African Telecommunications Union

REPORT

of the

**2ndAFRICAN PREPARATORY MEETING FOR
WORLD RADIOCOMMUNICATION CONFERENCE 2019
(APM19-2)**

held from

11 to 15 September 2017

at

Pullman Teranga Hotel

in

Dakar – Senegal

September, 2017

TABLE OF CONTENTS

1 INTRODUCTION

The African Telecommunications Union (ATU) in collaboration with the Autorité de Régulation des Télécommunications et des Postes (ARTP) and the support of the Government of Senegal convened the 2nd African Preparatory meeting for the World Radiocommunication Conference 2019 (APM19-2) in Dakar - Senegal from 11to 15September 2017.The WRC-19 will be held from 28 October to 22 November 2019 and shall be preceded by the Radiocommunication Assembly 2019 from 21 to 25 October 2019. The ITU Member States are being consulted regarding the venue in Sharm el-Sheikh (Egypt) (see ITU CL-17/39).

The objectives of the meeting were to:

1. Note pertinent and recent developments on mobile, satellite, HAPS and WhiteSpaces technologies via information workshops;
2. Consider some issues arising from WRC15 decisions, namely; channelling of the 3300-3400MHz and L-band (1452 – 1492MHz), and PPDR frequency range harmonization in 694-894MHz;
3. Note the ITU-R progress and work plans towards preparations for WRC-19;
4. Note the sub-regions' key issues and work plans for WRC-19;
5. Note the other ITU regions' key issues and work plans for WRC-19;
6. Consider the reports of the ATU WRC-19 Preparatory Working Groups; and
7. Develop African views on WRC-19 agenda issues.

The meeting was attended by 235 participants from:

- Thirty (30) African countries: *Algeria, Benin, Botswana, Burundi, Burkina Faso, Congo, DRC, Cote d'Ivoire, Djibouti, Egypt, Gabon, Ghana, Guinee, Guinee-Bissau, Kenya, Madagascar, Malawi, Mali, Mozambique, Niger, Nigeria, Rwanda, Senegal, South Africa, South Sudan, Sudan, Swaziland, Tchad, Uganda and Zimbabwe*;

- Eighteen (18) associate members: *Access Partnership, ASECNA, Boeing, Ericsson, Eutelsat, GSMA, Huawei, Iridium, Inmarsat, LS telecom, Motorola Solutions, SES, Sonatel, Telkom SA, Vodacom SA, Qualcomm, Turksat, and Yahsat*;

- Three (3) African Regional Economic Communities: *East African Community (EAC) through East African Communications Organization (EACO), Economic Community of West African States (ECOWAS) and Southern African Development Community (SADC);*

- The African Union Commission (AUC) ;

- The International Telecommunications Union (ITU);

- Two (02) international regional telecommunications organizations: CEPT and CITEL.

- Four (04) partner organisations: AUB, *ESMT, ICAO, and IARU*;

- Twenty-two (22) observer organizations/companies: *Airbus, ANFR,* ASDEC, *Commonwealth ITU Group, CSU SA, EBU, ESOA, EXPRESSO, Fikiyatech, GNSS, IMATEC, Intelsat, FICRACON, GREES, MODIEC, OneWeb, Orange, Realtime Int., Rohde & Schwarz, TELRAD Networks, WhiteSpace Alliance and Zest Nigeria.*

The list of participants is attached in **Annex 1** (List of participants).

2   OPENING CEREMONY

The opening ceremony noted opening remarks from the following:

- **Mr. Abdoulkarim SOUMAILA**, ATU Secretary General.
- **Ms. Souhila AMAZOUZ,** representative of the Africa Union Commission;
- **Mr. Modou Mamoune NGOM,** representative of the Ministry of ICTs of Senegal.
- **Mr. Mario MANIEWICZ**, Deputy Director of BR; and
- **Mr. Abdou Karim SALL**, DG ARTP Senegal who officially opened the meeting.

The remarks are annexed to this report as **Annex 2a to 2d,** respectively.

3   APPOINTMENT OF THE BUREAU

The meeting appointed the following bureau:

Chairman	:	Mr.Papa CIRE CISSE	(Senegal)
Vice-Chairman	:	Mr.Augustine NWAULUNE	(Nigeria)
Rapporteurs	:	Mr. Galiam OUEDRAOGO	(Burkina Faso)
		Mr. Henry MUGABI	(Uganda)
		Mr. Mandla MCHUNU	(South Africa)

4   ADOPTION OF AGENDA

The meeting adopted the agenda as provided in **Annex 3**.

5   INFORMATION WORKSHOPS

APM19-2 noted pertinent and recent developments on mobile, satellite, HAPS and WhiteSpaces technologies via information workshops. Speakers composed of experts from respective industries whose presentations can be found on the APM19-2 event page on the ATU website. The summaries below provide the key issues under each workshop category.

5.1   Mobile

The mobile workshop was themed "*Understanding 5G Technology and Spectrum Opportunities and Challenges in Africa*". Some key points of discussion and messages are as follows:

- Ecosystem Development:
    - o   5G is a common Network Platform designed to serve multiple industries and use cases, each with different requirements
    - o   Technological advances such as network slicing will enable realization of cost efficient 5G networks for transforming industries. Efficient network deployments and flexible capacity allocations will be enabled
    - o   Transformed industries will offer innovative services and delivery systems that can serve society better
    - o   Technology alone cannot realize the full potential that 5G promises. Appropriate enabling policy is a must. Spectrum availability and regulatory certainty will be key.

- 5G Use Cases and Trials: Relevance to Africa

- 5G promises to transform lives and contribute to an active citizenry, while unlock innovation across multiple sectors and industry. Several use cases were highlighted, including:
  - Enhanced broadband access to crowded areas
  - Broadband access in public transport
  - Deployment of smart infrastructure
  - Enhance access to media (on demand)
  - Mission critical services in health, manufacturing, mining, search and rescue missions (UAV)

IoT enablement through M2M for farming and agricultural purposes.

Like in other countries and regions, ICT stakeholders in Africa have an opportunity to define and develop appropriate use cases.

5G trials are ongoing or planned around the world mainly in 3.5 GHz, 4.5 GHz and 26-28 GHz bands. So far there has been no trial in Africa.

- Accessing suitable spectrum for 5G

Addressing 5G spectrum needs a multilayer approach: various 5G applications and services will require access to appropriate spectrum from within the three layers.

- Low Frequencies (below 2 GHz) for coverage layer (wide and deep indoor coverage);
- Medium Frequencies (2 to 6 GHz) for coverage and capacity layer (best compromise); and
- High Frequencies (above 6 GHz) for super data layer use cases requiring extremely high data rates

3GPP is working on 5G-NR (5G new radio specification) in the range of 3300-4200MHz;

The 3300-3600 MHz frequency range is key for LTE-A evolution and 5G in Africa;

- GSA supports the TDD mode for this spectrum, adopting common synchronization and alignment of UL/DL transmissions between operators;
- GSA believes that operators will need access to contiguous, unpaired, nation-wide spectrum assignments in the order of 100 MHz;
- GSA encourages countries to release 3300 – 3400 MHz for IMT, and to migrate 3400 – 3600 MHz from FWA to IMT;

The 24.25-27.5 & 40.5-43.5 GHz are the most promising high frequency ranges for 5G early commercialization globally;

- Spectrum Needs for deploying services to all communities:

Spectrum remains key to continued ICT growth in Africa: making spectrum available for use by the operators in a timely and required amount is crucial.

Making available frequencies already identified for mobile will be key for 4G but also for the launch of 5G in Africa.

Mobile operators need spectrum in the sub-1GHz, 1-6GHz and above 6GHz for deployment of 5G

The frequencies on the agenda item 1.13 of the WRC19 will provide new mobile services that should foster at longer term increase of Africa's growth.

5G licensing should be done in similar manner as with all other IMT spectrum, based on technology neutral, exclusive and nationwide licensing.

- Benefits of Harmonization of IMT Spectrum:

Spectrum harmonization is very beneficial as it maximises economies of scale, limits the interference risks and facilitates international roaming.

Harmonization of spectrum bands for mobile services will be crucial to ensure Africa take advantage of the numerous benefits of spectrum harmonization.

In the run up to 5G, Africa has a great opportunity to take important decisions on frequency arrangements for the bands identified for IMT by WRC-15.

