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## Power Distribution

(Including Transformers and Circuit Protection)

**Course Description:** This course addresses power from where it enters the plant, goes through transformers, into panel boxes and out to the loads. Safety begins the course and is discussed throughout, including personal protective equipment based on requirements specified in National Fire Protection Association standard NFPA 70E. Building distribution systems, power characteristics, power measurements and power quality are then discussed. A good discussion of transformers follows. Power supplies are covered as well as circuit protection including breakers, fuses and overloads. Hands-on exercises and if possible, visits to the plant floor are incorporated throughout the course to reinforce concepts.

**Prerequisites:** Basic Electrical Class or Equivalent

**Textbooks:** Transformer Principles & Applications and/or Power Quality Measurement.

### Learning Objectives:

- Explain lockout/tag out procedures
- Explain why lockout/tag out procedures must be followed when servicing equipment
- Explain the importance of properly grounded electrical equipment
- Describe the hazards associated with electricity (fire, arc flash, arc blast, shock etc...)
- Select the proper protective equipment when working with energized equipment
- Describe a typical power distribution system
- Name power characteristics
- Explain power quality problems
- State power measurement procedures
- Discuss transformers
- Explain Delta - wye windings
- Explain control voltage transformers
- Discuss 3 phase to single phase conversion
- Identify various power supplies
- Define KVA rating and fusing requirements
- State the purpose of fusing and circuit breakers
- Categorize Motor Circuit Protectors (MCP's)