2020 TAC Working Groups

5G/IOT/v-RAN WG (Continued from 2019)

5G in low/mid/high frequency bands continues to be a topic that is critically important to the communications industry, our economy, and U.S. international competitiveness. As 5G systems are now being deployed, and 6G is being discussed among researchers worldwide, the working group is tasked in 2020 to provide information on the development and deployment of this technology, make recommendations, and provide technical insights on new developments that have arisen that the Commission should be aware of and/or address. In particular, recent industry developments in the virtualized radio access network space, such as those undertaken by the O-RAN Alliance, have the potential to disrupt conventional cellular network design and deployment. How scalable are such approaches and what time frames should be anticipated before scalability is achieved? How can v-RAN help large and small companies to become more efficient or competitive? What are the key challenges of disaggregating the network among multiple vendors? How can such disruptive technologies be tested and deployed in realistic environments? How will they evolve to keep pace with the ever increasing bandwidth requirements of cellular systems? Other topics for this Working Group include how can 5G services over mmWave bands be made more robust? How will 5G coexist with Wi-Fi in bands with existing and new unlicensed devices? What is the status of the deployment of service by verticals such as transportation, energy, health care, etc. and is any Commission action needed to encourage this deployment? Is dedicated or shared spectrum needed to support industrial IoT applications, what spectrum would be suitable for this purpose, and what are the enabling technologies to consider? Are there any other communication technology trends about which the Commission should be aware to prepare for the future beyond 5G?

Future of Unlicensed Operations WG (New WG for 2020)

Unlicensed operations play a vital role in the 5G ecosystem and continue to provide opportunities for innovation. It is critically important for the Commission to understand both the potential pathways for continued evolution of unlicensed operations as well as potential modifications of current operations that are necessary to support new services and applications. To that end, this working group will focus on a number of key topics for future unlicensed operations: (1) How do unlicensed operations continue to complement or compete with licensed services? (2) How can unlicensed operations improve the user experience and potentially become more competitive? (3) What are the new services and novel applications of unlicensed (i.e. low power IOT, personal radar, unlicensed LTE/5G NR, UWB etc.)? Are there new protocols that may improve the spectrum sharing among various services and applications? Should the Commission reevaluate certain regulations to promote such novel applications? (4) How can we enhance the use of unlicensed operations while sharing with radars (i.e. DFS in 5GHz) and what are the enabling technologies that may allow more unlicensed operations in more bands?

AI WG (Continued from 2019)

The Artificial Intelligence (AI) and Computing working group will continue its work on analyzing the ability of AI to improve the performance of telecommunications networks and the services enabled by these networks. To that end, the working group will focus on the following questions: (1) How can the results from recent programs in AI for spectrum and networking, such as the DARPA Spectrum Collaboration Challenge (SC2) and the NSF/Intel joint solicitation on Machine Learning for Wireless Networking Systems (MLWiNS), be leveraged for real-world systems and applications and for investigating new applications? (2) AI relies on curated and labeled data sets being available for algorithm development and testing: what should the parameters of such data sets be? What data sets are already available? How can new data sets be collected and made available to the community? (3) How can AI be used to extract meaningful information from data that is either already available (e.g. from the Measuring Broadband America (MBA) program) or may become available, to determine coverage, service parameters and fraudulent activities such as unauthorized spectrum usage? (4) As legitimate applications of AI start proliferating, what risks should be evaluated and what AI tools exist or should be developed to identify and mitigate harms that might arise from the proliferation of AI?

5G Radio Access Network Technology (New WG for 2020)

This working group will explore advanced technologies that may be used in 5G/6G radios, both at base stations and client devices. What is the roadmap of RAN architecture evolution in 5G/6G radios and how does it compare to the previous generations? How does the potentially disruptive network virtualization proposed by O-RAN affect the development of RF front-end and fronthaul technologies? This working group will study multi-band antennas and other RF components that comprise the entire front-end of radio transmitters and receivers and the broader implications of the convergence of the use of advanced RF system components and spectrum management policies. The work group will also consider advancements in filtering technology, feed networks, efficiency of amplifiers, analog/digital converters, and self-optimization and configurability features of these advanced components. Specifically, does incorporation of these advanced technologies and capabilities into radio equipment warrant a reexamination by the Commission of its policies and procedures pertaining to spectrum management? How can the Commission best characterize the use of advanced RF system components in the analysis of in-band and out-of-band emissions to optimize efficient use of spectrum? How can propagation modeling tools be better utilized to predict interference between systems? How might equipment authorization procedures need to be modified to better address these advanced features, especially as the worst-case configuration used during testing continues to deviate from expected performance under normal operations? Additionally, the group will address the potential for interference risks as more dynamic components and features are introduced into advanced wireless systems, which could

result in widely varying interference potential over time, particularly across broad geographic areas.