

The BCO & Fire Marshal

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OBJECTIVES

- ☐ Explain to relationship between the BCO and FM
- ☐ Who needs who?
- ☐ How a BCO can assist with Fire Investigation Safety Survey?
- ☐ Overview on fire investigation process

BACKGROUND

- ☐ PA is a Building Code Driven state
- ☐ Most jurisdictions do not have a Fire Marshal
- ☐ No State Fire Marshal's Office
- ☐ PSP do not enforce codes

What is a Fire Marshal?

- ☐ Fire Inspector
- ☐ Life Safety Inspector
- ☐ Code Inspector
- ☐ Fire Chief
- ☐ Fire Warden
- ☐ Arson Investigator

FIRE MARSHAL DUTIES

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- ☐ **Code enforcement**
- ☐ **Fire Origin & Cause Investigation**
- ☐ **Community Risk Reduction/Public Education**
- ☐ **Emergency Maangmeent Coordinators**

CODE ENFORCEMENT

- ☐ Enforcement locally adopted codes
- ☐ Enforce all aspects of the Fire Code
- ☐ Fire hydrants
- ☐ Fire Department connections
- ☐ Fire Department key boxes

COMMUNITY RISK REDUCTION

- ☐ **Fire safety education**
- ☐ **Demonstrations**
- ☐ **Firehouse tours**

FIRE INVESTIGATION

- ☐ **Emergency demolition**
- ☐ **Building evaluation**
- ☐ **Building stabilization**

EMERGENCY DEMOLITION

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EMERGENCY DEMOLITION

- ☐ **Demolition and removal of building components**
- ☐ **Facilitate extinguishment of pocketed fire**
- ☐ **Priorities of fire extinguishment**
- ☐ **How far do you go?**

EMERGENCY DEMOLITION

- ☐BCO provides input on where to start
- ☐BCO provides input on what should be removed
- ☐Heavy equipment for debris removal
- ☐Provides safe access to burning materials
- ☐Mindful of equipment and proximity to fire conditions

BUILDING EVALUATION

- ☐ Safe area access
- ☐ Concentration loads
- ☐ Suspended loads
- ☐ Undesigned loads

BUILDING STABILIZATION

- ☐ **Evaluation of building conditions**
- ☐ **Determination if stabilization is required**
- ☐ **What areas need to be stabilized?**
- ☐ **Who determines the method of stabilization?**



BUILDING CONDITIONS

BUILDING CONDITIONS

- ☐ Safe to perform an investigation
- ☐ Calculated risks
- ☐ Experience of fire investigators
- ☐ Safety assessment

BUILDING CONDITIONS

- ☐ **Holes in the floor**
- ☐ **Piles of debris**
- ☐ **Dark, wet environments**
- ☐ **Electrical hazards**
- ☐ **Pocketed gas areas**
- ☐ **Biohazards**

PERSONAL PROTECTIVE EQUIPMENT

- ☐ **Absorption hazards**
- ☐ **Inhalation hazards**
- ☐ **Slip and fall hazards**
- ☐ **Puncture hazards**

PERSONAL PROTECTIVE EQUIPMENT

- ☐ **Appropriate respiratory protection**
- ☐ **Head & eye protection**
- ☐ **Appropriate skin protection**
- ☐ **Steel toes**

BUILDING STABILIZATION

- ☐ **Who specifies the method or type of stabilization?**
- ☐ **What should be stabilized first?**
- ☐ **Complicated issues with stabilization**

BUILDING STABILIZATION



FIRE SCENE HAZARDS







Letisse
INC.

