



Chapter 1 Historic Fires, Injury Prevention, and Community Risk Reduction



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Welcome!

- Introductions
- Objectives – NFPA 1035
- Class Requirements and Course Outline
- Expectations
 - What you can expect
 - What I can expect
- It's an Uphill Climb!
- What's going on in your department?

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Introduction

- Local fire departments
 - Many people will never need to call
 - May never experience their expertise
- Fire and life safety educators
 - Ability and duty to reach the community
 - Safety lessons and more
 - Become the face of the department
 - Marketing at it's best!

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Objectives (1 of 3)

- Develop an appreciation for the roles engineering, enforcement, education, economic incentives, and emergency response play in fire and life safety (NFPA 4.1.1). (pp. 1–2)
- Understand the importance of learning about historical fires and the implications their outcomes have for fire and life safety efforts in the future. (p. 1)
- Identify the role of fire and life safety education in preventing line-of-duty deaths for fire fighters. (p. 16)

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Objectives (2 of 3)

- Explain the reasons a safety educator needs a basic understanding of human behavior in fires and other disasters (NFPA 4.1.1). (pp. 17–18)
- Determine the type of information the public needs to know to improve their chances of survival in a fire or other emergencies (NFPA 4.1.1). (p. 20)
- Recognize and dispel common myths about human behavior in fires (NFPA 4.1.1). (pp. 18)
- Apply and include information about human behavior in fires to appropriate fire service programs (NFPA 4.1.1). (pp. 17–19)

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Objectives (3 of 3)

- Describe the role fire service and life safety educators play in the area of injury prevention education (NFPA 4.1.1). (pp. 20)
- Describe community risk reduction as it relates to fire prevention (NFPA 4.1.1). (pp. 29–30)
- Explain the basic steps to a community risk reduction plan (NFPA 4.1.1). (pp. 29–30)
- Identify the value of community partners. (pp. 29–30)

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Where, Why, and How Does FLSE Fit in the Big Picture of the Fire Service?

What do you think?



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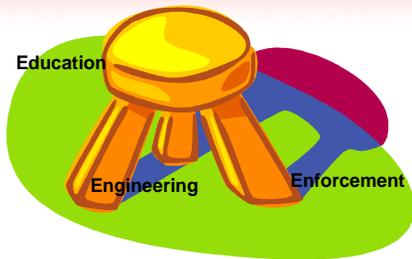
History

- Lessons are to be learned from past fires.
- Disastrous outcomes can be mitigated by educating people.
- Educators will be better prepared if they understand the evolution of this area of study.

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Three E's of Fire Prevention



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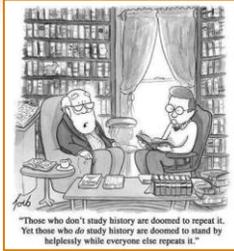
Historical Fires in the United States



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Learning from the Past Before Moving Forward



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Historical Fires

What Have We Learned?

Break into groups according to assigned fire

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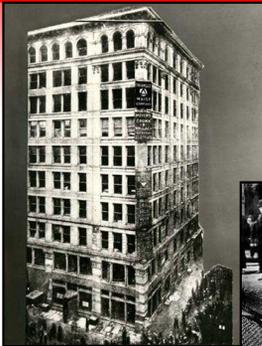
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Iroquois Theater Fire (December 30, 1903) (2 of 2)

- Later reports:
 - Investigations revealed several serious safety code violations.
 - Ushers and other personnel had no idea what to do in the event of fire.
- Code changes and reform:
 - Outward-opening exit doors to remain unlocked and fitted with panic hardware
 - Mandatory upgrades

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**Triangle Shirtwaist
Factory Fire
March 25, 1911
146 deaths**



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Triangle Shirtwaist Factory Fire (March 25, 1911) (1 of 2)

- One of the most infamous industrial fires in America's history.
- Contributing factors:
 - Presence of highly flammable material
 - Inefficient system in place to raise fire alarm
 - Deficiencies in fire escape avenues
 - Desperate escape attempts by the people trapped
 - Fire fighters hampered in their fight by inadequate equipment

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Triangle Shirtwaist Factory Fire (March 25, 1911) (2 of 2)

- Code changes and reform:
 - Paved the way for today's National Fire Protection Association (NFPA) 101—Life Safety Code.
 - The Sullivan-Hoey Law was passed, by which separate fire prevention bureaus were created in New York.
 - Changes were brought about regarding construction of structures like stairways, elevators, sprinklers, doors etc.

