Preparation for Initial Company Operations

PICO-Student Manual

2nd Edition, 2nd Printing-July 2016

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Acronyms

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ACKNOWLEDGMENTS

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COURSE GOAL

The goal of the course is to clarify the role the Company Officer (CO) plays in the preparation and education of firefighters.

AUDIENCE, SCOPE AND COURSE PURPOSE

The primary target audience for the "Preparation for Initial Company Operations" (PICO) course is:

- Newly promoted COs and firefighters acting in the CO role.

- First and second COs who arrive on an incident scene.

The course is designed to help newly promoted COs learn planning and preparedness techniques and the importance of these techniques in promoting company readiness and firefighter safety during emergency incidents.

GRADING METHODOLOGY

Course Grade

The required performance to successfully complete the course is attained by completing the examination with at least a "C" by answering correctly a minimum of 21 out of 30 questions.

The following course grading plan should be used to determine the assigned course grade for each student in the class.

Letter Grade	Point Range
A	90-100
B	80-89
C	70-79
F	69 or lower

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SCHEDULE

TIME	DAY 1	DAY 2
8:00 - 9:45	Introduction, Welcome and Administrative	Unit 3: Communications (cont'd)
9:45 - 10:00	*Break*	*Break*
10:00 - 10:45	Unit 1: Roles and Responsibilities	Unit 3: Communications (cont'd)
10:45 - 11:00	*Break*	*Break*
11:00 - 12:00	Unit 1: Roles and Responsibilities (cont'd)	Unit 3: Communications (cont'd) Unit 4: Building Construction and Fire Behavior Factors
12:00 - 1:00	*Lunch*	*Lunch*
1:00 - 2:15	Unit 1: Roles and Responsibilities (cont'd)	Unit 4: Building Construction and Fire Behavior Factors (cont'd) Unit 5: Preincident Planning
2:15 - 2:30	*Break*	*Break*
2:30 - 5:00	Unit 2: Mission Readiness Unit 3: Communications	Unit 5: Preincident Planning (cont'd) Final Exam

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FIREFIGHTER CODE OF ETHICS
Background

The Fire Service is a noble calling, one which is founded on mutual respect and trust between firefighters and the citizens they serve. To ensure the continuing integrity of the Fire Service, the highest standards of ethical conduct must be maintained at all times.

Developed in response to the publication of the Fire Service Reputation Management White Paper, the purpose of this National Firefighter Code of Ethics is to establish criteria that encourages fire service personnel to promote a culture of ethical integrity and high standards of professionalism in our field. The broad scope of this recommended Code of Ethics is intended to mitigate and negate situations that may result in embarrassment and waning of public support for what has historically been a highly respected profession.

Ethics comes from the Greek word ethos, meaning character. Character is not necessarily defined by how a person behaves when conditions are optimal and life is good. It is easy to take the high road when the path is paved and obstacles are few or non-existent. Character is also defined by decisions made under pressure, when no one is looking, when the road contains land mines, and the way is obscured. As members of the Fire Service, we share a responsibility to project an ethical character of professionalism, integrity, compassion, loyalty and honesty in all that we do, all of the time.

We need to accept this ethics challenge and be truly willing to maintain a culture that is consistent with the expectations outlined in this document. By doing so, we can create a legacy that validates and sustains the distinguished Fire Service institution, and at the same time ensure that we leave the Fire Service in better condition than when we arrived.

FIREFIGHTER CODE OF ETHICS

I understand that I have the responsibility to conduct myself in a manner that reflects proper ethical behavior and integrity. In so doing, I will help foster a continuing positive public perception of the fire service. Therefore, I pledge the following...

- Always conduct myself, on and off duty, in a manner that reflects positively on myself, my department and the fire service in general.

- Accept responsibility for my actions and for the consequences of my actions.

- Support the concept of fairness and the value of diverse thoughts and opinions.

- Avoid situations that would adversely affect the credibility or public perception of the fire service profession.

- Be truthful and honest at all times and report instances of cheating or other dishonest acts that compromise the integrity of the fire service.

- Conduct my personal affairs in a manner that does not improperly influence the performance of my duties, or bring discredit to my organization.

- Be respectful and conscious of each member's safety and welfare.

- Recognize that I serve in a position of public trust that requires stewardship in the honest and efficient use of publicly owned resources, including uniforms, facilities, vehicles and equipment and that these are protected from misuse and theft.

- Exercise professionalism, competence, respect and loyalty in the performance of my duties and use information, confidential or otherwise, gained by virtue of my position, only to benefit those I am entrusted to serve.

- Avoid financial investments, outside employment, outside business interests or activities that conflict with or are enhanced by my official position or have the potential to create the perception of impropriety.

- Never propose or accept personal rewards, special privileges, benefits, advancement, honors or gifts that may create a conflict of interest, or the appearance thereof.

- Never engage in activities involving alcohol or other substance use or abuse that can impair my mental state or the performance of my duties and compromise safety.

- Never discriminate on the basis of race, religion, color, creed, age, marital status, national origin, ancestry, gender, sexual preference, medical condition or handicap.

- Never harass, intimidate or threaten fellow members of the service or the public and stop or report the actions of other firefighters who engage in such behaviors.

- Responsibly use social networking, electronic communications, or other media technology opportunities in a manner that does not discredit, dishonor or embarrass my organization, the fire service and the public. I also understand that failure to resolve or report inappropriate use of this media equates to condoning this behavior.

Developed by the National Society of Executive Fire Officers

A Student Guide to End-of-course Evaluations

Say What You Mean ...

Ten Things You Can Do to Improve the National Fire Academy

The National Fire Academy takes its course evaluations very seriously. Your comments and suggestions enable us to improve your learning experience.

Unfortunately, we often get end-of-course comments like these that are vague and, therefore, not actionable. We know you are trying to keep your answers short, but the more specific you can be, the better we can respond.

Actual quotes from student evaluations:	Examples of specific, actionable comments that would help us improve the course:
1 "Update the materials."	• The (ABC) fire video is out-of-date because of the dangerous tactics it demonstrates. The available (XYZ) video shows current practices. • The student manual references building codes that are 12 years old.
2 "We want an advanced class in (fill in the blank)."	• We would like a class that enables us to calculate energy transfer rates resulting from exposure fires. • We would like a class that provides one-on-one workplace harassment counseling practice exercises.
3 "More activities."	• An activity where students can physically measure the area of sprinkler coverage would improve understanding of the concept. • Not all students were able to fill all ICS positions in the exercises. Add more exercises so all students can participate.
4 "A longer course."	• The class should be increased by one hour per day to enable all students to participate in exercises. • The class should be increased by two days so that all group presentations can be peer evaluated and have written abstracts.
5 "Readable plans."	• The plans should be enlarged to 11 by 17 and provided with an accurate scale. • My plan set was blurry, which caused the dotted lines to be interpreted as solid lines.
6 "Better student guide organization," "manual did not coincide with slides."	• The slide sequence in Unit 4 did not align with the content in the student manual from slides 4-16 through 4-21. • The instructor added slides in Unit 4 that were not in my student manual.
7 "Dry in spots."	• The instructor/activity should have used student group activities rather than lecture to explain Maslow's Hierarchy. • Create a pre-course reading on symbiotic personal relationships rather than trying to lecture on them in class.
8 "More visual aids."	• The text description of V-patterns did not provide three-dimensional views. More photographs or drawings would help me imagine the pattern. • There was a video clip on NBC News (date) that summarized the topic very well.
9 "Re-evaluate pre-course assignments."	• The pre-course assignments were not discussed or referenced in class. Either connect them to the course content or delete them. • The pre-course assignments on ICS could be reduced to a one-page job aid rather than a 25-page reading.
10 "A better understanding of NIMS."	• The instructor did not explain the connection between NIMS and ICS. • The student manual needs an illustrated guide to NIMS.

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UNIT 1:
ROLES AND RESPONSIBILITIES

TERMINAL OBJECTIVE

The students will be able to:

1.1   *Identify the roles and responsibilities of the Company Officer (CO).*

ENABLING OBJECTIVES

The students will be able to:

1.1   *List the eight elements of CO leadership.*

1.2   *Identify the key safety factors that affect safe tactical operations.*

1.3   *Describe the transitional steps from firefighter to CO, and discuss the importance of each.*

1.4   *Recognize the 16 Firefighter Life Safety Initiatives.*

1.5   *Identify the primary size-up factors, and discuss their impact on strategies and tactics.*

1.6   *Explain the Command Sequence Action Cycle.*

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UNIT 1:
ROLES AND
RESPONSIBILITIES

Slide 1-1

ENABLING OBJECTIVES

- List the eight elements of Company Officer (CO) leadership.
- Identify the key safety factors that affect safe tactical operations.
- Describe the transitional steps from firefighter to CO, and discuss the importance of each.

Slide 1-2

ENABLING OBJECTIVES
(cont'd)

- Recognize the 16 Firefighter Life Safety Initiatives.
- Identify the primary size-up factors, and discuss their impact on strategies and tactics.
- Explain the command sequence planning cycle.

Slide 1-3

I. TRANSITION TO COMPANY OFFICER

TRANSITION TO COMPANY
OFFICER

Photo/National Fire Academy (NFA)   Slide 1-4

DEFINITION OF A COMPANY
OFFICER

- Supervises a single resource of the fire department.
- Acts in the capacity of the CO.

Photo/NFA
Slide 1-5

A. Definition of a Company Officer (CO).

1. This individual supervises a single resource of the fire department.

Examples:

a. Engine company.

b. Ladder/Truck company.

c. Emergency Medical Services (EMS) unit.

2. Member of a company who acts in the capacity of a CO will be included in this definition; however, in smaller companies, a firefighter may fill the tactical operations role if no CO is assigned to the company.

3.   The transition from firefighter to CO can be a difficult one. The new CO must change his or her mindset from front-line fireground responsibilities during an incident to an organizer's responsibilities, which include the health, education and safety of his or her firefighters.

DEFINITION OF A COMPANY OFFICER (cont'd)

- CO is one of the most important positions in the organization.
- Promotion to CO is worthy of recognition.

Photo/NFA

Slide 1-6

a.   The CO's position is one of the most important in the organization. The CO is a midlevel leadership role with new responsibilities in the people, administration and safety management areas.

b.   Manages many departmental resources on a daily basis.

c.   Typically, the CO is the first to arrive at emergency incidents and takes control of all aspects of the incident.

4.   Promotion to CO is worthy of acknowledgment.

a.   Swearing-in ceremony.

b.   Promotional party.

c.   Family members present during ceremony.

```
┌─────────────────────────────────────┐
│                                     │
│       DIFFICULT TRANSITION          │
│  ─────────────────────────────      │
│    Firefighter          CO          │
│  • Performed tasks   • Assign tasks to │
│    previously.         others (delegation). │
│  • Involved in hands- • Midlevel leadership. │
│    on fireground     • Supervise    │
│    operations.         fireground   │
│  • "Things" business.  operations.  │
│                      • "People" business. │
│                                     │
│                            Slide 1-7 │
└─────────────────────────────────────┘
```

B.   As a firefighter, you are used to performing the job at hand; as the CO, you are now responsible for having work performed through others.

   1.   Changing from a "things business" (hose, ladders, equipment) to a "people business" (leadership).

   2.   Middle person.

      a.   Not a firefighter.

      b.   Not a chief.

II.   COMPANY OFFICER'S LEADERSHIP RESPONSIBILITIES

```
┌─────────────────────────────────────┐
│         COMPANY OFFICER'S           │
│   LEADERSHIP RESPONSIBILITIES       │
│  ─────────────────────────────      │
│  • Personnel responsibilities:      │
│     – Foster teamwork and cooperation. │
│     – Support individual and team development. │
│     – Present a positive role model. │
│     – Review personnel performance and │
│       establish professional growth goals. │
│     – Promote effective communication. │
│     – Motivate personnel.           │
│                                     │
│                            Slide 1-8 │
└─────────────────────────────────────┘
```

A.   Personnel responsibilities.

COMPANY OFFICER'S LEADERSHIP
RESPONSIBILITIES (cont'd)

• Foster teamwork and cooperation.
  – Nonemergency work performed by the team.
    -- Preplanning.
    -- Maintaining apparatus.
    -- Cleaning quarters.
    -- Training activities.
    -- Community education.

Slide 1-9

1. To foster teamwork and cooperation.

    a. Most nonemergency work performed by the team.

       - Preplanning.

       - Maintaining apparatus.

       - Cleaning quarters.

       - Training activities.

       - Community education: The CO is responsible for planning and staffing the events and maintaining coverage at the fire station.

          -- These opportunities provide fire department visibility and foster greater understanding and better relationships with the community.

          -- Smoke detector education and replacement, if needed.

          -- School programs such as school bus safety, drug prevention programs, and fire apparatus familiarization.

COMPANY OFFICER'S LEADERSHIP
RESPONSIBILITIES (cont'd)

– Teamwork is essential during an emergency.
  -- Safety is everyone's responsibility.
  -- Advancing a 2 1/2-inch attack line.
  -- Providing a water shuttle operation.
  -- Providing emergency medical care.
  -- Providing special operations response.

Slide 1-10

b.   Teamwork is essential during an emergency.

-       Safety is everyone's responsibility.

-       Advancing 2 1/2-inch attack line.

-       Providing a water shuttle operation.

-       Providing emergency medical care.

-       Providing special operations response.

COMPANY OFFICER'S LEADERSHIP
RESPONSIBILITIES (cont'd)

• Support individual and team development.
  – Individual development prepares the
    department's leadership for the future.
    -- Help individuals develop a personal growth plan.
    -- Higher education programs.
    -- National Fire Academy (NFA) courses.
    -- State and local training programs.

Slide 1-11

2.   To assist with individual and team development.

a.   Individual development prepares the department's leadership for the future.

-       Help individuals develop a personal growth plan.

- Higher education programs.

- National Fire Academy (NFA) courses.

- State and local training programs.

COMPANY OFFICER'S LEADERSHIP
RESPONSIBILITIES (cont'd)

– Team development.
-- Understand group dynamics.
-- Use sound management principles/best
practices.
• Present a positive role model.
– Lead by example.
– Follow the mission statement.
– Do not underestimate positive role modeling.

Slide 1-12

b. Team development.

- Understand group dynamics.

- Use sound management principles/best practices.

3. To provide a positive role model.

a. Lead by example.

b. Follow the mission statement.

c. Positive role modeling should not be underestimated.

COMPANY OFFICER'S LEADERSHIP
RESPONSIBILITIES (cont'd)

• Instruct/Train.
– Constantly provides instruction.
-- Formally.
• Drills can take a number of forms, including reading.
• Practical evolutions that follow the process path from
beginning to end.

Slide 1-13

4. To instruct/train.

    a. Constantly provides instruction.

        - Formally.

            -- Drills can take a number of forms, including reading.

            -- Practical evolutions consist of hands-on, process-driven practice sessions that usually follow the process path from beginning to end.

COMPANY OFFICER'S LEADERSHIP
RESPONSIBILITIES (cont'd)

-- Informally.
  • Explanations of policy and procedure.
  • Job requirements and expectations.
– Instruction supports all functions of the organization.
– A continuous process — from recruitment to retirement.

Slide 1-14

        - Informally.

            -- Explanations of policy and procedure.

            -- Job requirements and expectations.

    b. Instruction supports all functions of the organization.

    c. A continuous process — from recruitment to retirement.

COMPANY OFFICER'S LEADERSHIP
RESPONSIBILITIES (cont'd)

– CO should be trained as an instructor.
-- Most organizations require prerequisite training.
-- Most organizations adhere to National Fire
Protection Association (NFPA) 1041, *Standard
for Fire Service Instructor Professional
Qualifications.*

Slide 1-15

d.   CO should be trained as an instructor.

-       Most organizations require prerequisite training.

-       Most organizations adhere to National Fire Protection
        Association (NFPA) 1041, *Standard for Fire Service
        Instructor Professional Qualifications.*

COMPANY OFFICER'S LEADERSHIP
RESPONSIBILITIES (cont'd)

• Review personnel performance and
establish professional growth goals.
– Provides positive reinforcement.
– Provides program for improvement.
– Continuous process — regular feedback
about behavior is important to people.
– It is important for all personnel to know how
they are performing, formally and informally.

Slide 1-16

5.   To review performance.

a.   Provides positive reinforcement.

b.   Provides program for improvement.

c.   Continuous process — regular feedback about behavior is important
        to people.

    d. It is important for all personnel to know how they are performing, formally and informally.

COMPANY OFFICER'S LEADERSHIP
RESPONSIBILITIES (cont'd)

- Enforce departmental rules and regulations.
  - Follow standard operating procedures (SOPs) and standard operating guidelines (SOGs).
- Provide effective communication.
  - Critical element of leadership.
    -- Verbal communications.
    -- Written communications.

Slide 1-17

    6. Enforce departmental rules and regulations.

      Follow standard operating procedures (SOPs) and standard operating guidelines (SOGs).

    7. To communicate.

      Critical element of leadership.

      a. Verbal communications.

      b. Written communications.

COMPANY OFFICER'S LEADERSHIP
RESPONSIBILITIES (cont'd)

- Motivate personnel.
  - Must be self-motivated.
  - Need to motivate individuals.
  - Need to motivate team.
  - Use motivational skills.
    -- Feedback on results.
    -- Praise of good behavior.
    -- Positive work environment.

Slide 1-18

8.   To motivate.

   a.   Must be self-motivated.

   b.   Need to motivate individuals.

   c.   Need to motivate team.

   d.   Use motivational skills.

      -      Feedback on results.

      -      Praise of good behavior.

      -      Positive work environment.

COMPANY OFFICER'S LEADERSHIP
RESPONSIBILITIES (cont'd)

- Administrative responsibilities.
  – Support the goals of the organization.
    -- Establish objectives for subordinates.
    -- Measure results, and make appropriate changes.
  – Plan work assignments.
    -- Continually adjust schedule to meet priorities.

Slide 1-19

B.   Administrative responsibilities.

   1.   To support the goals of the organization.

      a.   Establishes objectives for subordinates.

      b.   Measures results, and makes appropriate changes.

COMPANY OFFICER'S LEADERSHIP
RESPONSIBILITIES (cont'd)

-- Priorities change constantly.
  • Established by higher authorities.
  • Emergency incidents take highest priority.
– Compile reports and records.
– Prepare and implement company budget.
– Control costs.

Slide 1-20

2.   To plan work assignments.

    a.   Continually adjusts schedule to meet priorities.

    b.   Priorities are constantly changing.

        -    Established by higher authorities.

        -    Emergency incidents take the highest priority.

3.   To compile reports and records.

    a.   Written documentation of activities.

    b.   Incident reports.

    c.   Routine reports.

    d.   Special reports.

4.   CO's responsibilities to safety.

    a.   Firefighting is one of the most dangerous occupations in the United States.

        -    The CO must take a strong stand for firefighter safety. Inappropriate (unsafe) behavior must be corrected.

16 FIREFIGHTER LIFE SAFETY INITIATIVES

- Define and advocate need for cultural change.
- Enhance accountability for health and safety.
- Focus on integration of risk and incident management.
- Empower all firefighters to stop unsafe practices.

Slide 1-21

b.   16 Firefighter Life Safety Initiatives:

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

-      Enhance the personal and organizational accountability for health and safety throughout the fire service.

-      Focus greater attention on the integration of risk management with incident management at all levels, including strategic, tactical and planning responsibilities.

-      All firefighters must be empowered to stop unsafe practices.

16 FIREFIGHTER LIFE SAFETY INITIATIVES (cont'd)

- Develop and implement national training, qualification and certification standards.
- Create national research agenda and data collection system.
- Utilize available technology to produce higher levels of health and safety.

Slide 1-22

- Develop and implement national standards for training, qualifications and certification (including regular recertification) that are equally applicable to all firefighters based on the duties they are expected to perform.

- Create a national research agenda and data collection system that relates to the initiatives.

- Utilize available technology whenever it can produce higher levels of health and safety.

16 FIREFIGHTER LIFE SAFETY INITIATIVES (cont'd)

- Investigate all fire fatalities, injuries, and near misses thoroughly.
  – Fire Near Miss website.
  – **http://www.firefighternearmiss.com**
- Ensure grant programs are used to implement safe practices.

Slide 1-23

- Thoroughly investigate all firefighter fatalities, injuries and near misses.

- Access the Fire Near Miss website to view all near misses reported in your state **(http://www.firefighternearmiss. com)**.

- Grant programs should support the implementation of safe practices and/or mandate safe practices as an eligibility requirement.

16 FIREFIGHTER LIFE
SAFETY INITIATIVES (cont'd)

- Champion emergency response policy standards.
- Champion protocols for violent incident response.
- Provide counseling to firefighters and their families.

Slide 1-24

- National standards for emergency response policies and procedures should be developed and championed.

- National protocols for response to violent incidents should be developed and championed.

- Firefighters and their families must have access to counseling and psychological support.

16 FIREFIGHTER LIFE
SAFETY INITIATIVES (cont'd)

- Provide additional resources to public education concerning critical fire and life safety programs.
- Advocate for strengthened code enforcement and home fire sprinklers.
- Make safety the first consideration when designing apparatus and equipment.

Slide 1-25

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

- Advocacy must be strengthened for the enforcement of codes and the installation of home fire sprinklers.

- Safety must be a primary consideration in the design of apparatus and equipment.

III. ANALYTICAL SIZE-UP FOR INCIDENT MANAGEMENT

USE THE
SCIENTIFIC METHOD

- Observe the facts (size-up).
- Test the accuracy of the facts through observation.
- If the facts are accurate, a logical hypothesis can be deduced.
- If the hypothesis is proved true, outcomes may be predicted in similar situations.
- These hypotheses are called principles.