In selecting the channelling plan for L-band, Africa ought to select a plan that maximises harmonization in the region and with other regions.

- Active Participation in WRC-19 Preparatory Studies

It's important that African Administrations get involved in discussion for spectrum for 5G to make sure the bands identified cater for African needs (even though implementation might be later than in other regions).

African Administrations and Industry are encouraged to actively participate in the Task Group 5/1 to ensure regional views are well articulated in the work of the group.

Sharing in higher bands is very different and should be possible. Studies in the ITU-R are on-going.

- Exploring collaboration between industry and government for realization of 5Gin Africa:
  - Recommendations:
    - Examine how stakeholders (government, regulators, operators and technology suppliers) can cooperate to conduct 5G trial/s
    - Move ahead with release of 3300-3600 MHz for IMT
    - Aligning with the rest of the world and designate 26 GHz and 40 GHz as priority candidate bands

5.2 Satellite

Advances in Satellite Technologies

- Satellite form an integral part of ICTs because it, among other things, plays the crucial complementarity role to terrestrial systems and is in some cases the only means of communications e.g. rural/remote, in air, at sea;
- Both satellite and mobile systems have evolved tremendously during last two decades;
- There are significant advances in satellite and associated technologies (e.g. high throughput satellites, HTS) that are dramatically changing the economics of provisioning of satellite services and thereby driving down the cost per MB of user charges for satellite services;
- Emerging satellite use cases now include e-Education, as well as capacity building and job training, e-Medicine and e-Elections as was the example in Burkina Faso;

Need for Harmonized Regulatory Framework for Satellite communications

- South Africa, Nigerian and Kenya were cited as countries with best satellite licensing practices. In other African countries, regulatory barriers to satellite services prevail. These include;
  - High taxation;

- o High licence fees;
- o Gateway requirement;
- o Prohibition of satellite services in some instances;
- The satellite industry considers harmonised common approach to satellite regulations including removal of import duties as being absolutely necessary to promoting and maximising the benefit of satellite services;
- Regulations should foster innovation and adoption of services to spur social and economic development through use of satellite technologies and services;
- While security remains a concern in some countries, there are technical solutions available which can mitigate the concern of governments;

Future Spectrum Considerations

- Existing allocated spectrum in C-band as well as Ku and Ka bands remains crucial to the provisioning of satellite services in Africa and thereby needs to be maintained;
- 5G implementation will not be revolution but rather an evolution from the current 4G/4.5G networks/systems;
- 5G will be realised via a mix of technologies with satellite playing a key role through extending the coverage, capacity and higher throughputs in all areas thereby enabling 5G services to be feasible;

Satellites an integral part of ICT Ecosystem

- Despite continued progress in network roll-out, reaching rural population and delivering last mile broadband to many users is a challenge. Satellite intrinsically bridges the digital divide.
- There has been tremendous growth and advances in satellite technologies over the last 30-40 years in various areas: launcher technology (e.g. reusability), space segment, ground segment and terminal developments. These advances have resulted in higher throughput, greater capacity, global coverage and lower the user costs (price/Mb);
- Today there are more powerful HTS satellites that use spectrum much more efficiently by using advanced frequency reuse techniques, narrow beams, and steerable beams;
- Over the next 3-4 years, over 100+ HTS operating in Ka band will be launched and require the necessary spectrum to continue to support African continent wide and global BSS/FSS/MSS services;
- The satellite industry encourages review of VSAT licensing regulations in most African countries in order that regulations:
  - o foster competition;
  - o are adapted to modern satellite services;
  - o provide clarity and transparency in national licensing framework;
  - o are based on a regionally harmonized approach for license fees on satellite user terminals;
  - o allow free circulation for Visiting User Terminals once authorized in country of origin;
  - o provide for Class/blanket licenses for Domestic User Terminals with no individual terminal-by-terminal licenses; and
  - o provide for reasonable spectrum pricing structure adapted to cost of satellite services.
- ESOA invites ATU and the African sub-regional groups (ECOWAS, SADC, EACO, ECCAS) to reflect on an harmonised approach on satellite regulation that is transparent and simplified.

ATU's proposed two-day event on Satellite Regulations and Licensing, originally foreseen on 30-31 October 2017 and now postponed to 5-9 February 2018, is a very welcome initiative to this end.

5.3 HAPS

- High-altitude platform station (HAPS) is a radio station located on an object at an altitude of 20 to 50 km and at a specified, nominal, fixed point relative to the Earth;

- There has since been significant advancements in HAPS technologies. Unlike the initial narrowband HAPS systems, the recent advancements/developments render broadband HAPS feasible. Comparatively to former platforms, new broadband HAPS have the following key characteristics:
  - Tens of Gigabits of data capacity
  - Lower operational costs
  - Longer flight duration
  - Improved safety and security
  - Ease of launch and monitoring

- The Broadband HAPS are capable to supplement services to those offered by mainstream terrestrial and satellite backhaul systems in rural and remote areas but at lower cost, which currently accounts for the bulk of the network operations (OpEX) for cellular and ISP Operators. It is expected that the low-cost backhauling would enable lower service costs and hence result in more sustainable connectivity and higher penetration in rural and remote areas;

- HAPS will complement existing networks and fill the existing gap between satellite and terrestrial footprints outside urban centres where low population densities, low personal income levels and disadvantageous geographies make it economically unfeasible and technically challenging to deploy terrestrial infrastructure, such as fiber and microwave backhaul technologies.

- HAPS service will provide secure backhaul and comply with local regulations and in collaboration with local Operators.

- The ecosystem of HAPs now involves many leading companies from various areas;

- Spectrum needs are very important and a key element for HAPS technology deployment in terms of both suitable bands and ample spectrum bandwidths (amounts) and crucially as widely harmonised as far as possible. It was urged that currently, the spectrum identified for HAPS is either not widely harmonised, has less than the minimum spectrum bandwidths of 4.1 GHz (considering 1 Gateway) or is not in suitable bands. The WRC19 AI 1.14 seeks to address these shortcomings of the current spectrum identified for HAPS;

- Assessment of spectrum needs for the different deployment scenarios has since been done by WP 5C. Sharing Studies in all current and new bands have been completed and presented at the APM and to be concluded by WP5C Nov 2017 meeting (note: methodologies finalized at WP5C May 2017 meeting);

- Facebook presented in their input document[1], compatibility and sharing study results with incumbent and planned services in the existing and candidate bands.Several countries expressed interest and support for the new HAPS systems in view of the potential service

---

[1]Input 10 - APM19-2 Facebook contribution on AI 1.14 (HAPS)

offerings which could benefit the ICTs growth in particular the rural and remote areas thereby reducing the digital-divide and result in social-economic development;

- So far, CEPT, CITEL, APT and ATU are supportive of HAPS.

5.4 WhiteSpaces

- Wireless broadband powered by license exempt or lightly licensed spectrum has great potential to address the persistent challenge of digital divide between the urban and rural/remote areas;

- Much of the TV spectrum is not used in rural and remote areas. This is expected to be the case in the foreseeable future;

- TV WhiteSpaces technology offer the possibility to:
    o use the unused TV spectrum
    o achieve long distance wireless connectivity in rural/remote areas
    o achieve connectivity using low power consumption
    o use short/light mast structures
    o achieve higher bandwidth capacity with use of multiple channels

- There has been successful trials, in terms of both non-interference free operations in relation to TV services and connectivity, all over the world including Africa;

- The WhiteSpaces Forum recommends establishing of national TVWS regulations, which among others, allow operation of TVWS under specified terms and conditions such as power limits, geographical areas, sensing requirements and interference avoidance mechanisms including TV signal databases;

- Malawi was said to have established TVWS regulations while South Africa was reported to have published draft TVWS regulations. Other African countries were invited to consider establishing similar guidelines by borrowing from those that have;

- TV WhiteSpaces achieves electromagnetic compatibility with TV broadcast service using spatial and/or frequency discrimination;

- Tested spectrum sensing and capacity improvement technologies exist including databases.

6 SOME POST WRC-15 ISSUES (*ISSUES ARISING FROM WRC15 DECISIONS*)

6.1 Channelling plans for 3300-3400MHz band

Following the presentation and discussion of *Input 06 - APM19-2 - GSA contribution on 3300 MHz*, the meeting **agreed** as follows:

- The designation of 3300-3400 MHz for IMT has been led by Africa. Industry and national administrations would benefit from clear guidance on the regulatory regime that would ensure coexistence between the radiolocation service and the mobile service. In particular, vendors need to understand the requirements for the equipment in each country where it would be deployed.

