



International  
Association  
of Fire Chiefs



National  
Fire Protection  
Association

# Fire Officer

Principles and Practice  
THIRD EDITION

## Chapter 17 Fire Attack (Fire Officer I)

# Fire Officer I Objectives

- Discuss the results of the full-scale structure fire experiments conducted by the National Institute of Standards and Technology (NIST) and Underwriters Laboratories (UL).
- Describe a fire officer's role in supervising a single company.

# Fire Officer I Objectives

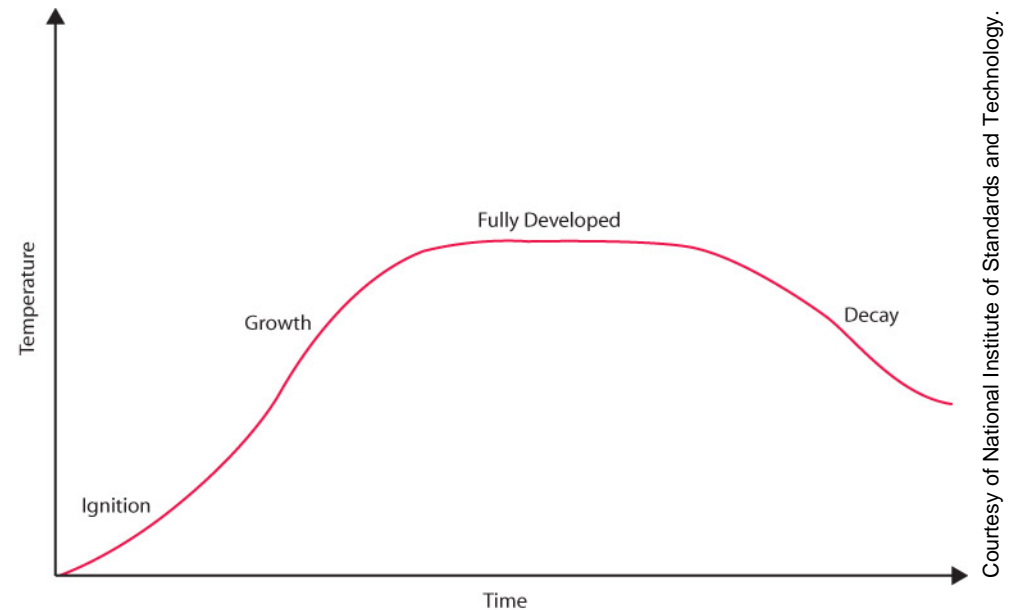
- Describe how to size up the incident.
- Discuss how to develop an incident action plan.
- Discuss tactical safety considerations when fighting fires.

# Introduction

- Structural firefighting is a practice built upon experience and experiments.
  - Recent findings have:
    - Changed our understanding of fire dynamics
    - Identified the importance of controlling flow path
    - Changed ventilation and interior firefighting practices

# New Fire Behavior Graph

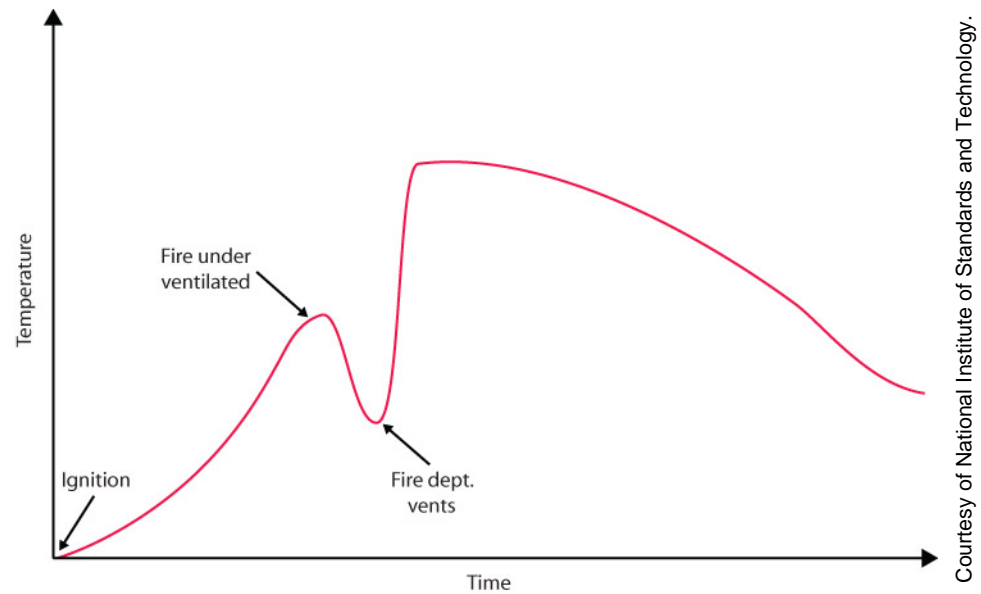
- Fire experiments in 1908 led to the development of a time-temperature curve.
  - At the time, fires within a structure were fuel limited.