Slide 1-26

A. Use the scientific method.

1. Observe the facts (size-up).

2. Test the accuracy of the facts through observation.

3. If the facts are accurate, a logical hypothesis can be deduced.

4. If the hypothesis is proved true, outcomes may be predicted in similar situations.

5. These hypotheses are called principles.

PRIMARY
FACTORS SIZE-UP CHART

Slide 1-27

B. Primary Factors Size-Up Chart.

Column 1 Primary Factors Size-Up Chart		Column 2 Incident Objectives Specific/Measurable/Attainable/Relevant/Time Sensitive (SMART)	Column 3 Activities (Strategies)	Column 4 Evaluate Effect of Activities (Strategies) Every 10 Minutes — EFFECTIVE / INEFFECTIVE
Pertinent Factors (P) Check appropriate boxes	P	Examples of Incident Objectives	(R) Rescue	
Life Hazard	Occupants	• Removal of all occupants within 10 minutes	• Interior/Exterior	
	Firefighters		(E) Exposures	
Location/Fire	Fire Bldg/Exposures on Arrival	• Contain and control fire to building of origin in 30 minutes	• Exposure examination	
	After Arrival — Burn Time	• Contain, control, limit fire in exposure within one hour	(C/E) Confine/Extinguish	
Construction	Fire Building		• Hoseline placement	
	Exposures	• Remove all smoke within 20 minutes	(O) Overhaul	
Occupancy (Contents)	Fire Building		• Expose hidden fire	
	Exposures	List Incident Objectives	(V) Ventilate	
Height	Fire Bldg (Front/Rear)	1 Provide for the safety of all responders for the duration of the incident.	• Removal of all occupants	
	Exposures (Front/Rear)		• Fire control	
Area	Fire Bldg/Configuration	2	(S) Salvage	
	Proximity of Exposures/Config.		• Water run-off	
Structural Collapse	Fire Building	3	• Apply salvage covers	
	Exposures		List Incident Strategies / Assigned To	
	Apparatus Placement			
Weather	Visibility	4	1	
	Temperature/Humidity		2	
	Wind — Direction/Velocity			
Resources	Apparatus/Personnel/Equip/RIC	5	3	
	Water Supply/Suppression Agent			
Auxiliary Appliances	Fire Building Supplied	6	4	
	Exposures Supplied			
Topography	Street Conditions	7	5	
Explosion Backdraft	Flashover Conditions	8	6	
			7	Identify alternative strategies for firefighter safety when occupant safety has been determined not to be a primary factor.
Time	Duration of Incident	9		
	Time of Day			
	Time of Alarm			

PRIMARY FACTORS SIZE-UP CHART (cont'd)

- Column 1:
  - The conditions and elements that should be recognized and evaluated on arrival and during operations.

Slide 1-28

1. Column 1 — pertinent factors.

    a. Pertinent factors are the conditions and elements that should be recognized and evaluated on arrival and during operations.

    b. Some examples:

        -   Life hazard.

        -   Location of fire.

        -   Construction.

        -   Occupancy.

        -   Height.

        -   Area.

        -   Structural collapse.

        -   Weather.

        -   Resource requirement.

        -   Auxiliary appliances.

        -   Topography.

        -   Explosions/Backdraft.

        -   Time/Duration of operations

PRIMARY FACTORS SIZE-UP
CHART (cont'd)

- Column 2:
  - Safe removal of all
    occupants:
    -- When life hazard for
       occupants is the
       limiting or strategic
       factor.

Slide 1-29

2.   Column 2 — incident objectives.

    a.   Safe removal of all occupants: when life hazard for occupants is the
           limiting or strategic factor.

PRIMARY FACTORS SIZE-UP
CHART (cont'd)

  - Contain and control fire
    to room/building of
    origin:
    -- No life hazard for
       occupants, and fire is
       considered to be
       controllable by a direct
       or indirect attack.

Slide 1-30

    b.   Contain and control fire to room/building of origin: no life hazard
           for occupants, and fire is considered to be controllable by a direct or
           indirect attack.

PRIMARY FACTORS SIZE-UP
CHART (cont'd)

– Contain, control and
limit fire in exposures:
-- No life hazard for
occupants, and the
situation is temporarily
uncontrollable.

Slide 1-31

c.   Contain, control and limit fire in exposures: no life hazard for
occupants, and the situation is temporarily uncontrollable.

PRIMARY FACTORS SIZE-UP
CHART (cont'd)

• Column 3:
– **R**escue.
– **E**xposures.
– **C**onfine the
fire/**E**xtinguish.
– **O**verhaul.
– **V**entilate.
– **S**alvage.
– RECEO-VS.

Slide 1-32

3.   Column 3 — activities (strategies).

a.   **R**escue.

b.   **E**xposures.

c.   **C**onfine the fire/**E**xtinguish.

d.   **O**verhaul.

e.   **V**entilate.

f.   **S**alvage (RECEO-VS).

g.   **S**ize-up.

      h.   **L**ocation of fire.

      i.   **I**dentify and control flow path.

      j.   **C**ool space from the safest location.

      k.   **E**xtinguish the fire.

      l.   **R**escue.

      m.   **S**alvage.

DVD PRESENTATION

"PRINCIPLES OF MODERN FIRE ATTACK - SLICE-RS OVERVIEW"

Slide 1-33
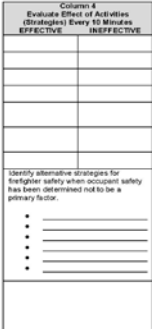
PRIMARY FACTORS SIZE-UP CHART (cont'd)

- Column 4:
  - Re-evaluation of the progress of incident strategies in use.
  - Implement alternative strategies to affect and/or resolve primary factors.

Column 4
Evaluate Effect of Activities
(Strategies) Every 10 Minutes
EFFECTIVE   INEFFECTIVE

Identify alternative strategies for
firefighter safety when occupant safety
has been determined not to be a
primary factor.

Slide 1-34

---

    4.   Column 4 — evaluate effect of activities (strategies).

        a.   Re-evaluation of the progress of incident strategies in use.

        b.   Implement alternative strategies to affect and/or resolve primary factors.

C.   Using the Primary Factors Size-Up Chart.

1.   Step 1: Assess the pertinent factors, and establish major incident objectives.

List the major objectives in Column 2.

2.   Step 2: Identify incident strategies (circle).

List incident strategies in Column 3 (left).

3.   Step 3: Assign incident strategies.

Indicate unit or units assigned to the strategy in Column 3 (right).

4.   Step 4: Evaluate incident strategies.

a.   At 10-minute intervals, re-evaluate (in Column 4) the primary factors and the effects of the strategies on these factors.

b.   Always identify alternative strategies for firefighter safety when occupant safety has been determined not to be a primary factor.

MAKING DECISIONS

• Strategies affect the importance of primary factors.
• Primary factors have an effect on strategies.

Slide 1-35

D.   Making decisions.

1.   Example: Effective ventilation facilitates the advance of hoselines, but ineffective stretching or laying of hoselines nullifies the effectiveness of ventilation and can even cause it to be harmful if it results in spreading the fire before a line is ready to operate.

2.   Strategies can also affect primary factors, such as extent of fire after arrival, heat and smoke conditions, exposure requirements hazards, duration of operation, requirements to operate, and so on.

3.   Each of the primary factors has an effect on strategies.

a.   We determine objectives and strategies based on the size-up that we conduct evaluating the primary factors.

b.   When we implement actions to meet our objectives, these actions affect the primary factors. This is a circular process.

LIMITS

- Risk a lot to save a lot.
- Risk a little to save a little.
- Risk nothing to save nothing.

Slide 1-36

E.   Limits: For practical purposes, there are three limits.

1.   Risk a lot to save a lot.

2.   Risk a little to save a little.

3.   Risk nothing to save nothing.

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ACTIVITY 1.1

Using the Primary Factors Size-Up Chart

Purpose

Use a Primary Factors Size-Up Chart to analyze a simple incident.

Directions

1.   Use the Primary Factors Size-Up Chart on the following page to analyze the primary factors of the incident shown on the slide.

2.   Indicate the pertinent primary factors in Column 1, on the left side.

Problem Description

Building is a two-story single-family dwelling with an attached garage and no basement. It is 11 a.m. on Wednesday, and the weather is mild. On arrival, fire is visible on the first floor in the A-D corner. An occupant is visible in a second-story window. She appears to be scared but unharmed at this time.

Column 1 Primary Factors Size-Up Chart		Column 2 Incident Objectives Specific/Measurable/Attainable/Relevant/Time Sensitive (SMART)	Column 3 Activities (Strategies)		Column 4 Evaluate Effect of Activities (Strategies) Every 10 Minutes EFFECTIVE INEFFECTIVE
Pertinent Factors (P) Check appropriate boxes	P	**Examples of Incident Objectives** • Removal of all occupants within 10 minutes • Contain and control fire to building of origin in 30 minutes • Contain, control, limit fire in exposure within one hour • Remove all smoke within 20 minutes	(R) Rescue • Interior/Exterior		
Life Hazard	Occupants		(E) Exposures • Exposure examination		
	Firefighters				
Location/Fire	Fire Bldg/Exposures on Arrival		(C/E) Confine/Extinguish • Hoseline placement		
	After Arrival — Burn Time				
Construction	Fire Building		(O) Overhaul • Expose hidden fire		
	Exposures				
Occupancy (Contents)	Fire Building	**List Incident Objectives**	(V) Ventilate • Removal of all occupants • Fire control		
	Exposures				
Height	Fire Bldg (Front/Rear)	1 Provide for the safety of all responders for the duration of the incident.	(S) Salvage • Water run-off • Apply salvage covers		
	Exposures (Front/Rear)				
Area	Fire Bldg/Configuration	2			
	Proximity of Exposures/Config.		List Incident Strategies	Assigned To	Identify alternative strategies for firefighter safety when occupant safety has been determined not to be a primary factor.
Structural Collapse	Fire Building	3			
	Exposures		1		
	Apparatus Placement		2		
Weather	Visibility	4			
	Temperature/Humidity		3		
	Wind — Direction/Velocity				
Resources	Apparatus/Personnel/Equip/RIC	5	4		
	Water Supply/Suppression Agent				
Auxiliary Appliances	Fire Building Supplied	6	5		
	Exposures Supplied				
Topography	Street Conditions	7			
Explosion Backdraft	Flashover Conditions	8	6		
			7		
Time	Duration of Incident	9			
	Time of Day				
	Time of Alarm				

IV.   EVALUATING PRIMARY FACTORS

LIFE HAZARD FOR
OCCUPANTS

What effect would
status of occupants
have on your
strategy?

Photo/NFA

Slide 1-39

A.   Life hazard for occupants.

1.   Rescue work.

Forcible entry is made with less regard for structural damage, exposure
hazards, or the availability of a hose stream to protect personnel.

2.   Covering exposures.

Life hazard may make the task of covering exposures more difficult and
may delay the attack on the fire itself.

B.   Life hazard for firefighters.

1.   Acceptance of warranted risks is essential for good results in carrying out
fire activities.

2.   A reasonable expectation to save lives.

LOCATION OF FIRE ON
ARRIVAL

• What effect would
location of fire on
arrival have on the
strategy?
– Fire building.
– Exposures.

Photo/NFA

Slide 1-40

3.   Location of fire on arrival.

LOCATION OF FIRE ON
ARRIVAL (cont'd)

• Forcible entry.
– Force entry near location of fire.
– Enables firefighters to get water to fire more
quickly.
– Minimizes hardship of advancing hoselines.
• Ventilation.
– Localize fire and stop horizontal spread
within a structure.

Slide 1-41

a.   Forcible entry.

-       It is preferable to force entry near the location of the fire,
especially when the area involved is large.

-       This enables firefighters to get water on the fire more quickly
and minimizes the physical hardship of advancing hoselines.

b.   Ventilation.

-       The main objective of ventilation is to localize the fire, to
stop its horizontal spread within a structure.

-       For example, if a fire is extending into a cockloft via pipe
recess or similar channel, the roof should be opened. If this
were done in the wrong place, it could be disastrous.

```
┌─────────────────────────────────────────┐
│                                         │
│        LOCATION OF FIRE ON              │
│         ARRIVAL (cont'd)                │
│        ────────────────────             │
│   • Removal of occupants.               │
│     – Fire location is critical.        │
│   • Checking for extension of fire.     │
│     – Fire near a vertical or horizontal structural │
│       channel will spread quickly.      │
│   • Placement and use of hoselines.     │
│     – Fire location determines the amount of │
│       hoseline to be stretched, and sometimes │
│       size.                             │
│                                         │
│                              Slide 1-42 │
└─────────────────────────────────────────┘
```

    c.   Removal of occupants.

         -      Location of fire is critical. A fire on the first floor of a five-story residential building could endanger all the occupants and necessitate their removal.

         -      However, if the same fire originated on the fourth floor, it may be better to move occupants of the fifth floor to the first or second floors. This is especially true if the fire occurs on a cold night and occupants are scantily clothed.

    d.   Checking for extension of fire.

         -      A fire near a vertical or horizontal structural channel will spread readily.

         -      Thus, officers assigned to check for fire extension should note the location of fire and keep in mind how heat travels by conduction, convection and radiation via exposed channels.

    e.   Placement and use of hoselines.

         -      The location of the fire determines the amount of hoseline to be stretched and, in some cases, the size.

LOCATION OF FIRE ON
ARRIVAL (cont'd)

- Use of special equipment.
  – High-level fires may require standpipe
  systems, ladder pipe, or other high-caliber
  streams.
- Heat transfer.
  – Radiation.
  – Conduction.
  – Convection.

Slide 1-43

      f.   Use of special equipment.

           -      High-level fires may require the use of standpipe systems, ladder pipe, or other high-caliber streams.

           -      The fire also may influence the decision to use sprinkler systems or fixed systems of various types.

      g.   Heat transfer.

           -      Radiation.

           -      Conduction.

           -      Convection.

EXTENT OF FIRE AFTER
ARRIVAL

What impact would
extent of fire after
arrival have on your
strategy?
- Fire building.
- Exposures.

Photo/NFA

Slide 1-44

      h.   Extent of fire after arrival.

CONSTRUCTION

What is the effect of
construction on
strategy?
• Residential.
• Commercial.

Photo/NFA

Slide 1-45

4.   Construction.

        a.   Ordinary construction.

        b.   Wood-frame construction.

        c.   Fire-resistive (modern high-rise) construction.

OCCUPANCY

What effect would
occupancy have on
your strategy?
• Type of occupancy.
• Contents of
  structure (fire load).
• Exposures.

Photo/NFA

Photo/NFA
Slide 1-46

5.   Occupancy and contents.

        a.   Ventilation.

                -       Ventilation is achieved more slowly in the presence of
                        materials that give off gases that are toxic or injurious to the
                        eyes or skin.

- To prevent an explosion or minimize the results, exterior ventilation measures should be taken where the presence of explosive mixtures or substances is suspected.

b. Placement of hoselines.

- Difficulty in ventilating can reduce the effectiveness of hoselines.

c. Selecting an extinguishing agent.

- In some cases, water will spread the fire or may cause an explosion or release gases that may intensify and abet extension of the fire.

d. Overhauling.

- The quantity of material involved, the manner in which it is stored, its nature, and the degree to which it has been subjected to the fire affect overhauling.

HEIGHT

What effect would height of building have on your strategy?
• Fire building.
• Exposures.

Photo/NFA
Slide 1-47

6. Height.

a. Ventilation.

- Height can affect activities at fires in high-rise buildings.

- At lower-level fires, roof or window ventilation may be possible, facilitating the advance of lines from either side of the fire as well as the search for and removal of occupants.

b.   Placement of hoselines.

-    Exterior lines also may be used. Control will likely be established more quickly in a lower-level fire because interior and exterior attacks can be used.

AREA

What effect would area of building have on your strategy?
- Fire building.
  – Subdivisions.
- Exposures.
  – Exposure proximity.

Photo/NFA

Slide 1-48

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7.   Area.

a.   If the fire can be confined to a small room, the fact that the total floor area is 200 by 200 feet hardly matters.

b.   However, if such an area is not effectively subdivided and there is no small room, the extent of the fire can, sooner or later, extend to the total floor area.

c.   Proximity of exposures.

-    Proximity alone does not make an exposure vulnerable. To evaluate the effects of proximity in selecting strategies and tactics, proximity must be considered in conjunction with other contributing factors — such as construction, location of fire, occupancy, and wind direction and velocity.

STRUCTURAL COLLAPSE

What effect would structural collapse have on your strategy?
- Fire building.
- Exposures.
- Collapse zone.
- Apparatus placement.

Photo/NFA

Slide 1-49

8. Structural collapse: In assessing the effects of other factors on structural collapse, officers should carefully consider the type of construction involved in the fire.

WEATHER

What effect would weather have on your strategy?
- High temperatures.
  – Rain.
  – Wind.
- Low temperatures.
  – Snow.

Photo/NFA

Photo/NFA

Slide 1-50

9. Weather.

    a. Low temperatures retard the initial development of fire; however, once a fire has started, they impair efficiency.

    b. High temperatures generally are classified as temperatures in the 80s and 90s.

       - High humidity and inversion conditions can cause dense smoke and poor visibility.

       - High humidity and high moisture content make it more difficult for a vigorous fire to become established but do not slow its spread once it is well-started.

c.   Rain greatly reduces the probability of fire spreading from building to building.

d.   Wind.

-      Velocity is an important factor. Winds less than 15 mph usually can be controlled by defensive measures.

-      With winds 15 to 30 mph, the rate of fire propagation increases dramatically. A 30 mph wind is a threat to exposures downwind; such winds are conducive to conflagrations.

e.   Visibility: Impaired visibility makes it more difficult to recognize and properly evaluate pertinent factors, thereby hampering decision-making and increasing the possibility of error.

RESOURCE REQUIREMENTS

What effect would resource requirements have on your strategy?
• Water.
• Apparatus.
• Equipment.
• Personnel.
• Special extinguishing agents.

Photo/NFA

Photo/NFA

Slide 1-51

10.   Resource requirements: The water, apparatus, equipment, personnel, and special extinguishing agents required and available for an effective fire operation.

AUXILIARY APPLIANCES

What effect would auxiliary appliances have on your strategy?
- Sprinkler systems.
- Pressurization of stairways or other building areas.

Combination Standpipe/Sprinkler System

Photo/NFA

Photo/NFA

Slide 1-52
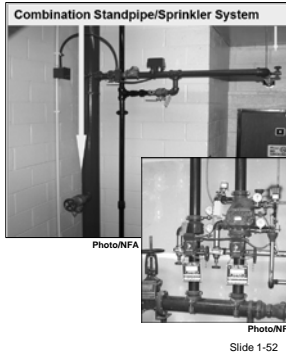
11.   Auxiliary appliances.

     a.   Sprinkler systems.

     b.   Mechanical pressurization of stairways or other building areas (heating, ventilating and air conditioning for example).

TOPOGRAPHY

- What effect would topography have on your strategy?
  - Steeply graded streets/roads.
  - Leveling portable ladders on grades.

Photo/NFA
Slide 1-53

12.   Topography.

     a.   When operating at a fire on steeply graded streets, it may be advisable to position aerial trucks or tower ladders on the high side of the fire to ensure maximum reach.

     b.   Use wedges to level portable ladders to allow for safe climbing on hilly terrain.

TOPOGRAPHY (cont'd)

- What effect would topography have on your strategy?
  – Congested streets/roads.
  – Snow- or ice-covered streets/roads.

Photo/NFA
Slide 1-54

       c.   Streets that are one-way, congested by vehicular traffic, or snow- or ice-covered tend to delay response of the fire department.

EXPLOSIONS

What effect would explosions have on your strategy?
- Smoke explosions.
- Bomb explosions.

Photo/NFA

Slide 1-55

    13.   Explosions.

        a.   Smoke explosions or backdrafts at fires are caused essentially by the rapid combustion under certain conditions of a mixture of flammable gas, vapor, mist, or dust and air.

        b.   Bomb explosions.

             -       Warnings of the impending explosion may or may not be given.

             -       Fire officers responding to the designated target must assume that the warning is authentic and conduct operations accordingly.

DURATION OF OPERATIONS

• What effect would
  duration of operations
  have on your strategy?
  – Long-duration
    incidents are difficult to
    deal with.
  – May indicate heavy
    involvement and
    structural collapse.

Photo/NFA

Slide 1-56

14. Duration of operations.

    a. Fire operations of long duration generally are difficult to deal with from the beginning.

    b. They may feature heavy involvement and structural collapse.

DURATION OF OPERATIONS
(cont'd)

• What effect would
  duration of operations
  have on your strategy?
  – Maximizes the
    exposure hazard.
  – Consider personnel
    relief.

Photo/NFA

Slide 1-57

    c. They may maximize the exposure hazard.

    d. Consider relief for personnel.

V.   COMMAND SEQUENCE ACTION CYCLE

THE COMMAND SEQUENCE

- Incident priorities.
  – Life safety.
  – Incident stabilization.
  – Property conservation.
- The mission statement of the fire department.

Slide 1-58

A.   The incident priorities define the mission. All strategy and tactics must be conceived within the boundaries of the mission. The incident priorities are:

1.   Life safety.

2.   Incident stabilization.

3.   Property conservation.

THE COMMAND SEQUENCE
(cont'd)

Size-Up

Slide 1-59

B.   Size-up is gathering and recognition off informal cues.

THE COMMAND SEQUENCE
(cont'd)

- Size-up:
  - First step in the process of determining the incident situation.
  - Assessment of the situation.
  - Gathering and analyzing cues.
  - The first action.

Slide 1-60

1.   The assessment of a situation.

2.   Gathering and analyzing cues.

3.   The first action.

THE COMMAND SEQUENCE
(cont'd)
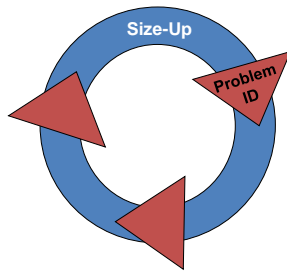
Slide 1-61

C.   Size-up is the analysis and comparison of incident cues and is the basis for problem identification.

THE COMMAND SEQUENCE
(cont'd)

• Problem identification:
   – The analysis and comparison of incident cues are the basis for problem identification.
   – Problem identification is the first outcome.

