

## CENTRAL FLORIDA SECTION 1222

By Jeff Willey



The Central Florida Section 1222 meeting was held on October 11, 2012 and hosted by Harris Corporation in Palm Bay, Florida. Special thanks to Roger Coleman and his metrology lab staff for their efforts in helping to organize this event and its success. This was the first meeting for this section in quite some time, yet resulted in roughly 25 attendees. This relatively small turn out did not reflect the keen interest and enthusiasm for the subjects that were presented by our four speakers or for having the opportunity to network amongst other industry peers.

The day started bright and early with breakfast and introductions by Jeff Willey and Roger Coleman followed by the NCSLI International board report from Mark Lapinskes, Tektronix and NCSLI Division VP. The report featured highlights from this meeting, the recent annual conference held in Sacramento, California including strategic planning, new membership structure, international business, awards, future conferences and meetings.

First presenter of the day was Jonathan Harben, (NASA/Bionetics) discussing the robustness of the calibration process that included some particularly interesting 3-D graphics and illustrations that included two video clips illustrating both EOPR and TUR effects on True and Observed Values.

End of period reliability (EOPR) is the probability of a unit under test (UUT) test-point being in-tolerance at the end of its normal calibration interval. The idea of EOPR is similar to the process capability index often used in manufacturing, which compares the output of a process to the specification limits. In calibration, this comparison is made by testing the UUT output value to the manufacturer's specification. Observing a process to be highly



Harris Corporation Building.



Mark Lapinskes, NCSLI Division VP.

reliable infers indirectly that the test uncertainty ratio (TUR) is high and therefore the calibration process is robust. Further process analysis may not be needed; the implications of this will be discussed.

Next up Ken Sloneker (ASL US) discussing accuracies of thermometry ratio bridges and how it correlates to measurement accuracy of fixed points and SPRT's. Advances in thermometry bridge design and their testing provides an opportunity to discuss what the accuracy specifications really mean. Even the basic idea of ratio error is not easily understood. This presentation will review how ratio error converts to an error in temperature depending on all of the input parameters. Ratio bridge testing as it relates to thermometry is also discussed including why the ratio method is used. Uncertainty as it relates to traceability when

using ratio thermometry bridges is also briefly covered.

After lunch the next presenter was Jim Wachter (NASA/SMA) discussing *NCSLI RP-21* "Recommended Practice for the Assessment of ANSI/NCCL Z540.3 sub-clause 5.3."

Working Group 3 of the NCSLI 171 Calibration System Resources Committee has recently developed Recommended Practice 21 (*RP-21*). Sub-clause 5.3 prescribes the requirements for a calibration system to control the accuracy of the measuring and test equipment used to ensure that products and services comply with prescribed requirements. Sub-clause 5.3 includes the statement, "Calibration-servicing components [of the calibration system] may be considered competent to provide calibration services when they have been accredited to meet *ANSI/ISO/IEC 17025:2005*,



Jonathan Harben, NASA-Bionetics-KSC.

including the requirements of this sub-clause [5.3], or otherwise found to be in conformance by an authority acceptable to the customer.” Consequently, most U.S. accreditation bodies now offer optional accreditation to Z540.3 by including the requirements of sub-clause 5.3 in the assessment to the requirements of 17025.

The concept of *RP-21* grew out of discussions among specifiers, calibration laboratory managers, test equipment manufacturers, accreditation bodies, government organizations, metrology experts and other interested and motivated parties. These stakeholders felt that successful operation and assessment of calibration laboratories to the requirements of 17025, as extended by those of Z540.3, would be greatly enhanced by non-interpretative guidance.

Thus, Working Group 3 has endeavored to ensure *RP-21* is equally useful for: 1) technically trained assessors assigned the responsibility of assessing calibration laboratories to meet the requirements of sub-clause 5.3 of Z540.3; and, 2) calibration laboratory personnel desiring to prepare for an assessment. *RP-21* addresses each requirement of sub-clause 5.3, providing corresponding discussion, guidance, and examples, as well as information on selected topics in Z540.3 such as measurement decision risk, probability of false accept, test uncertainty ratio, and guard banding.

Next up after a two day flight adventure from Los Angeles and some other logistic challenges, Mingjian Zhao (Additel) arrived with 10 minutes to spare to give his presentation on “Improving Field Pressure



Mingjian “Jack” Zhao, Additel.

Calibrations” and demonstrated a variety of equipment that included recent improvements.

Process calibrators, digital pressure gauges, and hand pumps are widely used as pressure calibration tools in the field. Many of these tools have limitations and can be difficult to use. With this in mind Additel set out to reduce calibration uncertainty, improve efficiency, and make field calibration easier.

With the development of unique new pressure pumps, easy to use pressure calibrators, and even automated pressure calibrators for field use, field calibrations from vacuum to low inches of water and up to 10,000 psi are possible with accuracies as good as 0.02%FS. We discuss how we have dealt with environmental effects even when dealing with pressures as low as

0.1 inches of water. With the innovation of unique technologies and devices pressure calibration in the field will be more reliable and even automated calibration usually reserved for the lab, is now possible in the field.

Following all presentations, door prizes were drawn and Roger Coleman provided a guided tour of the Harris Calibration Laboratory. Spring meeting plans include the possibility of NASA – KSC or Honeywell – Clearwater as hosts. Our section is always in search of hosting locations, speakers/presenters and sponsors.

To offer your services or request copies of any of these presentations, please feel free to contact me directly anytime.

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