

Advanced Stray Voltage Investigation

Tuesday, November 16 - Wednesday, November 17, 2021

The Pyle Center

702 Langdon Street
Madison, WI 53706

Developed by

Midwest Rural Energy Council

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 November 16, 2021. The final exam will be taken online. The course will be presented by 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 16 years at Alliant Energy. He has been assisting with the Stray Voltage Investigator Training classes for the past 10 years.

Robert Fick, PhD, P.E., 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 22 years and helped develop the Wisconsin Farm Wiring Classes.

Michael Haas, P.E., is a Lead Engineer in the Power Quality & Distributed Generation department at Alliant Energy. In the last 15 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 Alliant Energy Agriculture, Engineering Solutions, and Design Teams.

Paul Ortmann, P.E., is a Principal Electrical Engineer with Idaho Power Company. He has been involved in the investigation of stray voltage for approximately 20 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 and is on the standard committee for IEEE -1695; the IEEE Guide to Understanding, Diagnosing, and Mitigating Stray and Contact Voltage.

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.

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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:

Tuesday, November 16:	7:45 am	Check-in/Registration
	8:00 am - 5:00 pm	Class <i>Lunch included, Dinner is on your own</i>
Wednesday, November 17:	8:00 am - Noon	Class

General Information

REGISTRATION FEES:

\$360.00 per person
\$410.00 if registered after November 1, 2021
Fee includes registration, materials, breaks and lunch on Tuesday, November 16.

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: Wisconsin Union Conference Management, 800 Langdon Street, Madison, Wisconsin 53706

Make checks payable to: Conference Management-MREC Advanced Stray Voltage

Online: <https://uwmadison.eventsair.com/advsv/reg>

Please email conferences@union.wisc.edu with any dietary or special accommodations.

COURSE LOCATION: The Pyle Center, 702 Langdon Street, Madison, WI 53706, (608) 262-0881

AREA HOTELS (Please make your own reservation):

The Graduate Hotel, 601 Langdon Street, Madison, (608) 257-4391

Hampton Inn & Suites, 440 West Johnson Street, Madison, (608) 255-0360

CANCELLATIONS/REFUNDS: All cancellations must be made in writing to conferences@union.wisc.edu by Monday, November 1, 2021 in order to receive a partial refund. A \$75 process and handling fee will be assessed to any cancellation made by the deadline. Cancellations after Monday, November 1, 2021 will not receive a refund. WU Conference Management may require up to 10 business days to process and issue a refund.

Registration Form

Advanced Stray Voltage Investigation

MAIL TO: Wisconsin Union Conference Management

800 Langdon Street
Madison, Wisconsin 53706
Email: conferences@union.wisc.edu

ONLINE: <https://uwmadison.eventsair.com/advsv/reg>

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

Name _____

Company _____

Job Title _____

Address _____

City/State/Zip _____

Daytime Phone _____

Email address to access coursework:

- \$360.00 (early registration fee)**
 \$410.00 (late registration fee - after October 5)

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

Make checks payable to Conference Management - MREC Advanced Stray Voltage

Please charge to the following account:

Visa MC AMEX DISC

Expiration Date _____

Credit Card # _____

Name on Card _____

Signature _____