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Cocoanut Grove Nightclub Fire November 28, 1942 492 deaths



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Cocoanut Grove Nightclub Fire (November 28, 1942) (1 of 2)

- Contributing factors:
 - Exits that were either not visible or not easily accessed
 - Decorations made of highly flammable material
 - Presence of an overcapacity crowd



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Cocoanut Grove Nightclub Fire (November 28, 1942) (2 of 2)

- Code changes and reform:
 - Nightclubs were recognized as public places and considered a jurisdiction of the fire department.
 - Special regulations resulted concerning the exits, lighting, sprinklers, and the use of combustible materials in the premises.
 - Importance of burn treatment and respiratory management of burn victims was recognized.

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Our Lady of the Angels School Fire December 1, 1958 95 deaths



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Our Lady of the Angels School Fire (December 1, 1958) (1 of 2)

- Contributing factors:
 - Interiors of the building were predominantly wood-based with floors coated with flammable petroleum-based waxes.
 - Fire safety devices were either absent or inaccessible even to most adults.
 - No fire alarm connected directly to the fire department.
 - Further delay in raising the alarm was caused by the protocol in place.

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Our Lady of the Angels School Fire (December 1, 1958) (2 of 2)

- Code changes and reform:
 - All schools must have fire detection devices and fire fighting systems.
 - Structural changes were also recommended regarding the hallways, stairwells, and exit doors.
 - School personnel were required to be trained in fire safety besides empowering them to call the fire department for help.
 - Monthly drills were required to be conducted.

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Beverly Hills Supper Club May 27, 1977 165 deaths



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Beverly Hills Supper Club Fire (May 28, 1977) (1 of 2)

- The third deadliest nightclub fire in U.S. history
- Contributing factors:
 - Failure to remedy major safety defects
 - Structural problems, substandard wiring, flammable building materials, a shortage of exits, gross overcrowding, and “myopic” inspection efforts

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Beverly Hills Supper Club Fire (May 28, 1977) (2 of 2)

- Code changes and reform:
 - Requirements for automatic sprinklers and fire alarm systems in new and existing assembly occupancies when the number of occupants exceeds 300



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MGM Grand Hotel Fire (November 21, 1980)

- Contributing factors:
 - Poor structural design and installation errors
 - 83 building code violations
 - A fire damper bolted open that should have been caught during an inspection
 - No one pulled any of the many available manual alarms.



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Station Nightclub Fire February 20, 2003 100 deaths



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16 Firefighter Life Safety Initiatives

Initiative #1

Define and advocate the need for a *cultural change* within the fire service relating to safety; incorporating leadership, management, supervision, accountability and personal responsibility.

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16 Firefighter Life Safety Initiatives

Initiative #14

Public Education must receive more resources and be championed as a critical fire and life safety program.

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Human Behavior in Fires



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What Do You Think?

Fire Alarm Reaction

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Human Behavior in Fires

- Evacuation
 - Occupants become aware of emergency
 - Experience several mental processes
 - Success depends on several factors
 - Important decisions and actions
 - Most happen before fire department arrival

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Facts and Fallacies of Human Behavior in Fires



- Myths
 - People panic
 - Does not occur in most cases
 - Coconut Grove: as few as one third panicked
 - People are selfish and capricious
 - People help one another
 - Actions are altruistic

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Fallacies of Human Behavior in Fires

- Myths:
 - People always panic.
 - In most cases of serious fires, panic did not occur.
 - People do not think clearly.
 - People try to solve the problem in what would be a rational manner.
 - People become selfish and ineffectual.
 - They are often helpful and calm in the face of danger.
 - People do help one another and come to the aid of those less able to take care of themselves.

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Facts of Human Behavior in Fires

- Facts:
 - People are poor estimators of their risk and abilities to cope with hazards.
 - Family groups favor a group survival strategy.
 - People move toward the familiar.
 - A group leader can generally determine the outcome for everyone.
 - Learned irrelevance is a potential risk that comes out of ignoring safety signs because of their familiarity.

