Industrial Workshop

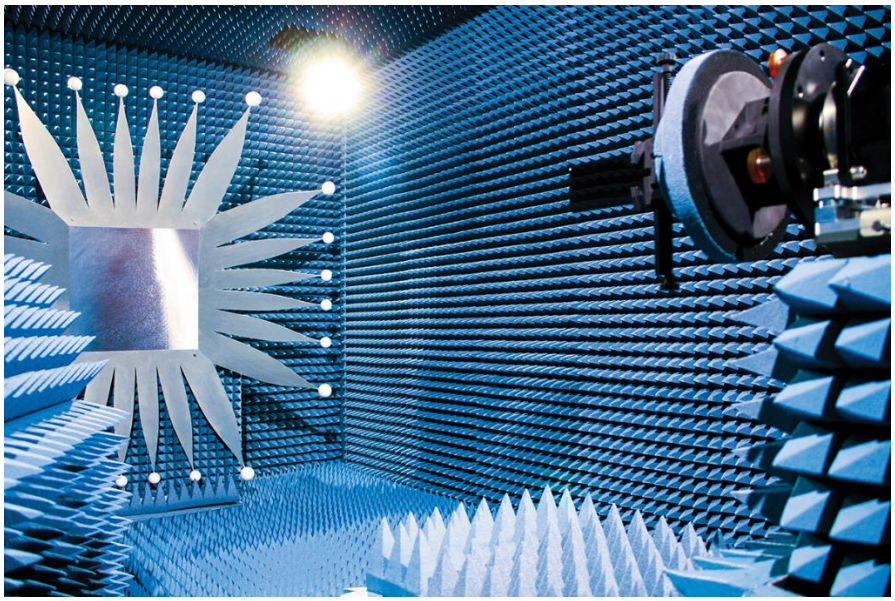
Organiser: Janet O'Neil

Company/Organisation: ETS-Lindgren

Title: Regulatory and Performance Testing Considerations for Future Wireless Communication Technologies

Abstract: Antenna design is a distinct art, combining sound engineering principals with creative and novel approaches. Design efforts can be costly and time consuming. In this workshop, speakers will address emerging test methodologies to efficiently and cost effectively validate antenna performance in a design lab environment. The significance of different test methods will be shown using near-field, far-field, and alternative test techniques. In the three presentations, attendees will learn about:

- Development and experimental evaluations of a wide-bandwidth mm-wave hybrid beamforming testbed with electrically large antenna array.
- The results of a study using a smaller near-field measurement system to accurately measure the modulation purity of a modern millimeter wave phased antenna array.
- What are the regulatory and measurement challenges with the new Wi-Fi 7 enabled devices.



Outline:

We will have three speakers from industry, each with a 30 minute presentation as follows:

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Title: Wi-Fi 6E/7: Amazing New Frontiers and Challenges…

Abstract: Wireless connectivity has had such an impact on how we conduct our daily lives. With the wires removed, suddenly we are able to be connected to almost anyone, anywhere and anytime. According to a report released by IDC Research, 3.8 billion Wi-Fi devices were forecasted to be shipped in 2023. Over the last few years, the number and complexity of the Wi-Fi standards has grown. The U.S. opened up the 6 GHz band while the EU opened up about half of the 6 GHz bands for Wi-Fi 6E, and now Wi-Fi 7. Although the Wi-Fi 7 standard has yet to be formally adopted, manufacturers have released Wi-Fi 7 products already. Each new standard offers more: more bandwidth, more data transfer, more capability. With that increase, however, comes more measurement challenges to address for regulatory approval. This presentation will review the changes and discuss the measurement challenges in achieving regulatory approval.

Speaker: Mr. Bill Koerner, Senior Application Engineer, Keysight Technologies

Biography: Bill Koerner is a Senior Application Engineer with Keysight Technologies. He started out in the original Hewlett-Packard Test & Measurement organization as an RF/Microwave Systems Engineer where he was responsible for supporting the RF and Microwave test equipment and applications, focusing on Radar, Metrology, Electronic Warfare, Satellite Communications and Cable TV. Since re-joining with Keysight, his focus is on supporting Keysight's Microwave Compliance Testing solutions, including Wireless Regulatory (Wi-Fi, Bluetooth®, Zigbee); EMC Receivers; and recently co-existence testing for medical devices. Bill is the Keysight representative to the FCC's Telecommunications Certification Body (TCB), the ETSI Broadband Radio Access Networks (BRAN) working committee and the Wi-Fi Alliance TAG working group where he brings his expertise in systems engineering and metrology to review and advise on measurement techniques to meet regulatory approval requirements.

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Title: Continued Evaluation of the Modern 5G Millimeter Wave Antenna Array Evaluation in Near- and Far-Field Environments

Abstract: The purpose of this study is to further investigate the possibility of using a smaller near-field measurement system to accurately measure the antenna

performance of a modern millimeter wave phased antenna array. The results made in near-field test system are then compared to the far-field results performed in a typical Compact Antenna Test Range (CATR). Measurements are made using modulated signals to evaluate if the complex waveforms can be accurately measured in the near field environment without significantly reducing the signal integrity. The goal of the study is to see if correlation can be found between different methods to allow a more compact and cost-effective test solution to be used for antenna evaluation.

Speaker: Mr. Jari Vikstedt, Director, Design Engineering, ETS-Lindgren

Biography: Jari Vikstedt is the Director, Design Engineering for ETS-Lindgren in Cedar Park, Texas. He has over 25 years of experience with ETS-Lindgren in developing and testing RF test solutions for EMC and Wireless applications. Mr. Vikstedt and the other engineers at ETS-Lindgren are active technical contributors to the leading wireless industry organizations, including the CTIA, 3GPP and IEEE. Recently, Mr. Vikstedt has devoted his expertise to the development of CTIA and 3GPP Over-The-Air (OTA) testing solutions as well as developing innovative 5G OTA test solutions. His research interests include developing creative test solutions to meet unique customer requirements. He holds a patent for creating a novel design for an adaptive antenna performance validation system. Mr. Vikstedt earned a BSEE degree in RF Engineering from the Turku University of Technology, Finland.

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Title: Trials and Tribulations of a Wireless and Digital Services Test Lab

Abstract: Today's modern wireless devices contain multiple radios. Examples include the many radios present in a mobile phones such as Bluetooth, WiFi, cellular, proximity payments, and GPS, to name a few. Many products today are increasingly sophisticated with wireless capabilities, from household appliances to surgical implants to complex aeronautical vehicles such as satellites. These products are required by regulatory organizations to meet industry and government issued standards to document compliance and be tested to validate intended performance. In this informal presentation, Daniel will share some of the most common design mistakes that result in a product failing to meet compliance testing. He will provide quick tips to ensure designers of wireless devices and radios meet regulatory requirements and if not, what are some common solutions to a product not passing a test.

Speaker: Mr. Daniel Churchill, Test Group Lead – Wireless and Digital Services, Cambridge Consultants

Biography: Daniel Churchill is the Test Group Lead – Wireless and Digital Services with Cambridge Consultants based in Cambridge, UK. He is a Test Engineer specialising in hardware and RF test environments. His primary responsibility is to ensure radios are working in their intended environments. He is also verifies intended performance of a wide variety of products from surgical implants to rockets. Some of these products may be quite unusual and require a special test rig, which Daniel and team are responsible for building. Due to the wide range of projects in the lab, Daniel may also be found designing an experiment or investigating new test equipment. His work includes elements of software development, prototyping and fabrication, project management, data analysis and visualisation, among a few of his responsibilities. He received his BSc degree in Physics, Satellite Technology from the University of Surrey.