

# Electrical System Training for Health Care Facilities

Two Day Course



## Ensuring Health Care Electrical Power Reliability and Safety

Health care electrical power systems support critical life-saving processes. Maintaining electrical reliability and safety requires a high level of knowledge and expertise in order to be successful and comply with industry standards.

National Fire Protection Association Standard 99 (NFPA 99), the Health Care Facilities Code, provides the most current requirements for minimizing the risks of fire and explosion and maintaining electrical safety.

NFPA 110, the Standard for Emergency and Standby Power Systems, contains requirements covering the installation and performance of backup power systems in critical applications where a power outage would create a life safety risk such as those in health care facilities. Both standards are critical to ensuring electrical power safety in a health care environment.

Participants who complete this course will learn about electrical power system theory and operation maintenance within health care facilities and gain an understanding of NFPA 99 and 110 requirements.

### Next Level Reliability

To learn more about ERS' Training Services, please contact us at 1 877-468-6384 or visit [ERS.vertiv.com](http://ERS.vertiv.com)

## Course Overview

This course is focused on electrical power systems management and safety in health care facilities. It provides an understanding of electrical system operation, maintenance requirements, and troubleshooting approaches to managing power system reliability and safety. The course also covers electrical system design-theory for critical power needs and system configurations, along with NFPA 99 and 110 standard requirements for emergency and standby power generators and power systems redundancies.

In addition, the agenda will also include a review of fault prevention, diagram analysis for troubleshooting, and best practices for predicting the likelihood of equipment failure and identifying problems.

**Course Duration: 16 Hours.**

## Two Day Seminar Course Outline

### Day 1

#### Introduction

- Safety
- Arc Flash
- Electrical Shock
- LOTO
- Power Fundamentals

#### Schematic Diagrams

- Basic Components
- Advanced Components
- Single-Line Drawings
- Ladder Logic
- Physical Drawings
- System Troubleshooting

#### ATS Theory

- Transfer Equipment
- MTS Fundamentals
- ATS Fundamentals
- MTS Operation
- ATS Operations
- Transfer Operation

#### N+1

- N+1 Requirement
- UPS Operations
- Design
- Interlocks
- Dual Utility Feed
- Load Shedding
- Bypass Operation
- Battery Maintenance
- Load Test

### Day 2

#### Generators

- Generator Theory
- Field Excitation
- KW, VAR, and VA
- Power Factor
- Synchronous Generators
- Asynchronous Generators
- Primary Generators

- Standby Generators
- Voltage Regulators
- Speed Control
- Lube Oil Systems
- Generator Operations
- Synchronization
- Auto Start
- Manual Start
- Generator Maintenance
- Load Test
- Generator Faults

#### Single-Line Diagram Analysis

- Review Site Specific Diagrams
- Student Demonstration of System-Integration Practical Knowledge

## Training Materials

Electrical Reliability Services (ERS) will provide student manuals, supplemental materials, video presentations, and demonstration equipment. A "Certificate of Completion" is provided for students meeting or exceeding minimum course standards. Minimum course standards are defined as a 80% score on the written post-course examination.

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