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| **The Meeting of the SATRC Working Group on Spectrum** | **SAPVIII-SPEC1/ OUT-06** |
| 21 – 23 June 2022, New Delhi, India | 28 June 2022 |

Working Group on Spectrum

**WORKPLAN FOR THE WORK ITEMS**

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| **Work Item Title** | **Approaches towards spectrum harmonization for 5G bands** |
| **Rapporteur(s)** | Ms. Roja Kiran Basukala (NTA) (Lead), Mr. Sonam Phuntsho (BICMA), Ms. Syeda Shafaq Karim (PTA)  |
| **Output** | Report  |
| **Background and Purpose** | Access to several key spectrum frequency bands have been identified internationally as fundamental to the development of the world’s mobile industry. Meeting the rapid growth in demand for mobile voice and data services will require significant additional spectrum being allocated to mobile services. 5G is expected to support significantly faster mobile broadband speeds and increasingly extensive mobile data usage - as well as to enable the full potential of the Internet of Things. The speed, reach and quality of 5G services will be heavily dependent on regulators supporting timely access to the right amount and type of spectrum, and under the right conditions.The success of 5G is dependent on harmonised mobile spectrum. Spectrum harmonisation of internationally identified spectrum bands offers many advantages:* Lower costs for consumers, as device manufacturers can mass-produce devices that function in multiple countries on a single band.
* Availability of a wider portfolio of devices, driven by a larger, international market.
* Roaming or the ability to use one’s mobile device abroad.
* Fewer issues of cross-border interference.

Some of the SATRC member countries have launched 5G services. Among the identified 5G spectrum bands from WRC-19, the regulators in the SATRC sub region should also work towards aligning with global harmonised 5G bands to achieve the greatest benefits for consumers and avoid interference along their borders. |
| **Scope** | The suggested scope of study can include the following:* + Review existing users of spectrum in potential 5G bands and identify how best to meet the increasing demands for spectrum for mobile services
	+ Identify key 5G spectrum bands (e.g. 3.5 GHz and mm wave bands) that can be potentially harmonised for SATRC countries.
	+ Discuss how best to utilise the spectrum bands for 5G to benefit from international harmonisation with better economies of scale
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| **Time Frame** | * Drafting the questionnaire by lead experts (June 2022)
* Circulation of the questionnaire to WG experts (July….2022)
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| **Utilization of Output** | Regulators, Governments, Industry Stakeholders. |

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| **Work Item**  | **Evaluation of spectrum utilization in SATRC Member countries** |
| **Rapporteur(s)** | Mr. Adib Kamrani (CRA) (Lead), Mr. Awal Uddin Ahmed (BTRC), TRAI  |
| **Output** | SATRC Report |
| **Background and Purpose** | 1. *Whereas* spectrum is a limited natural resource of great economic and social value, and demand for using the spectrum is increasing rapidly, so that, several factors force us to evaluate spectrum assigned utilization. For instance, the existence of other radio services in a similar range of frequencies according to the national allocation frequency table, economical aspects, request of other licenses, etc.
2. Sometimes administrations need to define the degree and efficiency of spectrum use, as a tool for comparison and analysis for assessing the gains achieved with new or improved technologies and which actual radio systems will be useful when developing or improved technologies and assessing the performance of existing one's systems.
3. For this, administrations need some means for evaluating the utilization of the spectrum. SUE (Spectrum Utilization Efficiency) index will be applied.
4. According to ITU-R recommendation SM.1046, SUE can be expressed by a complex criterion:

*SUE*= {*M*, *U*} = {*M*, *B*⋅*S*⋅*T*}where: *M*:useful effect obtained with the aid of the communication system *U*:spectrum utilization factor for that system.If necessary, the complex spectrum efficiency indicator may be reduced to a simple indicator: the ratio of useful effect to spectrum utilization factor: where: *B* : frequency bandwidth *S* : geometric space (usually area) *T* : time.5)To carry out the spectrum audit of spectrum held by government agencies as well as private entities and take remedial steps. The key points to be assessed in spectrum audit are:(i) how well the spectrum is being utilised with respect to quantum, geography and time. (ii) the benefits that can be derived by upgrading the technology (iii) the amount of spectrum lying unutilised with the spectrum Manager. |
| **Scope** | * To study the efficiency of spectrum utilization in SATRC countries: spectrum held by public agencies as well as other entities
* To study the efficiency of spectrum utilization in terrestrial mobile networks (such as 2G, 3G and 4G)
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| **Time Frame** | * Drafting the questionnaire by lead experts (June 2022)
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| **Utilization of Output** |  |