Slide 1-62

1.   These problems must be identified to set incident priorities.

2.   Problem identification is the first outcome.

THE COMMAND SEQUENCE
(cont'd)

Size-Up

Problem ID

Establish Incident Objectives
Develop Strategy
Select Tactics
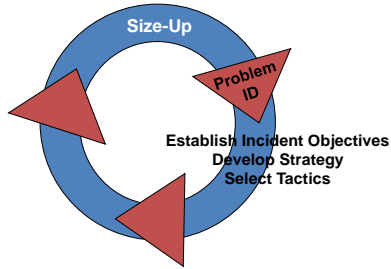
Slide 1-63

D.   Establishing incident objectives.

THE COMMAND SEQUENCE
(cont'd)

• Incident objectives:
   – Incident objectives are statements of guidance and direction.
   – Objectives must be SMART.

Slide 1-64

1.   Incident objectives are statements of guidance and direction.

2.   Objectives must be SMART.

SMART OBJECTIVES

Examples:
- Remove all occupants from areas of danger within 15 minutes.
- Treat all occupants with proper and effective medical care within 30 minutes.
- Control and extinguish the fire within 15 minutes.

Slide 1-65

THE COMMAND SEQUENCE (cont'd)

- Determining strategies and selecting tactics.
  - Strategy is the "what" of the solution.
  - Tactics are the "how" of the solution.
  - Designating incident objectives, strategy and tactics is the second action.

Slide 1-66

E.   Determining strategies and selecting tactics.

1.   Strategy is the "what" of the solution: what must be done to solve the problem.

2.   Tactics are the "how" of the solution: the specific actions that must be performed.

3.   Designating incident objectives, strategy and tactics is the second action.

THE COMMAND SEQUENCE
(cont'd)

Size-Up

Problem ID

Establish Objectives
Develop Strategy
Select Tactics

Action Plan

Slide 1-67
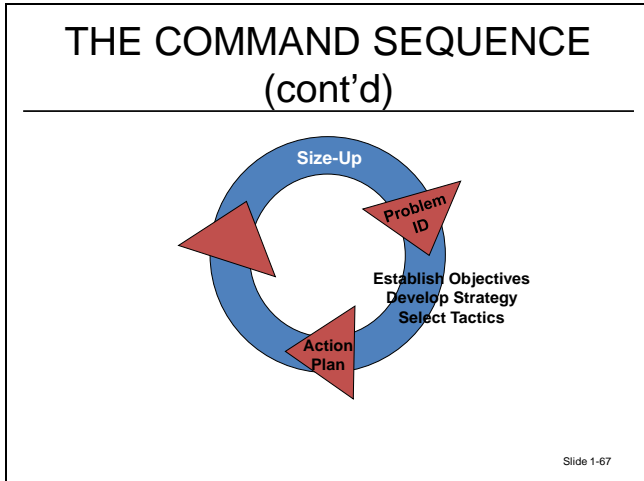
F.   The Incident Action Plan (IAP) delineates "who" takes the action and "when" and "where" the action takes place.

THE COMMAND SEQUENCE
(cont'd)

• Incident Action Plan (IAP):
   – Comprised of the strategy and tactics,
      including "who, where and when."
   – The IAP is the second outcome.

Slide 1-68

1.   The IAP includes the determined strategy and selected tactics.

2.   The IAP is the second outcome.

THE COMMAND SEQUENCE
(cont'd)

Size-Up

Problem
ID

Establish Objectives
Develop Strategy
Select Tactics

Implementation

Action
Plan
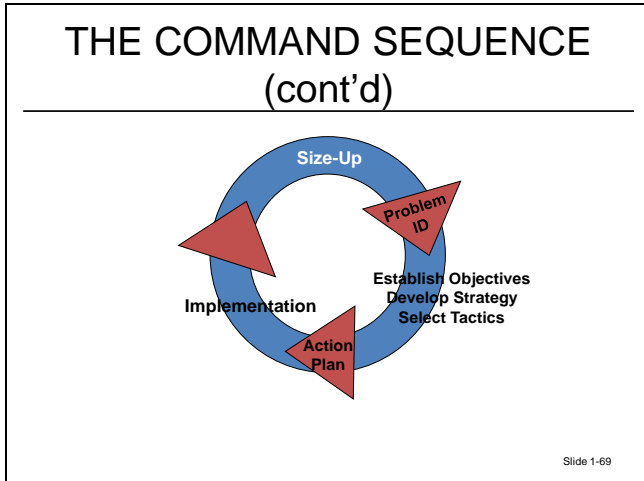
Slide 1-69

G.   Implementing the IAP.

THE COMMAND SEQUENCE
(cont'd)

- Implementing the IAP:
  – Directives issued to resources delineating
    their part of the plan and the "where" and
    "when."
  – Implementation is the third action.

Slide 1-70

1.   Resources need to know their part of the plan.

2.   Directives are issued to the resources delineating the part of the plan, the
        "when" and the "where."

3.   Implementing the IAP is the third action step.

THE COMMAND SEQUENCE
(cont'd)

Size-Up

Problem ID

Tasks

Establish Objectives
Develop Strategy
Select Tactics

Implementation

Action Plan

Slide 1-71

H.   Performing tactical operations (tasks).

THE COMMAND SEQUENCE
(cont'd)

• Performing tactical operations (tasks):
  – The tasks that companies and crews perform
    to accomplish the tactics.
  – Performing tasks is the third outcome.
  – Tactics are done at the division or group level
    by those supervisors.
  – Performance of tactical operations cycles
    back into the first action step: size-up.

Slide 1-72

1.   Companies and crews perform specifically learned manual tasks that, when completed, achieve or help achieve a tactic.

2.   Performing tasks is the third outcome.

3.   Tactics are done at the division or group level by those supervisors.

4.   Performance of tactical operations cycles back into the first action step: size-up.

```
GUIDE TO ACTION PLANNING

• Makes you think before you act.
• Helps keep the Incident Commander (IC)
  in a proactive mode.
• Ensures critical cues are not overlooked.
• Can be used on any type of incident.
• Provides a logical thought process.

                                    Slide 1-73
```

I.   A guide to action planning.

      1.   Makes you think before you act.

      2.   Helps keep Incident Commander (IC) in a proactive mode.

      3.   Helps to ensure that critical cues are not overlooked.

      4.   Can be used at any type of incident.

      5.   Provides a logical thought process.

VI.   SUMMARY

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                    SUMMARY

• Transition to CO.
• CO leadership responsibilities.
• Analytical size-up for incident
  management.
• Evaluating primary factors.
• Command Sequence Action Cycle.

                                    Slide 1-74
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APPENDIX

TAMPA2: CARRYING THE SAFETY MESSAGE INTO THE FUTURE

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TAMPA2: Carrying the Safety Message into the Future

Report from the 2014 Firefighter Life Safety Summit

March 10–12, 2014

National Fallen Firefighters Foundation

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10th Anniversary of the Firefighter Life Safety Initiatives: Building for the Future

Table of Contents

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Introduction

In March 2004, a select group of fire service leaders came together for a landmark event: the first Firefighter Life Safety Summit. Held in Tampa, Fla., and hosted by the National Fallen Firefighters Foundation (NFFF), the summit brought together more than 200 individuals representing a broad spectrum of the fire service and related organizations. The participants included the leaders of national fire service organizations, influential members of the fire service, representatives of numerous governmental agencies, researchers, fire service media and industry, and related fields. All came to Tampa with one goal in mind: Drastically reduce firefighter line-of-duty deaths (LODDs).

More specifically, the first summit sought to produce a common vision of changes that would have to occur to produce a significant reduction in LODDs and to seek a broad consensus and commitment to work toward that goal. The U.S. Fire Administration had established ambitious targets of reducing LODDs by 25 percent within five years and 50 percent within 10 years. By the conclusion of the 2014 meeting, an exciting new slate of recommendations and goals were put forward which served to increase the scope and impact of the 16 Firefighter Life Safety Initiatives.

The participants in Tampa produced a wealth of material covering a broad spectrum of subjects, but equally important they had a shared sense of mission to implement the strategies that emerged from the process. Following the event, the NFFF released a set of 16 Firefighter Life Safety Initiatives (FLSIs) distilled from the summit discussion and began the Everyone Goes Home campaign to educate the fire service on one unified agenda for reducing LODDs. The project has produced a wealth of information and educational resources for the fire service.

As the 10-year anniversary of the first Tampa summit dawned, it became clear that it was time to assemble again, to assess how far the fire service had come in implementing the initiatives and achieving the LODD reduction goals. It was also the appropriate time to ask whether the 16 FLSIs are still on target and to develop priorities and strategies for the next decade. TAMPA2, as it was dubbed, sought to bring a similar group of fire service leaders together, but with an added focus on the company officer/crew boss and the next generation of leadership.

In fact, TAMPA2 was not the second firefighter life safety summit, but actually the third. In 2007, a smaller summit was held in Novato, Calif., bringing together many of these same fire service leaders, along with several new faces. The second summit was directed toward further discussion and refinement of the FLSIs. The participants were asked to focus on each of the specific initiatives and propose key strategies to achieve the desired results. In addition, the NFFF held a series of mini-summits focusing on particular topics (e.g., wildland firefighting, structural firefighting, fire prevention) between 2005 and 2007. The foundation also

Firefighter Fatalities in the United States
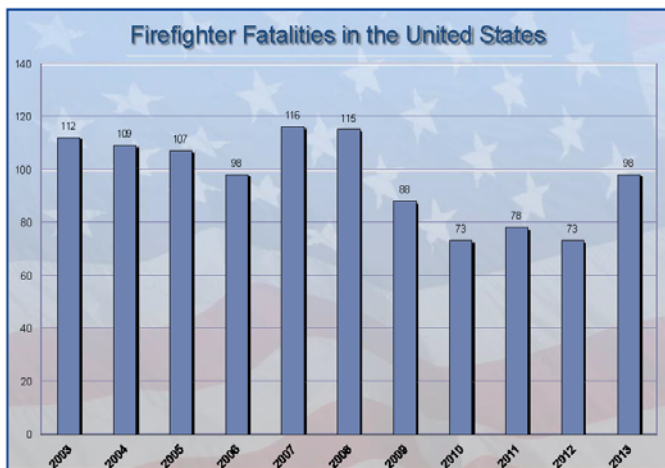
Source: NFFF

published in-depth white papers on each of the initiatives that were used as briefing material for the Novato summit.

Coming into TAMPA2, there was no shortage of thought or effort that had gone into crafting the FLSIs and thinking about how they could be implemented. And there was some indication that these efforts were working: The number of LODDs was declining, although not as quickly as the aggressive goal of a 50 percent reduction would have required. From 2004 to 2012 there was a reduction of 32 percent in the annual rate of firefighter deaths, from 119 to 81. Moreover, the focus on health and safety issues throughout the fire service was much more evident on many different fronts.

Tragically, however, TAMPA2 followed a year where the declining LODD trend had been interrupted by two exceptional incidents in (Prescott, AZ and West, TX) that resulted in 29 firefighter fatalities. It was a discouraging year for many individuals who had been working hard over the previous decade to make a difference.

Such was the backdrop for TAMPA2: an understanding and appreciation that over the past 10 years, the conversation around safety in the fire service had definitely produced results, and yet the realization that there was a long way to go in achieving the objectives established at the original summit.

Program Format

To tackle this enormous task, the NFFF convened the TAMPA2 summit on March 10–12, 2014, at the same location as and on the 10-year anniversary of the first summit. Key to the event was the support and involvement from the fire service industry. In-kind and general sponsors of the event included:

- California Casualty
- Columbia Southern University
- Common Voices
- IAFC's Safety, Health and Survival Section
- IAFC's Volunteer and Combination Officers Section
- International Society of Fire Service Instructors
- International Fire Service Training Association-Oklahoma State University
- Kidde
- Lion Apparel
- Motorola Solutions
- National Fire Protection Association

- National Fire Sprinkler Association
- Neptune Aviation
- PBI
- Phoenix Society
- Provident
- RescueAir
- Safety Components
- Scott Safety
- South Carolina State Firefighters' Association
- State Farm
- Stedfast
- UL
- VFIS

In addition, Honeywell and W.L. Gore lent sponsorship support to the Vulnerability Assessment Program (VAP), which was introduced at TAMPA2. VAP is an NFFF-coordinated tool to help fire departments evaluate their risk profile.

The planning team reached out to various groups to identify key figures from the fire service and related organizations. This time, however, there was a special effort to involve the next-generation fire service leadership, which was reflected in the attendance of more company officers and line firefighters. This outreach was considered as essential, not only to bring a different perspective to the discussion, but to develop continuity in the leadership for the next 10 years. The foundation established a scholarship program to ensure that these younger members could attend.

The foundation formulated an extensive pre-summit survey assessing participants' awareness and implementation of the FLSIs and the many programs that had been produced in support of their implementation. In addition, the NFFF provided all participants with an extensive package of materials, including the reports generated following the 2004 and 2007 summits as well as the FLSI white papers. This helped prepare participants and ensure that they would see the TAMPA2 summit within the proper historical context; the preparation also gave them an opportunity to reflect on previous recommendations and strategies and consider how much progress has been made since the original summit.

The TAMPA2 format was similar to previous summits: a series of plenary sessions to share information and inspirational messages, followed by significant time spent in smaller discussion groups. At TAMPA2, those groups were structured to focus on the following areas:

1. Behavioral Health
2. Company Officer/Crew Boss Development
3. Firefighter Survivability
4. Leadership
5. Wildland Firefighting
6. Physical Health
7. Reducing Fire Occurrences
8. Firefighting Operations and Thermal Assault
9. Training and Education
10. Transportation Trauma

As they broke into their smaller discussion groups, TAMPA2 participants were given two main assignments:
1. Assess each of the 16 FLSIs from the perspective of what's working, and what's not working; whether the initiative is still relevant in 2014; what successes have been achieved toward implementing the initiative; and what new strategies should be undertaken to further progress toward achieving the initiative.

2. Focusing more narrowly on the topics assigned to the group, develop a series of problem statements that identify contributing factors for LODDs and injuries. Then, recommend key strategies to address those problems and consider which groups/individuals should take the lead in implementing those strategies.

The general assembly reconvened on the last day of the summit to allow each group to share their problem statements and recommendations. This report summarizes not only those presentations, but also many of the discussions that occurred within the small groups. Following the summit, the NFFF conducted a post-event survey of all participants. Responses to that survey are incorporated throughout this report.

Scholarship Program

Early on in the planning for TAMPA2, the NFFF identified the need to invite not just well-known fire chiefs and senior-level officers, but to make a special effort to include the next generation of fire service leaders. Although high-level officer participation is critical to producing cultural change, participation and buy-in at all levels is essential to ensure that change initiatives don't lose momentum. In addition, the efforts have to be relevant and logical to the individuals who are most directly impacted by the changes.

Company officers and firefighters, however, often lack the resources to travel to fire service meetings. That's why the NFFF settled on the idea of a scholarship program that would cover the travel costs for these up-and-comers to attend. The scholarship program was funded by generous contributions from fire service and private sector organizations, including:

- IAFC's Safety, Health and Survival Section
- Lion Apparel
- Scott Safety
- UL

Seeking applicants, the planning team put the word out through major fire service media and various organizations. A selection committee organized by the International Society of Fire Service Instructors (ISFSI) used a 100-point scoring system to select 46 scholarship recipients from more than 145 applications.

Many of these individuals expressed humility and gratitude that they had been chosen to be included along with well-known fire service leaders. They also provided valuable feedback about the impact of the FLSIs and what's needed to continue building a culture of safety. As full participants throughout the conference, their opinions are reflected throughout this entire report.

A special debriefing session convened by Chief Timothy E. Sendelbach at the end of the event provided some focused feedback from this important group. Some of the trends that emerged from that discussion include:

- **The "all-inclusive" FLSIs are difficult to apply at the company level.** The scholarship group felt that as currently stated, most of the FLSIs are either too broad or at too high a level for company officers to implement. They recommended adding components within the initiatives at the strategic, tactical and task levels. They also pointed out the need for more ideas for customizing the initiatives based on local-level resources, staffing and other factors. As noted later in this report, this is a sentiment that was shared broadly across the TAMPA2 participants, regardless of age or fire service experience.

- **Modernize the message.** Scholarship participants suggested revising the FLSIs to "support the Twitter Age," using shorter messages and multimedia formats to spread the message. They also recommended the development of a smartphone or tablet app, a wallet card and a taskbook approach for training. At the same time, participants cautioned that it's important not to oversimplify the messages being conveyed in the FLSIs.

- **Fitness remains one of the biggest barriers to success.** The scholarship group stressed that physical ability testing should be established as a baseline standard throughout the fire service and that a special focus on the fitness level of volunteer firefighters is needed.

- **Get the company officer/crew boss involved.** Scholarship participants focused heavily on the role of the company officer/crew boss in creating cultural change. Participants recommended developing a formal and structured company officer/crew boss development program at the national level. They also recommended the dissemination of best practices that company officers can customize and adapt to the needs of their department.
- **Engage individuals.** The younger generation is often characterized as having a "me" focus, and the scholarship participants indicated that it is important for cultural change efforts to promote individuality and personal accountability, empowering firefighters at the individual level to implement and apply the FLSIs. The "officers of now" need to provide an opportunity for all members to be equal participants.

As the FLSI program moves into its second decade, tapping into the energy of this younger group will be essential in understanding how firefighters of all ages view cultural change, and what specific strategies will resonate with those just entering the ranks.

Progress Check: How Have Visions Changed?

One lens through which we should view the results of TAMPA2 is how the 2014 recommendations compare with those developed at the last major summit, held in Novato in 2007. At that event, six groups dissected the FLSIs and came up with more than 90 recommendations directly related to their implementation.

It's beyond the scope of this report to examine each of those 90 recommendations and determine the fire service's success in achieving them, but we can benefit from a brief analysis. The following summaries represent the 2014 reflections on some of the key statements that were included in that list.

For true culture change to happen, everyone in the fire service, from firefighter to fire chief, must take accountability to promote safe actions and stop unsafe actions.
Although this is a difficult dimension to measure, TAMPA2 participants generally felt that there has been real progress in relation to firefighters and fire service leaders accepting the call for accountability. White papers have been produced on each of the FLSIs, and the Everyone Goes Home program has a national presence. The push toward a "culture of safety" has produced backlash among certain circles, but this debate has also prompted healthy discussion on how we can preserve the best of the fire service while also initiating changes that save lives. And such controversies bring the conversation to the kitchen table, exposing more firefighters to the discussion.

Fire prevention can no longer be an afterthought. We must incorporate prevention in initial and ongoing firefighter training and develop more scientifically based, effective fire and life-safety education programs that resonate with the public. Fire service leaders must promote and support model building and fire codes and residential sprinklers, including incentives for home builders.
This recommendation was repeated nearly word for word at TAMPA2. There have been some local successes with the building code and residential fire sprinklers. Community risk reduction concepts are starting to garner more success. Vision 20/20 has also made important advancements in quantifying the value of prevention and education programs to build support and funding for them. But fire prevention remains an afterthought in too many departments, in terms of funding and in the interest level of engagement by firefighters.

Unsafe acts must be punished, or at least go unrewarded, while safe acts should be rewarded. These efforts should include challenging the traditional definition of what it means to be a "heroic" firefighter.
The fire service still has a long way to go with this recommendation. Of course, firefighters who risk their lives to save others should be commended, but in many cases these actions tend to reward behavior that is

outside the boundaries of acceptable risk versus potential benefit. In addition, more recognition should be given to firefighters who fight, often unrecognized, for better building codes, or who work ceaselessly at the company level to check smoke alarms and generally help residents reduce their risk of death or injury.

Our efforts will be more successful if they are shared and standardized across the fire service in terms of staffing levels, incident command procedures, risk management policies, standard operating procedures, training and certification requirements, to name a few.

Lack of knowledge about existing standards was identified as a priority by TAMPA2 participants, many of whom clearly see national standards as a key element to reducing firefighter LODDs and injuries. The adoption of the Incident Command System and the National Incident Management System, as well as related programs such as Blue Card Command, are examples of success in this area. But we still face significant hurdles in developing national standards, let alone in building acceptance for them and implementing them across the diverse fire service.

The fire service should have a zero-tolerance seatbelt policy.

The call to "Buckle up!" has become widespread, but seatbelt use is inconsistent, and there are many departments that do not enforce seatbelt policies. Further, responding unbelted in personally owned vehicles (POVs) continues to be a source of injuries and deaths. The International First Responder Seatbelt Pledge (www.everyonegoeshome.com/seatbelts), and Dr. Burton Clark's work in developing and building support for it, has been a huge step in the right direction for establishing a zero-tolerance attitude toward seatbelts. Critical work has also been done in this area by Mike Wilbur and FDNY in developing more firefighter-friendly seatbelts. The NFFF has also been working with NIOSH on an anthropometric study directed toward ensuring that apparatus seating spaces are engineered to accommodate firefighters wearing protective clothing.

The fire service should have a zero-tolerance policy for tobacco use.

On the positive side, the conversation around cancer has grown steadily, fueled at first by 9/11 and, in more recent years, by research that has documented the toxic environment to which firefighters are routinely exposed, and the direct impact of these exposures on firefighter cancer rates. More must be done, however, to reveal this connection and to educate firefighters on how they can limit exposure (e.g., cleaning PPE, showering after fires, monitoring the air at incident scenes). If the fire service is going to continue to fight for cancer presumption legislation, maintaining a zero-tolerance policy for any and all forms of tobacco is critical.

We must implement mandatory medical examinations and physical fitness programs for all members, in accordance with NFPA standards.

NFPA 1582: Standard on Comprehensive Occupational Medical Program for Fire Departments has gained much more acceptance in the years since the Novato summit, but clearly this is still an area where much progress needs to be made. There is increasing focus on the need for annual ("incumbent") fitness testing as well as sophisticated medical screenings to identify cardiovascular and cancer risks as early as possible. Fortunately, this issue has a lot of momentum and although universal implementation appears daunting, there is little doubt that the culture within the fire service is slowly shifting toward demanding that firefighters be fit for duty.

Firefighter mental and emotional wellbeing is an often-overlooked topic. The fire service must address it at the national organizational level all the way down through the local department level with targeted offerings that help firefighters suffering from depression, suicidal thoughts, post-traumatic stress disorder, addiction and other behavioral health issues.

