



Minnesota Municipal Utilities Association

Transformer School

December 13-14 — *Basic Single-Phase Connection and Theory*

December 14-16 — *Three-Phase Connections*

MMUA Training Center, Marshall



Minnesota Municipal Utilities Association along with our partners, Minnesota Rural Electric Association and American Public Power Association, is pleased to offer the 2016 Transformer School. As in the past, two courses will be offered: Three-Phase Connections and, back by popular demand, our pre-conference course: Basic Single-Phase Transformer Connection & Theory.

Mr. Scott Meinecke, an instructor from Northwest Iowa Community College, will again be

the instructor for these courses. Through a combination of classroom and hands-on learning opportunities, participants will be exposed to situations that are as “real world” as possible, without the real-world risk/danger.

Did you know—MMUA’s Training Center is an APPA Academy? It’s the perfect setting to gain valuable experience, enhance knowledge, increase confidence and learn from other professionals in the public power industry.

Class, Registration and Lodging Information

Pre-Conference Course Overview

Basic Single-Phase Transformer Connection and Theory School

The pre-conference is intended to serve as a basic or refresher course on the basics of single-phase transformer connections and theory. The course includes classroom and hands-on instruction on topics such as safe work practices, transformer theory, basic calculations, connections, sizing, and troubleshooting.



This course would be helpful for anyone that is involved with the electric line crew—from the apprentice to employees from other departments that may assist as a ground person. This pre-conference course would also be beneficial for the apprentice/journeyman lineworker who desires to strengthen their basic transformer knowledge prior to attending the Three-Phase Transformer Connections course the remainder of the week!

Conference Overview

Three-Phase Transformer Connections

The three-phase course will start with the basics of transformers, including turns ratios, polarities, calculations, connections, and troubleshooting.

Participants will learn about the basic three-phase systems with some basic phasor diagrams and explain the relationship of the phasor to the transformer itself.

In the hands-on portion of the course, participants will work with miniature transformers that are energized and will blow fuses, in order to experience what happens when something is wired incorrectly.

The class will continue to build on the miniature transformer banks and work on troubleshooting. Additionally, they will discuss motor rotation as it relates to three-phase systems; as well as ways to prevent voltage surge when switching a three-phase bank.

Upon completion of the Three-Phase Transformer Connections class, participants should have a good understanding of the following topics, related to transformers:

- Basic Three-Phase Connections
- Delta Connection
- Wye Connection
- Open Delta Connection
- Three-Phase Troubleshooting

Save the Date!

MMUA/MREA/APPA Meter School, Feb. 14-17, 2017

Pre-Conference Schedule

Tuesday, December 13

12:00-1:00 Registration
1:00-4:00 Basic Transformer Connections
(classroom training)

Wednesday, December 14

8:30-11:30 Basic Transformer Connections
(hands-on training)

Dec. 14—Lunch will be served at the Training Center for those staying for the Conference.

Conference Schedule

Wednesday, December 14

12:00-1:00 Registration
1:00-4:00 Classroom Three-Phase Transformer Connections

Thursday, December 15

8:30-12:00 Classroom and Hands-On Training
12:00-1:00 Lunch served at Training Center
1:00-4:00 Classroom and Hands-On Training

Friday, December 16

8:30-12:00 Classroom and Hands-On Training
12:00 Conference Ends

What to Bring

Class attendees will be required to bring their own personal protective equipment, including:

- Arc Flash Shield and Hard Hat
- Safety Glasses
- Secondary Rubber Gloves
- FR Clothing
- Appropriate Footwear
- Volt/Amp Meter
- Calculator
- Notebook and Pen/Pencil

Location

Pre-Conference and Conference:
MMUA Training Center, 1004 Michigan Rd.
Marshall, MN 56258

Certificate of Achievement

A certificate of achievement will be provided showing the hours of attendance acquired. Certificates will be emailed after the course.

2016 Transformer School - Registration and Hotel Information

MMUA Registration Information

Registration Fees

Members

Basic Single-Phase Transformer Connections Pre-Conference
\$115 per person*

Three-Phase Connections

\$440 per person*

Non-Members

Basic Single-Phase Transformer Connections Pre-Conference
\$265 per person*

Three-Phase Connections

\$690 per person*

* **NOTE:** All registration fees increase \$50 on November 24, 2016.

Registration fee includes course tuition, materials, Wednesday lunch (for those attending both Pre-Conference and Conference), Thursday lunch, refreshment breaks and a certificate of achievement.

Cancellations/Refunds

MMUA charges a \$25 processing fee/person for registrations cancelled on/by November 23, 2016. MMUA must be notified by 4:30 pm on November 23 to qualify.

