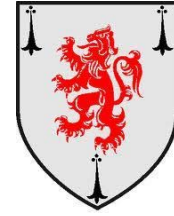


HVAC THEORY & OPERATIONS



Understanding the operation, maintenance and appropriate trouble response to power system equipment begins with a detailed knowledge of and ability to read and interpret electrical prints. This course is designed to provide the knowledge of the various types of electrical diagrams used in the industry, and to develop the skills necessary to read, draw, and interpret these diagrams. With a basic understanding of diagrams, technicians and engineers are able to develop a logical pattern of troubleshooting that can aid in the successful analysis of systems.

Inherent dangers exist with the daily operations of HVAC systems. The proper understanding and knowledge provided to staff allow for staff to be proactive in their pursuit of optimum system operations.

The purpose of this course is to give the students an understanding of the complexities associated with working on or around HVAC systems as well as electricity. Anyone who works on or near HVAC or electrical equipment as well as supervisors, managers and safety personnel should attend this course.

Course Duration: 8 hours

INTRODUCTION

Course Objectives
Required Worker Safety Training

SAFETY FUNDAMENTALS

Federal Safety Regulations (OSHA)
PPE
Boundaries
Safety Engineering

HVAC THEORY

Thermal Dynamics
Psychrometric Chart
Latent vs Sensible Heat
PI&D Loops
Direct & Reverse Acting Systems
Reset Schedule Loop Control
Analog & Binary Control

APPLICATIONS

Chiller Loop Control
Boiler Loop Control
Morning Warm-Up
VAV Control (Single & Dual Deck)
Static Air Pressure Control

SYSTEM DESIGN

Equipment Sequence Operations
Fire-Life Safety Integration
Transmitter/Transducers
4-20ma & 2-10VDC I/O signals

SYSTEM MAINTENANCE

ANSI/ASHRAE/ACCA 180 standards
NETA MTS 2011
Manufactures requirements
Preventive & Predictive Maintenance
ESPN compliant guidelines
Contractor Responsibilities
Equipment Working Clearances
Preliminary Planning
Use of Safe Work Practices
Safe Switching Procedures
Lock Out and Tag Out Procedures
Working On or Near Energized POA's
Safe Use of Test Equipment
Interlocks

SPECIAL SITUATIONS

High Temp High Pressure
Arc Flash & Shock
Rotating Equipment
Spring/Kinetic
Chemicals
Different Skill Sets

DATA & RISK MANAGEMENT

Record Keeping
MSDS
Trending of critical loads, temps, etc.
Annual audit of operations