

Advanced Stray Voltage Investigation

February 12-13, 2019

Embassy Suites Minneapolis Airport

7901 34th Avenue South
Bloomington, MN 55425

Developed by

University of Wisconsin Biological Systems
Engineering Department

Public Service Commission of Wisconsin

Wisconsin Department of Agriculture, Trade and
Consumer Protection

This advanced course is designed to develop analytical skills of the experienced stray voltage investigator, including detailed technical information for a complete stray voltage investigation, 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 course combines an online study component with classroom work. Upon enrollment you will be sent instruction to access the web-based course modules so you can study them and take the quizzes prior to February 12, 2019. The final exam will be taken online. The course will be presented by Tom Seidl of We Energies; Robert Fick, Brian Costello, and Michael Haas of Alliant Energy, Paul Ortmann of Idaho Power, and Doug Reinemann of the University of Wisconsin-Madison.

Over 500 stray voltage investigators have attended this course.

Course Organizers and Instructors:

Brian Costello is a Senior Agricultural Representative for Alliant Energy. As a stray voltage investigator, Brian has conducted more than 500 investigations in his 14 years at Alliant Energy. He has been assisting with the Stray Voltage Investigator Training classes for the past 8 years.

Robert Fick, PhD, PE, is Lead Agricultural Engineer at Alliant Energy and adjunct professor of Biological Systems Engineering at the University of Wisconsin. He has helped develop stray voltage rules and protocols for the State of Michigan and has taught stray voltage classes at Michigan State University and the University of Wisconsin for the last 21 years and helped develop the Wisconsin Farm Wiring Classes.

Michael Haas, PE, is a Lead Engineer in the Power Quality & Distributed Generation department at Alliant Energy. In the last 12 years he has had a wide variety of responsibilities ranging from performing numerous stray voltage investigations to working as an expert witness. Michael's responsibilities include investigating and identifying solutions to power quality issues as well as working cooperatively with the Alliant Energy Agriculture Team.

Paul Ortmann, PE, is a Principal Electrical Engineer with Idaho Power Company. He has been involved in the investigation of stray voltage for several years, and has taught classes on stray voltage in Wisconsin, Minnesota, and Idaho. Paul has also been involved in the development of stray voltage rules and investigation protocols.

Douglas J. Reinemann, PhD, is professor of Biological Systems Engineering and Associate Dean for Extension and Outreach in the College of Agricultural and Life Sciences at the University of Wisconsin-Madison. He has Extension, research and teaching appointments in the areas of machine milking and rural energy issues. He has conducted research and educational programs on stray voltage since 1990.

Tom Seidl, PE, is a Principle Engineer with We Energies, a Wisconsin utility. In the course of his duties, he has been conducting stray voltage investigation and analysis for over 30 years. He has been involved in stray voltage investigator training for the last 21 years, and participated in the development of the training class for electricians participating in Wisconsin's Farmstead Rewiring Program. He is a Registered Professional Engineer in the State of Wisconsin.

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COURSE TOPICS INCLUDE:

- ◆ **Utility Service Transformations**
- ◆ **Factors Contributing to Stray Voltage from Utility Systems**
- ◆ **Electrical Code Update for Agricultural Buildings**
- ◆ **Factors Contributing to Stray Voltage from Farm Wiring Systems**
- ◆ **Advanced Measurement Techniques and Source Determination**
- ◆ **High Frequency Measurement Equipment and Methods**
 - ◆ Capabilities of Various Commercial Stray Voltage Measuring Devices
 - ◆ Use and Misuse of Data Loggers for Stray Voltage Investigations
 - ◆ 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**

COURSE SCHEDULE:

February 12:	7:45 am	Check-in/Registration
	8:00 am - 5:00 pm	Class <i>Lunch included, Dinner is on your own</i>
February 13:	8:00 am - Noon	Class

General Information

REGISTRATION FEES:

\$350.00 per person

\$400.00 if registered after February 2, 2019

Fee includes registration, materials, breaks and lunch on February 12.

Class sizes will be limited to 40 registrants.

Registration will be filled on a first come/first served basis. Information will be emailed to confirm your registration.

HOW TO REGISTER:

Mail to: CALS Conference Services, 640 Babcock Drive, Madison, Wisconsin 53706 or FAX your registration form to (608) 262-5088.

Make checks payable to: UW-Madison.

Online: <https://uwccs.eventsair.com/asvi/reg19>

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

COURSE LOCATION: Embassy Suites Minneapolis Airport Hotel, 7901 34th Avenue South, Bloomington, MN 55425, (952) 854-1000

A block of rooms has been reserved until January 17, 2019 (or until all rooms are reserved, whichever comes first) for conference participants at the nightly rate of \$159, single or double, plus 14.525% tax. Breakfast is **included** with your guest room reservation. Be sure to mention that you are attending the MREC Rural Energy Conference to receive the special rate. Reservations can be made by calling the Embassy Suites at (952) 854-1000 or online at: <http://group.embassysuites.com/MRECCConference-Feb>

CANCELLATIONS/REFUNDS: If you are unable to attend, please notify CALS Conference Services immediately at (608) 263-1672. To receive a full refund, you must contact CALS Conference 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.

Registration Form

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

ONLINE: <https://uwccs.eventsair.com/asvi/reg19>

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

Name _____

Company _____

Address _____

City/State/Zip _____

Daytime Phone _____

Email address to access coursework:

\$350.00 (early registration fee)

\$400.00 (late registration fee - after February 2)

Enclose fee. Payment must be made at time of registration.

Make checks payable to UW-Madison.

Please charge to the following account:

Visa MC AMEX DISC

Expiration Date _____

Credit Card # _____

Name on Card _____

Signature _____