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Occupant Characteristics and Other Factors Determining Human Behavior in Fires

- Age
- Gender
- Alertness
- Familiarity with the building
- Role and responsibility
- Commitment
- Focal point

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Human Response to Cues

- People have learned to ignore alarms
 - Seek more information
 - Before taking action
 - Underestimate seriousness
 - Dissolution of responsibility
- Decision to evacuate
 - Commitment to initiate safety behaviors



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Human Response to Cues

- Initial response is to ignore alarms and wait for further cues.
- Dissolution of responsibility prompts them to believe that others will handle the situation.
- Most effective strategy: trained wardens facilitating the process coupled with a live voice message identifying the problem and location and giving instructions.

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Decision Making When Encountering a Fire

- Actions taken during pre-movement time are most critical.
- Variables influencing the decisions made:
 - Person's personality
 - Experience
 - Cognitive abilities
 - Information available about the situation
 - Time left before situation becomes desperate
 - What else might be at stake

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Decision Making of People Encountering a Fire

- Some may leave immediately
 - Others will:
 - Gather things of importance
 - Notify others
 - Seek more information
- Pre-movement time:
 - Between cue recognition and evacuation
- Types of decisions made vary

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Training the Public for More Efficient Evacuation

- System design:
 - Must compensate for human error
 - Three E's
- Training:
 - Provides ability to retrieve the right skills
 - Helps eliminate need to figure out what to do
 - Drills validate effectiveness

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Training the Public for More Efficient Evacuation

- Staff training is done best through classroom instruction followed up by conducting evacuation drills.
- Training provides a simulation of the real experience.
- All information should be included while imparting training in evacuation.
- The importance of attending to alarms immediately should be stressed.

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Injury Prevention and the Fire Service



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Injury Prevention

- Fire service’s role has expanded to include emergency medical services.
- Injuries: Any unintentional or intentional damage to the body
- Many of these unintentional injuries can be prevented.

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Injury Prevention and the Fire Service

- Fire department role has shifted
 - From “load-and-go” EMS to:
 - Advanced pre-hospital care
 - Injury prevention
- Accidents
 - People have little or no control
- Injuries
 - Defined as unintentional or intentional – not accidents

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Early Pioneers and Their Contributions to Injury Prevention

- Haddon (cont'd)
 - Developed three phases of prevention
 - Primary prevention: efforts focused on stopping an injury before it occurs
 - Secondary prevention: efforts to reduce the seriousness of the injury once it has occurred
 - Tertiary prevention: medical treatment and rehabilitation to reduce the disability after the injury occurs

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Phase	Host (Human)	Vector (Boat)	Physical Environment	Socioeconomic Environment
Pre-event	Driver ability, training, judgment, experience, alcohol intoxication	Condition of boat, speed of travel, type of boat, stability of boat	Visibility, weather and water conditions, number of boats on lake	Attitudes toward drinking; laws related to drinking and boating; access to alcohol, boats, and other watercraft
Event	Position of people in the boat, number of people in the boat, physical condition of occupants, Personal Flotation Device (PFD) use	Size of boat, crash worthiness, placement of seats, load containment	Presence of unsecured items, guard rails, speed limits on lake, crowded conditions in boat and on water	Attitudes about alcohol use and boating, enforcement of waterway speed limits, laws about alcohol use and boating, PFD use laws
Post-event	Victims' general health status	Design of watercraft systems to minimize post-event explosion and capsizing	Emergency communications systems, availability and quality of Emergency Medical Services (EMS)	Public support for trauma care and rehabilitation systems, training of EMS personnel, education for boat and recreational watercraft rental agencies, education for local establishments selling alcohol

TABLE 1-3 Haddon's Matrix as Applied to Adolescents, Drinking, and Boating – page 29)

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Haddon's Matrix Exercise



- Choose an unintentional injury in your "group department"
- Fill in Haddon's Matrix to break down event to be able to create lesson based on pre-event, event, and post-event

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Haddon's Matrix - Incident:

Phase	Host	Vector	Physical Environment	Socioeconomic Environment
Pre-Event				
Event				
Post-Event				

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Injury Prevention Makes Strides

