Albuquerque Meeting.

REGIONAL NEWS

Albuquerque

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The NCSL International Albuquerque Section held its summer meeting on June 4, 2018 at the Compa Industries/ TEVET Albuquerque Corporate Office. The meeting lasted for approximately seven hours and had 25 attendees. The meeting was led by Dilip A. Shah of E = mc3 Solutions, who has over 40 years of industry experience in metrology, electronics, instrumentation, measurement and computer applications of statistics in the Quality Assurance areas. The meeting host was Keysight Technologies, who provided both the meeting location and lunch for all attendees. Snacks and refreshments were provided throughout the meeting by the NCSL International Albuquerque Section leads.

The meeting began with an announcement of upcoming NCSL International events such as the Workshop & Symposium in late August. Then attendees were urged to become an NCSLI member if they were not already.

After the meeting opening remarks we welcomed our presenter Dilip Shah, E=mc3 Solutions. His first topic discussed measurement uncertainty. Dilip addressed why measurement uncertainty is important, what contributions to uncertainty should be considered when performing an uncertainty analysis and how to create a measurement uncertainty budget. Dilip asked the audience what they had hoped to gain from the class, which led to a great discussion about uncertainties. The various methods of performing a standard deviation was discussed, Dilip's solution being to always use the sample standard deviation since that will always lead to the correct answer. We had an in-depth discussion regarding the proper method of reporting repeatability of a measurement by using the square root of the measurements' variance.

Dilip discussed many metrology principles such as precision, accuracy, resolution, and metrological traceability. He provided an uncertainty calculation example for using a micrometer to perform a measurement. In this example, we accounted for the gage block specification, the coefficient of thermal expansion of the gage block, the controlled temperature of the laboratory environment and the calibration uncertainty. We discussed the type of contribution and the distribution of each of these accounted factors in overall measurement uncertainty.

In the afternoon, we took the developed measurement uncertainty budget from the morning and evaluated how we can apply it to a real-world application. Dilip discussed managing risk in relation to the newly published *ISO/IEC 17025* standard, which requires calibration and

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testing laboratories to evaluate and incorporate risk-based thinking when evaluating measurements. This discussion focused on *ISO/IEC 17025:2017* Clauses 7.8.4, 7.8.5 and 7.8.6. This risk analysis was based upon relating the measurements of the calibration to acceptance limits along with involved uncertainties. This pertains to how to calculate the Test Uncertainty Ratio (TUR) and the Cpk value to ensure that any associated risk is minimized. This also ties into reporting statements of conformity for a calibration with the goal of minimizing allowed risk by having a large TUR and Cpk and reducing the false rejection and acceptance risk. The risk discussion ended with a briefing on mitigating risk through guard banding. Dilip concluded with an open forum to obtain feedback from the attendees. Dilip went around the whole class and feedback was quite positive. Everyone was pleased with the training class.

The next Albuquerque section meeting will be scheduled for early 2019. We are hoping to have multiple technical presentations that relate to metrology. The meeting announcement is to follow on the NCSL International website.