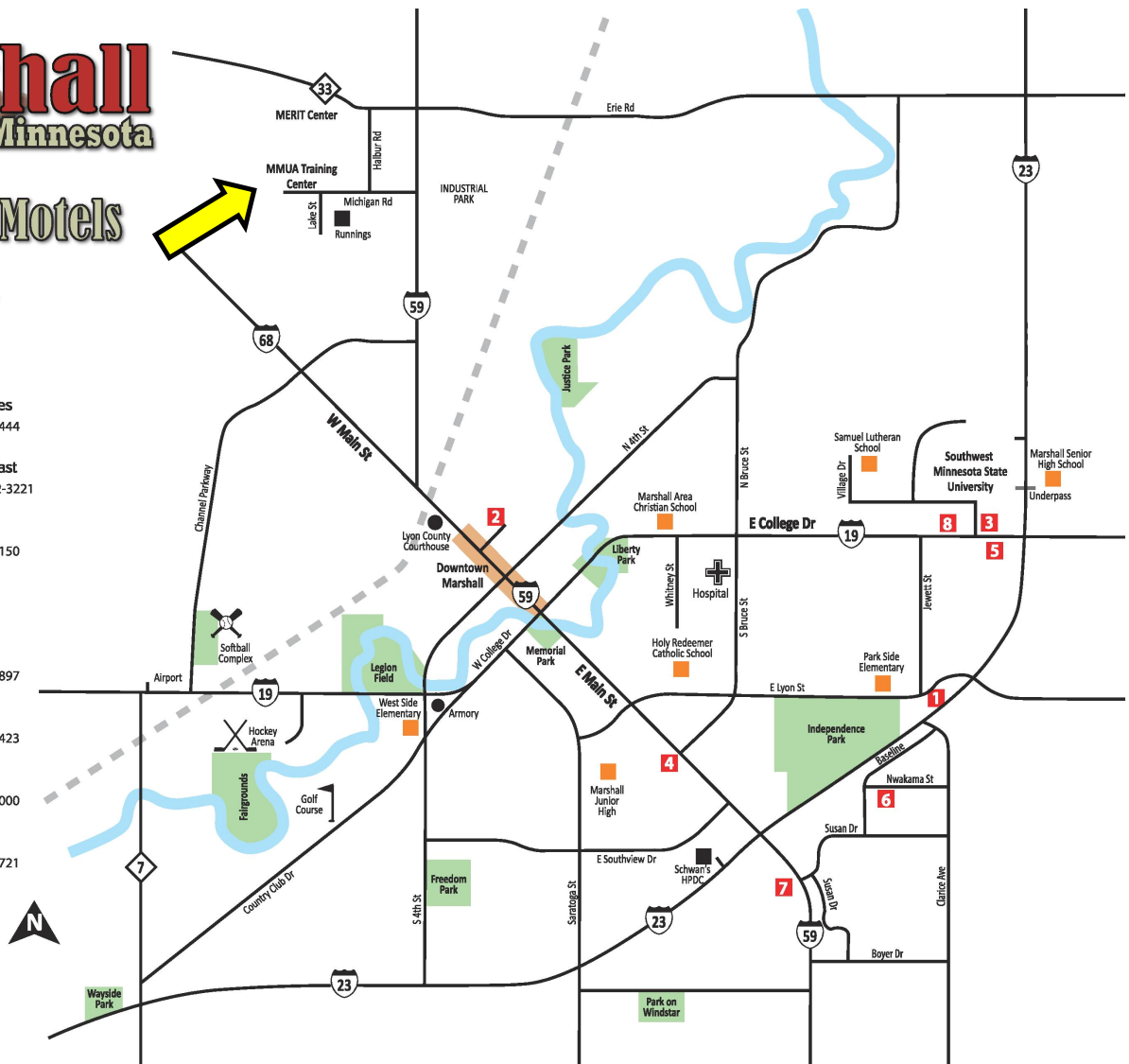
Hotel / Motel Information - Marshall, MN

AmericInn and Ramada offer special pricing for participants. Just ask for MMUA's reduced rate when making your reservation. (Note: Yellow arrow indicates location of MMUA Training Center.)



Hotels

1. AmericInn Motel & Suites
507-537-9424 or 800-634-3444
2. Arbor Inn Bed & Breakfast
1500 E. College Dr., 507-532-3221
3. Comfort Inn
507-532-3070 or 800-228-5150
4. Delux Motel
507-532-4441
5. Ramada Marshall
507-532-3221 or 800-422-0897
6. Sleep Inn
507-337-0103 or 877-424-6423
7. Super 8 Motel
507-537-1461 or 800-800-8000
8. Traveler's Lodge
507-532-5721 or 800-532-5721



2016 Transformer Registration Form

4412

Note: This form may be used to register more than one person, provided all are registering for the same class(es).

Attendee Information

Name (1): _____

Email: _____

Name (2): _____

Email: _____

Name (3): _____

Email: _____

Name (4): _____

Email: _____

*Note: Our registration system requires that each person has a unique email address and the certificate will automatically be sent to that address.

Class Selection

___ **Single-Phase Pre-Conf. Only** ___ **Three-Phase Course Only**

___ **BOTH Single-Phase and Three-Phase Courses**

Utility: _____

Address: _____

City: _____

State/Zip: _____

Main Contact: _____

Email: _____

Phone: _____

Registration Fees (by Nov. 23 deadline)

Single-Phase:

- Member Rate - \$115 per person
- Non-Member Rate - \$265 per person

Three-Phase:

- Member Rate - \$440 per person
- Non-Member Rate - \$690 per person

Note: Registration fees increase \$50/person on November 24.

Total Due \$ _____

Payment

- Check Payable to MMUA
- Bill Utility/Company
 - Purchase order _____
- Credit Card
 - Visa MasterCard Discover

Name as it Appears on Card

Cardholder's Signature

Credit Card Number

Expiration Date _____
Card Code on Back

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PHOTOGRAPHS: By registering for this conference, I, the attendee named above, authorize Minnesota Municipal Utilities Association (MMUA) to photograph me at this event and use such photographs in MMUA marketing materials (both electronic and print). I understand that I will not be paid for giving this consent.

**Registering
Is Easy!**

Register online: www.mmua.org/events/calendar/month/2016-12-01
Register by mail: Minnesota Municipal Utilities Association
3025 Harbor Lane North, Suite 400
Plymouth, MN 55447-5142
Register by email: tneddermeyer@mmua.org
Register by fax: 763-551-0459

**Deadline to
Register
Nov. 23**

QUESTIONS: Please contact Theresa Neddermeyer at 763-551-1230 or email tneddermeyer@mmua.org