This is an area where the NFFF's efforts have had huge impact. Initiative #13 has been an area of special focus for the foundation in the past five years, resulting in a host of programs and resources for firefighters and fire departments to draw on. Most recently, the move away from Critical Incident Stress Management to a new focus on the After-Action Review and Stress First Aid has given company officers concrete tools to proactively use at every call to identify and mitigate undue stress at the company level. The foundation has also produced a series of articles on firefighter behavioral health and produced two reports on firefighter depression and suicide which can be found on the EGH website, www.everyonegoeshome.com. More can be done, but critical progress has been made.

Every fire department must identify, investigate, report on and learn from near-misses and LODDs.

The NIOSH Firefighter Fatality Investigation program and the Firefighter Near-Miss Reporting System are two highly visible contributors to this effort. NIOSH reports routinely make headlines in fire service media and are distributed widely; although not every death is investigated, NIOSH now meets little resistance from fire departments in investigating LODDs. The Near-Miss program made great strides before losing funding, but it has now been brought back in a reinvigorated form that has the potential to help firefighters and officers learn from near-misses in a more interactive, in-depth format. In addition, many more fire departments are committed to conducting in-depth investigations and openly sharing the results.

Grant funding is key to achieving many of the initiatives, but it must be pursued responsibly and in line with best practices and a commitment to use the equipment or staffing to enhance safety. We must also use data to justify the need for safety programs, higher levels of staffing and new equipment.

The success of the FIRE Act grant program is obvious, even taking into account reductions in funding in recent years. Yet many departments still view the grant funding process as mysterious and arbitrary. More research and sharing of information is needed to help fire departments big and small, career and volunteer, understand how to build safety into grants and use data to document why grant funding is needed. And efforts to educate legislators to support the reauthorization of grant programs will be critical in ensuring that departments continue to receive greatly needed funding to implement the changes called for in the FLSIs.

The Next 10 Years

As you will see in the following pages, many of the recommendations passionately put forth at the Novato summit, and the reactions to the FLSIs, were echoed at TAMPA2. But rather than seeing the repetition as an indication of a lack of progress, it may be helpful to understand it as a continued discussion of ideas that are central to firefighter survivability, yet are often difficult to quantify or measure. These are not "check the box" ideas, but comprehensive concepts that will take many years to achieve. The "mini" summits of the past 10 years have laid valuable groundwork to build off of, and have kept the issues at the forefront.

Now, the time has come to drill down into these sometimes nebulous concepts, develop concrete actions that can address the issues, and prioritize them based on achievability, cost-effectiveness and available resources. When, at the next summit, we look back at the list of recommendations from TAMPA2, there should be many that we can say emphatically, "We accomplished that—together."

The Firefighter Life Safety Initiatives:
10 Years Later

The 16 Firefighter Life Safety Initiatives (FLSIs) were introduced to the fire service a decade ago. At the time, they were designed to identify the essential challenges that needed to be addressed to meet the U.S. Fire Administration's objectives of reducing firefighter line-of-duty deaths (LODDs) by 25 percent in five years and 50 percent in 10 years.

Those goals were aggressive, and so were the FLSIs. There is little doubt, however, that the 16 initiatives provided a common agenda for the leadership of the fire service to push toward significant change. The overall effort has been described as building a culture of safety within the fire service. There is also little doubt that the fire service itself has changed significantly in 10 years, and that different strategies may be needed to sustain such change going forward.

Accordingly, a portion of the small group work at TAMPA2 was dedicated to reviewing the FLSIs. Rather than restricting the groups to the FLSIs that most related to their topical area, each group was invited to weigh in on any and all of the initiatives. Specifically, for each initiative, they were asked to consider six questions:

1. After 10 years, is the Initiative still on the mark?
2. Has progress been made in the last 10 years to address the Initiative? Anything solved?
3. What has changed in the past 10 years? What changes can we foresee in the next 10 years?
4. Any particular examples of success in the last 10 years?
5. What works, what doesn't work?
6. Suggestions for going forward?

In the following pages, we take a look at each FLSI and reproduce what the various groups had to say about the fire service's progress toward achieving it. First, however, it's important to look at some overall statements that came out during the discussion.

Identify Action Items for Each FLSI

Perhaps the most compelling critique of the FLSIs in general was the need to provide not just high-level goal statements, but more specific actions for how to achieve each goal. It was frequently emphasized that the most significant changes in firefighter attitudes and behaviors are often influenced by the discussions that occur around the kitchen table in the firehouse. "The initiatives are great, but they go on the wall and then are forgotten—we need tactics," one participant said. "Initiatives are goals/mission statements, not tools for their toolbox."

That sentiment was repeated over and over. "They're a great administrative tool but they don't mean a lot to the officers; they're not practical for those in the firehouse," said another participant. "If we're going to change the kitchen table, we need to gear initiatives toward something they can do." Or to put it simply: We do a good job of telling firefighters that "everyone goes home," but we don't do a good job telling them what to do to ensure that happens.

A related suggestion was to extract the five or six key points from the 16 FLSIs that can be used by the company officer/crew boss at the kitchen table. As one participant noted, there is a successful precedent in the law enforcement community: the Below 100 campaign, which seeks to lower officer LODDs below 100 annually—a level that has not been seen for more than 65 years. By using 5 simple statements (Wear Your Belt; Wear Your Vest; Watch Your Speed; WIN—What's Important Now? And Remember: Complacency Kills!), the campaign gives law enforcement officers specific things to do, rather than involving them in a prolonged discussion about culture and safety. Although many factors affect law enforcement LODDs, in the years since the campaign was introduced, LODDs have fallen significantly: 2013 was the lowest level of loss since 1944, and 2012 was the lowest since 1959. Could a similar strategy in the fire service have a significant impact on reducing LODDs from heart attacks, apparatus accidents, etc.?

Target the Messaging

Closely related to the need for action items is the suggestion to break down the FLSIs so that there are messages appropriate for different audiences. Some of the initiatives are clearly set at a high level and do not apply directly to individual firefighters or fire departments. The participants encouraged the development of action items that could be applied by line firefighters, company officers and chief officers to promote positive change at their levels.

"Perhaps the concepts are too difficult to understand for the average firefighter or company officer/crew boss," one group noted. "It was recommended that these be simplified for local-level firefighters and company officer-level understanding at the kitchen table. We need to organize and package them into specific FLSIs for firefighters, company officers and chief officers. They could package them as pocket guides that can be marketed at the local level."

Another group suggested a similar breakdown, but along the lines of the three fire service levels of operation: strategic, tactical and task: "For example, the average Joe firefighter doesn't have any authority over vehicle response policy development. He should focus on what he can control. The initiatives could potentially be re-ordered—1-4 may be specifically for firefighters, 5-10 for company officers, etc. Obviously there is a lot of overlap, but it's a concept to be considered."

Such an approach also recognizes the important role that the company officer/crew bossplays in changing fire service culture. "Real change needs to occur at the fire station/company officer/crew bosslevel," one group said. "Leaders and recruits are buying into this, but we need change at the company officer/crew boss level."

Perhaps change at the company officer/crew boss level is slow because officers struggle to talk with their crews about the high-level organizational concepts reflected in the initiatives. That's where targeted, action-oriented messages might have the biggest impact.

Integrate the FLSIs into NFPA standards

Another overarching suggestion to come out of TAMPA2 was the need to weave the initiatives into NFPA standards. Integrating the FLSIs into NFPA 1001 and NFPA 1021 would ensure that the information is delivered to all firefighters training/certifying at these levels, one group noted. "Departments feel they only need to cover what's in national standards," another group said. "The initiatives should have to appear in the national standards as job performance requirements (JPRs). Standards drive every textbook and training program. We can recommend everything we want, but if you get it in the NFPA standard, it will get done."

Increase Enforcement, Reinforce Success and Positive Change

Finally, many participants focused on the need to increase enforcement—to create consequences when safety initiatives aren't followed. "The fire service makes excuses, covers up," said one participant. "There are no consequences for taking unsafe actions. There are very few fatalities where the person did not know what they SHOULD have done. We shouldn't have to pledge to wear a seatbelt—it should be automatic and there should be consequences for not doing so." If the fire service can find ways to "put teeth into" the initiatives, it could go a long way toward achieving the change that the initiatives envision.

But it should be a carrot-and-a-stick approach; rewards are an equally important part. "We focus on negative culture but we do not recognize positive actions or safe actions," said one participant. "It's hard to make some things sexy—sometimes it can't be done—but we need to reinforce positive behaviors." Or as another participant put it, we need to "fall out of love with the pageantry associated with an LODD, and celebrate what works" to prevent them.

Looking Ahead

Rather than focusing on eliminating specific FLSIs or adding additional ones, suggestions from participants at TAMPA2 were mainly related to the need to provide more actionable items for the fire service to work toward the high-level goals.

The Firefighter Life Safety Initiatives have helped the fire service achieve significant progress over the past decade, but it's time for the next step. As one participant noted, 10 years from now at TAMPA3, "There should be fewer than 16 initiatives, because we should have accomplished some of them."

Fortunately, there's a model in the fire service that can provide the vision for the next decade, one that all firefighters are already familiar with. "We've reached the 'Awareness' level for the 16 Firefighter Life Safety Initiatives," one participant noted. "In these next 10 years, we need to reach the 'Operations' level and maybe even the 'Technician' level."

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.

Initiative #1 is the broadest of any of the 16 FLSIs, and an area where TAMPA2 participants see great progress. Without doubt there is much more emphasis on and acceptance of safety throughout the fire service than there was a decade ago. The desired change is occurring, but there is also a great distance still left to travel.

"The initiative is hard to define, not quantifiable or measurable," one group noted. Another stated, "We feel we are off to a slow start with this process. More direction on cultural change needs to be defined." But others focused on "a new openness" and "a significant shift in mindset toward safety." Examples of this change included seatbelt use and integration of data to help focus efforts on exactly where change is needed.

Several groups focused on the relationship between cultural change and leadership, especially the leadership of a new generation. "Once our leadership changed, our culture changed," one group noted. "With new leadership, either people got on board, or left." Yet another group noted the difficulties in such an aggressive approach: "In Smalltown USA, change has to been done slowly or personnel will leave."

Several groups noted the challenge of starting the FLSIs with an initiative that focuses on cultural change rather than defining specific behaviors that will lead to that change. "Culture is the consistent acceptance of behaviors," one group wrote; another noted that "behavior changes attitudes; attitudes don't change behavior." Participants also stressed the importance of keeping perspective, reminding firefighters where the fire service has come from in its journey to create a culture of safety, and to focus on supporting behavioral change, not enforcement.

So what could help firefighters make the transition from this broadly worded initiative to behavior that realizes its vision? The groups offered the following suggestions for going forward:

- Use case studies and stories to personalize the need for safety and change.
- Get the company officer/crew boss involved. Progress has been made in training recruits to be safer, but we haven't been as successful at educating and changing the culture at the company officer/crew boss level.
- Consider rewriting FLSI #1 to be more tactical. As written, this and many of the FLSIs are overwhelming.
- Make data accessible to those in the field.
- Remember that cultural change takes time.

INITIATIVE 2—Enhance the personal and organizational accountability for health and safety throughout the fire service.

There is almost total agreement that personal and organizational accountability are needed to reduce fire-fighter injuries and deaths, but envisioning how to create accountability is a bigger challenge.

The groups at TAMPA2 agreed that the goal of Initiative #2 is still very much on the mark, but struggled with it being elusive. "We are definitely talking more about accountability and safety now than we were 20 years ago," one group noted, but another expressed frustration that the fire service hasn't better prepared firefight-ers and chief officers for what happens when they push for change. "When you propose change, it makes you a big target," one group noted. "Everyone wants change, but no one wants to change." This group also noted that fire chiefs are often not held accountable for safety because their role more closely resembles that of a politician, and they are "caught in bureaucracy." Perhaps related to that, fewer firefighters show an interest in advancing to chief—something the group called a "dangerous symptom."

Still, several examples of progress and change in the last 10 years were noted, including numerous research studies to ground the fire service in scientifically proven tactics, improved data on firefighter LODDs, better access to NIOSH LODD reports and the FDNY retrofit of all apparatus seatbelts.

For the road forward, the groups proposed the following ideas:

- Push prevention from the very beginning; focus on community risk reduction.
- Emphasize academy-level training on health and safety.
- Require the seatbelt pledge at the academy level.
- Don't use punishment to enforce accountability: "Punitive does not work."
- Participate honestly in injury and death investigations.
- Improve injury reporting; develop a central database for injuries. Develop common definitions of injuries.
- Enhance near-miss reporting. Consider using rewards to encourage firefighters to report near-misses.
- Improve statistical analysis of LODD trends to better identify what's causing/contributing to LODDs.
- Explore grant funding and other options to make annual medical evaluations a reality. Ensure administration supports annual testing so those in the field see that it is important.
- Use the new Vulnerability Assessment Program and integrate the program into the initiatives.

INITIATIVE 3—Focus greater attention on the integration of risk management with incident management at all levels, including strategic, tactical and planning responsibilities.

After 10 years, Initiative #3 was widely regarded by TAMPA2 participants as still very much valid. Further, the groups indicated that significant progress toward the integration of risk management has been made. "We have made good strides on this initiative, primarily because it is more tactical and implementable," one group noted. The availability of technology, and the willingness of the new generation to use it, was cited as a main reason behind the initiative's success, as well as the increased emphasis on after-action reviews (AARs) and self-questioning risk factors in relation to tactical decisions, such as, "Was interior attack appropriate in this situation?"

Other examples of success related to FLSI #3 included ISO ratings, CPSE community risk assessments, AFG grants for community risk assessment; the seatbelt pledge; implementation of NFPA 1410 (Standard on Training for Initial Emergency Scene Operations) evolutions; and a tactical approach to funding of research (e.g., technology, accountability systems).

> **But there's still much work to be done. Participants cited the need to improve National Fire Incident Reporting System (NFIRS) consistency and application, as well as the need for more reliable data. In the future, they would like to focus on the following:**
>
> - Recruit, develop and promote the most qualified, level-headed, safety-oriented candidates to company officer/crew boss positions.
> - Continue to improve two-way voice communications for fireground operations, both firefighter-to-firefighter and fire officer-to-command (inside to outside).
> - Promote the National Fire Academy curriculum.
> - Recognize positive examples of unsafe practices that were recognized and stopped.
> - Stress fire prevention/education.
> - Teach departments how to integrate tactical risk management into training.
> - Require continuing education and re-certification in order to continue going to fires.
> - Better educate firefighters and officers on knowledge of fire protection systems.

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INITIATIVE 4—All firefighters must be empowered to stop unsafe practices.

Participants at TAMPA2 had mixed feelings about Initiative #4. Although all groups agreed that the initiative is still valid, whether the fire service has made progress in this area was more up for debate. A few groups stressed that progress is relative. Change is often slower and more difficult in large departments, one group noted, while another indicated that "Change has not occurred across the board, but there are success stories."

Participants focused on the concepts of empowerment and the need for zero-tolerance policies. One group stressed that the fire service already employs the "see something, say something" approach during special operations incidents, such as technical rescue. "When someone says STOP, everyone stops. Why isn't structural firefighting the same?" they asked. But several groups were optimistic that reluctance to speak up will largely be a problem of the past as a new generation of firefighters enters the ranks. "The new 'me' generation has less of a problem speaking up on their own behalf," one group noted, while another stressed their openness to new ideas and change.

But it can be an uphill battle against peer pressure and negative kitchen-table talk. "After you train a new employee and infuse them with the new culture, they are changed within minutes after hitting the bay floor," one group noted. "Everyone knows that [someone's doing something] dangerous, but they do nothing out of fear of reprisal [at the kitchen table]. We reward the wrong things. Courage and valor awards are often given for the wrong acts; we need to stop reinforcing unsafe acts and start rewarding things like enacting a sprinkler act. We are rewarding individualism and pride (machismo)."

> **So what is working? Groups stressed the role of continuing education, including the Executive Fire Officer program, as well as online training, in helping fire officers understand how to build a culture where firefighters feel comfortable speaking up. And they noted many examples of strategies to consider to further empower firefighters:**
>
> - Better define how to accomplish FLSI #4. Develop better definitions for "unsafe practices" and specific actions related to challenging them.
> - Ensure that departmental leadership offers the empowerment and allows it to occur.
> - Don't hire speakers or instructors who claim the fire service has pushed "the safety thing" too far.
> - Recognize positive examples of when unsafe practices were recognized and stopped.
> - Develop standard operating procedures (SOPs) that help departments establish procedures to empower firefighters to stop unsafe practices.
> - Continue to stress the importance of company officers teaching firefighters about unsafe conditions.
> - Emphasize decision-making and safety in all training.
> - Be willing to fire/discipline repeat offenders of safety rules.

INITIATIVE 5—Develop and implement national standards for training, qualifications and certification (including regular recertification) that are equally applicable to all firefighters based on the duties they are expected to perform.

This initiative was one of the most discussed at the TAMPA2 meeting. Participants widely agreed that enhanced training, qualifications and certification standards are urgently needed in the fire service. How far we've come, and whether such standards are achievable in the near future, was the subject of greater debate.

First, the progress. One group noted that there are more certified firefighters today than 10 years ago, and that many states have increased education requirements since 2004. There's a broader recognition of certifications, credentialing and the Executive Fire Officer program within the fire service in general.

Yet significant challenges still remain. One of the most obvious: the gap between volunteer and career firefighters when it comes to universal standards. The push for higher training standards creates challenging demands for many volunteer departments that are struggling to recruit and retain active members. "We have states where legislators will not put requirements on volunteers because they are afraid of losing them," one group noted, while another put it succinctly: "The mere fact that we have 'all' firefighters in the statement makes it problematic."

And, since the fire service has not typically adopted uniform standards and recertification requirements, there is a lot of resistance to the introduction of mandatory requirements at the individual level as well. "We hear 'we don't have time, or you can't make me do it,'" one participant noted. "But people EXPECT us to be certified and trained."

The discussion noted the significant differences across states when it comes to standards. "The 'development' portion [of the initiative] is largely accomplished (NFPA 1001, Pro Board, etc.)," one group noted. "The challenge … is in the implementation." One group felt that federal legislative action would likely be required to fully implement Initiative #5. And of course, any additional standards and training requirements imposed on fire departments must be balanced against the costs and resources required.

Given all this debate, it's no surprise that the list of recommended strategies going forward was quite long, including:

- Update the NFPA professional qualification standards to address current realities.
- Change NFPA standards to require recertification.
- Advocate for federal legislative mandates for certification.
- Press state fire training directors to support national standards.
- Define significant benchmarks for recertification training (e.g., 5, 10, 15 years of service).
- Develop systems to better document training.
- Require officer development schools/programs.
- Consider different levels of certification standards based on resources, demographics and geography. (For example, limiting what certain firefighters can do on the fireground based on their training and resources. Some firefighters should not be expected to perform interior firefighting.)
- Consider interim steps to certification, similar to EMR/EMT/Paramedic (possibly, Firefighter Awareness, Operations, Technician, Specialist).
- Consider age limits for active firefighters.
- Ensure every firefighter receives an annual physical that screens for cardiovascular disease and cancer.
- Emphasize achieving competency/proficiency, not simply fulfilling an amount of training or education.
- Identify ways to enforce national mandates and to compel fire service organizations to comply.
- Don't allow "one and done" training competency evaluation. Constant, rigorous, ongoing training needs to be reinforced.

INITIATIVE 6—Develop and implement national medical and physical fitness standards that are equally applicable to all firefighters, based on the duties they are expected to perform.

Perhaps no issue is more contentious in the fire service than the need for firefighters to be fit for duty, and how to achieve this across the varied and complex fire service. Firefighter Life Safety Initiative #6 is "a huge can of worms," noted one group. That's because discussion about mandatory national fitness and medical standards immediately brings up career vs. volunteer issues (Is it realistic to expect volunteers to meet the same physical standards as career firefighters?) as well as labor rights issues (Can incumbent testing be required? What happens if the incumbent doesn't pass?).

Furthermore, there are genuine questions about what makes a firefighter fit for duty and how to test for it. One group noted that the application of NFPA 1582 (Standard on Comprehensive Occupational Medical Program for Fire Departments) has been largely successful, but others noted that to truly attack the problem, differentiation between "medical" and "physical fitness" standards is necessary.

Although they recognized many of these challenges, most of the participants at TAMPA2 were supportive of annual fitness and medical testing, and expressed the need for standards. "Some people are not built to be firefighters ... not everybody should get a trophy, like in T-ball," one group noted. "Other countries have very stringent requirements that result in expulsion from the service if a minimal fitness level is not maintained."

Suggestions for the future include:

- Add language to the initiative specifically concerning cancer.
- Add specific wording in the initiative for annual physicals.
- Require incumbent physical testing, much like maintaining a red card for wildland firefighting.
- Base standards and testing on the duties firefighters are expected to perform (e.g., red card testing has different levels—Walk, Moderate, High-Impact—based on duties that the person is expected to perform).
- Seek implementation at a national level, but don't let it stall local/regional efforts.
- Find ways to enforce national mandates to compel fire service organizations to comply.
- Identify funding sources (federal grants?) for volunteer firefighter physicals.
- Partner with public and private organizations to develop health standards.
- Increase screening for heart disease and strokes.
- Build a standard model for firefighter physicals that is followed nationally.
- Develop a national program to educate physicians who perform firefighter physicals.
- Ensure programs aimed at physical fitness are non-punitive and provide incentives for being in good health.
- Use rest studies and other research on shift durations and nutrition to identify how fatigue impacts firefighter health and performance.
- Track post-retirement health of firefighters.
- Develop return-to-work standards.
- Consider age limits for active firefighters.
- Develop personal protective equipment that provides more flexibility and reduces the amount of stress experienced by firefighters.

INITIATIVE 7—Create a national research agenda and data collection system that relates to the initiatives.

Initiative #7 is "another wide-ranging and moving target," as one group put it. Yet few doubt the necessity of data collection and research in the fire service, and it's not difficult to point to numerous examples of research that has saved firefighter lives.

Unfortunately, TAMPA2 participants were mostly negative about how far the fire service has come in achieving the data collection portion of FLSI #7—something they identified as extremely important in the effort to reduce fires. "We don't feel like we've made that much progress with data collection, given the technology available today, especially with NFIRS," said one group. Another noted, "We really do not have a good system in place yet. Data quality is a big issue." Some questioned whether NFIRS is collecting the appropriate information.