- With regards to liaison statement[2] from 3GPP RAN4 seeking information on "*any regulatory requirements (e.g. EIRP, out of band emission, mask blocking or others) for the 3.3-3.4GHz band in Africa region that ATU believes 3GPP should take into account in its specifications*", the meeting agreed that ATU responds to 3GPP as follows:

---

[2] See *Input 06(annex) - APM19-2 - 3GPP liasion statement to ATU on 3300MHz channelling*.

- Currently, there are no additional regulatory requirements in Africa for this band besides that **may exist** within the ITU Radio Regulations. And therefore ATU´s view is that 3GPP should not introduce any additional unique constraints in its specifications;
- Any unique regulatory requirements will be dealt with at national or sub-regional level if so required taking into local conditions and coexistence needs with adjacent band services notably radar. To help administrations in defining the possible options for the unique requirements, ATU and ITU are currently working on co-existence options between radars and IMT.

- Accepted the proposal for development of guidelines on the use of the band similar to the guidelines on digital dividend being developed by the African Union Commission (AUC). In this regard, the meeting tasked WG-2 to prepare draft guidelines with the technical assistance/support of GSA, GSMA and other interested parties. The draft shall have to be validated by a competent ATU spectrum meeting (ideally APM19-3) before being submitted to AUC for approval consideration.

- In order to make progress in the definition of the appropriate regulatory regimes for the 3300-3400 MHz, it is necessary to have better information about actual radar usage in the African countries. The meeting agreed to send a questionnaire to administrations asking for further detail on radar usage. WG2 is tasked to review the questionnaire proposed in **Input 06 - APM19-2 - GSA contribution on 3300 MHz**, and to send their final version to the ATU secretariat for distribution to administrations.

6.2   Channelling plans L-band (1427-1518MHz)

Following the presentation and discussion of *Input 13 - APM19-2 - GSMA contribution on L-band (channelling) harmonisation, Info Doc 1 - APM19-2 Information Document on L-band Frequency Arrangement CG August 2017* as well as *Info Doc 1annex - APM19-2 Proposed Frequency Arrangement for 1 427-1 518 MHz*, the meeting **noted** and **agreed** as follows:

- **Noted** that five (05)channelling options (G1 to G5) related to L-band has been proposed as shown in Part C of *Input 13 - APM19-2 - GSMA contribution on L-band (channelling) harmonisation;*
- **Agreed** to support options that seek to yield harmonisation, to the fullest extent, among the regions in order achieve and benefit from economy of scale;
- **Agreed** that the protection of existing MSS Service in the adjacent band as well as the special needs (e.g. coverage needs) of the African region should be taking in consideration when selecting the appropriate option;
- **Agreed** that more consideration of the options is required before a decision could be made on the most appropriate option notwithstanding the consideration by WG19-1 Correspondence Group on L-band of the options. The group proposed SDL as a more preferred option.
- **Tasked** WG2 to actively continue considering the options and develop a draft ATU common proposal to the work of ITU taking into account the relevant timelines on this important issue. Member states to be given opportunity to consider and endorse any draft ATU common proposals.

6.3   PPDR frequency range harmonization in 694-894MHz (Resolution 646 Rev. WRC-15)

The chair of the WG19-1 correspondence group on PPDR frequency range harmonization presented a paper (see *Input 35 - APM19-2 - Chair WG19-1 CG on PPDR SADC Guidelines for PPDR Spectrum*) The paper contains the Guidelines on the Frequencies for Public Protection and Public Disaster in

SADC and was presented to the meeting as a possible starting point in gathering the PPDR frequency ranges as requested by WP 5A. Below are the highlights:

- Disasters are inevitable and bound to happen in every country. These may be caused by natural events or human actions;

- It is important that public safety agencies (fire, police, ambulance, coast guard, customs and border patrol, defence force, etc.) are able to communicate with each other within the country, regionally and internationally;

- Therefore, the framework is addressing the harmonisation of radio frequency spectrum that could be used in the context of PPDR, as defined by the ITU;

- Spectrum harmonisation shall allow for interoperability, a broader manufacturing base and increased volume of equipment resulting in economies of scale and expanded equipment availability, improved spectrum management and planning, enhanced cross-border coordination, cheaper equipment and circulation of equipment;

- CRASA Members identified the need to harmonise PPDR frequency bands, throughout SADC for narrowband, wideband and broadband PPDR applications;

- Examples of PPDR applications for narrowband, wideband and broadband spectrum use were provided;

- WRC-03 approved Resolution 646 (WRC-03), which recommends regionally harmonised frequency ranges 380-470 MHz in Region 1, where the band 380-385 MHz is paired with 390-395 MHz. CRASA Members adopted the recommended frequency ranges.

- ITU has not identified any bands for wideband PPDR applications, CEPT has identified the tuning range 380-470 MHz for both narrowband and wideband PPDR applications. Within this tuning range, three frequency bands have been earmarked as potential bands for the implementation of wideband PPDR systems namely (1) 385-390 MHz paired with 395-399.9 MHz, (2) 410-420 paired with 420-430 MHz and (3) 450-460 MHz paired with 460-470 MHz;

- SADC has adopted the frequency bands 385-390 MHz paired with 395-399.9 MHz for PPDR wideband systems as the primary band. 410-420 MHz paired with 420-430 MHz could be used for additional spectrum requirements for wideband PPDR applications. The band 450-470 MHz was excluded since it has been identified for IMT;

- ITU recommended frequency range or portions of frequency range 694-894 MHz for possible harmonization to facilitate broadband communications for robust and reliable mission critical emergency services in PPDR;

- CEPT has identified the tuning range 4 940- 5 925 MHz for broadband PPDR applications. Within this tuning range the following frequency bands are considered for broadband PPDR applications: (1) 4940-4990 MHz, (2) 5150-5250 MHz, (3) 5470-5725 MHz, (4) 5725-5875 MHz and (5) 5875-5925 MHz. Based on sharing possibilities, the band 5150-5250 MHz is the most suitable for Europe whereas the band 4 940-4 990 MHz is an optional band in some countries.

- CRASA countries agreed that band 4 940-4 990 MHz was preferable for identification for broadband PPDR applications since it is already reserved for "Government Services".

Following the presentation, the meeting agreed the following cause of action:

1. WG2, through its WG19-1 correspondence group on PPDR, to expeditiously progress and conclude the work on gathering information as requested by WP 5A and to ensure the information within the set deadline. This is would to ensure that African information is

reflected in the reports/recommendations of WP 5A on PPDR frequency ranges, as appropriate;

2. WG2, through its WG19-1 correspondence group on PPDR, was invited to consider using the SADC PPDR guidelines as the starting point for gathering the said information in 1 above. The group to take into account the concerns of some administrations regarding the frequency bands listed in table 4 of the document; and

3. All interested were invited to actively participate in the work of WG2, through its WG19-1 correspondence group on PPDR;

4. The General Secretariat reiterated its pledge to assist in the work such as circulation of any questionnaire(s) or member states' endorsement of a common proposal, wherever requested.

6.4   Update on ESIMs Harmonised regulatory framework implementation

The meeting noted the update on the implementation of the ATU endorsed ESIMs Harmonised regulatory framework provided by Immarsat (see ***Info Doc 2 - APM19-2 Inmarsat - Update on ESIMs Harmonised regulatory framework implementation)***. The following were the highlights and key observations:

- Resolution 156 (WRC-15) contains the technical and operational conditions for use of Earth Stations in Motion (ESIMs);

- ATU developed and provided to the sub-regions a draft recommendation for the development and establishment of frameworks/agreements for a harmonised approach to domestic licensing of ESIMs and mutual licence recognition (including type approval) of ESIMs in accordance with Res 156 (WRC15);

- As per the decision of the first ATU WRC 19 Preparatory meeting in September 2016, sub-regional organizations were urged to consider the proposed draft ESIMS recommendation on a harmonized approach to domestic licensing and mutual license recognition in their respective sub-regions/countries; and that,

- In ECOWAS, EACO and SADC, the framework is going through the sub-regional and national adoption as per the rules of the respective sub-regions. The meeting noted with appreciation the progress being made by the sub-regions and invited the other sub-regions to consider starting the process of adoption so that the harmonised framework could be completed for the entire African region as soon as possible and to allow maximum benefits from ESIMs services considering that these services are already in use in maritime, aeronautical, disaster relief, media and by specialized government agencies.

