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| **The South Asian Telecommunication Regulators’ Council** **(SATRC) Workshop on Spectrum Management**18 – 20 December 2019, Goa, India |

**CONCEPT NOTE**

1. **Background**

The 19th Meeting of the South Asian Telecommunication Regulators’ Council (SATRC-19) held in Islamabad, Pakistan from 13 to 15 December 2018 approved the SATRC Action Plan Phase VII for the implementation period of 2019-2020. SATRC Action Plan consists of three basic activities: working groups, capacity building workshops and web portal. SATRC Workshops are held as part of activities under capacity building with the objective of developing the capacity of human resources of the regulators of SATRC Members.

Three work items were identified for the activities of SATRC in relation to spectrum management during the implementation of SATRC Action Plan Phase VII:

* Assessment of current practices in spectrum management and developing spectrum roadmap
* Spectrum re-farming
* Spectrum consideration for the deployment of IoT
1. **The South Asian Telecommunication Regulators’ Council (SATRC) Workshop on Spectrum Management**

The SATRC Workshop on Spectrum Management will be held as part of implementation of SATRC Action Plan Phase VII. The objective of the workshop will be to give an in-depth analysis on the work items under the SATRC Working Group on Spectrum in order to increase the understanding on those issue. Important issues such as spectrum licensing and pricing, spectrum re-farming and developing spectrum roadmap will be discussed in depth. In addition, the workshop will also share the outcomes of World Radiocommunications Conferences 2019 (WRC-19) and it’s implication for spectrum management. It will give an opportunity for the SATRC Members to share their experiences and future plan on spectrum management. A number of eminent experts and speakers will be invited to conduct the workshop.

1. **Expected outcomes**
* Enhanced understanding of the SATRC Members on above mentioned work items on Spectrum Management
* Discussion will provide guideline to SATRC Working Group on Spectrum to develop tangible outcomes on the work items during the implementation of SATRC Plan Phase VII.
1. **Host, timing and location**

The SATRC Workshop on Spectrum Management will be held from 18 to 20 December 2019 in Goa, India. It will be hosted by Telecom Regulatory Authority of India (TRAI). Details are provided in Information for Participants.

1. **Contact**

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| **APT Secretariat** | **Local Secretariat** |
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1. **Tentative Programme**

The tentative programme of SATRC Workshop on Spectrum Management is provided in Annex A.

**Annex A**

**Tentative Programme**

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| **Time** | **Wednesday, 18 December 2019** |
| 09:30 – 10:00 | **Opening** * Welcome Address by APT
* Address by Chairman, SATRC Working Group on Spectrum
* Welcome Address by TRAI

