



# Coffee Break Training - Fire Investigation Series

## Building Construction: Part 3: Fire Investigations: Fire Protection Systems and Codes

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**Learning Objective:** The students shall be able to recognize various types of building fire protection systems and related fire codes and their relationship to fire investigation.

Today, fire protection systems are an integral part of many structures. These systems can activate to control or mitigate a fire or its effects. These systems include automatic sprinklers, special suppression systems including commercial kitchen range hood systems, fire alarms, smoke alarms, standpipes, and smoke management systems.

The design of fire protection systems may include methods to notify the occupants and/or fire department. Failures in these systems may be due to either accidental or intentional reasons. Items to check during the postincident investigation include

- the last time the system was serviced or inspected;
- whether control valves are open;
- any possible alarm impairments;
- possible impairments to fire department connections;
- impairments to individual items such as sprinklers and smoke detectors;
- inadequate design;
- inadequate water pressure; and
- dead, disconnected, or missing batteries.

Occupancy classes are based on an assessment of life safety considering the characteristics of occupants and purpose served by the occupancy. The occupancy class is often combined with the size and fire protection systems of the building to determine the type of construction. The “fuel load” and “occupant load” and life-safety characteristics of the occupants often directly relate to the occupancy class. While the actual names can vary, occupancy classes include Assembly, Business, Educational, Institutional-Unrestrained, Institutional-Restrained (Detention/Correction), Residential, Mercantile, Factory/Industrial, Storage, and Utility.

Code areas that most often incur investigation are means of egress, interior finish, proper construction of fire separations, proper protection of openings such as the use of fire doors, lack of or improper fire protection systems, and overcrowding for the size and type of occupancy. A fire investigator should consider getting help from code experts including municipal fire and building code officials to determine potential issues.

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The existence and reason for the missing battery in this smoke alarm should be documented in the investigator's report.