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| **Work Item** | **Regulatory approaches for sharing, trading and leasing of spectrum** |
| **Rapporteur(s)** | Ms. Sonia Madan (TRAI) (Lead), Mr. Kashif Ghafoor (PTA), (BTRC) |
| **Output** | Report  |
| **Background and Purpose** | Spectrum is a scarce natural resource and with growing digitalization and uptake of wireless services, demand for spectrum has been increasing and will continue to rise. To cater to the ever-increasing data demand, it is utmost important that the spectrum is used efficiently. Efficient utilization of spectrum has been the focal point for the country administrators while deciding on any spectrum-related policy. Keeping this in mind, most of the countries have permitted the mobile service providers to share exclusively assigned spectrum to them. The basic objective of spectrum sharing is to provide an opportunity to the TSPs to pool their spectrum holdings and thereby improve spectral efficiency. Sharing can also provide additional network capacities in places where there is network congestion due to a spectrum crunch. Many countries have also permitted spectrum trading and opened up a secondary market. However, with the passage of time, newer spectrum sharing techniques such as Licensed Shared Access, Licensed Assisted Access, leasing of spectrum, etc. have become prevalent in many geographies. With the deployment of 5G technology at the cusp, there will be different kinds of use cases covering almost all the economic verticals. One of the primary requirements, for the deployment of different 5G use cases, is the availability of sufficient spectrum in globally harmonized bands. For the success of 5G, it is important that infrastructure sharing including spectrum sharing and spectrum leasing are enabled to a great extent. |
| **Scope** | The suggested scope of the study can include the following:* + Benefits of spectrum sharing, spectrum trading and spectrum leasing
	+ Examination of spectrum sharing, spectrum trading and spectrum leasing regime in SATRC member countries
	+ Different techniques of spectrum sharing to examine how best these techniques can be used in meeting the increasing spectrum demands, particularly for 5G services.
	+ Spectrum leasing to meet the demand for spectrum for localized captive use such as Industry 4.0
	+ International practices
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| **Time Frame** | * Drafting the questionnaire by lead experts (June 2022)
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| **Utilization of Output** | Regulators, Governments, Industry Stakeholders. |

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| **Work Item** | **Cross-border coordination for interference in SATRC countries** |
| **Rapporteur(s)** | Ms. Syeda Shafaq Karim (PTA) (Lead), Mr. Arman Ghafari (CRA)  |
| **Output** | Report  |
| **Background and Purpose** | Radio frequency spectrum is the vital strategic natural resource for the sustainable development of the global economy and society. All the administrations have sovereign right to use the spectrum on the whole territory of their countries. Demand for more spectrum is increasing for new radio technology/services/applications. Many SATRC member countries have adopted technology neutral spectrum as per the time demand. The radio wave propagation properties of different spectrum bands for different technology/services make it challenging to fully preclude signals radiation on the territory of other countries, especially when those signals are transmitted to and from the border area of the country. Therefore, the administrations develop effective bilateral or multilateral agreements on frequency use in border areas to promote efficient spectrum utilization and avoid interference. Still the cross-border communication issues still exist in the SATRC member countries. Radio frequency monitoring is essential procedure to be used for aiding frequency coordination at the border areas. It is necessary to draft one SATRC report to serve as a useful reference for the administrations in this region to support frequency coordination affairs.It should be noted that a number of administrations in this region have specific agreements with their neighbors on the use of frequencies to avoid mutual interference between stations of these services. This report is not intended to be a replacement for any part of the cross-border agreements between administrations. The technical and operational information from the point of view of spectrum monitoring contained herein could help facilitate the sharing of terrestrial services deployed in the neighboring countries.  |
| **Scope** | * Conduct survey of existing documents & mutual agreements on cross border coordination
* Collect Member Administrations ideas/views on studied agreements
* Analyze SATRC member countries experiences on managing cross border interference issues.
* Recommend some procedures for arranging cross border interference issues among SATRC members in different services/bands
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| **Utilization of Output** | Regulators, Governments, Mobile Operators. |

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| **Work Item Title** | **SATRC action plans for the development of spectrum management infrastructure, procedure and tools** |
| **Rapporteur(s)** | Mr. M. P. Gunasinghe (TRC) (Lead); Mr. Sonam Phuntsho (BICMA) |
| **Output** | Report  |
| **Background and Purpose** | Connectivity is an important pillar for achieving the objective of digital transformation of the economy and the society. Spectrum is a key resource for delivering connectivity. Improving the policies, regulations and measures for spectrum is must doing activities for SATRC Members. Development of spectrum management infrastructure, procedure and tools plays an important role in this aspect. The objective of this work item is to study and recommend a harmonized action plan for SATRC Members for institutional development of spectrum management infrastructure, procedure and tools.  |
| **Scope** | * Study and analyse related reports, recommendations, guidelines etc published by ITU, APT, Member countries.
* Analyze SATRC member countries experiences on Spectrum Management procedures, infrastructures, and tools.
* Analyse difficulties faced by the member countries in the process of developing their spectrum management infrastructures and necessary tools.
* Study and analyse good practices on the implementation of infrastructure facilities tools along with proper spectrum management practices.
* Prepare a report with the guidelines to follow by the member countries to develop and strengthen the spectrum management procedures, infrastructures, and tools.
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| **Time Frame** | * Drafting the questionnaire by lead experts (June 2022)
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| **Utilization of Output** | Regulators, Governments, Industry Stakeholders. |