 (Group Photograph) |
| 10:00 – 10:45 | Session 1 – ***SATRC Working Group on Spectrum**** Activities of the SATRC Working Group on Spectrum (10 min)
* Activities of APT in spectrum management (15 min)
* Keynote Presentation on ‘Economics of Spectrum Management’ (20 min)
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| 10:45 – 11:00 | **Coffee/Tea Break** |
| 11:00 – 12:30 | Session 2 – ***Outcomes of WRC-19 and what to do next**** Understanding the process of WRC (20 min)
* Outcomes of WRC-19 (30 min)
* What needs to be done following WRC-19 (15 min)
* Interactive discussion on experience and various aspects of the outcomes of WRC-19 (25 min)
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| 12:30 – 14:00 | **Lunch Break** |
| 14:00 – 15:30 | Session 3 – ***Assessment of current practices in spectrum management and developing spectrum roadmap: National Long-Term Strategies for Spectrum Utilization***Wireless technology is evolving rapidly and spectrum management practices need to be modified as per time demand - with clear formulation of spectrum roadmaps. To ensure that consumers and businesses have access to new wireless technologies and new services are introduced in timely manner. SATRC countries have put in place several spectrum management practices and strategies. However, this is becoming more challenging due to the unbalanced pace of development in technology and services. In addition, the implementation of spectrum management framework and allocation often take a considerable amount of time to take effect. A spectrum roadmap is essential to ensure there is enough spectrum to meet surging demand for new services. Development of Spectrum Roadmap is required to forecast future and increase certainty about the regulators future allocation plans and spectrum management. In this session the various aspects of the spectrum management’s practices and essential components of developing a spectrum roadmap will be discussed in details. Following topics will be covered: * *Planning spectrum use, national frequency allocation plan, spectrum audit, national interest vs. socio-economic interests (Academic lecture 40 min)*
* *Current practices of spectrum management in SATRC countries (from 2 SATRC Members, 30 min.*
* *Question and answer (20 min)*
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| 15:30 – 15:45 | **Coffee/Tea Break** |
| 15:45 - 17:15 | Session 3 – ***Assessment of current practices in spectrum management and developing spectrum roadmap (continue…)***In this session will continue on the previous session. Following topics will be covered in this session: * *Essential components and considerations to develop spectrum roadmap or national spectrum strategy (30 min)*
* *Best practices of developing spectrum roadmap/national spectrum strategy from around the world (30 min)*
* *Interactive discussion (30 min)*
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| **Time** | **Thursday, 19 December 2019** |
| 9:00 – 10:30  | Session 4 – ***Spectrum Authorization: Licensing and Pricing*** Spectrum licensing and pricing mechanism still an important issues for the regulators in order to get maximum benefits for the people and the industry. This session will look into various aspects of spectrum licensing and pricing including an in depth analysis, current practices in South Asian Countries and globally and the views of the industry for spectrum licensing and pricing. The session will focus on some of the following issues:* *Spectrum rights, assignment and licensing procedures (30 min)*
* *Delivering a spectrum licensing and pricing regime that meets the needs of all: Revenue maximization vs. socio-economic development; cost benefit analysis (30 min)*
* *Case study of India for determining the price for spectrum (30 min)*
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| 10:30 – 10:45 | **Coffee/Tea Break** |
| 10:45 - 12:15 | Session 5 – ***Spectrum Authorization: Licensing and Pricing***In this session will continue on the previous session. Following topics will be covered in this session: * *Unlicensed spectrum and its socio-economic impact (20 min)*
* *Spectrum sharing and secondary market for spectrum: it’s challenges and opportunities (20 min)*
* *Sharing experience of SATRC countries (30 min)*
* *Interactive discussion (20 min)*
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| 12:15 – 14:00 | **Lunch Break** |
| 14:00 - 15:30 | Session 5 – ***Spectrum licensing and pricing in the era of 5G and IoT*** 5G has the potential to accelerate the creation of connected digital future in the Asia-Pacific. Following the outcomes of WRC-19, 5G will be deployed in many countries around Asia-Pacific and worldwide. This session will look at the progress that has been made for the deployment if 5G. Specially, the context of spectrum licensing and pricing issues will be address in this session. Among the key topics will include* *How to ensure sustainable spectrum pricing that foster the development and deployment of 5G (20 min)*
* *Bands under consideration for 5G deployment and what needs to be done for the low bands for 5G and (20 min)*
* *The issues associated with C-band and potential of millimeter-wave bands (20 mins)*
* *Case studies on some recent and forth coming auctions for 5G (20 min)*
* *Interactive discussion (10 min)*
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| 15:30 – 15:45 | **Coffee/Tea Break** |
| 15:45– 17:00 | Session 6 – ***Spectrum Efficiency: Spectrum re-farming and spectrum co-ordination***As spectrum is a scarce resource, there is every reason to strive for technical efficiency in most circumstances. There are clear benefits from increasing utilization while also planning for future use of spectrum. Re-farming is a regulatory strategy to reuse the frequency resources to introduce latest wireless technologies and to improve the spectral efficiency and overall benefits. Further, spectrum coordination is an important aspects to consider for ensuring spectrum efficiency by reducing cross-boarder interferenceThis session will focus on the various aspects of spectrum re-farming including:* *Regulatory aspects of spectrum re-farming including recent case studies of recent spectrum re-farming in Asia-Pacific and globally (30 min)*
* *The process of spectrum coordination for radiocommunication services (40 min)*
* *Interactive discussion (20 min)*
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| **Time** | **Friday, 20 December 2019** |
| 09:00 – 10:30 | Session 7 – ***Spectrum as a crucial element to deliver connectivity*** Providing last mile connectivity is still a challenge in South Asian despite many efforts to tackle the digital divide in the region. Governments, service providers and other stakeholders are working together and collaborating in delivering connectivity in rural areas. No doubt that spectrum is a key element to such efforts. This session will look into the aspects of into the requirements of spectrum for such efforts and how it can be ensured that access to the necessary bandwidth is available.* *Spectrum considerations for satellite communications: Spectrum requirements for high-throughput satellites and future satellites (30 min)*
* *Efforts by other industries such as Wi-Fi, social media and other technology groups (2 representative, 40 min)*
* *Interactive discussion* (*20 min*)
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| 10:30 – 10:45 | **Coffee/Tea Break** |
| 10:45 – 11:45 | Session 8 – ***Looking into future and the way forward*** This session will look into the aspects future of spectrum management in the context of South Asia and try to find out a way forward towards the development of national spectrum strategy/roadmap. It will also update the current status of implementation of APT Frequency Information System (AFIS).* *Aspects of future spectrum management in the context of South Asia: Concept of regional harmonized licensing for industry automation and captive use (20 min)*
* *Update on AFIS (20 min)*
* *Interactive discussion (20 min)*
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| 11:45 – 12:15 | Session 9 – ***Summary of discussion and closing*** * Summary of the workshop by Chairman of SATRC WG Spectrum *(15 min)*
* Closing Remarks by Secretary General, APT *(5 min)*
* Closing Remarks by TRAI *(5 min)*
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| 12:15 – 13:30  | **Lunch Break** |
| 13:30 – 17:30 | **Local Site Visit** |