Courtesy of National Institute of Standards and Technology.

# New Fire Behavior Graph

- Recent experiments have shown that modern fires are ventilation limited.
  - Resulted in a different time-temperature curve

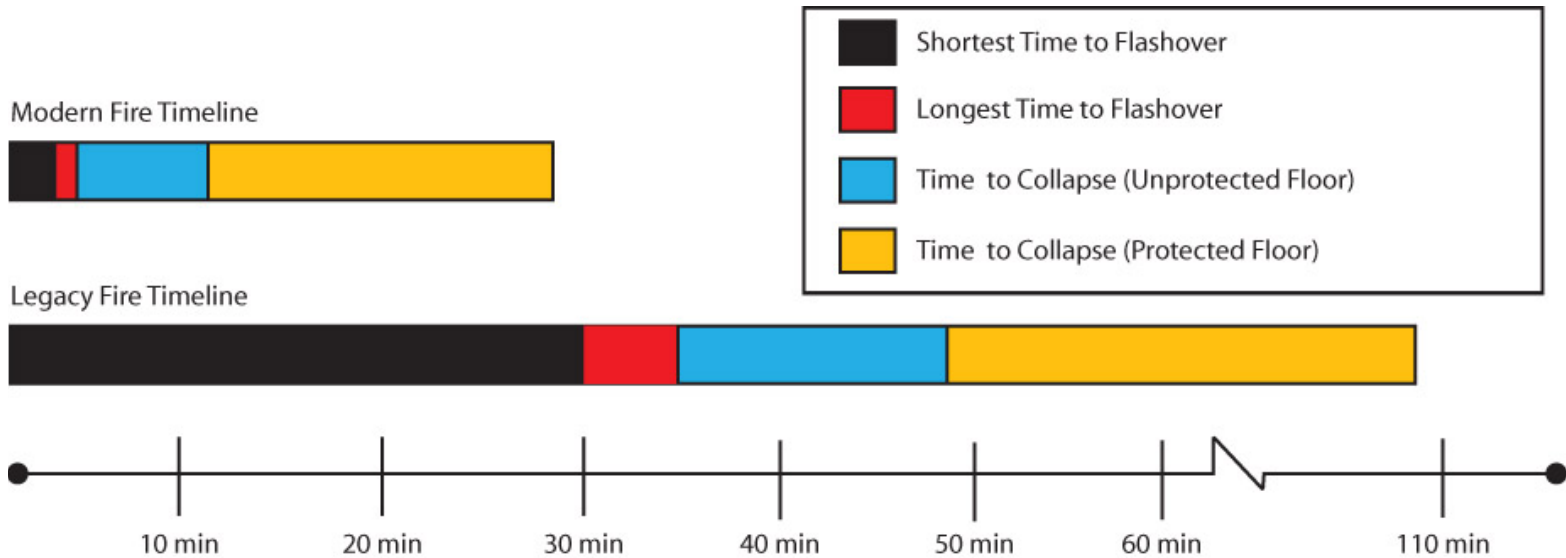


Courtesy of National Institute of Standards and Technology.

# Modern Versus Legacy Single-Family Dwellings

- Four factors distinguish modern versus legacy single-family dwellings:
  - Larger homes
  - Open house geometries
  - Increased fuel loads
  - New construction materials

# Modern Versus Legacy Single-Family Dwellings



Reproduced from: Fire Technology 48(4): 865-891, "Analysis of Changing Residential Fire Dynamics and Its Implications on Firefighter Operational TimeFrames", Kerber, S., Copyright © 2012, National Fire Protection Association.