7   CONSIDERATION OF ITU PREPARATORY WORK PLAN FOR WRC-19

Mr. Philippe AUBINEAU, ITU Radiocommunication Bureau Counsellor for ITU-R Study Groups, presented information on the ITU preparations for CPM19-2, RA-19 and WRC-19 (see *Info Doc 3 - APM19-2 - ITU BR-CPM19-2, RA-19, WRC-19 preparations*). In responses to several questions, some clarifications were provided on the preparation for WRC-19 agenda items 8 (countries footnotes in the Radio Regulations (RR)) and 9.2 (BR Director's Report to WRC-19 on difficulties or inconsistencies encountered in the application of the RR), as well as on the three ITU Inter-regional Workshops on WRC-19 Preparation to be held on 21-22 November 2017 and planned for 2018-Q4 and 2019-Q3. The meeting noted with thanks the information provided.

8 NOTING OF SUB-REGIONAL PREPARATORY WORK-PLANS AND KEY ISSUES FOR WRC-19

The meeting noted, with deep appreciation, the sub-regional preparatory work-plans and key issues for WRC-19 from EACO, ECOWAS and SADC as provided in the respective presentations/documents:

- EACO: see Info Doc 8 - EACO strategy for WRC-19 preparation
- ECOWAS: see Info Doc 9 - ECOWAS strategy for WRC-19 preparation and status update
- SADC: see Info Doc 10 - SADC strategy for WRC1-9 preparation and status update

The ATU Secretary General encouraged the sub-regions to keep up the good work on their WRC-19 preparatory programs. He also noted the offer made by SADC to host the fourth African Preparatory Meeting (APM-4) for WRC-19 within its sub-region. He invited member states to offer to host APM19-3.

9 NOTING OF OTHER REGIONS' PREPARATORY WORK PLANS AND KEY ISSUES FOR WRC-19

The meeting noted, with profound appreciation, CEPT's preparatory work-plans and key issues for WRC-19by CEPT and CITEL as provided in the presentation made by the **Mr Gerlof OSINGA (CPG Vice Chairman)** and **Mr Dante IBARRA**, respectively:

- CEPT: see Info Doc 4 - CEPT organization and status of WRC-19 preparations
- CITEL: see Info Doc 6 - CITEL organization and status of WRC-19 preparations

The ATU Secretary General expressed profound gratitude to CEPT and CITEL for sending their representatives to share their experiences, preparatory work-plans, key issues for WRC-19 and other information. He pledged ATU commitment to endeavour to attend their regions meetings (as well other regions), whenever invited.

10 CONSIDERATION OF WRC-19 AGENDA ITEMS

The meeting considered WRC-19 agenda items based on recommendations of WG19-1, the APM19-2 input documents as well as comments/proposals expressed during the meeting. In warranted cases, key observations/notables were recorded under the respective agenda items. The outcome of this consideration is summarised below:

10.1 Chapter 1: Land mobile and fixed services

Agenda Item (annex number)	APM19-2 Outcomes
AI 1.11 Railway Radiocommunication Systems (RSS) **(Annex 2-01)**	**The APM19-2 agreed to**: 1. **Support** global or regional harmonization of frequency bands for use by railway radio communication systems between train and trackside (RSTT) within the existing mobile service allocation so that no additional constraints are imposed on services to which these frequency bands are already allocated. 2. **Encourage** administrations contribute and actively participate in sharing studies in the identified potential bands, in order to among other things, ensure that existing services are protected. 3. **Encourage** administrations to study the current and future spectrum needs for RSTT applications in order to support studies on harmonized frequency bands.

	4. **Request** ICAO to provide information on ILS usage of 328.6 – 335.4 MHz in Africa to help in conducting the studies. 5. **Note** that the Rapporteur for AI 1.11 **(Mr. Ali Al Hadji (Cameroun))** was tasked and mandated by WG19-1 to provide the ATU questionnaire results related to this agenda item to ITU-R Working Party 5A. 6. **Authorise** WG1 to examine the adequacy of the existing information on potential bands for railway radiocommunication systems as gathered through an ATU questionnaire. If this information proves to be inadequate, authorise WG1 to develop a new ATU questionnaire aimed at gathering the appropriate/more information. 7. **Support** the harmonization of frequency bands through an ITU-R recommendation (which could be developed by WP5A). 8. **Note** that before making any decision ATU administrations should carefully analyse the current use of concerned frequencies in African countries.
AI 1.12 Intelligent Transport Systems (ITS) *(Annex 2-02)*	***The APM19-2 agreed to:*** 1. **Encourage** administrations to contribute and actively participate in sharing and compatibility studies on the agenda item. 2. **Encourage** administrations to ensure that the possible global or regional harmonized frequency bands for Intelligent Transport Systems (ITS) within existing allocations should not impose additional constraints on services already having allocations in these or adjacent frequency bands. 3. **Invite** administrations to consider developments on AI 1.16 when considering this agenda item (i.e. AI 1.12) due to frequency overlaps around 5.8GHz. 4. **Support** the harmonization of frequency bands through an ITU-R recommendation (which could be developed by WP5A). 5. **Note** the need the narrow down the candidate bands for ITS to the more promising ones as shown on page 3 of ***WG19-1 Report Annex 2-02 AI 1.12 Intelligent Transport Systems (ITS*) with to having focused studies.
AI 1.14 High-Altitude Platform Stations (HAPS) *(Annex 2-03)*	***The APM19-2 agreed to:*** 1. **Note** that technological developments and advancements, such as power mechanisms and materials, and the need for ubiquitous broadband have given new implementation scenarios and impetus for HAPs. 2. **Support** the introduction of technologies that seek to provide broadband connectivity in unserved and underserved regions and therefore support the sharing and compatibility studies provided that these studies demonstrate that HAPS and existing and planned services (including the services in the bands under consideration under AI 1.13 and 1.6 and adjacent bands) can co-exist. 3. **Note** the sharing studies as presented in ***Input 10 - APM19-2 Facebook contribution on AI 1.14 (HAPS*), in respect to the co-

	existence between HAPS and existing and planned services, including the services in the bands under consideration under AI 1.13 and 1.6 and adjacent bands.
	4. **Support** appropriate regulatory actions to facilitate the use of HAPS, including modifying regulatory provisions in currently identified bands and identifications in candidate bands
	5. **Invite** developers of HAPS to test and do trials in African areas with heavy-rain in order to test the robustness of the systems with respect to high attenuation (due to rain-fade).
AI 1.15 Land-mobile and fixed service applications in 275-450 GHz *(Annex 2-04)*	*The APM19-2 agreed to:* 1. **Encourage** administrations to closely follow the ongoing studies on the identification of frequency bands in the range 275-450 GHz for Land Mobile and Fixed Service applications to ensure the protection of passive services identified in No 5.565.

10.2 *Chapter 2: Broadband applications in the mobile service*

Agenda Item (annex number)	APM19-2 Outcomes

AI 1.13
Additional spectrum identification for IMT between 24.25 and 86 GHz
(Annex 2-05)
	The APM19-2 agreed to:
	• **For the 26GHz band (24.25-27.5 GHz frequency range)**
	    1. **Designate** the 26GHz band as a priority candidate band for IMT identification under Resolution 238 (WRC15).
	    2. **Support** sharing and compatibility studies for the band and urge administrations to contribute and actively participate in the studies.
	    3. **Note** that ICAO does not support any identification of the frequency band for IMT that could impact aviation systems, within new or existing allocations to the mobile service in the frequency range 24.25 to 86 GHz, unless agreed ITU-R studies demonstrate no adverse impact to those systems. According to ICAO, the frequency band 24.25 – 24.65 is used for airport surface detection equipment (ASDE)in other regions outside of Africa.
	    4. **Note** that Cote d'Ivoire and Ghana had proposed that APM waits for compatibility and sharing study results before a final position on the frequency band is taken. However, the meeting clarified that considering the frequency band as a candidate band for identification did not translate to a decision on its allocation but rather also intended to ensure that studies on that band are considered a priority.

