

SIM Training and Development on Electrical Metrology, June 2009

Item	Date	Description	Notes
1	June 15 (morning) C. Avilés CENAM	High-accuracy DC Voltage Measurements Language: Spanish	Contents: <ul style="list-style-type: none"> - DC voltage traceability - Standard based on Josephson effect - Zener references - Scaling methods - High accuracy multimeters and calibrators
2	June 15 (afternoon) R. Elmquist NIST	DC Resistance Measurements Language: English	This workshop will describe dc resistance measurement practices suitable for maintaining traceability in National Measurement Institutes of the SIM region. The basic precepts are that the laboratory obtains traceability through transfers of standard resistors at key levels, maintains and scales the resistance unit to working standards, maintains check standards, and calibrates customer standards with appropriate uncertainties. Topics that are covered include: <ul style="list-style-type: none"> - Types and properties of standard resistors - Laboratory requirements such as measurement systems and environmental controls - Scaling techniques suitable for different resistance levels - Uncertainty budgets and types of uncertainty, basic statistical concepts, control charts, and prediction of drift in working standards.
3	June 16 (morning) P. Filipiski NRC	AC-DC Thermal Transfer Standards and Calibrations Language: English	This tutorial will concentrate on the practice of the ac-dc transfer measurements. After a short but necessary theoretical introduction, practical aspects of the ac-dc voltage and current transfer will be discussed. The topics will include: <ul style="list-style-type: none"> - Primary and secondary standards used by the leading laboratories - Practical construction of an ac-dc transfer comparator - Extensions of voltage and current ranges, - Extension of the operating frequency ranges - Practice of routine measurements and calibrations - Typical components of uncertainty. <p>If time permits, some more exotic techniques, such as fast-reverse dc measurements and ac Josephson voltage standards (ACJVS) will also be introduced.</p>
4	June 16 (afternoon) D.Slomovitz UTE	Power and Energy Measurements Language: Spanish	This tutorial will concentrate on the general theory on high precision power measurements at national and secondary calibration laboratories. However, some time will be used to discuss the performance of other related meters used for billing purposes. The topics will include: <ul style="list-style-type: none"> - Metrology bases of power and energy, - Traceability to primary standards. - Voltage dividers, measuring transformers. - Principles of power measurements: analogue instruments, adding devices, thermal converters, TDM, digital transducers. - Phase and power-factor measurements. - Energy measurements in high voltages networks. - Effects of signal distortion