

**BASIC METER SCHOOL****TENTATIVE AGENDA**

May 12 ~ 16, 2008

**MONDAY**

<b>TIME</b>	<b>SUBJECT</b>	<b>INSTRUCTOR</b>
5:30 PM	Reception – Berkshire Room Foyer - NECCE	Don Perreault
6:30	Dinner - Main Dining Room at NECCE	

**TUESDAY**

<b>TIME</b>	<b>SUBJECT</b>	<b>INSTRUCTOR</b>
8:00 AM	Welcome & Introductions	Russ Grenier
8:05	Intro. to Electricity and Electrical Formulas	Bob Lee
9:15	Break	
9:30	Single Phase Meter Components and Operation	Les Rosenau
10:45	Break	
11:00	Meter Applications	Les Rosenau
12:00 PM	Lunch	
1:00	I-210+ Singlephase	Russ Grenier
2:00	Break	
2:15	Demand Metering Principles and Applications	Les Rosenau
3:15	Break	
3:30	Meter Application Exercises	Russ Grenier
4:30	Adjourn	
5:30	Bus leaves NECCE for Nubble Lighthouse Tour & Bill Foster's Clambake	Don Perreault
6:30	Dinner - Bill Foster's Downeast Clambake, York	

**WEDNESDAY**

<b>TIME</b>	<b>SUBJECT</b>	<b>INSTRUCTOR</b>
8:00 AM	Pulse Metering	Russ Grenier
8:45	Break	
9:00	An Introduction to Reactive Metering	Les Rosenau
10:30	Break	
10:45	kV2c Meter Operating Features & Functions	Russ Grenier
12:00 PM	Lunch	
1:00	kV2c Meter Operating Features...(cont'd)	Russ Grenier
2:00	Break	
2:15	Instrument Transformers	Russ Grenier
3:15	Break	
3:30	Cycle Insensitive Demand / IEEE Reliability Indices	Bob Lee
4:30	Adjourn	
6:00	Dinner - Main Dining Room at NECCE	

**THURSDAY**

<b>TIME</b>	<b>SUBJECT</b>	<b>INSTRUCTOR</b>
8:00 AM	Working with MM Comm software	Russ Grenier
9:00	Break	
9:15	Introduction to Metering Phasors	Les Rosenau
10:30	Break	
10:45	Installation Troubleshooting using Phasors	Les Rosenau
12:00 PM	Lunch	
1:00	Plant Tour	Don Perreault
4:00	Back to the NECCE	
5:30	Graduation Reception - Great Bay Foyer - NECCE	
6:30	Graduation Banquet – Great Bay Room - NECCE	

**FRIDAY**

<b>TIME</b>	<b>SUBJECT</b>	<b>INSTRUCTOR</b>
8:00 AM	ANSI Meter Forms & Fitzall	Les Rosenau
9:15	Break	
9:30	Working with kV2c Modem Communication	Russ Grenier
10:30	Adjourn	

**Instructors:**

Russ Grenier	Application Engineer
Les Rosenau	Application Engineer (Retired)
Bob Lee	Firmware Engineer

# Course Synopses

## Tuesday

### ***Introduction to Electricity and Electrical Formulas***

- Review of fundamental electrical concepts, formulas and theories including voltage, current, electromagnetic fields, resistance, impedance, reactance, inductance, capacitance, RMS calculations, Ohm's law, Faraday's laws, active & reactive power.

### ***Single Phase Meter Components***

- Review of the operational theory of a single phase induction watt-hour meter, including a discussion of the major components, their function, and a look at the various adjustments and compensations used to make the meter operate correctly under varying field conditions.

### ***Meter Applications***

- A discussion on how meters are applied in measuring various distribution services (single phase, network, and three phase circuits), including a look at Blondel's Theorem.

### ***I-210+ Singlephase Meter***

- A look at the new Solid State Singlephase Meter. Basic operation, theory and AMR compatibility.

### ***Demand Metering Principles and Applications***

- A discussion on the importance of Demand Metering, how Demand calculations are defined and how the calculations are performed by various types of demand registers. A comparison of how register technology and calculation techniques vary.

### ***Meter Application Exercises***

- A "hands-on" session that builds on the previous session. Students will be asked to pick the proper meter and instrument transformers for a variety of application examples, and show how they should be connected for proper operation. The correct solutions will be discussed as a group after individuals have tried to solve the problems themselves.

## Wednesday

### ***Pulse Metering***

- A discussion about pulse initiators, with practical information on PI ratio calculations and application tips. Class exercises will include calculating PI pulse weights, pulse rates, and maximum pulses per hour (or interval).

### ***An Introduction to Reactive Metering***

- Introductory review of reactive metering – what is it, why is it important, how is it done. Also, a look at definitions for quads (kvarh), apparent power (kVA), phasor power (kVA), distortion power (kVA), active power (kW), and reactive power (kvar). A discussion of their impact as cost of service measurements.

### ***kV2c Meter Operating Features & Functions***

- A comprehensive discussion on the features, functions, and available options of the kV2c meter. Includes comparisons to the kV & kV2 meter – what features overlap and what additional capabilities the kV2c offers.

### ***Instrument Transformers***

- A review of instrument transformers: how they operate, how they're applied, accuracy and burden considerations, and selection criteria.

### ***Cycle Insensitive Demand / IEEE Reliability Indices***

- A discussion with an alternate approach to calculating Max Demand.
- Discussion on Reliability Indices (MAIFI, SAIFI)

## **Thursday**

### ***Working with MM COMM Software***

- An overview of MeterMate Meter Communication software (MM COMM), focusing on the practical uses of the software for meter technicians. Includes reading, programming, and reporting functions as well as essential configuration settings. MM COMM command structure, screen information, and reading file maintenance features will also be discussed.

### ***Introduction to Metering Phasors***

- An introduction to the concept of phasor diagrams – what they represent, how they are developed, and how they may be used as effective diagnostic tools.

### ***Troubleshooting with Phasor Diagrams***

- Builds on the previous session to work with phasor information provided by new solid state electricity meters to troubleshoot new or existing metering installations. Includes some interactive exercises diagnosing miswired meters.

### ***Plant Tour***

## **Friday**

### ***Meter Forms & Fitzall***

- Review the ANSI Meter Form designations – what they represent, what are they, and how are they used in the industry.

### ***Working with kV2c Modem Communication***

- A review of practical installation and troubleshooting tips when working with a kV family meter equipped with an internal modem option board. Status light indicators, surge protection, important set-up strings, test call operation, communication link testing, etc.