5. **Note** that the band is adjacent to 28 GHz band where some countries in other regions are carrying out trial 5G operations.

6. **Note** the need for compatibility studies with adjacent bands due to the fact that this band is adjacent to the band 27.5-29.5 being studied for ESIMS.

- **For the 32GHz band (31.3-33.4 GHz frequency range)**
  1. **Support** the identification of the 32GHz band as a candidate for IMT under Resolution 238 (WRC15).
  2. **Support** sharing and compatibility studies for the band and urge administrations to contribute and actively participate in the sharing and compatibility studies.

- **For the 40GHz band (37-40.5; 40.5-42.5; 42.5-43.5 GHz frequency range)**
  1. **Designate** the 40GHz band as a priority candidate for IMT identification under Resolution 238 (WRC15).
  2. **Support** sharing and compatibility studies for the band and urge administrations to contribute and actively participate in the studies.
  3. **Note** that part of the band is also being considered under AI 1.6 with respect to regulatory framework for non-GSO FSS satellite systems. The AI 1.6 does not involve spectrum allocation/identification but rather regulatory framework for non-GSO FSS satellite systems in the stated four bands.

- **For the 46GHz band (45.5-47 GHz frequency range)**
  1. **Support** the identification of the 46GHz band as a candidate for IMT under Resolution 238 (WRC15).
  2. **Support** sharing and compatibility studies for the band and urge administrations contribute and actively participate in the sharing and compatibility studies.

- **For the 48GHz band (47.2-50.2GHz frequency range)**
  1. **Support** sharing and compatibility studies for the band 47.2-50.2 GHz.
  2. **Urge** administrations contribute and actively participate in the sharing and compatibility studies for the band.
  3. **Note** that the band is also being considered under AI 1.6 with respect to regulatory framework for non-GSO FSS satellite systems. It should also be noted that AI 1.6 does not involve spectrum allocation/identification but rather

	regulatory framework for non-GSO FSS satellite systems in the stated four bands.
	
	• **For the 52GHz band (50.4-52.6GHz frequency range)**
	  1. **Support** sharing and compatibility studies for the band 50.4 -52.6 GHz.
	  2. **Urge** administrations contribute and actively participate in the sharing and compatibility studies for the band.
	  3. **Note** that the band is also being considered under AI 9.1-6 and as such developments under the said AI 9.1-6 may have an impact on this band consideration under AI 1.13.
	  4. **Note** that the band is also being considered under AI 1.6 with respect to regulatory framework for non-GSO FSS satellite systems. It should also be noted that AI 1.6 does not involve spectrum allocation/identification but rather regulatory framework for non-GSO FSS satellite systems in the stated four bands.
	
	• **For the 70GHz band (66-76 GHz frequency range)**
	  1. **Support** sharing and compatibility studies for the band 66-76 GHz.
	  2. **Urge** administrations contribute and actively participate in the sharing and compatibility studies for the band.
	
	• **For the 80GHz band (81-86 GHz frequency range)**
	  1. **Support** sharing and compatibility studies for the band 81-86 GHz.
	  2. **Urge** administrations contribute and actively participate in the sharing and compatibility studies for the band.
	
	• **Organization of TG 5/1 and Ongoing studies within TG 5/1 Working Groups**
	  1. **Note** that TG 5/1 has established 4 working groups to develop as follows.
	    ▪ WG 1 – CPM text development
	    ▪ WG 2 – 30 GHz studies
	    ▪ WG 3 – 40/50 GHz studies
	    ▪ WG 4 – 70/80 GHz studies
	  2. **Note** that various studies have been submitted from ITU-R membership.
	  3. **Note** that the next TG 5/1 shall meet in Abu Dhabi from 19th to 28th September 2018.

AI 1.16 Wireless access systems, including radio local area	***The APM19-2 agreed to:*** 1. **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

networks (WAS/RLAN), in frequency bands between 5 150 MHz and 5 925 MHz *(Annex 2-06)*	the previous study results which showed that co-existence is not feasible implying that the incumbent services would not be affected. 2. **Encourage** administrations to contribute and actively participate in studies with a view to ensure protection of existing in-band and adjacent band primary services. 3. **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.
AI 9.1-1 Implementation of IMT in 1885 - 2025 MHz and 2110 - 2200 MHz *(Annex 2-07)*	***To invite APM19-2 to*** **Support** the on-going studies in WP4C and WP5D, and to urge African administration to contribute and actively participate.
AI 9.1-5 Impacts of referencing Recommendations ITU-R M.1638-1 and ITU R M.1849-1 in Nos. 5.447F and 5.450A of the Radio Regulations *(Annex 2-08)*	***The APM19-2 agreed to:*** **Support** the on-going studies in WP5A, and to urge African administration to contribute and actively participate.
AI 9.1-8 Implementation of narrowband and broadband machine-type communication infrastructures from the spectrum perspective	• **Note** the Senegal view that "*for the implementation of machine-based, narrow-band and broadband, Senegal supports studies for the development of Recommendations, Reports and / or Manuals, as well as the possibility of providing the necessary spectrum this type of network. Senegal has initiated a pilot project for "remote TV" in the 800 MHz band and proposes that compatibility studies are carried out in said band*". • **Note** the GSMA view that all IMT bands should ideally be explored and considered for IoT applications and not to exclude some of them at least at the consideration stage. GSMA believes all IMT bands have an equal potential to be used for IoT applications as part of the new IMT service offerings.
AI 9.2-2 Clarification of the use of deep space allocations in regard to certain provisions of the Radio Regulations	**No recommendation;** APM19-2 did not receive any input on this issue.

10.3 Chapter 3: Satellite services

Agenda Item (annex number)	APM19-2 Outcomes
AI 1.4 Review of Annex 7 to Appendix 30 *(Annex 2-09)*	***The APM19-2 agreed to:*** 1. **Support** the study of each limitation under **Annex 7 to Appendix 30;** studies of which these studies seek to explore ways of allowing better utilization of the orbit spectrum resource without creating undue constraints to all services in the band 11.7-12.7 GHz in all Regions. 2. **Note** that removal of these limitations should be associated with some implications on other networks currently in operation and registered successfully either in the PLAN or LIST but not implemented in some cases. 3. **Note** that removal of these limitations may allow new networks to be registered which may increase or create burdens for coordination of new assignment. 4. **Note** that the principle of the Planned bands is to allow equitable access to the spectrum and associated orbital resources, removal of these limitations will add new orbital locations and frequency assignment, these resources must be allotted to member states first which may require further studies that is not in the scope in the agenda item, and therefore removal of these limitations may deviate the current principle of the Plan. 5. **Note** that based on the above, some administrations noticed that No change method is not included in the current draft CPM text, and therefore these administrations are in the view that No change method to satisfy this agenda item may reflect concerns mentioned above. 6. **Mandate** the proponents of the "No Change" option to develop a document and submit the same as an African common proposal for consideration by the ITU Working Party 4A meeting in October 2017. It was agreed that the developed document shall be subjected to approval by ATU member states through circulation. This input document should carefully justify the proposal for explicit inclusion of the NOC option as part of the methods considering that by default NOC is a method for each agenda item.