Positive signs include increased data collection for suicide and cancer rates. But "we are constantly told the data does not match our testimony," one group noted. "Are we collecting the right data?"

One key factor several groups identified: The need to help company officers and line firefighters understand why data reporting is so important, enter it correctly and use the data later. "There is a behavior issue in that there's a desire to get to the next call and not document the previous call," one group said. "We dismiss the importance of data collection. We'll train in the heat and snow for hours, but won't take 3 minutes to properly fill out a report." After all, reports don't put out fires.

Funding also remains an issue. One group noted that this initiative may have been modeled off of similar efforts in the military, where funding is readily available. Fire departments, however, often lack the funding and staffing to support robust data collection efforts.

As for the path forward, groups identified the following possible steps:

- Advocate for a standardized reporting and data collection system.
- Train firefighters and company officers on the benefits of good data collection.
- Revamp NFIRS to collect more information, not just data.
- Reward departments and states that achieve 100 percent NFIRS reporting.
- Consider support for the National Fire Operations Reporting System (N-FORS).
- Examine EMS reporting systems and identify concepts to emulate.
- Focus on a plan for data analysis, implementation and dissemination—how we can use the data at the local level.
- Partner with other agencies (who often have more funding) to conduct research.
- Conduct a national summit on data collection to determine best practices and develop a plan forward to enhance data collection.

INITIATIVE 8—Utilize available technology wherever it can produce higher levels of health and safety.

TAMPA2 participants saw huge progress since this initiative was developed. They also reported being more open to technology, a trend they expect to grow with the new generation of firefighters. Seatbelt sensors, rollover protection, vehicle data recorders, thermal imaging cameras, advances in radio communication, atmospheric monitoring and incident command post monitoring are just some examples of successes within the technology arena. Participants noted that the advances will continue to come; drones, robotics and more advanced firefighter tracking systems were just a few examples.

Groups also provided some caveats. "We might not be utilizing technology to its fullest potential," one group noted, "and new technology comes with a high price." The key will be continuing to press for driving down costs. Further, participants stressed the need for a common voice about what new technologies would best serve the fire market. Along those lines, it's important that the fire service carefully evaluate technology originally built for the military or law enforcement. Technology transfer can be beneficial, but the fire service must also advocate for technology that's specifically developed for fire and rescue incidents.

Finally, new technologies must be implemented in step with culture, experience and practices. "Technology won't solve everything," one group noted. "Don't try to over-engineer our problems." For example, advances in PPE can provide additional thermal protection, but firefighters must also be making behavioral changes that take into account the risks they're facing.

Groups focused their recommendations not on specific technologies, but broader strategies, including:

- Leverage relationships and partnerships to continue progress in the technology arena.
- Embrace technology at the local level.
- Advocate for standardization in how equipment interacts with other equipment, across manufacturers (e.g., SCBA interface with radios).
- Advocate for technological solutions that "push" information to the incident commander, rather than having the IC "pull" information from the firefighter.
- Embrace modern fire tactics as taught by NIST/UL.
- Continue to teach the importance of technology—but know the limits.
- Investigate whether the fire service can benefit from military technology to transfer.
- Develop a clearinghouse of available technologies.
- Create a technology "wish list" that enhances firefighter safety.

INITIATIVE 9—Thoroughly investigate all firefighter fatalities, injuries and near misses.

Initiative #9 is "arguably one of the most critical initiatives," one group noted, and other groups agreed that this initiative is still valid 10 years later. Investigations into firefighter line-of-duty deaths (LODDs) are almost universal, and many departments have embraced the Near-Miss Reporting System or other types of injury and accident tracking. The fire service has seen "a huge increase in safety committees and accident investigations over the past 10 years," one group said, while another noted that larger departments talking about their mistakes makes a significant impact on other departments being willing to share information and learn from near-misses and LODDs.

And yet, we know that numerous injuries and near misses still go unreported. "We are not doing a good job of this," one group stated flatly. "We lack a lot of reporting due to lack of funding." Even the NIOSH fatality investigation program is on fragile ground from a funding perspective, forced to justify its existence every budget cycle. Another group mentioned the disconnect between generating reports and holding individuals accountable for changing behavior to prevent the circumstances from recurring.

Suggestions for improvement included:

- Expand the initiative to cover firefighter illness/disease.
- Advocate continued funding of the NIOSH firefighter fatality investigation program, Near-Miss, etc.
- Create a national definition of "injury" (Drexel University is working on this).
- Continue to address data gaps in death/illness/injury collection, such as firefighter suicides (which is actively being addressed by the NFFF through professional alliances with such as an on-going study with Florida State University). Chronic firefighter illness and cancer rates must also be scientifically studied and monitored.
- Focus on human factors in LODD/injury reports and investigations.
- Expand the NIOSH firefighter fatality investigation program to include wildland fatalities.
- Create a safe, non-punitive environment for reporting.
- Perform an after-action review on every call.
- Use specific case study examples of LODD incidents in training programs.
- Conduct an analysis of non-physical contributing factors to cardiovascular incidents (emotional, external stressors, etc.).
- Enhance NFIRS reporting consistency.

INITIATIVE 10—Grant programs should support the implementation of safe practices and/or mandate safe practices as an eligibility requirement.

Initiative #10 gets the support of all groups at TAMPA2, but participants noted some shortcomings: There's no good way to measure success related to this initiative, and "safe practices" is a broad term that begs definition or description.

Many participants cited the federal grant programs, and related Congressional support, as having a significant impact on the fire service. "We require equipment and firefighters using it to meet applicable standards, or you must be requesting money for the training to use the equipment," noted one participant. "Safety is paramount in the discussions for grant criteria." Yet many departments still lack the expertise and resources to prepare successful grant applications, and there is no guarantee that grant funding will be around 10 years from now.

Clearly, securing grant funding in and of itself is a challenge, not to mention connecting such programs to specific safety practices. As far as future efforts, participants recommended the following:

- Require departments to spell out specific safety program improvements as a category on grant applications.
- Apply research data to grant requests.
- Increase funding for human factors training instead of equipment.
- Use the Vulnerability Assessment Program to document need and therefore improve chances of successful grant applications.

INITIATIVE 11—National standards for emergency response policies and procedures should be developed and championed.

TAMPA2 participants clearly struggled with FLSI #11, recognizing the benefit of a national response policy to differentiate between emergency response situations and non-emergency incidents, but ultimately being unable to reconcile this model with local realities. Each fire department, one group noted, has different needs and applications based on resources and demographics. "We need to keep working on this initiative," one group said. "How is this going to be implemented and enforced?"

Perhaps not surprisingly, then, most of the progress in the area of response standards is seen at the local level. "Numerous departments have developed sensible, non-emergency response policies," one group said. "These should be shared with peer departments and careful data should be collected on their successes and/or failures."

One group stressed the need to start small. "Fire-related events come with a great cultural challenge for altered response. Start with the low-hanging fruit: water leaks, non-injury lift assists, etc." Developing standard responses to these calls can be a "foot in the door" to further expand national response policies and procedures.

Other suggestions for moving forward included:

- Integrate altered response policies into NFPA 1710/1720.
- Mandate the installation of vehicle data recorders on fire apparatus and enforce their use.
- Examine the rationale behind carrying emergency equipment in privately owned vehicles (POVs).
- Examine the rationale behind allowing tankers/tenders to respond as emergency traffic.
- Develop a model for writing standard operating procedures/guidelines.

INITIATIVE 12—National protocols for response to violent incidents should be developed and championed.

When this initiative was first written, most of the focus was on firefighter response to incidents of terrorism or situations where firefighters had come under attack. But some TAMPA2 participants focused on a very different aspect: incidents where fire is used as a weapon. "We need to look at this issue through the Department of Justice," one group noted. "Arson is considered a violent incident. The fire service is [therefore] considered a 'target' of violent incidents."

More recently, Initiative #12 has come into sharp focus during several high-profile active-shooter incidents, including those where fire was used to lure firefighters to a structure, where they were then attacked. Participants felt that IAFF/IAFC protocols developed for active-shooter response have helped make progress in this area. The NFFF has developed a 90-minute course on the Response to Violent Incidents that can help any department navigate this issue. The debate about firefighter/paramedics entering the "warm zone" during active-shooter situations illustrates, however, that there is still no national model standard. Some departments have begun training personnel (with the support of local law enforcement) to move into "warm" zones under certain conditions, but many still specifically require personnel to stage in a safe place away from the scene until law enforcement has declared it secure.

Actions participants would most like to see:

- Increase funding for training and PPE appropriate for violent incidents.
- Expand protocol development to today's issues, such as active shooters and improvised explosive devices (IEDs).
- Form partnerships with law enforcement and conduct joint policymaking and joint training.

INITIATIVE 13—Firefighters and their families must have access to counseling and psychological support.

In 2010, the NFFF launched a major effort around Initiative #13, introducing a new approach to mental and behavioral health in the fire service. That effort continued in 2013 with the introduction of a new Behavioral Health Model aimed at helping firefighters recognize the signs of mental and emotional stress in themselves and others and react accordingly. Clearly, as one group noted, we've made a lot of progress in this area: Stress First Aid, multiple programs from the National Volunteer Fire Council, the work of the Safety, Health and Survival Section of the IAFC, expanded employee assistance programs. Such efforts have "produced measurable success in the last decade," according to one group.

But as with all of the FLSIs, there is still work to be done. There is "still a significant stigma associated with behavioral health issues," one group said. In some departments, seeking help through an Employee Assistance Program (EAP) leads to immediate removal from normal duty until a psychological evaluation is completed. "Seeking help should not mean being immediately 'pulled off the line,'" one group noted. "This decreases participation and increases stigma"—or looked at another way, it can create the same kind of reluctance firefighters often have to calling a mayday on the fireground. Still another group noted the difficulty in recognizing mental and emotional stress in firefighters who are conditioned to hide it: "You have to have experienced it so you know what to recognize."

Further, many fire departments remain unaware of the excellent resources available to them; even among the well-connected TAMPA2 participants, many had not heard of the NFFF behavioral health resources. Other groups noted the need to expand efforts to retirees, EMS personnel, veterans and firefighters' family members.

To that end, potential solutions included:

- Continue to encourage firefighters to seek help when feeling distressed.
- Encourage family members to seek counseling.
- Explore additional fire service partnerships in the realm of behavioral health.
- Promote training for (not from) EAP providers through outlets such as the "Helping Heroes" website.
- Improve pre-employment psychological profile testing.
- Equip firefighters with tools and support for non-incident stressors (family issues, marital problems, substance abuse, financial problems, etc.).
- Encourage departments to bring behavioral health training in house before there's a problem.
- Address chronic post-traumatic stress disorder due to racism, sexism and homophobia in the fire service.
- Monitor firefighters months and years after an incident.
- Increase data collection on suicide in the fire service.

INITIATIVE 14—Public education must receive more resources and be championed as a critical fire and life safety program.

Groups unanimously supported the need for public education to receive more resources, but were split in terms of how much success the fire service has made in this area in the past 10 years. Some groups thought that, other than fire prevention, public education has changed little since the first Life Safety Summit. On the other hand, some groups noted successes such as the work of Vision 20/20, Fire 2020's Partnering for Prevention program, USFA's efforts to educate and prepare public information officers for the transition to External Affairs Officers and new National Fire Academy programs that focus on community risk reduction.

One key area identified related to public education: the need to educate firefighters as well. "[We] need more education on fire protection systems for firefighters and fire officers," one group wrote. Only when firefighters understand and support residential fire sprinklers can they, in turn, educate the public. Another group stressed the need to take proactive rather than reactive approaches when dealing with homebuilders associations regarding residential sprinklers and other fire and life safety codes.

Another challenge to this initiative: how fire prevention and education is downplayed within the fire service itself. "It's always the first program to go," one group noted, "and it's not always the most effective people [who are] assigned there. It's usually used as a dumping ground for our personnel." To overcome this attitude, participants noted, fire service leadership must embrace prevention and prevention must be taught to firefighters as an offensive fire tactic: "When you think about it in the context of 'fast water,' you realize that fire sprinklers are indeed the fastest water we have."

Given that public education is "one of the most crucial areas for a true cultural change across the board," as one group put it, what can be done to continue to marshal support for public education? Suggestions from the groups included:

- Make prevention a normal, standard part of the job for all firefighters.
- Integrate social media into all prevention strategies.
- Consider renaming fire departments as Community Risk Reduction Departments.
- Emulate the community policing model.
- Resist budget cuts to prevention and public education.
- Integrate community risk reduction activities at the fire company level.
- Make fire prevention and life safety education mandatory in public and private schools starting with K4/K5 and continuing through high school.

INITIATIVE 15—Advocacy must be strengthened for the enforcement of codes and the installation of home fire sprinklers.

Although residential sprinkler success stories abound, many TAMPA2 participants still felt strongly that the fire service has not come far enough in achieving Initiative #15. "We need to create a public demand for sprinklers," one group said. "We say how important prevention is, but we fail to take actionable steps to do something about it." And homebuilders associations keep up the fight against change, even in communities that have seen initial success.

Further, there's the danger of boiling down the entire initiative into a residential sprinkler issue, when in fact it's much broader than that. "It is not one issue; too many think this initiative is only about residential sprinklers," one group noted. "[We need to] define the work environment." A firefighter's work environment goes way beyond the station, encompassing any structure they respond in. And just as we would not be OK with firefighters living in fire stations that are not up to code, we should not be OK with them responding to structures that aren't up to code.

Legislative support was seen by many groups as key to success in this area. Individual legislators (local and federal) can push for tax breaks as incentives for support of safe buildings and updated codes, and apply pressure that the fire service cannot. "Money works," one group noted. Getting politicians on board will be critical to future success.

Other ideas from the groups included:

- Firefighters, and especially fire service leaders, should set the example by installing residential sprinkler systems in their own homes.
- Push for new, more cost-effective technologies in sprinkler design and installation.
- Take on groups disseminating false information and call out builders who don't allow fire sprinklers.
- Provide more resources (time, money) for code enforcement at the company level.
- Continue and enhance fire service involvement in the codes and standards process.
- Consider marking lightweight construction buildings with signs to warn firefighters.
- Promote the concept of company officers being certified inspectors and encourage company level inspections with enforcement.

INITIATIVE 16—Safety must be a primary consideration in the design of apparatus and equipment.

Initiative #16 is a bright spot in the Firefighter Life Safety Initiatives. Several groups noted that it is the most successful initiative, the area where the fire service has come the farthest. Why? Apparatus design standards as outlined in NFPA 1901 have changed dramatically to create much safer fire apparatus. "Apparatus manufacturers, in general, have done an extraordinary job here," one group noted.

Changes in technology have helped, too, creating rollover protection, improved seatbelt systems and cost-effective vehicle data recorders. Yet one group cautioned that working against all these developments is "the never-ending challenge of firefighters finding their way around certain apparatus safety features." And apparatus manufacturers can only do so much—sometimes, the first safety decision is in the type of vehicle that's being specified, and departments would do well to consider mini-pumpers and quick-response vehicles over larger, traditional pumpers and heavy-rescues, according to one group.

Interestingly, the groups focused almost exclusively on apparatus design in their discussions, even though equipment such as thermal imaging cameras and SCBA is also evolving to address safety concerns.

Even with all this success, there is always room for improvement. Suggestions included:

- Increase support for vehicle data recorders.
- Advocate for additional standards for specialized apparatus (e.g., tankers).
- Emphasize training and human factors in addition to technology.
- Revamp ambulance design standards.
- Expand the initiative to cover equipment age and maintenance and how firefighters use the equipment.
- Ensure that the newly produced anthropometric data is used to improve apparatus and equipment for firefighters.
- Develop zero-tolerance policies for firefighters who disable or find workarounds to apparatus safety features.
- Consider writing a separate set of FLSIs that provides specific actions for apparatus and equipment manufacturers.

Problems & Solutions

The second assignment for the small group discussions at TAMPA2 was for each of the 10 groups to develop a series of problem statements related to their assigned topic area. For each problem statement, they were also encouraged to identify strategies for addressing the problem, as well as who (what groups, organizations or ranks) should be tasked with implementing the strategies.

The 10 groups were assigned a wide range of topic areas, and not surprisingly they developed a long list of problem statements and potential strategies. In the concluding session at TAMPA2, each group briefly presented their findings. But with greater distance and time, we are able to examine all of the problem statements and strategies as a whole, and identify trends and topics that recurred across the groups.

Accordingly, in the following pages, we have grouped the suggestions into five main "problem" areas:
1. Standardization and certification
2. Data and research dissemination
3. Implementation of the Firefighter Life Safety Initiatives
4. Health and fitness
5. Risk management

Imposing this grouping on the long list of suggestions necessarily involves some measure of simplification. But it can be an effective means to digest what is otherwise a lengthy list of varied suggestions with incredibly varying amounts of detail. Some of the suggestions produced by the groups were at the 30,000-foot level, while others were specific and tactical. For example:

"Each fire agency should develop an attitude, exhibited by every member of the organization, ingrained from their first day on the job as a personal commitment to be a 'safety, survival, health and wellness advocate' and 'servant leader.'"

"Use traffic slowing/control devices while operating in the roadway to alert oncoming traffic."

Similarly, some groups identified specific roles (e.g., chief, company officer, Authority Having Jurisdiction) in the fire service that should be responsible for implementation of the suggested strategies, while others pointed toward broader groups or associations (NFPA, NFFF), and some preferred to leave this open to local level interpretation. A few groups identified timeframes for their suggestions, but many did not.

Grouping the problems and solutions into five broad categories allows us to present the ideas more uniformly, allowing trends to dominate rather than specific groups or topics. Viewing the problems facing the fire service in this manner is intended to illuminate the overarching messages and allow us to better prioritize suggestions for immediate action.

First, however, it is necessary to look at some comments that didn't fit into the "problems and solutions" format but are nevertheless important to document and consider.

- If we are truly focused on serving the citizens, we must stop celebrating "fire"—that's not to say we shouldn't get pumped up about putting the fire out, but we don't need to be just waiting on the "big one."

- We must develop solutions with the volunteer fire service and wildland firefighting in mind. Several individuals expressed concern that many of the 16 FLSIs, as well as the concepts discussed at TAMPA2, are just not realistic for the average volunteer fire department, many of which are very small, underfunded and serve predominantly rural areas.

- We should consider developing realistic target timeframes for each of the strategies suggested in this report.

- Materials generated around these efforts should be in-depth, but we should always consider developing companion messaging that is short, simple and appropriate for social media. More and more of our contact with firefighters comes through social media.

- Suggestions for change and for how we can build on the initial summit must take into account how our operating environment has changed since 2004. Then, we were "riding the wave" of support garnered by 9/11; today, we have massive cuts to municipal budgets, cuts to federal grant programs and a decline in employee morale. This may limit what we can accomplish.

- We should consider whether the paramilitary culture of the U.S. fire service actually works against the full acceptance and implementation of the FLSIs and inhibits productive community relationships and effective prevention programs.

- When looking for safety models to emulate, we should not limit ourselves to those in manufacturing or business, but should consider the military, especially the mindset of preparing for battle and training in real-life scenarios. The military's application of safety measures in training and combat is more applicable to our operating environment than the systems and approaches that have been developed for manufacturing and industry.

- We need to add an EMS component throughout the FLSIs.

- We need to make greater efforts to integrate wildland firefighters within the unified fire service community and, at the same time, provide more discussion and examples that are applicable in the wildland environment.

- We must stress both personal and organizational responsibility—whether you are the person with the gold or the informal leader or the manager of a large fire department, you have responsibility for yourself and you have an influence on those around you

- Smart, safe firefighting will never be about one silver bullet strategy; rather, firefighters must be able to use multiple tools in the "toolbox," read situations correctly and apply appropriate tactics.

- All firefighters should be encouraged to ask questions, and officers should use questions as teachable moments for the entire crew.

- We need an attitude shift to prevention. If we have only a suppression mindset, we will have a bad attitude about prevention. Firefighters should be brought up in a culture that emphasizes the "3 E's"—education, engineering and enforcement—early warning (smoke alarms), early suppression (fire sprinklers) and emergency response.

As you read the problem statements and proposed solutions on the following pages, we challenge you to keep these varied perspectives in mind and also to consider how the recommendations should be prioritized. To truly integrate health and safety into the culture of the fire service and drastically reduce LODDs and injuries, we must employ a variety of strategies. Some of these strategies are more complicated and challenging than others, but they are essential to sustain the effort over the long term and address deep-rooted beliefs that continue to reinforce unsafe behaviors.

PROBLEM: A lack of formal standards for firefighter training, certification and recertification contributes to LODDs and injuries.

The American fire service is fundamentally organized at the local community level. Every fire department prides itself on its unique identity, culture and history. The complex makeup of the fire service fosters independence, yet there is a growing realization that the lack of adopting formal standards for training and certification is a big contributor to firefighter LODDs and injuries. If we truly want to reduce deaths and injuries, fire departments—and firefighters—may need to be willing to give up some of their independence and commit to adopting national standards to ensure all firefighters meet a minimum level of competence in relation to the duties they are expected to perform.

The TAMPA2 groups identified a range of problems related to the lack of standardization in training and education, from apparatus accidents (driver/operator training is lacking) to inconsistent responses on wildland fires to fire prevention not being integrated into formal curriculum and job standards. Tackling each of these problems will require different tactics, but an underlying focus for all of them will be the need for fire service leaders and organizations to work together, put egos aside and think realistically about how to develop, adopt and strengthen standards that will work for all fire departments. .

At the same time, this effort will need to be conducted in a way that is appropriate and realistic for both career and volunteer departments. Several TAMPA2 participants felt that the discussion around standardization and increased training requirements was unattainable for many volunteer fire departments and the volunteers themselves. Others, however, noted that a standard for firefighter certification would give volunteer departments the power needed to enforce training requirements that often currently go unheeded.

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Strategies suggested by the various groups related to standardization include the following:

- **Call for a Presidential Blue Ribbon Commission to study minimum requirements for all firefighters and fire officers commensurate to their duties.** This study should devote specific attention to risk assessment, risk management and situational awareness, and incorporate fire dynamics and empirical, evidence-based strategies. Such requirements could be modeled following the Department of Transportation (DOT) regulations for EMS.