LADIES
HANDBAGS



FIRE INVESTIGATIONS



FIRE INVESTIGATIONS

- ☐ **To determine the cause of the fire**
- ☐ **To determine the origin of the fire**
- ☐ **Appliance or product recalls**
- ☐ **To determine human actions**
- ☐ **To determine if code changes are needed**
- ☐ **Insurance claims**

FIRE INVESTIGATION PROCESS

- ☐ **Generally, not a quick process**
- ☐ **Complications during investigations**
- ☐ **Everything is about documentation**

FIRE ORIGIN & CAUSE INVESTIGATION

- ☐ The process of determining the ignition source, first fuel ignited and the act of omission that brought them together.
- ☐ Is there a criminal act involved with the investigation?
- ☐ Are there potential civil actions?
- ☐ Everything is potential evidence

FIRE INVESTIGATION

- ☐ **NFPA 921- Guide for Fire and Explosion Investigations**
- ☐ **NFPA 1033 – Standard for Professional Qualification of Fire Investigators**
- ☐ **NFPA 1321 – Standard for Fire Investigation Units**

PRESERVATION OF FIRE SCENE

- ☐ **Securing the scene**
- ☐ **Allowing safe access to others involved**
- ☐ **Collection of specific evidence**

SUBROGATION

Legal term which refers to the right of an insurance company to pursue a third party that caused an insurance loss to an insured

SPOLIATION

- ☐ **Spoliation is a legal concept which refers to wrongful deprivation of possession of property without owner's consent**
- ☐ **Civil litigation can be a result of this action**

FIRE INVESTIGATOR RESPONSIBILITIES

- ☐ **Preserve anything that he/she identifies as potential importance**
- ☐ **Who will preserve this evidence?**
- ☐ **Where will the evidence be retained?**
- ☐ **Fire Investigation Units typically have policies to address these issues**





CODES IN FIRE INVESTIGATION

- ☐ **NFPA 921 specifies documentation of code violations**
- ☐ **Did the violation(s) contribute to injury or death?**
- ☐ **Potential litigation due to noncompliance**
- ☐ **Potential criminal charges due to noncompliance**

DOCUMENTATION





CODE VIOLATIONS

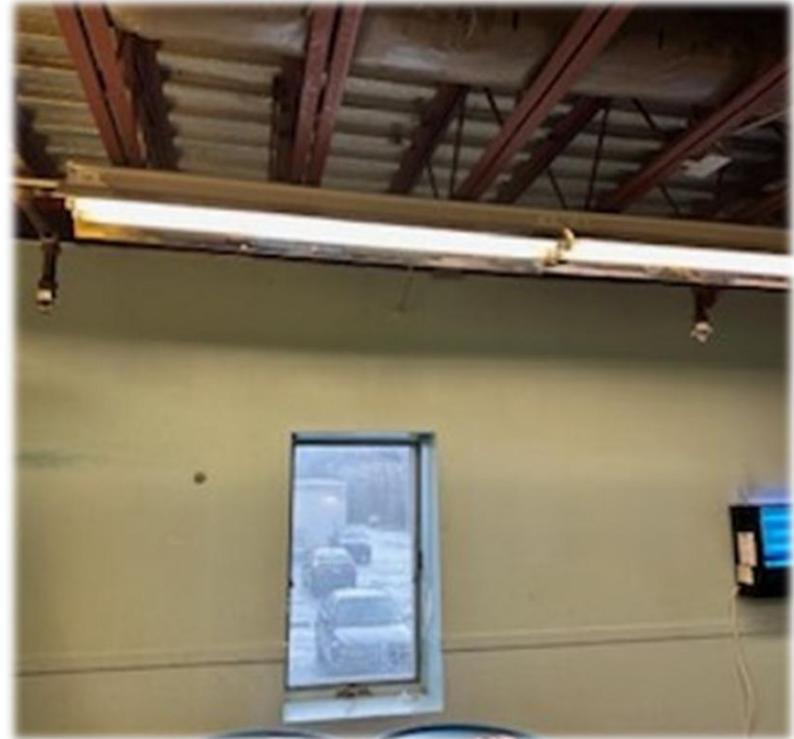
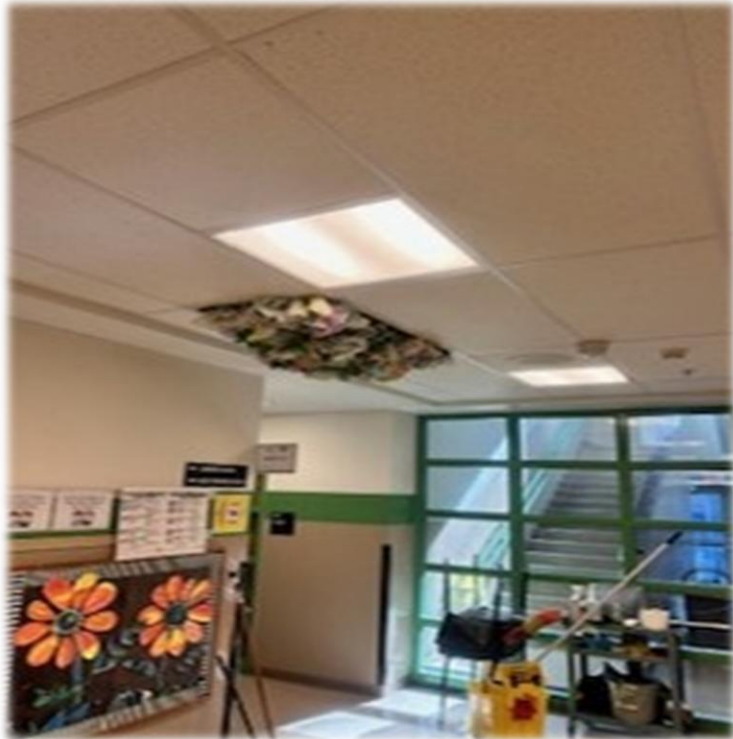