AI 1.5 Earth stations in motion 17.7 19.7 GHz and 27.5-29.5 GHz *(Annex 2-10)*	***The APM19-2 agreed to:*** 1. **Note** that EACO study results support the identification of the frequency bands 17.7-19.7 GHz and 27.5-29.5 GHz to the different type of ESIM, under the condition that sharing and compatibility between the three types of ESIMs and existing FS services allocated in the bands are feasible (see **Info Doc 8annex - EACO ESIMs studies on protection of FS Links**). 2. **Note** that SADC sharing and compatibility studies with three different types of ESIMs operating with geostationary FSS networks and current and planned stations of the existing FS allocated in the frequency bands 17.7-19.7 GHz and 27.5-29.5 GHz indicate the co-existence is possible (see **Input 26annex - APM19-2 - Zimbabwe and Tanzania Coexistence Studies between ESIM and FS (v20June)).** 3. **Note** that study results in Ghana and Senegal further support identification of the frequency bands 17.7-19.7 GHz and 27.5-29.5 GHz for operation of the three types of ESIMs to co-exist with FS links allocated in the two identified bands; 4. **Note** the need for compatibility studies with adjacent bands due to the fact that this band is adjacent to the band 24.25-27.5 GHz being studied for IMT; 5. **Conclude** that there is an increasing need for mobile-satellite broadband communications and given the studies conducted both in ITU-R WP4A and by the sub-regions and countries identification of the frequency bands 17.7-19.7 GHz and 27.5-29.5 GHz for ESIM operations can be supported whilst ensuring protection of, and not imposing undue constraints on, other existing primary services allocated in these frequency bands. 6. **Conclude** that each sub-region and countries having carried out the detail studies should submit their findings and report to the forthcoming meeting of WP4A as a sub-regional or country specific contribution.
AI 1.6 Non-GSO FSS satellite systems in 37.5-39.5 GHz and 39.5-42.5 GHz *(Annex 2-11)*	***The APM19-2 agreed to:*** 1. **Support** the studies under Resolution 159 (WRC-15) which aim at developing a regulatory framework for new non-GSO FSS satellite systems, while protecting GSO FSS systems in the frequency bands above 30 GHz. 2. **Encourage** administrations to contribute towards further development of the three working documents in WP4A. 3. **Note** that the overlap in frequency bands with other AIs should not be an issue because this AI does not involve spectrum allocation/identification but rather regulatory framework for non-GSO FSS satellite systems in the stated four bands.
AI 7 **Issue A** Studies relating to the BIU of frequency assignments to non-GSO satellite	***The APM19-2 agreed to:*** 1. **Encourage** administrations to support, contribute and actively participate in the studies; 2. **Note** that the milestone approach is the most favoured option at this stage; 3. **Note** that studies are currently focusing on non-GSO FSS.

systems, and consideration of a milestone-based deployment approach for non-GSO FSS satellite systems in certain bands *(Annex 2-12)*	4. **Note** that Report ITU-R SA.2348-0 identifies some of the regulatory challenges which this proposal for a simplified regulatory regime would seek to address in dealing with non-GSO small satellites with short duration missions**.**
Issue B Application of coordination arc in the Ka-band, to determine coordination requirements between the FSS and other satellite services *(Annex 2-12)*	*The APM19-2 agreed to:* **Support** the studies and to urge African administrations to contribute and actively participate in the studies.
Issue C Issues for which consensus was readily achieved in the ITU-R *(Annex 2-12)*	*The APM19-2 agreed to:* **Support** the WP4A proposal of treatment of non-contentious issues: the collection of several different topics that are viewed as being straightforward and for which consensus was readily achieved within ITU-R study groups into Issue C in order to enable the efficient work of WRC-19 and preparation thereof.
Issue D Identification of those specific satellite networks and systems with which coordination needs to be effected under RR Nos. 9.12, 9.12A and 9.13 *(Annex 2-12)*	*The APM19-2 agreed to:* **Support** the proposal which seek to have the BR provide more information for satellite coordination: this information would help administrations when undertaking coordination by the provision of more coordination information the before.
Issue E Harmonization of RR Appendix 30B with RR Appendices 30 and 30A *(Annex 2-12)*	*The APM19-2 agreed to:* **Support** studies to facilitate developing countries to have better access to satellite resources provided in Appendix 30A and 30B.
Issue F Concerns with the lack of implementation	*The APM19-2 agreed to:* **Support** studies to facilitate developing countries to have better access to satellite resources provided in Appendix 30A and 30B.

of certain provisions of the Radio Regulations that can lead to difficulties during the process of entering an assignment into the RR Appendix 30B List *(Annex 2-12)*	
Issue G Updating the reference situation for networks under RR Appendices 30 and 30A when provisional recording is used *(Annex 2-12)*	***To invite APM19-2 to*** **Support** studies. It was noted that the current 4 month could be inadequate to ensure the any level of protection of existing and incoming networks. A solution which involves agreement between existing and incoming networks is preferred.
Issue H Modifications to RR Appendix 4 data elements to be provided for non-geostationary satellite networks/systems *(Annex 2-12)*	***The APM19-2 agreed to:*** **Support** studies considering the potential benefit of this issue to developing countries.
AI 9.1-2 Compatibility of IMT and BSS (sound) in the frequency band 1 452-1 492 MHz in Regions 1 and 3 *(Annex 2-13)*	***The APM19-2 agreed to:*** 1. **Encourage** administrations to contribute and actively participate in the studies in order to ensure protection of incumbent services including IMT in the range 1452 – 1492MHz. 2. **Note** the good progress on this agenda item within the responsible ITU-R WP, namely WP 4A and WP 5D. 3. **Note** that some countries have or plan to implement services other than IMT in part or whole of the range.
AI 9.1-3 New non-Geo-satellite orbit systems in 4/6GHz bands allocated FSS *(Annex 2-14)*	***The APM19-2 agreed to:*** 1. **Note** that ITU-R studies so far show that it would be difficult to operate non-GSO circular orbit system for the purposes of global broadband network in the 6/4 GHz frequency bands. 2. **Encourage** administrations to review studies conducted on the issue in time, and make proposals during the next ITU-R Study Group 4 approval process of the studies. 3. **Task** WG3 to lead in the review process envisaged under 2 above.

Agenda Item (annex number)	APM19-2 Outcomes
AI 9.1-9 Spectrum needs and possible allocation of the frequency band 51.4-52.4 GHz to the FSS (E-to-s) ***(Annex 2-14)***	***The APM19-2 agreed to:*** 1. **Support** studies on evaluation of additional spectrum needs for development of the FSS in accordance with resolves to invite ITU-R 1 of Resolution 162 (WRC 15). 2. **Support** sharing and compatibility studies with existing services for the consideration of a new primary allocation to the FSS in the frequency band 51.4-52.4 GHz (Earth-to-space) limited to FSS feeder links for geostationary orbit use as long as the protection of existing services are ensured. 3. **Recall** that 52% of responding countries to the ATU Questionnaire on the possible allocation of the band to FSS stated that they would support the allocation. 4. **Invite** administrations to consider developments under AI 1.13 due to potential overlaps of the bands.

10.4 Chapter 4: Science services

Agenda Item (annex number)	APM19-2 Outcomes
AI 1.2 In-band power limits for earth stations in 401-403 MHz and 399.9-400.05 MHz ***(Annex 2-15)***	***The APM19-2 agreed to:*** • **Support** the studies for the in-band power limits for earth stations operating in the mobile-satellite service, meteorological-satellite service and Earth exploration-satellite service in the frequency bands 401-403 MHz and 399.9-400.05 MHz to ensure protection of existing and future meteorological operations. In this regard, APM19-2 is invited to urge African administrations to contribute and actively participate in the studies.
AI 1.3 Meteorological-satellite and Earth exploration-satellite services in 460-470 MHz ***(Annex 2-16)***	***The APM19-2 agreed to:*** • **Encourage** administrations to contribute and actively participate in the studies being carried out in accordance with **Resolution 766 (WRC 15)** whilst maintaining a "no change " to the current allocation status until studies prove that incumbent services are adequately protected with no additional constraints imposed on them. This view was informed by the heavy deployment of Mobile and Digital terrestrial television (DTT) services in the band and adjacent band in the majority of the African countries which need to be protected.
AI 1.7 Telemetry, tracking and command in the space operation service for non-GSO satellites with short duration missions	***The APM19-2 resolved to***: • **Support** the ongoing studies and to urge ATU administrations to contribute and actively participate in the studies with a goal of ensuring protection of incumbent services, including the safety of life COSPAS – SARSAT system operating in the 406 – 406.1 MHz band.

