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University of Wisconsin-Madison
College of Agricultural & Life Sciences

CALS Outreach Services
620 Babcock Drive
Madison, Wisconsin 53706

University of Wisconsin-Madison provides equal opportunities for
admission and employment

Introduction to Stray Voltage Training Course

April 28, 2003

Arlington Agricultural
Experiment Station
Arlington, Wisconsin

Stray Voltage Investigation

April 29 - May 1, 2003

Arlington Agricultural
Experiment Station
Arlington, Wisconsin

Advanced Stray Voltage Investigation

October 28-30, 2003

InnTowner-Best Western Hotel
Madison, Wisconsin

Developed by

University of Wisconsin
Biological Systems Engineering Dept.
Public Service Commission of Wisconsin
Wisconsin Department of Agriculture,
Trade and Consumer Protection
Midwest Rural Energy Council

Printed on recycled paper

Course Organizers

Mark Cook is certified as a Master Electrician and Electrical Inspector by the State of Wisconsin. He has been employed by the Public Service Commission of Wisconsin as a member of the Stray Voltage Analysis Team for the past ten years and was also a member of Wisconsin's Stray Voltage Task Force in 1986 and 1987. Mark has been a practicing electrician for over fifteen years.

Douglas Reinemann, PhD is an Associate Professor at the University of Wisconsin-Madison in the Department of Biological Systems Engineering. He has extension and research appointments in the areas of milking equipment and facilities, stray voltage and farm energy management. He has been a member of the Wisconsin Department of Agriculture, Trade and Consumer

Introduction to Stray Voltage Arlington Agricultural Experiment Station April 28, 2003

The series of Stray Voltage Educational Programs offered at the University of Wisconsin have been designed to target student groups with different levels of technical background.

The introductory course is for those new to the topic of stray voltage. It is designed to give dairy producers and agricultural professionals a basic understanding of stray voltage sources and solutions and includes a demonstration of simple spot check measurements for stray voltage.

Course Topics Include:

- ♦ Basic Electrical Knowledge
- ♦ Utility and Farm Circuits
- ♦ Review of Animal Research
- ♦ Stray Voltage Rules and Regulations
- ♦ Voltage Spot Checks

Course Schedule

April 28: 8:00 am - 5:00 pm - Lunch Included

Location

Arlington Agricultural Experiment Station
N695 Hopkins Rd.
Arlington, WI 53911-9719
Phone: (608) 846-3761
Fax: (608) 846-3920

Lodging

A block of rooms has been reserved at the Days Inn in DeForest, WI (608)-846-7473 (\$54S/\$62D). The block will be held until March 28, 2003; after that date the rooms will be sold on a first request basis. To receive the conference room rate, mention that you will be attending the Stray Voltage Investigators Training Course.

Protection Stray Voltage Advisory Board. He has conducted research and instructional programs on stray voltage since 1990.

Other Instructors

Robert Fick, PhD, Alliant Energy

Chuck Forster, Phasor Labs

John Roberts, DVM, Wisconsin Department of Agriculture, Trade & Consumer Protection

Richard Reines, Public Service Commission of WI

Tom Seidl, Wisconsin Electric Power Company

Coordinators

Roger Kasper, Wisconsin Dept. of Agriculture, Trade & Consumer Protection

Lorna Vinger, Public Service Commission of WI

Stray Voltage Investigation Arlington Agricultural Experiment Station April 29 - May 1, 2003

The investigation course is designed to give the professional stray voltage investigator the tools required to collect the data required for a complete stray voltage investigation. Students will gain an understanding of the farm and utility circuits associated with stray voltage and measurement techniques to determine the sources of voltage and current on a farm. This course includes a hands-on exercise during which the student will work with an experienced stray voltage investigator and perform all of the standard measurements of a stray voltage investigation.

Course topics include:

- ♦ Review of Electrical Calculation Methods
- ♦ Stray Voltage Circuits and Sources
- ♦ Agricultural Electrical Code
- ♦ Customer Relations
- ♦ Stray Voltage Measurement Tools
- ♦ Measurement Techniques and Data Recording
- ♦ Hands-On Stray Voltage Investigation in Small Groups Data Analysis and Group Reports

Course Schedule

April 29: 12:00 pm - 5:00 pm - Light Lunch and Dinner Included

April 30: 8:00 - 5:00 pm - Breakfast and Lunch Included

May 1: 8:00 am - 2:00 pm - Breakfast and Lunch Included

Location and lodging under Introduction to Stray Voltage.

Advanced Stray Voltage Investigations The InnTowner Best Western October 28-30, 2003

This advanced course is designed to develop analytical skills of the experienced stray voltage investigator. This course is designed to give the professional stray voltage investigator detailed technical information for a complete stray voltage investigation, including determination of sources and mitigation methods. The program draws upon extensive field experience gained by the Public Service commission of Wisconsin, electric power suppliers and nationally recognized experts. This is an interactive course that is focused on circuit analysis and small group evaluation of data from actual stray voltage investigators. Students will work in small groups with an experienced investigator to do a case study and use the analysis tools presented in the course. Over 500 stray voltage investigators have attended this course. A new module has been added to give participants hands-on-experience with the latest electrical test equipment for high frequency measurements.