VIOLATIONS



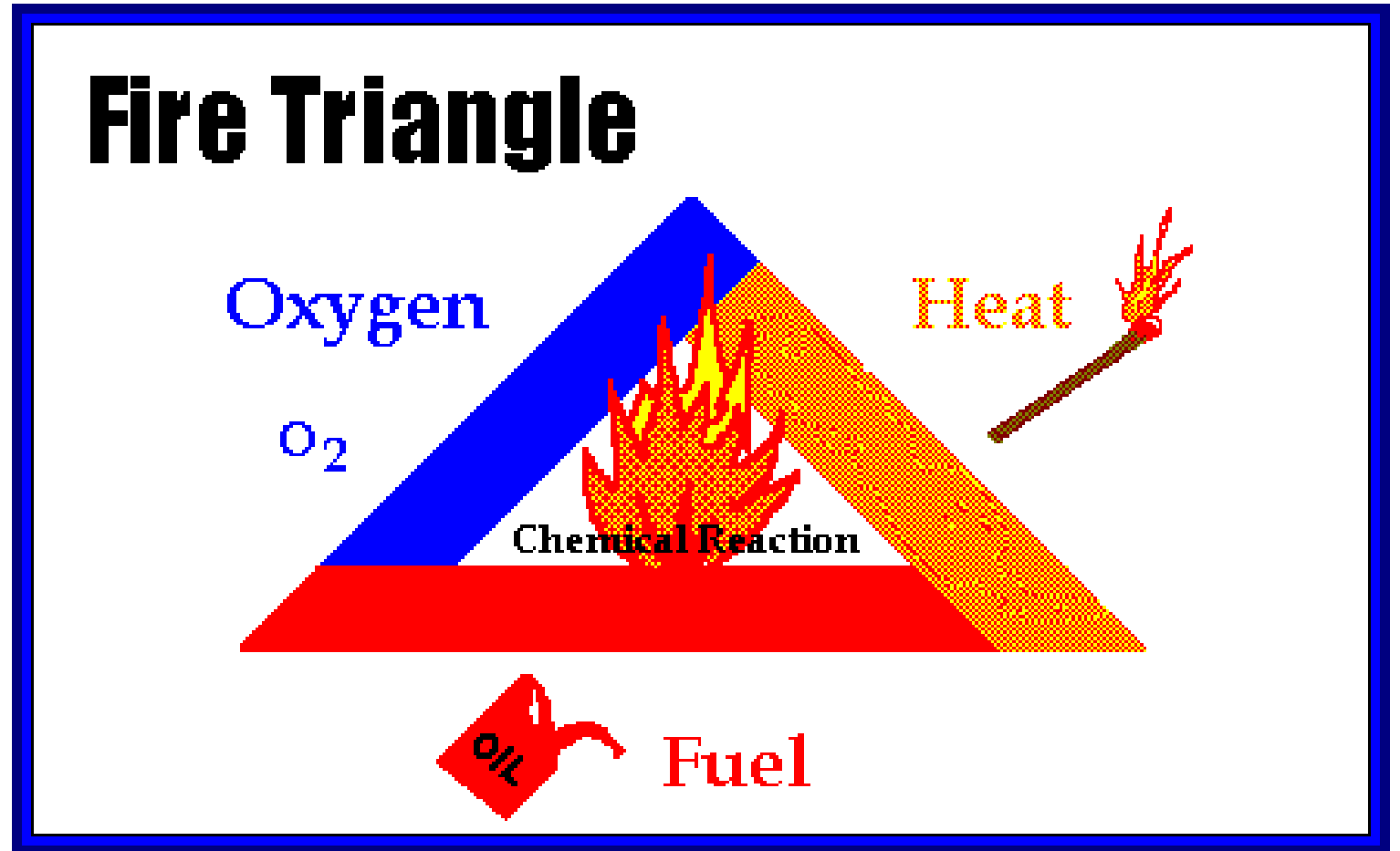
VIOLETIONS



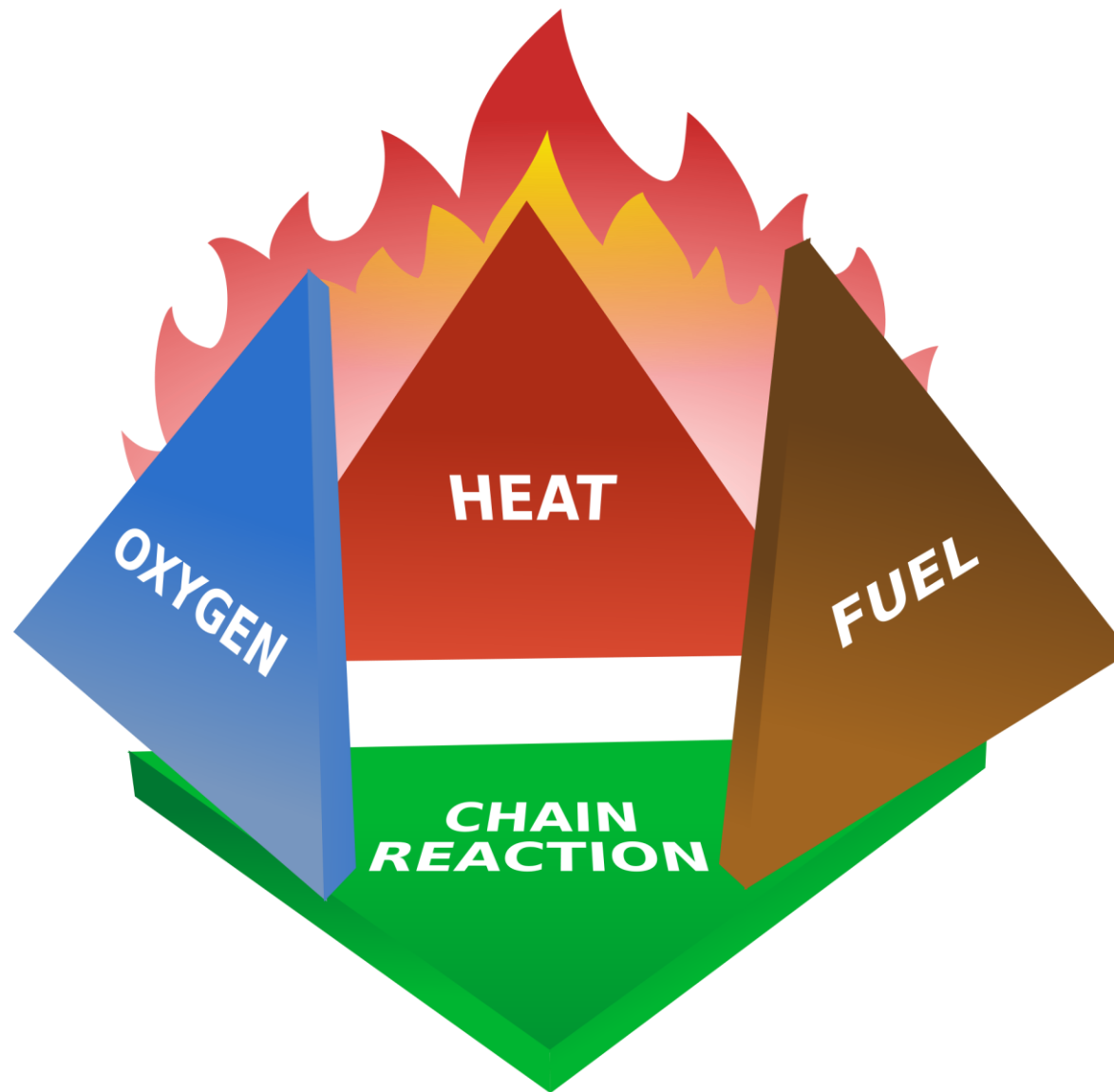
FIRE BEHAVIOR



FIRE TRIANGLE



FIRE TETRAHEDRON





STAGES OF FIRE DEVELOPMENT

- ☐ **Ignition (incipient)**
- ☐ **Growth**
- ☐ **Fully developed**
- ☐ **Decay**



FIRE INVESTIGATOR REQUISITE KNOWLEDGE

- ☐ Hazard recognition, evaluation and basic mitigation procedures
- ☐ Hazardous materials
- ☐ Building construction
- ☐ Fire protection systems
- ☐ Electricity and electrical systems
- ☐ Fuel gas systems

FIRE INVESTIGATOR REQUISITE KNOWLEDGE

- ☐ Fire chemistry
- ☐ Thermodynamics
- ☐ Fire dynamics
- ☐ Explosion dynamics
- ☐ Fire analysis

FIRE INVESTIGATOR REQUISITE KNOWLEDGE

- ☐ **Fire investigation methodology**
- ☐ **Fire investigation technology**
- ☐ **Evidence documentation, collection,
and preservation**

FIRE INVESTIGATION TASKS

- ☐ **Safety survey**
- ☐ **Witness interviews**
- ☐ **Photographs**
- ☐ **Sketching**
- ☐ **Debris removal**

SAFETY SURVEY

- ☐ Both NFPA 921 & 1321 require a safety survey
- ☐ Starts on the exterior of the building
- ☐ Interior safety survey
- ☐ Sharing hazard types and locations with others involved