Agenda Item (annex number)	APM19-2 Outcomes

(Annex 2-17)

10.5 Chapter 5: Maritime, aeronautical and amateur services

Agenda Item (annex number)	APM19-2 Outcomes
AI 1.1 Amateur service in 50-54 MHz in Region 1 *(Annex 2-18)*	***The APM19-2 agreed to:*** 1. **Note** that SADC resolved to support the allocation of the 50 – 54 MHz band to amateur service considering among others that in most SADC countries the range is already allocated to amateur on a primary basis. 2. **Support** the allocation of 50 – 54MHz (or part thereof) to the Amateur service in principle ***subject*** to favourable compatibility studies with the incumbent services – final study result to inform the final decision.
AI 1.8 Global Maritime Distress Safety Systems (GMDSS) *(Annex 2-19)*	***The APM19-2 agreed to:*** 1. **Support** studies on GMDSS Modernization following related activity in the IMO, in accordance with **Resolution 359 (Rev.WRC 15).** 2. **Support** introduction of additional satellite operator in the GMDSS, subject to IMO approval, in order to achieve, redundancy and global coverage in maritime safety services. 3. **Encourage** administrations to contribute to the development of suitable CPM text on the actual regulatory measures that could give effect to the objective in 1 and 2 above.
AI 1.9-1 Autonomous maritime radio devices, and *(Annex 2-20)*	***The APM19-2 agreed to:*** 1. **Urge** administrations to ensure that any change to the regulatory provisions and spectrum allocation resulting from this agenda item do not adversely impact existing services. 2. **Support** the ongoing studies to protect the GMDSS system and the AIS devices that is crucial for maritime safety from the autonomous maritime devices.
AI 1.9-2 New VDES satellite component *(Annex 2-21)*	***The APM19-2 agreed to:*** **Urge** administrations to ensure that any change to the regulatory provisions and spectrum allocation resulting from this agenda item do not adversely impact existing services.
AI 1.10 Global Aeronautical Distress and Safety System (GADSS) *(Annex 2-22)*	***The APM19-2 agreed to:*** 1. **Support** regulatory provisions that facilitate the implementation of the Global Aeronautical Distress and Safety System (GADSS) in accordance with ICAO's requirements, while protecting incumbent services. 2. **Task** WG5 to review the provisions contained within Chapters VI, VII and VIII (Articles 21–45) of the Radio Regulations related to aeronautical use of frequencies to determine whether any additional or modifications to existing provisions are required.
AI 9.1-4	***The APM19-2 agreed to:***

Stations on board sub-orbital vehicles *(Annex 2-23)*	1. **Support** the ongoing studies and encourage active participation in order to positively influence the outcomes of the studies. 2. **Request** the Secretary General to source experts who could conduct short seminars on the complex agenda items such as this one (i.e. AI 9.1-4).

10.6 Chapter 6: General issues

Agenda Item (annex number)	APM19-2 Outcomes
AI 2 Updating of ITU-R Recommendations incorporated by reference in the Radio Regulations	**No recommendation;** APM19-2 did not receive any input on this item.
AI 4 Review of resolutions and recommendations of previous WRCs	**No recommendation;** APM19-2 did not receive any input on this item.
AI 8 Deletion of country footnotes or country names from footnotes.	*The APM19-2 agreed to:* 1. **Note** that it is desirable that preparations for AI 8 (footnotes) commence early in order to resolve the potential impact or issues on other administrations; and therefore, 2. **Encourage** administrations who wish to bring issues under AI 8 to use the ATU preparatory platforms (notably the WGs and APMs) to bring to the attention of other administrations of such issues with a view to identifying and resolving any potential issues that may arise, at an early stage. 3. **Note** the ITU recommendation and invitation to administrations to indicate as soon as possible the footnote that they would like to modify. It was observed that this recommendation is consistent with numbers 1 and 2 above and therefore valid. 4. **Note** the ICAO invitation that countries named regarding AI 8 in their contribution document (***Input 01 - APM19-2 - ICAO Positions on WRC-19 Agenda Items***) to kindly review their respective footnotes which ICAO said could have an negative impact on radio navigation services in their current form.
AI 9.1-6 Wireless Power Transmission (WPT) for electric vehicles *(Annex 2-24)*	*The APM19-2 agreed to:* 1. **Support** the ongoing sharing and compatibility studies between Wireless Power Transfer (WPT) systems and existing services. 2. **Note** that the 85kHz band is the preferred band with high probability of harmonisation and is the least likely to cause interference to other services. 3. **Urge** administrations to contribute to and actively participate in the ongoing studies to ensure that existing services are protected from spurious and out of band emissions from WPT applications, and to positively influence the outcome of the studies.

	4. **Note** the ICAO concern regarding the impact modulation on aviation systems. 5. **Note** that WP 1B Report ITU-R SM.2303 contains the potential impact/effects of radiation from WPT systems and invited administrations to consider the information.
AI 9.1-7 1.Uplink transmissions of terminals of No. 18.1, and 2.Unauthorized operation of earth station terminals *(Annex 2-25)*	***The APM19-2 agreed to:*** 1. **Support** the ITU-R studies on best practices in training and monitoring capabilities, along with ITU developed reports and handbooks as well as capacity building, to assist national administrations in inhibiting the use of unauthorized uplink earth terminals and to enable national administrations to locate and terminate the unauthorized transmissions. 2. **Request** WP 1B to explore a possibility of a monitoring tool for developing countries as part of the studies. 3. **Note** the concerns of several administrations affected by unauthorized operation of earth stations terminals and observed that there is need to find a lasting sustainable solution to addressing the issue considering its potential impact on compromising the security and economies of the affected countries. These administrations requested the meeting to support additional measures needed to limit the unauthorized uplink transmission. 4. **Task** WG6 to carefully consider this important issue, which was supported by both ATU and ASMG at WRC-15, and develop a draft ATU common proposal for the work of WP1B, taking into account the relevant timelines. 5. **Note** the pledge by ECOWAS to share the results at APM19-3 of their ongoing study related to this issue. The meeting welcomed this initiative.
AI 10 WRC-23 Agenda	***The APM19-2 agreed to:*** 1. **Urge** administrations and WG6 to actively consider possible issues for discussion under this agenda item with a view to resolving any possible arising issues at an early stage: doing so would avoid the past experience whereby AI 10 issues are raised during the concluding stages of WRC thereby presenting significant challenges in the thorough considerations of the issues. 2. **Task** WG6 to spearhead considerations of possible issues under this agenda item and advise future APMs on possible causes of action.

11   OTHER BUSINESS

- **Considering** the complexities of AI 7, the **ATU SG** was requested to request ITU to conduct a seminar on the agenda item in order to appraise the next APM on some of the issues to help

in the next APM to take informed decisions on the AI. The seminar to be done during the next APM. This proposal was made by Cote d'Ivoire.

- **Cote d'Ivoire** invited all interested to attend the workshop on IPV6 planned to take place in Abidjan from 25-29 September, 2017. They also announced their candidature for ITU Council and asked the support of all African administrations.

- **South Africa:** (1) announced the intention to stand for ITU council membership as well as ITU Radio Regulations Board (RRB) and requested for the support of the administrations; (2) Lamented the lack of active participation and proactivity of some of the ATU WRC-19 rapporteurs, and called for a review of the performance of the rapporteurs; (3) expressed a concern regarding the participation of the industry in decision meetings in terms of their full participation in directly influencing decisions. In South Africa's view, decision making ought to be a reserved for member states.

- **Nigeria** informed the meeting of the candidature of **Mr. William IJEH** for the post of BDT Director as well as re-election for ITU council membership and sought the support for the candidatures. The meeting noted the candidatures.

- **Zimbabwe** informed the meeting of the candidature of **Dr. Cosmas ZAVAZAVA** for the post of BDT Director and sought the support for the candidature. The meeting noted the candidature.

- **Senegal** informed the meeting of their candidature re-election for ITU council membership and sought the support for the candidatures. The meeting noted the candidature.

- **AUB** made a presentation on challenges and opportunities associated with digital migration in Africa and the need to reserve some portion of spectrum, especially in the UHF for the future introduction of emerging technology of HDTV and UHDTV. The meeting appreciated this information presented. Both AUB and ATU pledged continued cooperation in the shared quest to spur ICTs in Africa including broadcasting.

- **ATU General Secretariat** announced the planned future ATU events as per **Annex 4** (ATU planned activities for the period October 2017 to September 2018. The meeting noted the planned activities.

12   DATE AND VENUE OF THE NEXT MEETING (APM19-3)

The proposed date for APM19-3 is 17-21 September 2018.The ATU SG to consult on the venue and announce accordingly.

13   ADOPTION OF REPORT

This report was adopted at about **12:45 Hours** on Friday **15 September 2017** as a true record of the proceedings of the meeting subject to editorial improvements only.