# Flow Path

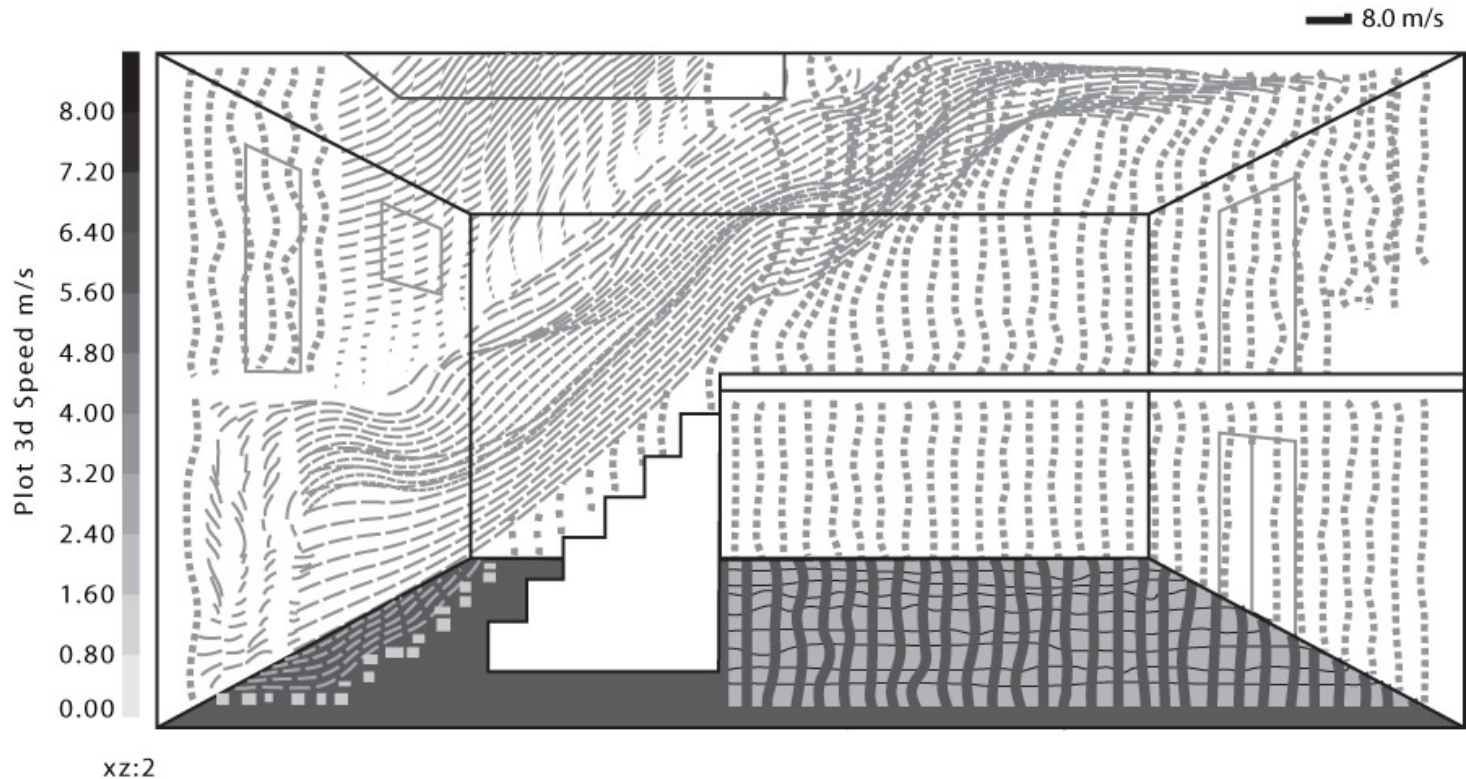
- **Flow path:** Volume between an inlet and an exhaust that allows heat and smoke to move from a higher-pressure area toward lower-pressure areas.

# Flow Path

- When combatting ventilation-limited compartment fires:
  - Control the access door.
  - Apply water before vertical ventilation.
  - Apply 30-90 seconds of water.
  - You cannot make a big enough ventilation hole.

# Flow Path

- Operations conducted in the flow path place fire fighters at significant risk.



Reproduced from: Madrzykowski, Daniel (2013) Fire Dynamics: The Science of Fire Fighting. International Fire Service Journal of Leadership and Management. Vol. 7, Number 2, page 7-15. Tulsa, OK: Oklahoma State University. Courtesy of National Institute of Standards and Technology.

# Supervising a Single Company

- The fire officer is the working supervisor of a fire company.



Courtesy of Mike Legeros

# Closeness of Supervision

- The level of supervision should be balanced with:
  - The experience level of company members
  - The nature of the assignment
- The level of supervision is also affected by the location of the task.

# Situational Leadership

- Adopt the appropriate leadership style for the situation.
  - Nonemergency situations: Participative leadership is appropriate.
  - Emergency incident: Decisions are needed quickly.

# Standardized Actions

- Emergency operations must be conducted in a structured, consistent manner.
- Strong emphasis is placed on standard operating procedures (SOPs).