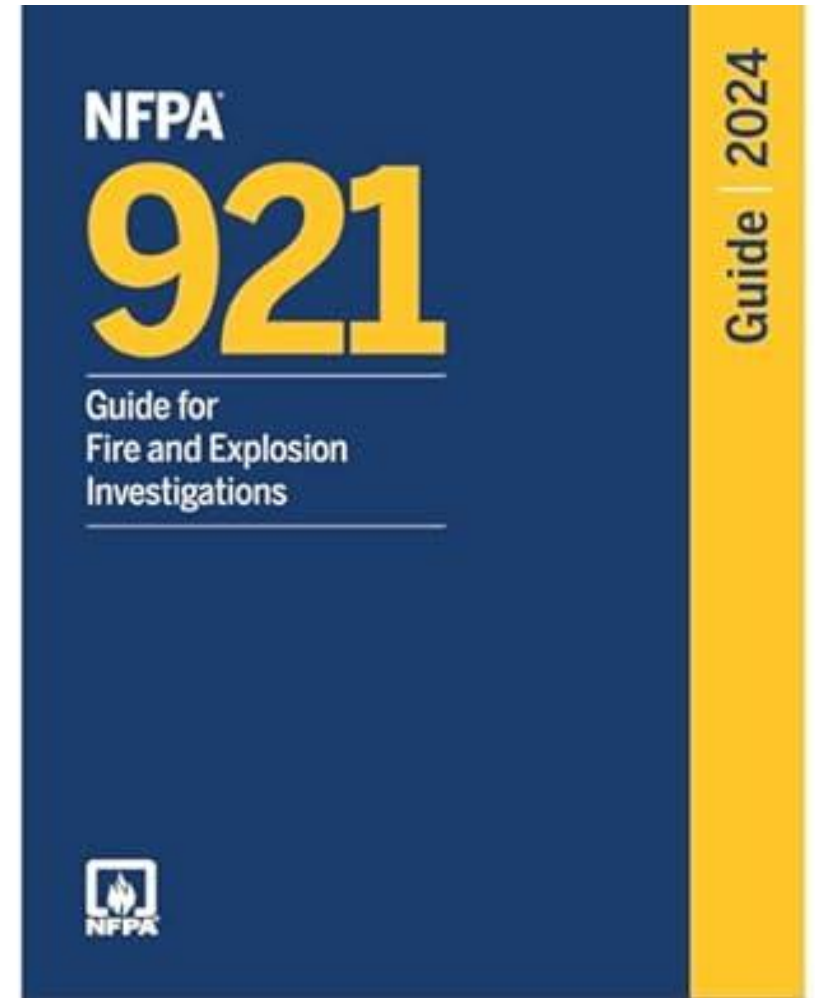
WITNESS INTERVIEWS

- ☐ **Critical to fire investigation process**
- ☐ **Help verify or discount initial reports**
- ☐ **Verify the placement of items in a room or building**

PHOTOGRAPHS

- ☐ First photo – Incident data card
- ☐ Front of the building
- ☐ Side
- ☐ Rear
- ☐ Other side

NFPA 921 outlines a systematic approach to fire investigation, emphasizing the scientific method to ensure reliable and objective conclusions about fire origins and causes.

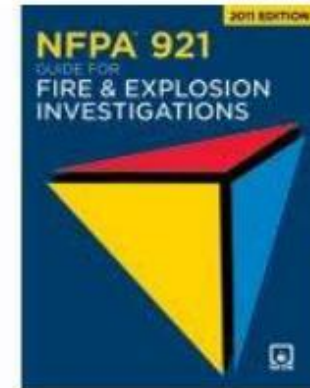


SCIENTIFIC METHOD

- ☐ 7 Step process
- ☐ Required by referenced documents
- ☐ Analytical process
- ☐ The method is the Systematic Approach

Seven Steps of the Scientific Method – NFPA 921

1. **Recognize** the problem (Identify)
2. **Define** the problem
3. **Collect data**
4. **Analyze** the data
5. **Develop a hypothesis** (inductive reasoning)
6. **Test** the hypothesis (deductive reasoning)
7. **Select** the final hypothesis



INCIDENT DATA CARD

- ☐ Agency name
- ☐ Date
- ☐ Incident number
- ☐ Address of incident
- ☐ Additional
information
- ☐ Camera type
- ☐ Investigator assigned



Department of Fire & Rescue Services
City of Reading, PA
Incident Investigation Form
Office of the Fire Marshal

RFD INCIDENT #:

RPD INCIDENT #:

DATE:

ADDRESS:

ADDITIONAL INFO:

PLATOON: A

INVESTIGATOR: Jeremy Searfoss/C23

INV. INITIALS: JSS

Photography Type: Digital

UTILITIES

- ☐ Documentation of all services
- ☐ Electric service
- ☐ Gas/Propane service
- ☐ Water service
- ☐ Photovoltaics