14   VOTE OF THANKS

The delegate of Uganda, **Mme Ramlah HUSSEIN**, gave the vote of thanks on behalf of the meeting participants in which she expressed profound gratitude to: (1) The president of the Republic of Senegal His Excellency **Macky SALL**; (2) The Government of the Republic of Senegal and the Autorité de Régulation des Télécommunications et des Postes (ARTP), and; (3) The People of Senegal in general, for the great support and hospitality shown towards ATU and its activities including the meeting. She extolled them all for the excellent goodwill will towards the meeting, which she said,

guaranteed the success of the meeting. She also thanked all the stakeholders, partners, CEPT and CITEL, logistical staff and interpreters for their unique roles in enriching and contribution to the success of the meeting. In equal measure, she appreciated the ATU Secretary General for facilitating the meeting.

The delegate of Inmarsat, **Mr. Mademba CISSE**, read-out the vote of thanks on behalf of the industry participants as found in **Annex 5**.

15   CLOSING REMARKS

The meeting noted closing remarks from the following officials:
- **Mr. Moda SEYE,** representative of the DG ARTP Senegal;
- **Mr. Papa CIRE CISSE**, the meeting Chairman;
- **Mr. Abdoulkarim SOUMAILA**, ATU Secretary General;
- **Mr. Modou Mamoune NGOM,** representative of the Ministry of ICTs of Senegal, who declared the meeting closed and wished everyone bon voyage.

16   LIST OF APPENDICES

Appendix 1: List of annexes
Appendix 2: List of referenced input documents
Appendix 3: List of referenced information documents
Appendix 4: List of input documents
Appendix 4: List of information documents

16.1 Appendix 1: List of Annexes

1. Annex 1 - APM19-2 List of participants
2. Annex 2a - APM19-2 Opening speech by Ms. Souhila AMAZOUZ, representative of the AUC
3. Annex 2b - APM19-2 Opening speech Mr. Modou NGOM, representative of the Ministry of ICTs of Senegal
4. Annex 2c - APM19-2 Opening speech by Mr. Mario MANIEWICZ, Deputy Director of BR
5. Annex 2d - APM19-2 Opening speech by Mr. Abdou Karim SALL, DG ARTP Senegal
6. Annex 3 - APM19-2 Agenda
7. Annex 4 - ATU planned activities - Oct 2017 to Sep 2018
8. Annex 5 - Industry Vote of Thanks

16.2 Appendix 2: List of Referenced Input Documents

1. Input 06 - APM19-2 - GSA contribution on 3300 MHz
2. Input 06(annex) - APM19-2 - 3GPP liaison statement to ATU on 3300MHz channelling
3. Input 10 - APM19-2 Facebook contribution on AI 1.14 (HAPS)
4. Input 13 - APM19-2 - GSMA contribution on L-band (channelling) harmonisation
5. Input 26annex - APM19-2 - Zimbabwe and Tanzania Coexistence Studies between ESIM and FS (v20June)

16.3 Appendix 3: List of Referenced Info Documents

6. Info Doc 2 - APM19-2 Inmarsat - Update on ESIMs Harmonised regulatory framework implementation
7. Info Doc 3 - APM19-2 - ITU BR-CPM19-2, RA-19, WRC-19 preparations
8. Info Doc 4 - CEPT organization and status of WRC-19 preparations
9. Info Doc 6 - CITEL organization and status of WRC-19 preparations
10. Info Doc 8 - EACO strategy for WRC-19 preparation
11. Info Doc 8annex - EACO ESIMs studies on protection of FS Links
12. Info Doc 9 - ECOWAS strategy for WRC-19 preparation and status update

13. Info Doc 10 - SADC strategy for WRC1-9 preparation and status update

16.4 Appendix 4: List of Input Documents

1. Input 01 - APM19-2 - ICAO Positions on WRC-19 Agenda Items
2. Input 02 - APM19-2 - Boeing contribution on AI 1.6
3. Input 02 - APM19-2(FR) - Boeing contribution on AI 1.6
4. Input 03 - APM19-2 - Boeing contribution on AI 9.1-3
5. Input 03 - APM19-2(FR) - Boeing contribution on AI 9.1-3
6. Input 04 - APM19-2 - Intelsat contribution on AI 7 issue E
7. Input 05 - APM19-2 - Intelsat contribution on AI 7 issue G
8. Input 06 - APM19-2 - GSA contribution on 3300 MHz
9. Input 06(annex) - APM19-2 - 3GPP liaison statement to ATU on 3300MHz channelling
10. Input 07 - APM19-2 SES contribution on AI 1.13
11. Input 08 - APM19-2 SES contribution on AI 7
12. Input 09 - APM19-2 - Senegal preliminary Positions on WRC-19 Agenda Items
13. Input 10 - APM19-2 Facebook contribution on AI 1.14 (HAPS)
14. Input 11 - APM19-2 - South Africa proposal on Non-GSO Simplified Regulatory Regime to ITU-R WP4A (AI 7)
15. Input 12 - APM19-2 - GSMA contribution on AI1.13 (IMT)
16. Input 13 - APM19-2 - GSMA contribution on L-band (channelling) harmonisation
17. Input 14 - APM19-2 - SADC contribution on AI 1.11
18. Input 15 - APM19-2 - SADC contribution on AI 1.12
19. Input 16 - APM19-2 - SADC contribution on AI 1.14
20. Input 17 - APM19-2 - SADC contribution on AI 1.15
21. Input 18 - APM19-2 - SADC contribution on AI 1.13 (IMT)
22. Input 19 - APM19-2 - SADC contribution on AI 1.16
23. Input 20 - APM19-2 - SADC contribution on AI 9.1-1
24. Input 21 - APM19-2 - SADC contribution on AI 9.1-5
25. Input 22 - APM19-2 - SADC contribution on AI 1.2
26. Input 23 - APM19-2 - SADC contribution on AI 1.3
27. Input 24 - APM19-2 - SADC contribution on AI 1.7
28. Input 25 - APM19-2 - SADC contribution on AI 1.4
29. Input 26 - APM19-2 - SADC contribution on AI 1.5
30. Input 26annex - APM19-2 - Zimbabwe and Tanzania Coexistence Studies between ESIM and FS (v20June)
31. Input 27 - APM19-2 - SADC contribution on AI 1.6
32. Input 28 - APM19-2 - SADC contribution on AI 9.1-2
33. Input 29 - APM19-2 - SADC contribution on AI 9.1-3
34. Input 30 - APM19-2 - SADC contribution on AI 7 (satellite regulations)
35. Input 31 - APM19-2 - SADC contribution on AI 1.8
36. Input 32 - APM19-2 - SADC contribution on AI 1.10
37. Input 33 - APM19-2 - Egypt views for AI 1.4 Review of Annex 7 to Appendix 30
38. Input 34 - APM19-2 - Egypt views for AI 9.1-7 Unauthorized operation of earth station terminals
39. Input 35 - APM19-2 - Chair WG19-1 CG on PPDR SADC Guidelines for PPDR Spectrum
40. Input 35annex - APM19-2 - Chair WG19-1 CG LS from ITU-R WP 5A calling for PPDR ranges
41. Input 36 - APM19-2 - EACO Contributions (Rev2)
42. Input 37 - APM19-2 - Guinee contribution on AI 1.16
43. Input 38 - APM19-2 - Cameroun contributions

16.5 Appendix 5: List of Info Documents

1. Info Doc 1 - APM19-2 Information Document on L-band Frequency Arrangement CG August 2017

2. Info Doc 1annex - APM19-2 Proposed Frequency Arrangement for 1 427-1 518 MHz
3. Info Doc 2 - APM19-2 Inmarsat - Update on ESIMs Harmonised regulatory framework implementation
4. Info Doc 2annex - APM19-2 Inmarsat –ATU ESIMs Draft Mutual Licence and Type Approval Recognition Framework
5. Info Doc 3 - APM19-2 - ITU BR-CPM19-2, RA-19, WRC-19 preparations
6. Info Doc 4 - CEPT Presentation Regional Org Sept 2017 (for APM19-2)
7. Info Doc 5 - WhiteSpace Forum tutorial-on-TV-WhiteSpaces
8. Info Doc 6 - CITEL Presentation Sept 2017 (for APM19-2)
9. Info Doc 7 - Eutelsat - Innovative broadband by satellite and the WRC-19 cycle
10. Info Doc 8 - EACO strategy for WRC-19 preparation and status update
11. Info Doc 9 - ECOWAS strategy for WRC-19 preparation and status update
12. Info Doc 10 - SADC strategy for WRC1-9 preparation and status update

———————