- **Develop a mandated firefighter certification and continuing competency program.** This effort will involve the NFPA 1000 Technical Committee, the International Fire Service Accreditation Congress (IFSAC) and the Pro Board as well as national fire service organizations.

- **Train all firefighters to NFPA 1001, all driver/operators to NFPA 1002 and all officers to NFPA 1021 within the next 10 years.**

- **Develop a uniform, mandatory, national officer/supervisor (company officer/crew boss or above) training program.** This program, which would go beyond current NFPA 1021: Standard for Fire Officer Professional Qualifications, should be based on current research and science and follow nationally recognized standards. It should be scalable for different department sizes and community needs and should include a mentorship program that outlines key job responsibilities. Consider including a tool box for officers with emphasis on safety, Everyone Goes Home and the 16 FLSIs (e.g., checklists, training tools, role definition). When developing the program, consider the military model of officer candidate development and training school.

- **Ensure structural departments that respond to wildland fires adopt and implement National Wildfire Coordinating Group standards.** When multiple fire departments respond to wildland fires with different levels of training and different approaches to communications, tactics and procedures/policies, it creates confusion and the potential for things to go wrong.
- **Develop processes to manage instructor qualifications and performance.** Promote NFPA 1041 certification for all instructors, and ensure that instructors are qualified and current in the subject matter, especially as related to health and safety.
- **Implement uniform driver/operator training and certification across the fire service.** This should incorporate annual competency evaluations and national traffic incident management training. It will require a lobbying effort for state and federal DOT agencies to enact legislation and/or regulations. Apparatus operators should NOT be exempt from appropriate licensing and competency evaluations.
- **Integrate fire prevention and community risk reduction into standardized training, core job requirements and qualifications for advancement.** It has been said many times that the best way to prevent firefighter LODDs is to prevent the fires from occurring in the first place. To do this, fire service leaders should consider changing the entry-level firefighter curriculum to place community risk reduction as a first-phase course, find additional ways to educate firefighters and company officers on the value and importance of fire prevention, and require all firefighters to participate in community risk reduction activities as a routine part of their duties.

PROBLEM: Valuable data and research are not widely disseminated or applied.

The last decade has been a boon for the fire service in terms of research and data collection. Grant funding has produced excellent research on heat stress, physiological monitoring, firefighter tracking, smoke exposure and many other topics. UL and NIST have scientifically reinforced our knowledge of fire behavior and how traditional tactics need to change. NIOSH, state fire marshal offices and individual departments now routinely produce highly detailed investigative reports on LODDs. Systems like Firefighter Near-Miss and the National Fire Incident Reporting System (NFIRS) produce meaningful data every year.

This week's ground-breaking study or statistical report is always at a danger for becoming lost in the never-ending tide of information. The coordinated effort of the UL Firefighter Safety Research Institute and NIST to develop many free, downloadable training programs is a shining example of applied research. But the reports produced by significant research projects too often land on a shelf, out of sight and lacking the mechanisms for dissemination and implementation. Firefighters struggle to stay up to date on all of the information that is available and particularly to understand what is truly relevant and actionable.

TAMPA2 participants identified a need not only to continue the valuable research and studies being conducted, but to improve the methods of disseminating the information and implementing the results. They look to organizations such as the NFFF and the International Society of Fire Service Instructors to summarize the information in order to produce actionable changes.

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Along those lines, the groups at TAMPA2 identified the following strategies:

- **Disseminate information in creative, accessible ways.** Long reports are important, but the fire service needs to focus on efficient methods to get the word out about new research and initiatives. Develop apps for smartphones, use websites and employ social media to reach firefighters and officers, rather than expecting them to seek out the information.

- **Emphasize the importance of and use of data for effective decision-making at all levels.** Every member of the fire service should understand and appreciate the need for valid data and data analysis to drive change.

- **Establish a clearinghouse for the coordination of data, research and technology.** Better systems are needed to rapidly deliver findings to major fire service organizations and policymakers for adoption and/or implementation. The NFFF should consider developing a research section to account for and report on research related to firefighter injuries and fatalities.

- **Advocate for the inclusion of research findings in academic coursework (e.g., requirements for degree programs, through the Fire and Emergency Services Higher Education model curriculum).**

- **Develop a clearinghouse for resources, sample policies and templates for validated training programs and delivery mechanisms.** This will help instructors, training officers and company officers access best practices in fire service training and education.

- **Overhaul NFIRS to improve the amount and the accuracy of data collection.** This could include encompassing evolving issues (exposures, etc.) and making the program more user-friendly. Seek out private partners to assist in this effort.

PROBLEM: The Firefighter Life Safety Initiatives and related training and education are not implemented across all fire departments.

In spite of the extensive efforts that have been made since 2004 to promote the 16 FLSIs, the great majority of firefighters are still unaware of the program and unfamiliar with the initiatives themselves. Awareness of the program is, of course, less important than awareness of the messages and implementation of the programs that are incorporated within the initiatives.

The challenge of reaching every firefighter in every fire department is monumental. The NFFF has spearheaded the immense effort to educate firefighters across the country about the initiatives and the importance of developing a safety culture. The Everyone Goes Home (EGH) program provides several different training opportunities and maintains a website with easily accessible resources. To further reach firefighters, the EGH program employs the use of advocates to spread awareness and implementation at the local level.

These efforts have had a significant impact on fire service culture. Many firefighters have participated in EGH training, fire service media routinely reference the initiatives and "everyone goes home" has become a rallying cry for thousands of firefighters. Yet, unfortunately, not everyone has gotten the message. As TAMPA2 participants pointed out, the initiatives are not universally institutionalized (known, understood and practiced) and fully implemented within all fire agencies. The fire service is approaching a tipping point—truly eliminating the perception that LODDs are an "acceptable" part of the job—but we must maintain the momentum. The mission continues to be reaching out to every firefighter and every fire agency to promote the initiatives and deliver all of the related training and information.

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Suggested strategies to accomplish this effort include:

- **Enhance the specificity of the FLSIs with task- and tactical-level strategies that operationalize them for all levels.** More effectively communicate the intent of each initiative in relation to individual firefighters and fire departments. This should include specific tangible, measurable steps to implement the recommended policies and practices. Identify those initiatives that target specific positions within the organization (firefighter, company officer, chief officer) and develop talking points for each level.

- **Use public/private partnerships to continuously communicate the safety message to the American fire service and our communities.** This message should include the essential elements of prevention, education, mitigation and research.

- **Develop mechanisms to communicate with our customers (internal and external) via the technology they use every day.** Such mechanisms could include social media, smartphone apps, blogs, websites, etc.

- **Revitalize the Everyone Goes Home program.** Develop a diverse marketing plan to inform firefighters and fire departments about the numerous line-of-duty death and injury initiatives developed by the NFFF over the last several years.

- **Update the training, delivery methods and implementation tools (including the train-the-trainer guide) for "Courage to Be Safe."** This will ensure that the next generation of firefighters is exposed to this valuable program.

- **Review the FLSIs on a biannual basis.** This will ensure that the initiatives reflect current trends and developments in the fire service.

- **Author a white paper to detail how the FLSIs correlate with wildland firefighting.** This should include an assessment of whether additional initiatives directed at wildland firefighting are needed.

- **Develop a program to educate firefighters' families on the life safety initiatives and on firefighter health and safety in general.** Families need to be an integral part of understanding the significance of safety, health, wellness, training and education.

- **Aggressively market NFFF's current programs around FLSI #13.** Such a campaign could include a standalone class offered at the National Fire Academy and a video that highlights firefighters who are "survivors"—either themselves or in their families—of mental health/suicide challenges.

- **Champion the image of a firefighter as a humble public servant.** Change the perception of a firefighter as a macho excessive risk-taker and invincible hero (an image that is predominantly male and white). Company officers will also need to be trained in how to lead and manage change as the fire service tackles this cultural shift.

PROBLEM: Fitness, health and medical issues continue to make up a large percentage of firefighter deaths and injuries.

Firefighter health and fitness is one of the most talked about and most contentious topics in the fire service. The issue of cancer within the fire service is also emerging as an undeniable priority. The focus is evolving from recognition of the problem to presumptive acceptance of cancer as an occupational disease and the necessity for regular medical screening. The additional area that requires immediate attention is the issue of what must be done to reduce exposures to carcinogens, beyond the steps that are already known.

But the issues are myriad. What does it mean to be fit for duty? Should firefighters be required to undergo annual medical and fitness testing? Is testing firefighters for cardiac or cancer risk before symptoms arise too invasive? If we implement fitness standards, will volunteer departments lose too many members? How will departments afford annual medical and fitness evaluations? If the fire service fights for cancer presumption laws, what behavioral changes is it fair to require of firefighters? How can we encourage firefighters to get help for post-traumatic stress, depression and alcohol and drug problems?

These issues produce endless debate. They are not simple issues and solving them won't be easy. It requires a more concerted effort among national organizations to promote a unified message of education, prevention, detection, treatment and monitoring. Further, it demands that all firefighters stop getting lost, even hiding, in the debate over why annual fitness testing won't work, and commit to taking immediate steps to enhance their own and others' fitness and health.

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TAMPA2 participants envision a health and fitness agenda that will study the toxic effects of the fireground, compile data on cancer rates, develop standards for firefighter physicals, eliminate the stigma associated with behavioral health issues and much more. It's an aggressive agenda, but the groups had no shortage of ideas on how to achieve it.

- **Adopt NFPA 1582 medical standards for all firefighters regardless of organization type.** Meeting the basic standard should be a prerequisite for receiving grant funding, participating in structural firefighting and being deployed on wildland fires and emergency events.

- **Make annual physicals affordable.** Identify partnerships that can provide funding for firefighter physicals. Use success stories from other departments to develop best practices. Produce a strategic plan on how fire departments can implement a cost-effective annual physicals program, drawing on the knowledge and experience of insurance companies, fire service leaders and unions. The plan should include approaches applicable for volunteer departments, small career departments and larger metro departments.

- **Expand research to establish the correlation between occupational exposures and health effects.** This effort will require additional grant funding, the establishment of reporting mechanisms to create databases to track and trend incidents of cancer, and an educational component to increase firefighter awareness and accountability.

- **Support research to identify methods to prevent exposure to carcinogens.**

- **Advocate for presumptive cancer laws in all states.**

- **Promote the importance of diet, exercise and nutrition as three critical elements to reducing risk of cancer and heart disease.** Bring "heart healthy" and cancer reduction programs to all departments.

- **Develop a "fit for duty" evaluation to be used nationwide to ensure job readiness for firefighters prior to returning to duty.**

- **Eliminate tobacco use in the fire service.** Departments should adopt and enforce policies prohibiting all tobacco use and explore the potential role legislation could play in this effort.

- **Investigate how the aging process affects firefighters.** Support efforts to determine whether fitness-for-duty programs should include a maximum chronological age point.

- **Establish a national fire service database for reporting behavioral health needs, training, gaps and successes.** Enhance firefighters' ability to manage behavioral health issues through education and training and use testimonials, case studies and peer support to battle the stigma associated with behavioral health issues.

- **Design and implement a Family Readiness Group program for the fire service.** In volunteer departments, a spouse could lead the group, and in career departments it could be led by an outreach coordinator. The purpose would be to host events for the families to develop a network of support to sustain firefighters and their families in the midst of traumatic events.

- **Consider the impact of harassment on firefighter behavioral health and its associated impact on safety.** Collect data on incidences of sexism, racism, homophobia, sexual assault and other forms of harassment, and create training programs that help firefighters recognize prejudicial and offensive behavior and react accordingly.

- **Require students to meet the NFPA 1582 medical standard before entering into any strenuous training program.** Training incidents related to medical conditions have killed and injured many firefighters.

PROBLEM: Risk management often remains a concept, rather than being translated into specific action.

Risk management gets a lot of lip service in the fire service, but it's a difficult concept to define and an even more difficult one to teach. Yet it is the key to dramatically reducing firefighter deaths and injuries.

There are two fundamental approaches to teaching risk management. The first is to use simulation-based training to walk firefighters through various scenarios and hone their decision-making skills in a safe environment. Fire service instructors often talk about this process as creating "slides" in a "slide tray" (or data in the hard drive for the younger generations) that firefighters later draw on when facing the real thing. Many training programs and products available on the market employ this approach, and the Firefighter Near-Miss Program recently added a training component based on pattern recognition and scenario-based training.

The second approach is to identify specific actions that increase risk, and train firefighters to avoid these actions. This takes the theory out of the mix and boils down risk management into simple directives: Wear your seatbelt, perform a 360-degree assessment at every fire, etc.

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Both approaches are needed within the fire service. We want "thinking firefighters" who maintain keen situational awareness, and we want all department members who act as officers/supervisors to be empowered and accountable for their role. But we also need to provide specific strategies that can be easily taught, absorbed and followed. Several of the recommendations that TAMPA2 participants developed suggest how the fire service can mitigate certain risks. They include:

- **Focus on developing firefighters as better decision-makers.** Firefighters must be taught to use scientific findings to inform their tactics. When we are entrenched in suppression through aggression we lose sight of science. Example: UL and NIST studies emphasizing the benefits of "fast water." The culture of safety is not about undercutting rescues or not saving people; it's about making sensible decisions.

- **Teach better air management.** Firefighters routinely stay too long in the IDLH atmosphere, often ignoring low-air alarms and other signals to exit. Fire departments should adopt, train on and enforce air management policies that require firefighters to closely monitor their air supplies and exit from IDHL atmospheres before reaching the alarm setting on their SCBA, such as NFPA Standard 1404: Fire Service Respiratory Protection Training.

- **Teach firefighters the limits of PPE.** Firefighter PPE is continually evolving and providing enhanced thermal protection, which can have the effect of reducing the users' awareness of extreme environments and increasing heat stress on firefighters. Fire departments should teach firefighters about how PPE is designed, and what it can and cannot do.

- **Enforce a zero-tolerance seatbelt policy.** Fire departments should mandate and enforce 100 percent use of seatbelts in all fire and EMS apparatus as well as personally owned vehicles (POVs). Further, the fire service should pursue changes to federal and state legislation that currently exempts firefighters from wearing seatbelts, and push for making seatbelt use mandatory in all 50 states.

- **Enforce high-visibility vest use.** Firefighters are at great risk when operating on roadways. Fire departments should require all firefighters to wear traffic safety vests when operating on roadways and should train firefighters on positioning apparatus to protect crews. A future NFPA Standard (1092) will address traffic management issues.

- **Adopt risk-based emergency response algorithms.** Too many departments still respond with lights and sirens to calls that don't merit the risk associated with emergency response. Fire departments should consider the wealth of research showing the ineffectiveness and danger associated with lights-and-siren response and adjust response policies for certain types of calls.

- **Train firefighters on radio use and radio discipline and advocate for improved radio technology.** Even after many developments in radio technology, firefighters still experience radio complications and failures. Fire departments should address limitations through specs, guidelines, testing and research and development. They should also train firefighters on radio use and the limitations of their system's technology.

- **Avoid over-reliance on technology.** Technology can produce sensory overload, and if firefighters come to rely excessively on it, they may be helpless if it fails. Fire departments should employ a cautious approach when implementing new technologies, and train firefighters with and without the technology so they're prepared in case of a failure.

- **Teach prevention as an offensive attack strategy.** Prevention and community risk reduction must be elevated to the level of offensive fire attack—in terms of initial training and overall culture—so that it becomes a tactical priority for every firefighter.

- **Discontinue the use of outdated and non-NFPA compliant apparatus.** Many tanker/tenders and some wildland aircraft are outdated and contribute to elevating risk for drivers, operators and the public.

Who Should Do What?

One critical aspect to maintaining the momentum from TAMPA2: Identifying who should do what for the strategies that are considered top priorities. Each strategy will involve different players, of course, but following are some of the roles TAMPA2 participants envisioned for individuals and groups:

National Organizations (IAFF, IAFC, USFA, CFSI, NFPA, NVFC, ISFSI, Pro Board, etc.)

Work collectively to produce model policies, procedures, standards; update and reinforce appropriate NFPA standards to incorporate FLSIs and other strategies recommended in this report; create model legislative and policy language; identify, develop and promote best practices; lobby for local, state and federal support.

State Organizations

Adopt national training, certification and recertification standards; train officers on the Everyone Goes Home Program and the 16 FLSIs; develop and adopt state legislation to address issues of firefighter fitness, seatbelt use, etc.; share best practices.

National Fallen Firefighters Foundation

Market the FLSI and Everyone Goes Home programs and ensure they are up to date; bring organizations together to improve information sharing and discuss possibilities for data collection and dissemination; solicit support from private organizations to build public/private partnerships for safety goals; partner with organizations to bring cancer and heart-healthy programs to all departments; continue efforts to identify the relationship between products of combustion exposure and cancer.

Fire Departments

Embrace and use the FLSIs; issue joint information on the value of good diet, regular exercise and nutrition; adopt tobacco non-use policies; implement policies to reduce continued exposure to toxins and carcinogens; adopt NFPA 1582 requirements and make every effort to secure an annual physical and fitness-for-duty program for operational firefighters.

Company Officer

Serve as a model of safety and health for firefighters on their crew; rigorously and uniformly enforce safe practices and stop unsafe practices; hold firefighters to high standards of training, fitness and readiness. Note: Special focus was given at TAMPA2 to the unique role of the company officer/crew boss in ensuring safe practices and implementing change at the company level. This will be an area of enhanced focus moving forward.

Other Individuals

Share information from TAMPA2 and encourage others to get involved; model safe practices; wear seatbelts and demand compliance from crew; subscribe to routine medical evaluations; get and stay fit; hold discussions on how to implement the FLSIs in your department; follow best practices for decontamination of PPE and personal hygiene; ensure the crew has time to exercise.

Focus on the Future

TAMPA2 was designed not only to assess the progress made since the development of the Firefighter Life Safety Initiatives, but also to reaffirm and re-energize the fight to dramatically reduce firefighter line-of-duty deaths and injuries.This report is just the beginning of the next phase of the journey that the National Fallen Firefighters Foundation will undertake to reduce firefighter line of duty deaths—but success will depend on the commitment of firefighters, company officers, fire chiefs, major fire service organizations and many others.

What will that effort look like? Responses from TAMPA2 participants provide some clues.

Actions Participants Are Taking

There's no need to wait for the next NFFF program or presentation to start, or continue, individual efforts to enhance the safety culture. Many TAMPA2 participants left with new ideas for actions they could personally take to advance this fight.

In the follow-up survey, the NFFF asked participants what they had done or are doing to implement the FLSIs and make their departments safer. Their responses range from very specific to much broader, long-term programs, illustrating how both will be required to achieve the vision of the FLSIs. By sharing them here, we hope that readers will see that a healthier, safer fire service is within reach, and be inspired to take steps of their own to identify and mitigate health and safety risks—immediately.

Here are just some of the many actions TAMPA2 participants are taking:

Health and fitness
- Ordering two washing machines designed to wash turnouts, to be shared by 13 volunteer fire departments.
- We have increased our focus on cancer training and awareness and we are developing a couple of quick-reminder safety bulletins.
- Installed an air hose on our primary structure engine for gross decon of PPE and equipment on scene.
- I hope to develop a more in-depth medical screening and physical fitness plan along with more training and knowledge on behavioral health issues, which currently are not on my organization's radar.
- Each engine now carries "wet wipes" for initial on-scene skin cleaning.
- Our department has been trying for two years to persuade our county to provide a facility to clean PPE, with no result. Our department is too small, with no "extra" turnouts, to utilize the traveling PPE cleaning vendors. We can't be without gear that long. Post-summit, our department negotiated with the largest municipal department in our county to have our PPE properly cleaned by their staff, one or two sets at a time, and same-day service.
- Our decrepit station has no option for diesel fume removal, so we are changing response and return protocols to limit exposure.
- I'm planning to push for prompt gross decon and then showers after fires. The summit really increased my concern about cancer.
- I have purchased baby wipes for my career and volunteer engine company to wipe down after a working incident (on the scene). Showers are taken as soon as we get back, clothes are changed. Turnout gear is washed down, and the rig interior is decontaminated.

- Will be requesting funding for vaccinations for volunteers from the County Board of Supervisors (which currently funds vaccinations for career firefighters) for next fiscal year.
- We will continue to make our behavioral health program better.
- Developed standard operating procedure to check CO level of firefighters before they leave structure fires.
- I am working on implementing a department directive that will enable the assistant district chiefs to immediately take companies out of service when back in the firehouse. This will allow all firefighters to put "clean" bunkers in service, properly clean all safety gear and shower before going back in service. Anything we can do to immediately remove carcinogens, the better.

Awareness

- Summit materials, websites and other information were passed along to our 19 member fire departments.
- We have framed and matted the 16 FLSIs and the Prevent Cancer posters and hung them in the station.
- I am meeting with every crew to discuss the FLSIs for each member. I am also adding initiative action items to our goals and objectives system to ask each member to take action in their capacity.
- Following the summit, we held department-wide discussions and "power-thinking" sessions related to identifying more risks, mitigating those identified and implementing several changes.
- I have selected one of our most talented captains, who in turn handpicked a team of 10 people to identify ways to implement the FLSIs and other best practices into our department. We will have a standing team that continues to push for a safer and healthier fire department.
- I plan to work with the NFFF to explore building a crowdsourcing mechanism for fire service standard operating procedures.

Prevention

- We are elevating prevention by analyzing our data to identify the most prevalent causes of our fires and targeting those causes with education and engineering measures. If we prevent the fire, we prevent the LODD associated with the fire.

Tactics and Training

- We will change, even more, our fire attack strategy [to reflect new fire behavior research].
- We held a drill focused on quick water and use of piercing nozzles as an initial tactic.
- In an effort to help get firefighters trained in surrounding agencies, I put together an abbreviated Hazmat Ops and Firefighter I Class. To achieve this we had to cut the number of in-classroom/drill ground hours significantly (36 classroom hours for hazmat and 44 hours for Firefighter I), but all students successfully passed the state testing requirements (which meet NFPA standards and are endorsed by IFSAC and Pro Board). The classroom/drill ground training was supplemented with Web-based training. Even though there weren't a lot of hours and such training may not meet expectations of others, there are now more volunteers who have received formal training under this format. Without this format, they would not be trained at all.

