



Transformer School

January 12-13, 2016—*Basic Single-Phase Connection & Theory*

January 13-15, 2016—*Three-Phase Connections*

Location: MMUA Training Center, Marshall, MN

Minnesota Municipal Utilities Association (MMUA)

MMUA, along with our partners, Minnesota Rural Electric Association (MREA) and American Public Power Association (APPA), 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 learn 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 “real world” experience, enhance your knowledge, and meet with other professionals in the public power industry.

Training Center Mission: *To promote, perform, and enhance safe work environments in our municipal utilities, with the willingness to learn and pass on the passion of the craft.*



Minnesota Municipal Utilities Association

3025 Harbor Lane North
Suite 400
Plymouth, MN 55447

Phone: 763-551-1230
Fax: 763-551-0459
www.mmua.org

2016 Transformer School

Pre-Conference Schedule

Tuesday, January 12

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

Wednesday, January 13

8:30-11:30	Basic Transformer Connections (hands-on training)
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Jan. 13—Lunch will be served at the Training Center for those registered for the Pre-Conference course

Conference Schedule

Wednesday, January 13

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

Thursday, January 14

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, January 15

8:30-12:00	Classroom and Hands-On Training
12:00-1:00	Lunch served at Training Center
1:00-2:30	Hands-On Training and Q&A
2:30	Conference Ends

WHAT TO BRING

Class attendees will be required to bring their own personal protective equipment. See the list of items to bring for clarification:

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

CERTIFICATES

A certificate of achievement will be provided showing the hours of attendance acquired.

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 hand-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.

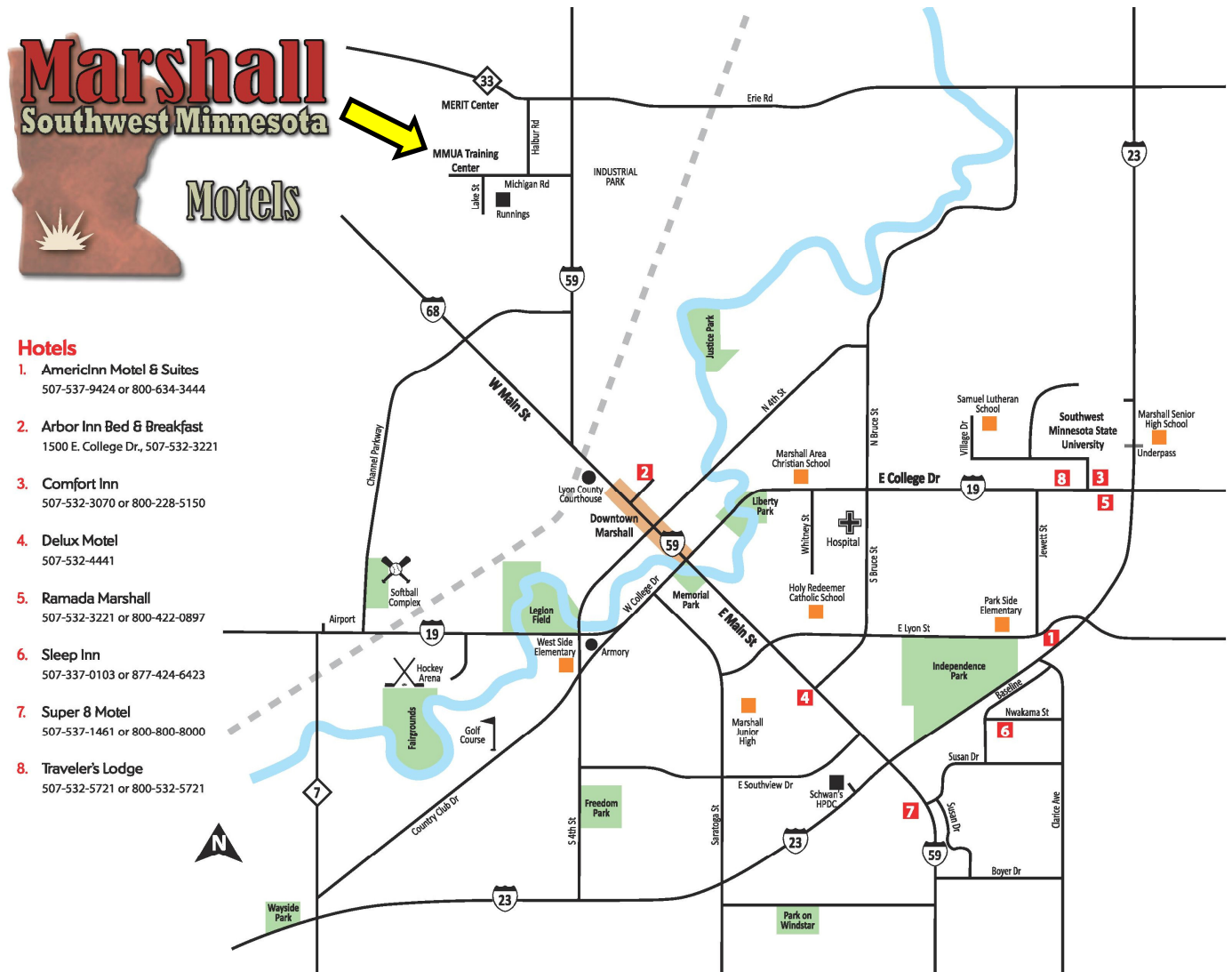
In the hands-on portion of the course, participants will work with miniature transformers that are energized and will blow fuses, in order to experience what happens when something is wired incorrectly.

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 — February 16-19, 2016**



2016 Transformer School

4412

Courses/Dates: **Single-Phase / January 12-13, 2016**
Three-Phase / January 13-15, 2016

Location: **MMUA Training Center**
1004 Michigan Road
Marshall, MN 56258



Minnesota Municipal Utilities Association
3025 Harbor Ln N #400, Plymouth, MN 55447
Phone 763-551-1230 / Fax 763-551-0459
www.mmua.org

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 Course Only ____ Three-Phase Course Only

____ BOTH Single-Phase and Three-Phase Courses

Utility: _____

Address: _____

City: _____

State/Zip: _____

Main Contact: _____

Email: _____

Phone: _____

Registration Fees

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 December 30.

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

REFUND: MMUA will issue a refund (less \$25 processing fee per person) provided MMUA is notified of the cancellation by 4:30 pm on December 29. *Sorry, no refunds after December 29.*

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.

QUESTIONS: Please contact Theresa Neddermeyer by email tneddermeyer@mmua.org or phone 763-746-0713.

**Registering
Is Easy!**

Register online: www.mmua.org/event/transformer-pre-conf-2015
www.mmua.org/event/transformer-school-2016

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 phone: 763-551-1230

Register by fax: 763-551-0459

**Fees
increase
\$50 after
Dec. 29**