



TECHNICAL TRAINING GROUP®

Generators / UPS

Generator and UPS Applications

With electric utility deregulation, large scale blackouts, the need for 100% reliability and legal requirements, emergency and standby power systems are more important than ever. This 2 day class covers the requirements for sizing and planning a generator installation. Also, learn how to properly size a UPS systems to meet critical load requirements and gain an understanding of UPS and generator compatibility issues.

Course Credit: 2 Days - 1.6 CEUs or 16 PDHs



Course Agenda

DAY ONE

CODES AND STANDARDS

NFPA, NEMA, UL, ANSI, IEEE,
Legally Required Systems

TYPES OF EMERGENCY AND STANDBY SYSTEMS

Generators, Uninterruptible Power Supplies, Stored Energy Systems, Static Transfer Switches, Battery Systems

PLANNING THE SYSTEM

Emergency, Standby, Peak Shaving, Data Centers, Health Care, Legal Requirements, System Layout and Design

SIZING GENERATORS

Load Characteristics and Calculations, Economic Analysis, Single-Step vs. Multi-Step, Motor Starting, Voltage and Frequency Concerns, Voltage Regulators

PROTECTION REQUIREMENTS

Short Circuit Current – X_d'' , Decrement Curves, Overcurrent Protection, Ground Fault, Under and Over Voltage, Under and Over Frequency Protection

PARALLELING REQUIREMENTS

Synchronizing Relays, Switchgear, Protection Requirements for Paralleling, Paralleling with the Utility

ENVIRONMENTAL REQUIREMENTS

Sound Levels and Regulations, Exhaust and Emissions, Fuel Types and Storage Requirements, Vibration, Cooling

DAY TWO

AUTOMATIC TRANSFER SWITCHES

Design, Operation, Emergency Rated
Short Circuit Withstand Ratings
Overcurrent Protection, 3 Pole Vs. 4 Pole

STATIC TRANSFER SWITCHES

Design, Operation, Source Requirements

UNINTERRUPTIBLE POWER SUPPLIES

Sizing, Selection, Batteries, Inverters
Protection, Grounding, Heat Rejection
Bypass, Maintenance

UPS BATTERY SYSTEMS

Types of Batteries, Sizing
Charging, Useful Life

NON LINEAR LOADS

Effect of Non-Linear Loads with Generators and UPS Systems, Filtering and Harmonics
Voltage and Current Distortion - THD

REDUNDANCY AND RELIABILITY

Failure Modes, MTBF and MTTR
2N and N+1, Cost of Outage Calculations

IN CLASS DESIGN PROBLEM

Bringing it all together, Sizing the UPS, Conductors, Heat Rejection, Cost of Outage, Sizing Generator

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For more information contact:

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See sample videos of Jim's teaching style at:

www.brainfiller.com