Leadership Development

- We are increasing the frequency and intensity of our leadership development program.
- We created a new position in the department: assistant chief for Safety and Planning. The person appointed has experience as chief of another department, and is trained as a mine rescue and safety techni-

cian (in a multinational mining corporation.)

- I am working with our assistant chief of Operations to improve the Company Officers Academy and develop a Company Officers Mentoring Program Taskbook which, in addition to the current minimum qualifications for promotion, must be completed to be eligible to take the fire captain's examination.
- We have created a new Health, Wellness and Safety Bureau to develop the strategic plan to implement each initiative.

Future Events

As mentioned in the introduction to this report, the foundation has employed different approaches over the past 10 years, including a series of mini-summits on specific topics and the development of white papers on each initiative. The Everyone Goes Home and Courage to Be Safe programs also continue to be delivered around the country.

Going forward, what format is best? Is small-group discussion and implementation more effective than large-scale presentations? How often should the fire service come together around the FLSIs and reducing LODDs? Who should be involved in setting priorities from the vast list of recommendations, and appropriating resources accordingly?

The NFFF will continue to gather input as it plans future activities. For now, the suggestions of the TAMPA2 participants provide valuable direction.

No matter the format, TAMPA2 participants underscored that the diversity of attendees matters. The effort to identify and invite next-generation fire service leaders through the scholarship program was greatly appreciated, but more can and should be done. Several participants suggested keeping that group involved in the coming years. Others noted the need for participation from even more line officers and staff.

Many participants advocated for more frequent summits—once every five years at a minimum. Participants were specifically asked about the effectiveness of mini-summits held in conjunction with national conferences. Thoughts were mixed on this—some saw it as an excellent place to reach key stakeholders, while others voiced concerns that this could limit the discussion to the "usual suspects" or, conversely, open the discussion up so much that the effort loses strategic direction. Others suggested holding the mini-summits at state conferences, where the program could be customized for the LODD and injury data of the specific state. Town-hall and roundtable discussion formats were promoted so that attendees can ask questions of subject matter experts and share ideas for local implementation.

Finally, prioritization is critical. As this report noted, the FLSI program has reached a point of maturity where there is no shortage of ideas, but rather a need for identifying those strategies that will have the best results and putting resources behind them. For that reason, some participants suggested that future meetings should involve work groups that map out how to implement specific suggestions from TAMPA2, rather than the reevaluating the FLSIs themselves. Others promoted the idea of a "top 10" list of priorities coming out of TAMPA2.

The Way Forward

Although the future programs, strategies and events have yet to be determined, one thing is clear: Too many firefighters die and are injured in preventable events each year. The NFFF stands ready to channel, support and organize the effort. But it will be the actions of individuals—their energy and their dedication—that will carry this effort forward.

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UNIT 2:
MISSION READINESS

TERMINAL OBJECTIVE

The students will be able to:

2.1   Describe how the five elements of readiness and personal values contribute to firefighter safety.

ENABLING OBJECTIVES

The students will be able to:

2.1   Explain each of the five elements of readiness and their importance.

2.2   Prioritize personal values, and recognize how they affect incident management and fire safety.

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UNIT 2:
MISSION READINESS

Slide 2-1

ENABLING OBJECTIVES

• Explain each of the five elements of
readiness and their importance.
• Prioritize personal values, and recognize
how they affect incident management and
firefighter safety.

Slide 2-2

I.   MISSION READINESS — AN INTRODUCTION

MISSION READINESS
DEFINITION

The fire company is ready when its
members have the necessary knowledge,
skills and abilities (KSAs) and the resources
to carry out the tactical operations required
to meet the objectives and strategies of the
Incident Commander (IC).

Slide 2-3

A.   Definition of mission readiness.

ELEMENTS OF COMPANY
MISSION READINESS

- The Company Officer (CO) personally.
- The company.
- Knowledge of departmental operations.
- Knowledge of response area and community.
- Knowledge of resources available to company and department.

Slide 2-4

B.   Elements of company mission readiness.

    1.   The Company Officer's (CO's) major role is to direct the efforts of others. He or she must maintain a level of knowledge that supports effective, safe company operations. The primary responsibility of the CO is his or her own safety and that of the firefighters within the company.

    2.   Together, the fire company is a team. Whether working together as one unit or with other companies in response to an incident, it is the CO's duty to make sure that the team and company equipment are ready to perform efficiently and effectively.

    3.   Knowledge of departmental operations.

    4.   Each community or response area holds its own unique incident potentials. Knowing what may arise in the area allows for preincident planning, which is critical to company readiness. Knowing the risks in the response area helps the CO provide appropriate training experiences to the firefighters.

    5.   Knowledge of resources available to the CO and department.

II. COMPANY OFFICER'S PERSONAL READINESS

COMPANY OFFICER'S
PERSONAL READINESS

Photo/National Fire Academy (NFA)

Slide 2-5

A.   Fire departments exist to save lives and property. The CO must respond to every incident ready to manage the incident, or his or her portion of the incident, effectively. For all potential incidents, the CO is responsible for his or her own preparation and the preparation of his or her company.

COMPANY OFFICER'S PERSONAL
READINESS (cont'd)

• Maintain KSAs that will provide for effective, safe company operations.
• Recognize that his or her major role is to direct the efforts of others.

Slide 2-6

COs need a thorough working knowledge of departmental procedures and operations, the response areas they support, and the resources available to them.

B.   The CO must recognize that his or her major role is to direct the efforts of others.

COMPANY OFFICER'S PERSONAL
READINESS (cont'd)

- Personal values or
  characteristics that
  affect the ability to
  direct and perform
  are based on:
  – Training and
    experience.
  – Knowledge of
    operations.

Photo/NFA

Slide 2-7

C. The personal values or characteristics that affect the CO's ability to direct and perform are based on:

1. Training and experience — a good training program would be to continually assess your skills and develop a plan to address any identified weaknesses.

2. Knowledge of operations — the CO needs a solid working knowledge of all aspects of company operations. Strategic, tactical and operational safety are key elements, along with building construction types and fire behavior forecasting. A solid knowledge base allows the CO to confidently take command at the incident scene.

COMPANY OFFICER'S PERSONAL
READINESS (cont'd)

- Leadership and
  management ability.
- Desire and motivation.
- Physical condition.
- The influence of personal
  values on incident
  priorities.

Photo/NFA

Slide 2-8

3. Leadership and management ability — it is the CO's duty to nurture individual and team growth. Lead by example. A positive role model cannot be underestimated.

4. Desire and motivation.

5.   Physical condition.

6.   The influence of personal values on incident priorities — risks taken by fireground personnel should be consistent with the potential results to be achieved.

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GENERAL KNOWLEDGE

• Safety considerations.
• Building construction.
• Fire behavior.
• Communication skills.
• Strategy, tactics and tasks.
• Analysis of company's performance.
• Understanding of liability issues.

                                    Slide 2-9
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D.   General knowledge.

1.   Safety considerations, as applied to strategic, tactical and operational modes.

   a.   Risk/Benefit analysis.

   b.   Situational awareness.

2.   Building construction.

3.   Factors that affect fire behavior — predictions are important when applying resources to solve a problem.

4.   Communication skills — many incident problems can be traced to lack of skill or training in communication. The communications model will be discussed in depth in a later unit.

5.   Strategy, tactics and tasks.

6.   Analysis of company's performance at incidents — post-incident analysis (PIA).

   a.   Informal, with company members.

   b.   Formal, structured.

7.   Understanding of liability issues and the importance of accurate reports and records.

III. COMPANY MISSION READINESS

COMPANY MISSION READINESS

• Before the alarm:
– Readiness of personnel.
– Collective capabilities.
– Readiness of assigned resources.

Photo/NFA

Photo/NFA

Slide 2-10

A. Before the alarm.

1. Personnel readiness is just one of the areas of importance to the CO. Individual attitudes toward safety, firefighter motivational levels, strategic and tactical knowledge, skills and abilities (KSAs) provide essential information used to designate fireground resources effectively.

2. Physical condition.

3. Collective capabilities of the group.

a. Another area of importance is the understanding of the performance level of the team to provide adequate lead time when making assignments during incident operations.

b. The CO must be able to determine performance levels for common evolutions, prior to incidents.

4. Readiness of assigned resources.

a. Apparatus.

- Proper type for response area.

- Well-maintained (daily check, preventive maintenance).

b. Personal protective equipment (PPE) checked and ready at all times.

c. Equipment and tools.

-        Proper type and size.

-        Properly maintained.

-        Adequate amount.

COMPANY MISSION
READINESS (cont'd)

- During alarm, the
  company must:
  – Work as a tactical
    unit.
  – Function with
    other companies.

Photo/NFA

Slide 2-11

B.   During the alarm, the company must be prepared to work as one tactical unit to
          achieve the objectives as assigned by the Incident Commander (IC).

          Depending on the nature of the incident, the company may function as one unit to
          resolve a minor incident or as part of a larger group, with other companies, to
          control more complex incidents.

COMPANY MISSION
READINESS (cont'd)

- Response to nonfire
  emergencies.
  – Emergency Medical
    Services (EMS) first
    responder.
  – Other emergency
    responses.

Photo/NFA

Slide 2-12

C.   Response to nonfire incidents. Are you prepared?

          1.   Emergency Medical Services (EMS) first responder.

                    a.   Establishing command.

        b.   Crew — EMS skills.

    2.   Rescue.

        a.   Vehicle.

        b.   High angle.

        c.   Elevator.

        d.   Collapse.

        e.   Water rescue.

COMPANY MISSION READINESS (cont'd)

- Returning to service.
  - Personnel.
  - Apparatus/Equipment.
  - Prepare required reports.
  - Conduct informal post-incident analysis (PIA).

Slide 2-13

D.   Returning to service.

    1.   Personnel.

        a.   Accounted for and ready for further service.

        b.   Look for signs of critical incident stress.

            -     Anxiety.

            -     Withdrawal.

            -     Irritability.

            -     Nervousness.

            -     Difficult breathing.

        c.   Rehab personnel.

2.   Apparatus/Equipment — operational readiness.

3.   Prepare required reports.

4.   Conduct informal PIA.

        a.   What was done right? Compliment personnel, as appropriate.

        b.   What went wrong? How can we do a better job next time?

IV.   KNOWLEDGE OF DEPARTMENTAL OPERATIONS

KNOWLEDGE OF DEPARTMENTAL OPERATIONS
- Organizational structure.
  - Specific department chain of command.
  - Relationship between line and staff personnel.
  - Whom the CO reports to.
  - Who reports to the CO.

Slide 2-14

A.   Fire department organizational structure requires an understanding of:

1.   Specific department chain of command.

2.   Relationship between line and staff personnel.

3.   Whom the CO reports to (supervisor).

4.   Who reports to the CO.

KNOWLEDGE OF DEPARTMENTAL
OPERATIONS (cont'd)

- Standard operating procedures/standard
  operating guidelines (SOPs/SOGs).
  – Provide guidelines for operations.
  – Provide anticipated strategies.
  – Formal and departmentwide.
  – Consistent with Incident Command System
    (ICS).

Slide 2-15
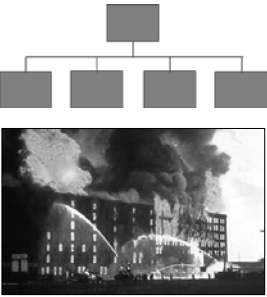
B.   Standard operating procedures/standard operating guidelines (SOPs/SOGs).

   1.   SOPs/SOGs establish the operational procedures and guidelines used to
         provide consistency of operations in an organization. SOPs/SOGs can be
         developed and enforced at varying levels within the organizational
         structure. SOPs/SOGs should:

         a.   Be simple and flexible enough to meet varied conditions.

         b.   Not impede the CO's decision-making responsibility.

   2.   In the fire department, SOPs/SOGs are employed to clarify anticipated
         strategies and tactics.

   3.   Formal and departmentwide.

   4.   Consistent with the Incident Command System (ICS).

KNOWLEDGE OF DEPARTMENTAL
OPERATIONS (cont'd)

- Command and
  control procedures.
  – Be thoroughly
    familiar with the
    structure of the
    departmental ICS.
  – Understand the
    various roles
    within the ICS.

Photo/NFA

Slide 2-16

    C.   Command and control procedures.

        1.   Be thoroughly familiar with the structure of the departmental ICS.

        2.   Understand the various CO roles within the ICS.

V.   KNOWLEDGE OF RESPONSE AREA AND COMMUNITY

KNOWLEDGE OF RESPONSE
AREA AND COMMUNITY
- Community risk assessment.
  – Risk potential.
  – Risk vulnerability.
  – Community consequences.
  – Target hazards.

Photo/NFA

Slide 2-17

    A.   Community risk assessment.

Identifying the potential types of incidents that may arise in your community helps target the types of training needed and aids in preplanning. Knowing the specific hazards that exist in the CO's response area enables him or her to establish preincident plans.

        1.   Four elements.

            a.   Risk potential (life risk).

            b.   Risk vulnerability (property risk).

            c.   Community consequences.

            d.   Target hazards.

KNOWLEDGE OF RESPONSE
AREA AND COMMUNITY (cont'd)

- Life risk affected by:
  – Number of people at risk.
  – Degree of risk.
  – Occupants' ability to provide for their own safety.

Photo/NFA

Photo/NFA

Slide 2-18

2.   Life risk affected by:

    a.   Number of people at risk.

    b.   Degree of risk can be determined by the progression of the fire or combustibles involved that affect fire spread.

    c.   Occupants' ability to provide for their own safety.

        -      For instance, a private home evacuation would be quite different from a day care center evacuation.

KNOWLEDGE OF RESPONSE
AREA AND COMMUNITY (cont'd)

- Property risk affected by:
  – Construction factors.
  – Condition of structure.
  – Exposures.
  – Occupancy.
  – Water supply.

Photo/NFA

Photo/NFA

Slide 2-19

3.   Property risk affected by:

The type and condition of the structure are key factors to consider when determining the property risk in a given situation. Construction types will be covered in detail in a future unit. For now, it is important to note that building construction has a huge impact on property risk.

a. Construction factors (size, type).

b. Condition of structure.

c. Exposures.

d. Occupancy.

e. Water supply.

4. Community consequences — potential impact determined by effect of specific fire on particular community.

a. Direct life loss and property damage.

b. Indirect losses, such as wage and tax loss.

c. Loss of pride and community spirit (e.g., landmark destroyed).

d. Environmental impact.

KNOWLEDGE OF RESPONSE
AREA AND COMMUNITY (cont'd)

• Target hazards.
  – Overload fire department equipment and personnel resources.
  – Involve atypical hazards.
  – Produce significant negative impact on the community.
  – Require technical advice for strategical development.
  – Initiate multiagency involvement.

Slide 2-21

5.   Target hazards.

      a.   Incidents that overload fire department equipment and personnel resources.

      b.   Involve atypical hazards.

      c.   Produce significant negative impact on the community.

      d.   Require technical advice for strategical development.

      e.   Initiate multiagency involvement.

ACCESS WITHIN RESPONSE
AREA

• Road and street condition.
• Normal traffic conditions.
  – Daytime.
  – Nighttime.
• Unusual conditions.
• Restricted conditions.

Photo/NFA

Photo/NFA

Photo/NFA

Slide 2-22

B.   Access within response area — the roads and streets and their condition, normal traffic conditions (day and night), unusual or restricted conditions affecting response.

OCCUPANCY OF THE
RESPONSE AREA

1. Residential.
2. Hotels.
3. Industrial.
4. Schools.
5. Rest homes.
6. Theaters.
7. Hazmat facilities.
8. Business.

Photo/NFA

Photo/NFA
Slide 2-23

C.   Occupancy of the response area.

      1.   Residential.

      2.   Hotels.

      3.   Industrial.

      4.   Schools.

      5.   Rest homes.

      6.   Theaters.

      7.   Hazmat facilities

            a.   Airport.

            b.   Petroleum products.

      8.   Business.

STRUCTURAL CONDITIONS
IN RESPONSE AREA

- Old or new construction.
- Separated or congested structures.
- Fire-resistive or ordinary construction.

Photo/NFA   Photo/NFA

Slide 2-24

D.   Structural conditions in response area — old or new, separated or congested, fire-resistive or ordinary construction.

CONTENTS AND PROCESSES
IN RESPONSE AREA

- Predominant industries.
- Specialized industries.

Slide 2-25

E.   Contents and processes in response area.

      1.   Predominant industries.

      2.   Specialized industries.

WATER SUPPLY IN
RESPONSE AREA

- Source adequacy and reliability.
- Storage.
- Distribution.
- Auxiliary supplies.
  – Private wells.
  – Lakes.
  – Streams.
  – Swimming pools.

Slide 2-26

F.   Water supply in response area.

      1.   Source adequacy and reliability.

      2.   Storage.

      3.   Distribution.

      4.   Auxiliary supplies.

            a.   Private wells.

            b.   Lakes.

            c.   Streams.

            d.   Swimming pools.

VI. KNOWLEDGE OF AVAILABLE RESOURCES

KNOWLEDGE OF AVAILABLE
RESOURCES

- Resource inventory.
  – Special apparatus.
  – Personnel.
    -- Staffing.
    -- Capability.
      • Certifications.
      • Educational level.
      • Firefighter 1, 2, etc.

Photo/NFA

Slide 2-27

A. The CO should maintain a resource inventory that includes the location and current functionality status of special apparatus, additional personnel and skill levels, and local government agencies that could assist, if needed.

1. Special apparatus.

2. Personnel.

   a. Staffing.

   b. Capability.

      - Certifications/Educational level.

      - Firefighter 1, Firefighter 2, etc.

KNOWLEDGE OF AVAILABLE
RESOURCES (cont'd)

   – Other local government agencies.
     -- Police department.
     -- Public works.
     -- Water department.

Photo/NFA

Slide 2-28

3. Other local government agencies.

    a. Police department.

    b. Public works.

    c. Water department.

KNOWLEDGE OF AVAILABLE
RESOURCES (cont'd)

– Outside agencies.
-- Utilities.
-- Construction
   companies.

Photo/NFA

Slide 2-29

4. Outside agencies.

    a. Utilities.

    b. Construction companies.

KNOWLEDGE OF AVAILABLE
RESOURCES (cont'd)

• Balancing incident
  needs with
  resources.
  – Adequate
    resources.
  – Additional
    resources.
  – Regional basis.

Photo/NFA

Slide 2-30

B. Balancing incident needs with resources.

    1. Having adequate resources available at the appropriate time is critical to successful incident operations. Anticipate the need for additional resources — personnel or equipment — and communicate the need ASAP. Call for additional resources early.

2. Having additional resources in reserve (staging) allows for timely reaction to unforeseen occurrences.

As identified in the National Fire Protection Association (NFPA) 1500, *Standard on Fire Department Occupational Safety and Health Program*, a Rapid Intervention Crew (RIC) should be available on-scene to allow for firefighter rescue.

3. Consider resources that might be available on a regional basis. **Request mutual aid.**

KNOWLEDGE OF AVAILABLE RESOURCES (cont'd)

• Part of the readiness process for the CO is to plan for the organization and management of resources.

Photo/NFA

Slide 2-31

C. Part of the readiness process for the CO is to plan for the organization and management of resources.

KNOWLEDGE OF AVAILABLE RESOURCES (cont'd)

• Effect of environment on resources.
    – Effect on personnel.
    – Effect on apparatus and equipment.

Photo/NFA

Slide 2-32

D. Effect of environment on resources.

1. The CO must consider all potential weather conditions and their effects on incident resources.

a. Rehab stations should be established to care for fatigued fireground personnel.

b. Backup resources should be at the ready in the event they are needed.

c. In extreme weather conditions, the CO should be prepared to consider the risks versus the benefits when making assessments on the incident scene.

2. Effect on personnel.

a. Need more frequent relief.

b. Necessary to monitor unsafe practices that result from fatigue.

c. Establish rehab areas.

3. Effect on apparatus and equipment.

Monitor.

a. Fuel and water levels.

b. Freezing water lines.

VII. SUMMARY

SUMMARY

- Mission readiness — an introduction.
- CO's personal readiness.
- Company mission readiness.
- Knowledge of departmental operations.
- Knowledge of response area and community.
- Knowledge of available resources.

Slide 2-33

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UNIT 3:
COMMUNICATIONS

TERMINAL OBJECTIVE

The students will be able to:

3.1   Identify the benefits of effective communications on and off the fireground.

ENABLING OBJECTIVES

The students will be able to:

3.1   Identify the benefits of incident communications, and explain the importance of each.

3.2   Define the communications model steps, and discuss the importance of each.

3.3   Demonstrate tactical communication responsibilities and skills in the capacity of the Company Officer (CO), given a simulation.

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UNIT 3:
COMMUNICATIONS

Slide 3-1

ENABLING OBJECTIVES

- Identify the benefits of incident communications, and explain the importance of each.
- Define the communications model steps, and discuss the importance of each.
- Demonstrate tactical communication responsibilities and skills in the capacity of the Company Officer (CO), given a simulation.

Slide 3-2

I. UNDERSTANDING INCIDENT COMMUNICATIONS

UNDERSTANDING INCIDENT COMMUNICATIONS

Four types of communication.
- Mobile radio.
- Face-to-face.
- Cellphone.
- Incident Action Plan (IAP).

Photo/National Fire Academy (NFA)

Slide 3-3

Effective incident management is dependent on good communication skills. The Incident Commander (IC) must maintain contact with fireground personnel and coordinate with emergency dispatch and other agencies involved with the incident. Effective communication lays the groundwork for safe operations. Conversely, faulty communication leaves openings for failures in incident resolution.

A.   Listed below are four types of incident communication. Typically, a combination of these types of communication will be used during emergency incidents.

   1.   Mobile radio is a two-way radio where communications are sent in one direction at a time over radio frequencies.

      Hey you, it's me (Engine 1 from Command).

