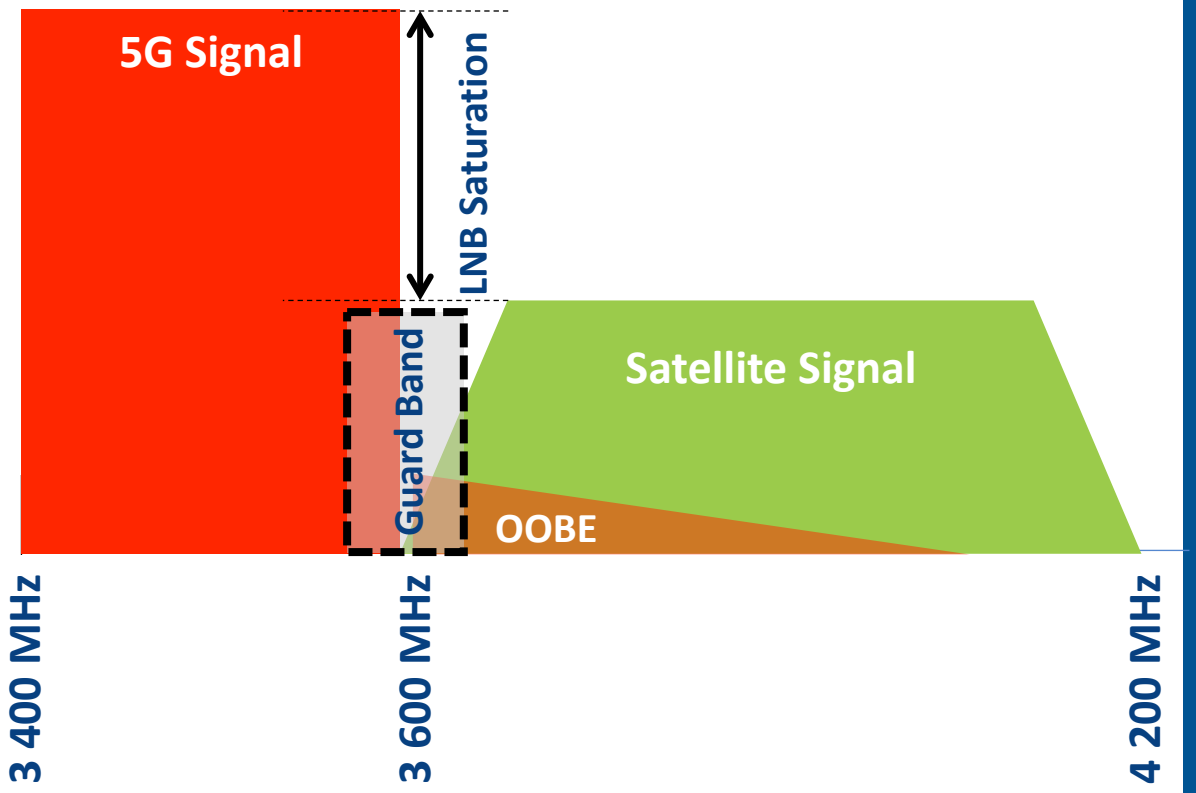
Co-existence between FSS and 5G in adjacent bands must be carefully managed



- Satellite earth stations are very sensitive to terrestrial interference
- 5G signals can interfere with FSS receive earth stations in two ways:
  - Saturate the LNB of the earth station, even if the 5G signal is adjacent to the satellite signal
  - Out-of-Band-Emissions (OOBE) and Spurious Emissions (SE) of the 5G signal can cause in-band interference to FSS signals
- OOBE levels specified in 3GPP standards do not protect FSS signals in adjacent bands

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GSC Position
Agenda Item 10
(3.3 GHz - 24 GHz)

Issue

- **Can IMT replace the services that will be displaced?**
- **33 GHz has just been studied, should even more spectrum for IMT really be studied?**

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AI 10 Proposals for IMT in 3.3 - 24 GHz

The GSC is of the view that there is no need for any additional spectrum to be identified for IMT:

- WRC-19, under AI 1.13, is expected to identify **many GHz** of new spectrum for IMT
- **Significant** amount of unlicensed or unused spectrum is **already** identified for IMT –
  ⇒ Around the world, less than 50% of available spectrum is licensed
- **3.3 - 24 GHz range covers core bands for the satellite industry:** C-, X, Ku- and Ka-band
  ⇒ Many satellites operate in these bands => heavily used for applications e.g. broadcasting DTH, VSAT, SNG, broadband, security, etc.

Any identification of IMT in the 3.3-15.35 GHz range will:

- Interfere with existing satellite services
- Negatively impact existing investments
- Harm competition by limiting the ability of satellite operators to meet the growing demands of satellite users, including government

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Thank you!