



Content  
Community  
Connection

United States  
The Electricity Forum Inc.  
One Franklin Square, Suite 212A  
Geneva, NY 14456  
Tel 289-387-1025

Canada  
The Electricity Forum  
1885 Clements Rd, Unit 218  
Pickering, ON L1W3V4  
Tel 905-686-1040  
Fax 905-686-1078  
Toll Free 855-824-6131

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## Power Generators and Voltage Regulators

Course details: <https://www.electricityforum.com/electrical-training/power-generators-voltage-regulators>

Power generation is no longer the primary domain of electric utilities. Many electrical engineering and maintenance personnel now have the responsibility for non utility generator systems.

How do you know if your generator control problems result from a deficiency in the prime mover or in the voltage regulator/exciter? Perhaps it's neither; maybe you're just facing grid fluctuations. But how do you know?

When it comes to malfunctions in generators and voltage regulators/excitors and prime movers (and their effects), there's not much information out there for maintenance engineers or electricians. And to make matters worse, the information that is out there is often unnecessarily complicated and hard to follow.

Our 2-Day Generators and Voltage Regulators course is designed to answer many of these questions. It includes a detailed study of power generators and voltage regulators, and the interaction between the two. The course also provides a solid understanding of generator paralleling, VAR flows, and generator/regulator response to changing loads and system voltages. A good working knowledge of polyphase AC theory is recommended as a prerequisite; however, a refresher of the important fundamentals is presented at the

beginning of the course.

## **LEARNING OBJECTIVES**

**This course is designed to enable participants to:**

- Identify the peak and effective AC voltage values on a waveform
- Describe the fundamental operations of a generator
- Describe how generators operate in parallel
- Describe the operating principle of differential protection

## **WHO SHOULD ATTEND**

This course is recommended for maintenance technicians, field engineers, and operators who are required to work with fixed plant generation equipment.

## **STUDENTS RECEIVE**

- FREE 100-Page Digital Handbook (Value \$20)
- \$100 Coupon Toward Any Future Electricity Forum Event (Restrictions Apply)
- 1.4 Continuing Education Unit (CEU) Credits
- FREE Magazine Subscription (Value \$25.00)
- Course Materials In Paper Format

## **COURSE OUTLINE**

### **DAY ONE**

## **I. Fundamentals of AC Power**

- AC waveforms
- AC phase relationships
- Resistance in AC circuits
- Capacitance in AC circuits
- Power in AC circuits

## **II. Semiconductor Fundamentals**

- Atomic review
- Semiconductor conduction
- Extrinsic semiconductors
- Diodes
- Transistors
- Silicon controlled rectifiers
- Thyrite
- Logic review
- Operational amplifiers

## **III. AC Synchronous Generators**

- Voltage regulator function
- Voltage regulator components
- Voltage regulator operation
- Auxiliary regulator functions
- Voltage regulator troubleshooting

## **DAY TWO**

#### **IV. Voltage Regulators/Exciters**

- Voltage regulator function
- Voltage regulator components
- Voltage regulator operation
- Auxiliary regulator functions
- Voltage regulator troubleshooting

#### **V. Generator Protection**

- Short circuit protection
- Ground fault protection
- Overload protection
- Thermal protection
- Overspeed protection
- Low field excitation or loss of field excitation protection
- Generator motoring protection
- Protection against unbalanced faults
- Overexcitation protection

#### **Questions and Answers**

#### **COURSE TIMETABLE**

Start: 8:00 a.m.

Coffee Break: 10:00 a.m.

Lunch: 12:00 noon

Restart: 1:15 p.m.

Finish: 4:30 p.m.

Contact us Today for a FREE quotation to deliver this course at your company's location.

<https://www.electricityforum.com/onsite-training-rfq>