



Basic Fire Alarm Systems Training Program Outline (5 Day)

Day 1

Safety

Understand the proper safe use of ladders, scaffolds, hand and power tools. Also the proper use of eye and hearing protection and other PPE (Personal Protective Equipment). Know the purpose of Material Safety Data Sheets (MSDS). Be able to recognize unsafe work conditions.

First-Aid

Be able to recognize common injuries and conditions to include: cuts, sprains, heat exhaustion, frost bite, fractured limbs, head trauma and heart attacks. Demonstrate proper first-aid techniques.

Physical Science Concepts

Terms and definitions related to concepts from mechanics and chemistry. Understand the relationship between electricity, heat, and light.

Ohm's Law

Understand Ohm's Law and how it applies to DC and AC circuits. Know conductor characteristics, series, and parallel circuits. Know the characteristics of current, voltage and resistance how their relationship affects electricity.

Electrical Theory

Understand the difference between DC and AC circuits, and know the characteristics of each. Be able to identify series and parallel circuits, as well as calculate resistance.

Day 2

Schematic Reading and Interpretation

Know common electrical symbols used in wiring diagram and circuit schematics. Be able to demonstrate the operation of AC and DC circuits from electrical schematics. Draw simple schematics from system sequence of operation.

Test Equipment

Demonstrate the proper selection and use of test equipment and accessories. Equipment covered include multi-meter, ohm meter and dB meter.

Electrical Workmanship Standards

Standards of electrical installation methods per NFPA 70, The National Electric Code (NEC) and "good workmanship". Grounding, conductor insulation characteristics and power limitations.

Wiring Fundamentals

Understand the wiring requirements and protection of wiring for fire alarm systems. Select outlet and junction boxes, cable and conduit. Calculate proper wire size, and over-current protection for the system.

Lab: Circuits and Electrical Theory

Demonstrate practical understanding of ohm's law. Analyze series and parallel DC circuits.

- Series / Parallel circuit calculations
- Series / Parallel circuit characteristics
- DC circuit calculations

Day 3

Codes and Standards

Develop a basic understanding of NFPA codes and standards in the fire alarm industry. Understand application and use appropriate NFPA standards.

Listing Agencies

Understand the purpose of agency listing of fire alarm equipment.

Fire Alarm Symbols and Terminology

Standard symbols and terms utilized in the fire alarm industry.

Fire Alarm Systems

Discuss the types of fire alarm systems and their requirements. Included are initiating devices and notification appliances. Basic sprinkler systems, fire alarm panel control functions and system signals.

Device and System Compatibility

Know the purpose for ensuring operational compatibility of fire alarm devices and control panels. Discuss approving methods from a recognized testing lab. Understand how codes and standards ensure device and system compatibility.

Circuits and Pathways

Understand the various styles and classes of circuits associated with intelligent devices, notification appliances and initiating device circuits

Initiating Devices

Know the basic operation and application of fire alarm and suppression system initiating devices. Be familiar with requirements of NFPA 72 that determine the installation and operation.

Day 4

Automatic Detection Methods

Understand the basic principles of automatic fire detectors. Select the best type of detection for the application and ambient conditions.

Smoke Detector Operation

Know the basic operating principles of different smoke-sensing devices. Know the advantages and disadvantages of each. Be able to determine the best device for the hazard or application.

Heat Detector Operation

Know the basic operating principles of different thermal-sensing devices. Know the advantages and disadvantages of each. Be able to determine the best device for the hazard or application.

Detector Spacing

Understand the proper placement and spacing of detection for irregular ceilings and compartments. Know the factors which affect spacing such as ceiling height, air movement, partitions, and ceiling construction. Determine the best device and quantity required for adequate protection

Prevention of Nuisance and False Alarms

Proper selection and placement of automatic detectors. Maintenance programs for reliable and proper operation of fire alarm systems. System program features to reduce unwanted alarms from utilizing alarm verification, positive alarm sequencing, cross zoning and pre-signal. Also electronic and pneumatic retard mechanisms for sprinkler water devices.

System Notification Appliances

Know the audible and visual requirements as well as proper placement of notification appliances. Understand how environmental and acoustical conditions affect operation and selection on devices.

Relocation and Evacuation Signals

Understand the recommended fire alarm evacuation signal, its purpose, where it is used, the recommended sound pressure level in various occupancies and modes, and how to determine the sound pressure level needed.

Day 5

Types of Fire Alarm Systems

Discuss the types of fire alarm systems and their requirements. Know the documentation requirements and codes for various systems.

System Integrity and Supervision

Understand the principles of monitoring for integrity and types of signals produced by fire alarm systems. Discuss methods of supervision for various circuit types.

System Periodic Test

Know periodic equipment and circuit testing procedures, including frequency of tests and method of testing each component and circuit of a fire alarm system.

Commissioning and Acceptance Testing

Understand the requirements and related procedures for conducting and documenting proper fire alarm system acceptance tests. Know code and insurance requirements

Maintenance Procedures

Understand the methods to isolate and identify faulty or malfunctioning components. Know methods of cleaning, servicing and proper operation.

Inspections

Understand the acceptable system test methods per NFPA 72. Know frequency of inspections and equipment to be tested. Review required documentation and reporting system deficiencies.

Course Evaluation

An Exam will be administered at the conclusion of the course. Students will be limited to one-hour and the exam will consist of 60 questions. References allowed during exam will be NFPA 72 the *National Fire Alarm Code* (2007), and NFPA 70 the *National Electric Code* (2008).

Sincerely,

A handwritten signature in black ink, appearing to read "Paul J. Inferrera", followed by a long horizontal line extending to the right.

Paul J. Inferrera, SET