

Fire and Gas Detection Systems (Instructor-Led Training)

Course Description

This course reviews building fire protection and detection systems; systems for monitoring and generating alarms or automatic shutdown of the effected system when potential hazards exist or a fire has started.

Course Prerequisites

- GTA Instructor-Led Training
 - Instrumentation Systems
 - Measurement Systems

Course Objectives

Upon completion of this course, the student will have received instruction designed to assist him/her in the following:

- Demonstrate basic knowledge of national codes for fire protection systems
- Define the terms associated with a protection and detection system.
- Identify and explain the components of a protection and detection system.
- Discuss the procedures for testing and maintaining components of the protection and detection system.

Course Outline

1. Code and Standards
 - a. National Electric Code (NEC) Article 500
 - b. National Fire Protection Agency (NFPA) Codes 497, 58, & 59
2. System Definitions
 - a. Attended vs. Unattended
 - b. Unit Stop Action
 - c. Emergency
 - d. Fast
 - e. Normal
 - f. Emergency Shutdown System (Plant Shutdown)
 - g. Fuel Gas Shutdown System (Building Shutdown)
 - h. Visual Indication (Strobe Lights)
 - i. Horn Indication (Unattended & Attended)
 - j. Hazard Horn Codes
 - k. Fire
 - l. High Level
 - m. Low Level
 - n. Rapid
 - o. Fault
 - p. Compressor Building Purge and Exhaust Fans
 - q. LEL
3. System Components
 - a. Smoke Detectors
 - i. Ionization-Type Smoke Detectors
 - ii. Photoelectric-Type Smoke Detectors
 - iii. Ultraviolet Detectors
 - iv. Infrared Detectors
 - b. UV/IR Flame Detection Controller
 - c. Normal Operating Mode

- d. Reset Operating Mode
- e. Test Operating Mode
- f. Gas Detectors
- g. Temperature Detectors
- h. Emergency Support Systems
- 4. System Testing and Maintenance
 - a. Test Gas Handling Procedures
 - b. Types of Tests Required
 - c. Test Equipment
 - d. Data Recording
 - e. Testing Procedures
 - i. Smoke Detector
 - ii. UV/IR Detector
 - iii. Manual Test
 - iv. Count Test
 - v. Bus Mode Test
 - f. Setting Span on a Gas Detector
 - g. Calibrating Low-Level Gas Concentration
 - h. Calibration Check Using High-Concentration Gas
 - i. Temperature Detectors
 - j. System Maintenance and Troubleshooting
 - i. UV/IR Detectors Routine Maintenance
 - ii. Cleaning the Detector
 - iii. O-Ring Inspection
 - k. Gas Detectors
 - i. Routine Inspection Procedure
 - ii. Removal and Refitting Flow Housing
 - l. Temperature Detectors

Recommended Resources

- GTA Fire and Gas Detection Systems Participant Guide
- GTA Fire and Gas Detection Systems Instructor Presentation.
- National Electric Code (NEC) Article 500.
- National Fire Protection Agency (NFPA) Codes 497, 58, and 59.
- Internet sites related to fire and gas detection systems.
- Textbooks and other publications related to fire and gas detection systems.