Location

InnTowner Hotel
2424 University Avenue
Madison, WI 53705
(608) 233-8778

A block of rooms has been reserved at the InnTowner Hotel (\$72S/\$82D). The block will be held up to one month prior to the meeting; after that date the rooms will be sold on a first request basis. To receive the conference room rate, mention that you will be attending the Stray Voltage Investigators Training Course. A block of rooms is also reserved at the J.F. Friedrich Center on campus (\$49S/\$58D). Call (608) 231-1341 for reservations.

Instructors

See course coordinators, instructors and organizers under Introduction to Stray Voltage and Stray Voltage Investigation.

Course topics include:

- ♦ **Utility Service Transformations**
- ♦ **Factors that Utility Sources of Voltage and Current Flow on the Farm**
- ♦ **Electrical Code Update for Agricultural Buildings**
- ♦ **Factors Contributing to Stray Voltage from the Farm Wiring System**
- ♦ **Advanced Measurement Techniques and Source Determination**
- ♦ **High Frequency Measurement Equipment and Methods**
 - ♦ Capabilities of Various Commercial Stray Voltage Measuring Devices
 - ♦ Use and Misuse of Power Quality Analyzers for Stray Voltage Investigation
 - ♦ Interpreting Field Data
- ♦ **Special Stray Voltage Mitigation Techniques**
- ♦ **Review of Research**
 - ♦ Low Level Contact Voltage and Animal Health
 - ♦ High Frequency Events and Animal Responses
- ♦ **Review of International Research Publications**
- ♦ **Case Studies - Small Group Exercise with Experienced Investigator.**
- ♦ **Case Study Reports and Discussion**

Workshop Schedule

Advanced Stray Voltage Investigation

October 28
12:00 pm - 5:00 pm - Light Lunch and Dinner Included

October 29
8:00 - 5:00 pm - Breakfast and Lunch Included

October 30
8:00 am - 2:00 pm - Breakfast and light Lunch Included

General Information

Registration Fees

**Introduction to Stray Voltage \$120
\$100 if postmarked before April 10, 2003**
Fee includes registration, conference materials and lunch.

**Stray Voltage Investigation \$360
\$300 if postmarked before April 10, 2003**
Fee includes registration, conference materials, lunch and breaks all three days, dinner on Tuesday and breakfast on Wednesday and Thursday.

**Advanced Stray Voltage Investigation \$650
\$600 if postmarked before October 10, 2003**
Fee includes registration, conference materials, continental breakfasts, lunches, all breaks and social hour and dinner on Tuesday.

Make checks payable to: **UW-Madison.**
Class size will be limited to 30 registrants.
Registration will be filled on a first come/first served basis.

Information will be sent to confirm your registration and provide detailed information on location, class schedule and accommodations.

Mail to: CALS Outreach Services, 620 Babcock Drive, Madison, Wisconsin 53706 or FAX your registration form to (608) 262-5088.

Please advise us at the time of registration if you have a disability and desire special accommodations. Requests will be kept confidential.

Cancellations/Refunds

If you are unable to attend, please notify CALS Outreach Services immediately at (608) 263-1672. To receive a **full refund**, you must contact CALS Outreach Services seven days before the course starts. **After that date, a \$75 cancellation fee will be charged.** If you **fail to cancel, no refund** will be granted.

Continuing Education Units

This course meets criteria for the nationally accepted Continuing Education Unit. To obtain a copy of your CEU transcript, call (608) 262-6215.

Registration Form

**Introduction to Stray Voltage
April 28, 2003**

**Stray Voltage Investigation
April 29 - May 1, 2003**

**Advanced Stray Voltage Investigation
October 28-30, 2003**

MAIL/FAX TO: CALS Outreach Services
620 Babcock Drive
Madison, Wisconsin 53706
Fax: (608) 262-5088

Fill out a **separate** registration form (or copy) for **each** registrant.

Print clearly or type

Social Security Number _____

Name _____

Company _____

Address _____

City/State/Zip _____

Daytime Phone _____

**Introduction to Stray Voltage \$120
\$100 if postmarked before April 10, 2003**

**Stray Voltage Investigation \$360
\$300 if postmarked before April 10, 2003**

**Advanced Stray Voltage Investigation \$650
\$600 if postmarked before October 10, 2003**

Enclose fee. Make checks payable to **UW-Madison.**

I will be paying by purchase order.

PO# _____

Please charge to the following account:

Visa _____ Mastercard _____ Expiration Date _____
Credit Card # _____
Name on Card _____
Signature _____

I cannot attend but please add my name to