



IEEE Phoenix EMC/MTT/AP Joint Chapter Meeting Announcement

New EMC Measurement Techniques for Efficient and Compliant Antenna Calibration and Test Site Validation

Complemented by Live Demonstrations

*This is a free half-day workshop, but you must register **IN ADVANCE**
no later than February 20 to assure your space.*

Date: Wednesday, February 25, 2015

Time: 1:00 pm – 2:00 pm Registration, complimentary lunch
2:00 pm – 4:30 pm Presentations, including a break between speakers
4:30 pm – 5:30 pm Demonstrations and facility tour

Speakers: Doug Kramer, Lab Manager - Wireless, EMC and Calibration, ETS-Lindgren
Zhong Chen, Product Manager - RF Materials, ETS-Lindgren

Location: Compliance Testing, LLC
1724 S. Nevada Way, Mesa, AZ 85204
Phone 480.926.1775
www.compliancetesting.com

RSVP: Register by calling or emailing Brett Gassaway - phone 480.926.1775 ext. 105,
email brettg@compliancetesting.com **SPACE IS LIMITED – RESERVE EARLY TO
SAVE YOUR SPACE!!!**

Demos: Real-world demonstrations of Time Domain Site VSWR measurements for test site
validation will follow the presentations.

TECHNICAL PROGRAM

Presentation 1: Introduction to Antenna Calibration Methods: An overview of new antenna developments, related standards, calibration and what you need to know for efficient and compliant EMC testing

By Doug Kramer, Lab Manager – Wireless, EMC and Calibration, ETS-Lindgren

Abstract: This presentation will provide an overview on antenna calibration, what it means to calibrate an antenna and why you should care. The set of operations for an antenna calibration that establish the relationship between values of quantities indicated by a measuring instrument and a reference standard will be explained. Essential concepts will be reviewed, such as metrology, verification, validation, and accreditation. Case studies will be provided on these concepts to provide practical examples of the concepts as applicable in the real-world. Finally, traceability and measurement uncertainty will be discussed according to standards such as ANSI C63.5, SAE ERP 958, IEEE 291, and CISPR 16-1-6. The presentation will conclude with a review of new antenna developments, including tips on which antenna to use for what measurement application, trade-offs in evaluating different antennas, and the new "balance test" for biconilog antennas.

Presentation 2: CISPR sVSWR versus ANSI C63® Time Domain sVSWR: A review of current and future measurement techniques for faster and more accurate test site validation

By Zhong Chen, Product Manager, RF Materials, ETS-Lindgren

Abstract: This presentation reviews the recent advances in the theory and measurement of the time domain site VSWR (TD sVSWR) method. The test setup of the TD sVSWR method resembles those included in the CISPR sVSWR method, including the antenna height, locations, and polarizations. The TD sVSWR method obviates the need to move the antennas to six positions along a 40 cm line. Instead, it uses the time domain transformation of the frequency domain data to separate the direct antenna response from the reflections in a chamber. The sVSWR can then be calculated from that data. Recent measurements have shown that the TD sVSWR method results are closely correlated to the CISPR sVSWR method results. Background information on the development of the method will be presented, as well as actual data collected from several EMC commercial test labs showing the sVSWR using both the time domain and the CISPR methods. Extensive data analyses will be presented showing the benefits of the TD sVSWR method, including faster testing ($1/6^{\text{th}}$ of the test time), better repeatability, greater accuracy in determining defects, and lower measurement uncertainties. The TD sVSWR method is expected to be included in the latest draft version of the ANSI C63.25 standard on test site validation. Following the presentation, live demonstrations of the technique will be conducted in the semi-anechoic EMC chamber at Compliance Testing. This will provide a real-world example of the material presented and further enhance the understanding of the time domain measurement technique.

SPEAKER BIOGRAPHIES

Doug Kramer is the Manager of the Calibration/EMC/Wireless Labs for ETS-Lindgren in Cedar Park, Texas. He has over 12 years of experience in managing a commercial test laboratory and providing test solutions to a variety of customers. He holds BSEE and MSEE degrees in Electrical Engineering from the University of Nebraska-Lincoln and is the outgoing Chair of TC1 of the IEEE EMC Society. Doug supports the technical staff at ETS-Lindgren, many of whom are active contributors to the leading wireless industry organizations, including the WiMAX Forum®, CTIA – The Wireless Association®, 3GPP, and the Wi-Fi Alliance®. Prior to joining ETS-Lindgren, Doug was the General Manager for the Nebraska Center for Excellence in Electronics (NCEE), the only full service EMC, environmental and safety product testing facility in Nebraska. He is a contract Senior Assessor to ISO/IEC 17025 and is an iNARTE certified EMC Engineer, a member of the CISPR B working group and Vice Chair of the ANSI C63.5 working group. He can be reached at douglas.kramer@ets-lindgren.com.

Zhong Chen is the Product Manager, RF Materials at ETS-Lindgren, located in Cedar Park, Texas. He has more than 19 years of experience in RF testing as well as EMC antenna and field probe design and measurements. He is an active member of the ANSI ASC C63® parent committee and chairman of its Subcommittee 1 which is responsible for the antenna calibration and test site validation standards, including ANSI C63.4, C63.5 and the new C63.25. He is chairman of the IEEE 1309 committee for developing calibration standards for field probes. Zhong Chen received his M.S.E.E. degree in electromagnetics from the Ohio State University at Columbus. He may be reached at zhong.chen@ets-lindgren.com.