- 1990s
 - Field took off
 - Injury prevention articles
 - Movement grew and called for coalitions
 - Urban Survival prevention program – Phoenix,
 - NFPA introduced Risk Watch®
 - How many are now doing some form of Risk Watch?
 - How do you do it?
 - Many variations are acceptable as long as it has impact
 - Need community partners

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Injury Prevention Makes Strides

- Formation of the Centers for Disease Control's (CDC) Center for Injury Control
- National Safe Kids Campaign® (NSKC)
- Risk Watch®

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2012 CDC Leading Causes of Death

2016 - WE'RE DOING MUCH BETTER THAN YEARS AGO

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Motor Vehicle Crashes and Prevention

- Leading cause of death for people from ages 1 through 44
- Challenge to educators:
 - Convincing the public to use available technology and to refrain from indulging in deadly behaviors like using the cell phone while driving

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Bicycle Injuries and Prevention

- Head injury is the leading cause of death in bicycle crashes.
- Tips to include in bicycle safety programs:
 - Use of helmets and advice on choosing a helmet
 - Advice on proper clothing
 - Proper behavior on the roads
 - Use of hand signals and obeying traffic signals

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Drowning and Prevention

- Tips to include in water safety programs:
 - Adults need to supervise children at all times around water.
 - Adults and children should wear PFDs.
 - Pools should be fenced.
 - Children should be taught to respect pool rules at all times.
 - All family members should learn to swim.

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Burns and Prevention

- Burns are categorized by the source of heat that damages the skin.
- Care for the burn is determined by the type of burn:
 - Thermal
 - Chemical
 - Electrical
 - Radiation

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Falls and Prevention

- Falls are preventable for all age groups.
- Experts have offered recommendations to lower the risk of falls in children and older adults.

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Poisoning and Prevention

- Tips that could help prevent accidental poisoning:
 - All medication and cleaners should be kept locked and in their original containers.
 - Unused medication should be properly disposed of.
 - Extreme care should be taken when taking medications.
 - Children should be warned against taking medicines on their own.
 - Poisonous plants should be identified.
 - Carbon monoxide detectors should be installed.
 - Poison Help number should be known to all.

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Suffocation and Prevention

- Precautions to take to prevent children from choking or suffocating:
 - Potential hazards around the house should be removed or kept out of reach.
 - Foods given to children should not be hard or too smooth.
 - Safe practices should be followed while eating and playing.

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Effective Strategies for Injury Prevention

- A few strategies have been identified as being critical for injury prevention.
 - Adoption of a culture of safety
 - Involvement of the community
 - Drawing up a combination of active solutions
 - A focused leadership collaborating with other agencies
 - Use of rewards to coax desired actions

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Effective Strategies for Injury Prevention

- Critical strategies
 - Multiple grounded strategies
 - Community stakeholders involvement
 - Community-based networking and advocacy
 - Local surveillance and data collections
 - Time to coordinate networks
 - Modeling, active, and passive solutions
 - Focused leadership and use of rewards

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Community Risk Reduction

- Six basic steps
 - Step 1: Identify risks.
 - Step 2: Prioritize risks.
 - Step 3: Develop tactics to mitigate risks.
 - Step 4: Prepare the community risk reduction plan.
 - Step 5: Implement the plan for the community.
 - Step 6: Monitor, evaluate, and modify the plan while tracking short-term and long-term results.



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Where Does the Fire Service Go from Here?

- Fire and life safety educators can:
 - Network with other injury prevention agencies
 - Integrate injury prevention messages into existing programs and presentations
 - Monitor local risks and trends
 - Take a leadership role in creating a local injury prevention coalition

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Summary (1 of 3)

- Fire and life safety educators should learn from the past and apply history's lessons to current practices.
- All Five Es of prevention are necessary to effectively prevent fire:
 - Engineering
 - Enforcement
 - Education
 - Economic incentives
 - Emergency response

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Summary (2 of 3)

- Everyone must be educated about the reasons behind the codes and enforcement.
- Human behavior in emergency situations is more rational and altruistic than previously believed.
- Educators can provide people with situations to fall back on in times of emergency.

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Summary (3 of 3)

- Injury prevention education is a responsibility of the fire service along with fire prevention education.
- Community risk reduction (CRR) is a strategic planning process for fire and injury prevention.
- Everyone is responsible for teaching fire and life safety, and everyone should invest the time to learn about this field of the fire service.

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