ELECTRIC SERVICE



ELECTRIC SERVICE



GAS SERVICE



GAS SERVICE



WATER SERVICE



PHOTOVOLTAIC SYSTEMS



FIRE PROTECTION SYSTEMS

- ☐ Importance of documentation
- ☐ Operable or inoperable
- ☐ Condition found
- ☐ Coverage gaps
- ☐ Civil actions
- ☐ Criminal actions

FIRE PROTECTION SYSTEMS



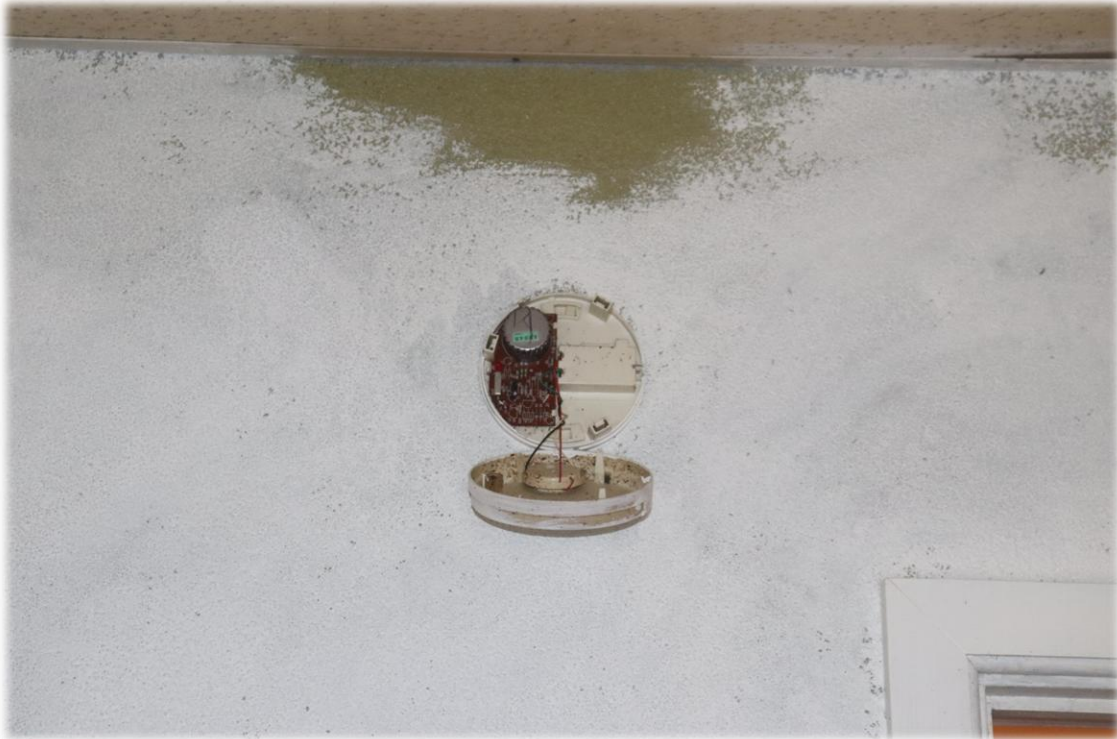
FIRE PROTECTION SYSTEMS



FIRE PROTECTION SYSTEMS



SMOKE ALARMS



FIRE PATTERNS

- ☐ **Visible and measurable physical or identifiable shapes formed by effects of fire on materials**
- ☐ **Two types – Movement and Intensity patterns**
- ☐ **Assist Fire Investigators to determine fire origin**

SYSTEMATIC APPROACH

- ☐ **Start of the outside of the building**
- ☐ **Move from areas of least burn to most burned**
 - **Lowest to highest floor**
 - **Highest to lowest floor**
 - **Follow a manufacturing process**

FIRE SCENE REVIEWS

A thick, hand-drawn style orange line that underlines the text "FIRE SCENE REVIEWS". It starts under the first letter 'F' and ends under the last letter 'S', with a slightly wavy, irregular appearance.

RESOURCES

- ❑ www.cfitrainer.net
- ❑ Local fire programs
- ❑ National Fire Academy

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