# Command Staff Assignments

- Include safety officer, liaison officer, and public information officer
- The fire officer working in one of these positions reports directly to the incident commander.

# Sizing up the Incident

- Size-up is a systematic process of gathering and processing information to evaluate a situation.
  - The end result is an incident action plan.
  - An experienced officer will adjust the plan as more information becomes available.

# Prearrival Information

- Size-up begins with dispatch.
- The name, location, and nature of the incident help the fire officer anticipate what might be happening at the scene.

# On-Scene Observations

- SOPs list the essential size-up factors.
- The fire officer must understand and recognize basic fire dynamics.
  - This information is needed to predict where the fire is burning and where it will spread
  - Visualization is a significant factor.

# On-Scene Observations

- An understanding of fire dynamics is also needed to develop action plans.
- Fuel load is another important factor.

# Lloyd Layman's Five-Step Size-up Process

1. Facts
2. Probabilities
3. Situation
4. Decision
5. Plan of operation

# National Fire Academy's Size-up Process

1. Preincident information
2. Initial size-up
3. Ongoing size-up

# Risk–Benefit Analysis

- Key size-up factor when selecting the appropriate strategic mode
  - The degree of risk that is acceptable is determined by the benefits that can be anticipated.

# Risk–Benefit Analysis

- Determines the appropriate strategy for an incident:
  - Offensive operation
  - Defensive operation
  - Transitional operation



Courtesy of Mike Legeros

# Incident Action Plan

- After size-up, the incident commander develops an incident action plan.
  - Two major components:
    1. Determination of appropriate strategy
    2. Development of tactics to execute strategy
  - SOPs are used.

# Incident Priorities

1. Life safety
2. Incident stabilization
3. Property conservation

# Tactical Priorities (RECEO VS)

- **Rescue**
  - Remove victims from danger.
- **Exposures**
  - Keep the incident from getting bigger.
- **Confinement**
  - Prevent the fire from spreading to uninvolved areas.

# Tactical Priorities (RECEO VS)

- **Extinguishment**
  - Extinguish the fire or mitigate the incident.
- **Overhaul**
  - Make sure the fire is completely out.

# Tactical Priorities (RECEO VS)

- **Ventilation**
  - Remove heat, smoke, and products of combustion from a fire area.
- **Salvage**
  - Protect or remove property that could be damaged by fire, smoke, water, or firefighting operations.

# Tactical Safety Considerations

- A full ensemble of protective clothing and equipment should be worn when exposed to hazardous conditions.
  - Its weight, bulk, and thermal properties must be considered during extreme weather conditions.

# Scene Safety

- Use lights at night.
- During cold weather, spread abrasive materials about the scene.
- If exposed to traffic hazards:
  - Position apparatus to protect the scene.
  - Wear high-visibility safety vests or jackets.
  - Request traffic control.

# Scene Safety

- Identify hazardous areas.
  - Hot zone
  - Warm zone
  - Cold zone
- Keep spare clothes on hand.

# Rapid Intervention Crew

- Initial rapid intervention crew (IRIC):
  - Two members from the initial attack crew
- Rapid intervention crew (RIC):
  - Four members
  - Generally positioned outside, ready for immediate action

# Personnel Accountability Report (PAR)

- Systematic method of accounting for all personnel at an emergency incident
  - The fire officer physically verifies members are present.
- Anytime a fire fighter cannot be accounted for, he or she is considered missing until proven otherwise.

# Summary

- Recent experiments have changed our understanding of fire dynamics and the importance of controlling the flow path.
- The fire officer is a working supervisor.
- The fire officer needs to adopt the appropriate leadership style based on the specific situation at hand.

# Summary

- Emergency incident operations must be conducted in a structured manner.
- Command staff assignments include the safety officer, liaison officer, and public information officer positions.
- The art of sizing up an incident requires a diverse knowledge base.

# Summary

- The specific size-up for an incident begins with the dispatch.
- The ability to size up a fire situation quickly requires a systematic approach.
- Chief Lloyd Layman presented a five-step process for analyzing emergency situations.

# Summary

- The National Fire Academy's size-up system includes three phases.
- Risk–benefit analysis is a key factor when selecting the strategic mode.
- After size-up, the incident commander develops an incident action plan based on the incident priorities.

# Summary

- Tactical priorities provide an order for dealing with incident priorities.
- Fighting fires is inherently dangerous.
- Many departments have developed RIC training and deployment procedures.
- When a PAR is requested, the officer verifies that all members are present.