   2.   Face-to-face.

   3.   Cellphone.

   4.   An Incident Action Plan (IAP) is a thorough plan that details strategic approaches, fire department personnel and resource tasking, and all other aspects of incident management.

      a.   Verbal — most of the IAPs are stored in the Company Officer's (CO's) head and delivered verbally.

      b.   Written — written IAPs usually pertain to long-term incidents and multiple operational periods.

FIREGROUND COMMUNICATIONS

- More than just yelling orders.
- Involves several steps.
- Giving and receiving information.
- Information understood.

Photo/NFA

Slide 3-4

B.   Incident site communication is much more than just an officer yelling orders. In a crowded emergency scene, orders will be misunderstood or possibly missed all together.

C.   For communication to be effective, several important steps need to take place.

D.   Communication is defined as the giving and receiving of information.

E.   Effective incident communications demand that a third step be included in the definition.

1.   Information is given or sent from one source to another.

2.   The individual at the other end of the communication device receives the information from the source. In an emergency situation, a third step is required. Response from the recipient is essential.

3.   Verification of understanding is the important third step. Strategic and tactical decisions are made based on that understanding.

II.   THE NEED FOR EFFECTIVE INCIDENT COMMUNICATIONS

THE NEED FOR EFFECTIVE
INCIDENT COMMUNICATIONS

• Ability to communicate essential
information quickly.
• Knowing where personnel are at all times.

Photo/NFA
Slide 3-5

A.   Improved personnel safety.

1.   Communication allows the IC to relay crucial information and status updates to fireground personnel.

a.   Based on the involvement of the fire, safety hazards or evacuation orders could be broadcast preventing injury or loss of life.

b.   IAPs are modified on the scene as needed to bring an incident under control. Communication allows these changes to be implemented quickly and across the board.

c.   Quick identification of the need for medical attention.

2. Knowing where personnel are located at all times.

   a. The IC can track where personnel are operating and how long they have been in there. In addition, if/when relief is needed, it can be sent quickly.

   b. Activities can be coordinated to eliminate conflicting operations, such as opposing handlines, master streams put in service prior to all personnel evacuating the structure, and ventilation prior to entry if backdraft conditions are present.

EFFECTIVE USE OF RESOURCES

- Manage IAP effectively.
- Gather clear and concise information.
- Flow of important information only.

Slide 3-6

B. Effective use of resources.

   1. Effective management of the IAP and advantageous resource deployment are dependent on continual communication between the CO and the fireground crew.

   2. Clear, concise orders define operational boundaries for fireground personnel and keep them functioning together as a team.

   3. Succinct, understandable orders and responses minimize excess radio traffic, which allows for the flow of important information only.

IMPROVED INTERAGENCY
COOPERATION

- Makes department look good.
- Makes it easier for others to understand your needs.
- Eliminates duplication of efforts.

Slide 3-7

C.   Improved interagency cooperation is achieved through good communication. Not all agencies understand the same "lingo." Standardizing radio communications using resource designators used by multiple agencies elicits clear messaging and quicker response times. Do not use ten-codes.

   1.   Good communication practices make your department look professional.

      a.   Radio communication may be the only contact you have with other agencies.

      b.   Clear communication and acknowledgment reduce/eliminate duplication of effort.

      c.   The company's reputation will be based on your communication skills.

   2.   Agency-to-agency communications are improved through clarity and standardization, making it easier for other agencies to understand your needs, thus improving their value to you.

   3.   Clear messaging helps to eliminate duplication of efforts among agencies operating at the same incident.

LEGAL IMPLICATIONS

- Many radio communications are taped.
- Tapes may be entered as part of the evidence.
- All departments must follow Federal Communications Commission (FCC) licensing requirements.

Slide 3-8

D.   Legal implications.

    1.   Communication center calls are usually logged to a voice recording device and are made available as evidence if legal action should result from the incident.

        a.   It is important to note that everyone in the courtroom, the jury included, may get to hear just how well you and your department communicate.

        b.   It can be embarrassing when it's your own voice making you look bad. If you don't sound professional, chances are the jury members will not be sympathetic.

    2.   All departments must follow Federal Communications Commission (FCC) licensing requirements.

        a.   Many departments don't have enough frequencies now.

        b.   Not knowing and following FCC regulations can jeopardize the frequencies you do have.

III.   THE NEED FOR A COMMUNICATIONS MODEL

THE NEED FOR A
COMMUNICATIONS MODEL

• Communications are a major factor in
  how well emergencies are managed.
• Training is an integral part of improving
  fireground communication procedures.

Slide 3-9

A.   Communications are a major factor in how well emergencies are managed. Standard operating procedures/standard operating guidelines (SOPs/SOGs) should be developed to identify radio frequencies, how and when they are to be used, standardized phrasing, designated call names for emergency equipment, hazard condition alerts, and proper use and maintenance of radio equipment.

B.   As with tactical maneuvers, the company needs training in effective communications. Remember, Perfect practice makes perfect.

THE NEED FOR A COMMUNICATIONS
MODEL (cont'd)

• Departments should have written
  communication procedures (standard operating
  procedures (SOPs)/standard operating
  guidelines (SOGs)).
  – Basis for training.
  – Compatible with other agencies.
  – Members know what the communication rules are.
  – Used during post-incident analysis (PIA).

Slide 3-10

C.   Written SOPs/SOGs provide step-by-step procedures for department, interdepartmental and interagency communication.

1.   Training should begin immediately and occur often within the department. Additionally, communication training sessions should be scheduled between other departments and agencies to ensure compatibility and understanding.

2. Provides clear communication rules, and makes members accountable for using them.

3. Beneficial tool use in post-incident analysis (PIA) to improve communications.

THE NEED FOR A COMMUNICATIONS
MODEL (cont'd)

• Written procedures provide a model.
– Assurance that all the important factors in effective communication are included.
– Followed at all incidents.
– Perfect practice makes perfect.

Slide 3-11

D. Written procedures provide a model to follow during training and at the incident.

1. Model should provide assurance that all the important factors in effective communication are included.

2. The company communications model should be followed as a matter of habit.

IV. THE COMMUNICATIONS MODEL

THE COMMUNICATIONS
MODEL

Photo/NFA

Slide 3-12

THE COMMUNICATIONS
MODEL — SIX STEPS

Slide 3-13
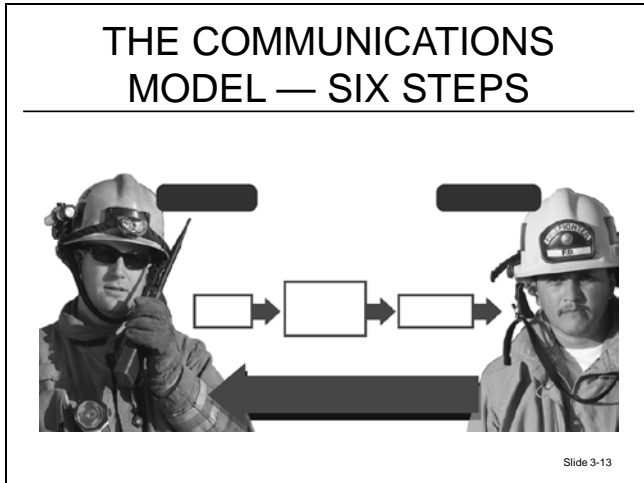
A.   The model is a six-step process.

    1.   Training in the use of the model makes communication a matter of habit.

    2.   It also develops confidence in your ability to communicate effectively.

THE COMMUNICATIONS
MODEL — STEP 1

Formulate

Slide 3-14
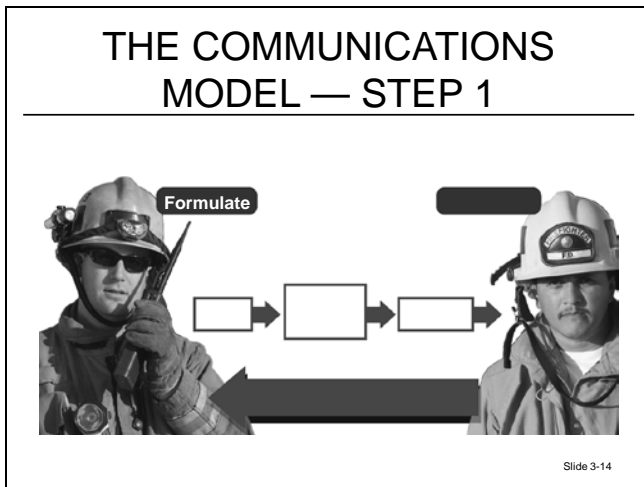
B.   Step 1: The sender formulates an idea to convey to another person.

    1.   Before attempting to send the message, the sender must have clear idea of what message to convey. It is very difficult to make a message clear to others until it is clear in your own mind.

    2.   Messages must be concise. Eliminate information that is not essential to the message you are trying to deliver.

    3.   The more information that is included, the greater the chance that important parts will be lost.

4.   If it is necessary to send a long message, send it in manageable parts.

5.   If the demands of the incident are interfering with your ability to formulate your messages, you must delegate to get back within the span of control.

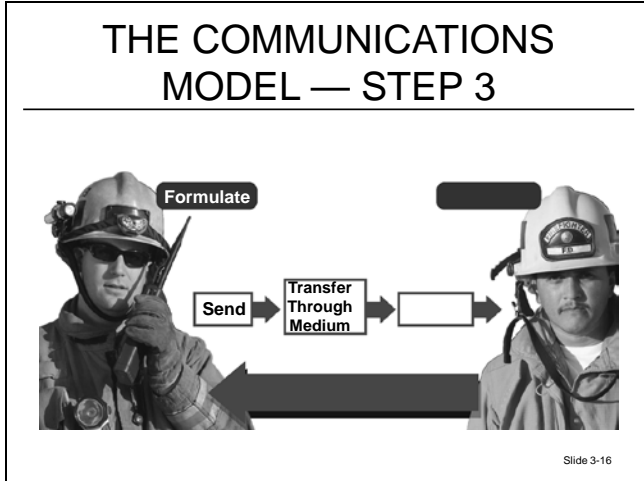

THE COMMUNICATIONS
MODEL — STEP 2

Formulate

Send

Slide 3-15
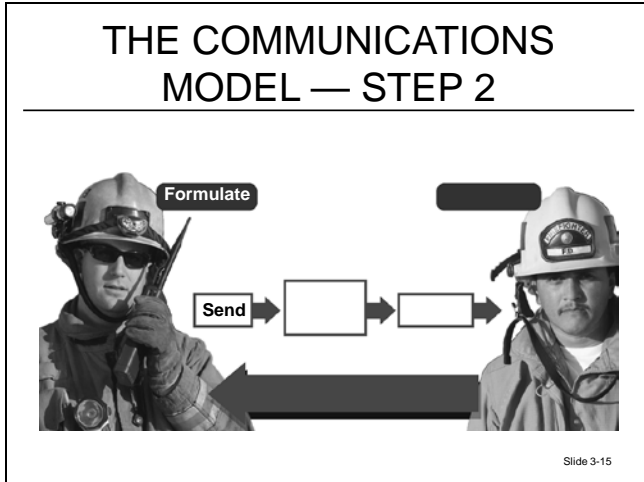
C.   Step 2: Sender sends the message.

1.   The first part of sending the message is getting the attention of the intended receiver.

2.   The second part of sending the message is actually conveying the message.

a.   Differences in word meaning are a major source of communication failure.

-       For example, the word "charge."

--   You charge someone a fee for doing a service.

--   You charge a purchase when you want to pay later.

--   You charge a hoseline.

b.   Discourage use of ten-codes and nicknames for apparatus, equipment or buildings.

c.   Use clear text and standard resource designators.

-       Clear text is a standard set of words and phrases used as part of your Incident Command System (ICS).

-       Standard resource designators are standardized terminology used to identify apparatus and equipment.

THE COMMUNICATIONS
MODEL — STEP 3

Formulate

Send → Transfer Through Medium →

Slide 3-16

D.   Step 3: Transfer the message through the medium.

    1.   Types of communication.

        a.   Verbal.

            -    Face-to-face.

            -    Radio.

        b.   Written.

            -    If handwritten, can the other person read it?

            -    Often used at major incidents covering a long period of time.

        c.   Visual.

            -    Hand signals.

            -    Signs or symbols.

        d.   Nonverbal.

            -    Body language.

            -    Expressions and gestures.

    2.   Training should include proper use of equipment.

    3.   Outside interference in the form of noise or confusion should be minimized.
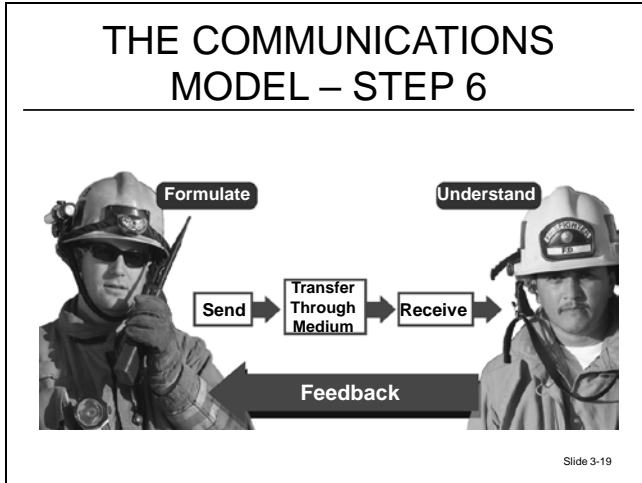
COMMUNICATIONS

4.   Equipment maintenance and purchase must have a high budget priority because of the importance of communications to safety and effectiveness.

5.   Written communication is usually transferred via memos, letters and fax. Oral communication can be transferred via direct conversation, radio, telephone, etc.

THE COMMUNICATIONS
MODEL — STEP 4

Formulate

Send   Transfer Through Medium   Receive

Slide 3-17
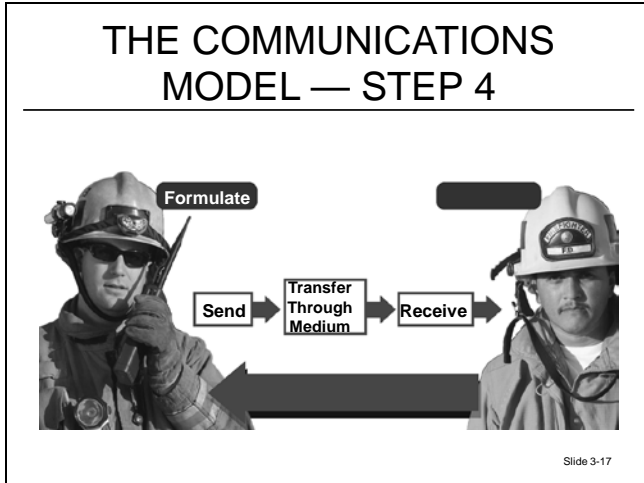
E.   Step 4: The receiver receives the message.

1.   The first part of receiving the message involves letting the sender know that you are ready to receive the message.

2.   The second part of receiving the message is actually receiving the intended information.

3.   Training and positive reinforcement of good skills should be provided.

4.   The receiver should try to minimize background interference.

THE COMMUNICATIONS
MODEL — STEP 5

Formulate   Understand

Send   Transfer Through Medium   Receive

Slide 3-18

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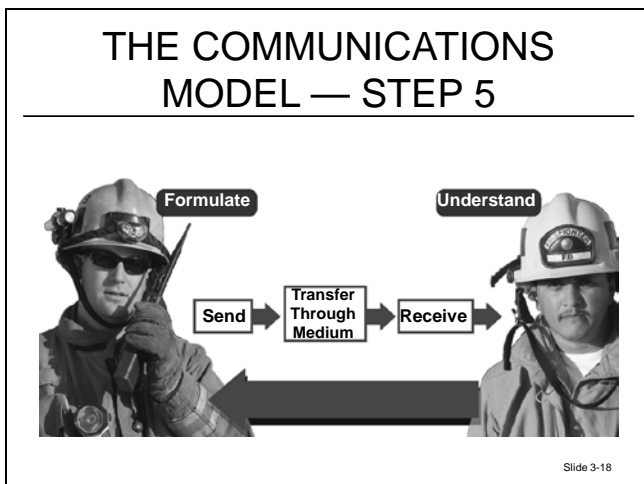
F.   Step 5: The receiver interprets the message.

     1.   Clear text and standard resource designators provide common terminology.

     2.   It is possible that the sender may have sent the message incorrectly or that the receiver might have heard it incorrectly.

THE COMMUNICATIONS MODEL – STEP 6
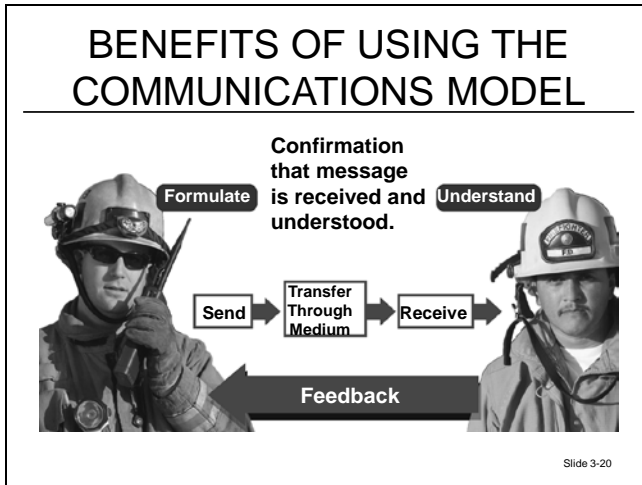
Formulate   Understand

Send   Transfer Through Medium   Receive

Feedback

Slide 3-19

G.   Step 6: The receiver confirms that the message has been received and understood by providing feedback.

     1.   If the message is important enough to send, it is even more important to know that it was received and understood.

     2.   If there is any confusion or misunderstanding, the sender has the opportunity to correct it.

     3.   The sender should ask for feedback if it is not provided.

     4.   Radio traffic is reduced because the communications model confirms receipt and understanding immediately through feedback.

V.   BENEFITS OF USING THE COMMUNICATIONS MODEL

BENEFITS OF USING THE
COMMUNICATIONS MODEL

Confirmation that message is received and understood.

Formulate — Understand
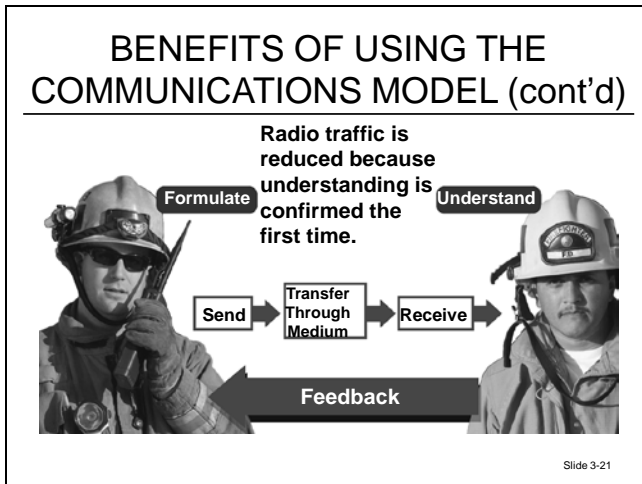
Send → Transfer Through Medium → Receive

Feedback

Slide 3-20

A.   Provides confirmation that messages are received and understood. A message may be critical to the IAP, and the IC needs to know it is being acted upon.

BENEFITS OF USING THE
COMMUNICATIONS MODEL (cont'd)

Radio traffic is reduced because understanding is confirmed the first time.

Formulate — Understand

Send → Transfer Through Medium → Receive

Feedback

Slide 3-21

B.   Radio traffic is reduced because the communications model confirms receipt and understanding the first time.

1.   Time is not wasted by the sender having to repeat the message just to make sure someone heard it.

2.   Sender does not need to worry whether the message was received and understood.

3.   Messages not acknowledged should be assumed not to have been received, then resent.

ACTIVITY 3.1

Communications

Purpose

Examine the communications from a fatal fire incident, identify the communication failures, and determine how to avoid them.

Directions

1. As you listen to the audio, write down cues or key words that indicate that the firefighters are in trouble.

2. In a large group discussion, identify your findings from the audio, and discuss what could have been done differently to save the lives of the firefighters who perished in the fire.

3. How, through communication, would you prevent this type of fatality in the future?

4. You will have approximately 40 minutes for this activity.

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VI. TACTICAL COMMUNICATIONS RESPONSIBILITIES

TACTICAL COMMUNICATIONS
RESPONSIBILITIES

Photo/NFA

Slide 3-24

TACTICAL COMMUNICATIONS
RESPONSIBILITIES (cont'd)

- When communication
  breaks down on the
  fireground, the
  following also break
  down:
  – Coordination.
  – Control.
  – The ability to provide
    for firefighter safety.

Photo/NFA

Slide 3-25

A.   When communication breaks down on the incident, the following also break down.

1.   Coordination: Interdepartmental and interagency coordination depend on leadership. When there is a communications breakdown, direction is missing, which risks duplication of effort and resources not assigned as needed.

2.   Control: The IC needs to be in constant communication with all incident-involved personnel. If the IC loses that connection due to a communications breakdown, he or she has lost management control of the incident scene.

3.   The ability to provide for firefighter safety: Firefighter safety is the primary concern of the IC. Lack of communication puts firefighters at risk and enhances the risk of line-of-duty deaths (LODDs).

TACTICAL COMMUNICATIONS
RESPONSIBILITIES (cont'd)

- What is a Brief Initial Report (BIR)?
  – A BIR is a verbally communicated, quick, concise size-up report that begins the emergency operations process.
  – All responding units are aware of what they will face upon arrival at the scene and can prepare en route.

Slide 3-26

4.   What is a Brief Initial Report (BIR)?

A BIR is a verbally communicated, quick, concise size-up report that begins the emergency operations process. All responding units are aware of what they will face upon arrival at the scene and can prepare en route. A BIR will typically include the following information:

a.   Engine (give number) arrived at (give address and building description), Side (Alpha, Bravo, Charlie or Delta) of building.

TACTICAL COMMUNICATIONS
RESPONSIBILITIES (cont'd)

- Typically, the BIR will include the following information:
  – Engine number.
  – Building address.
  – Incident conditions (smoke and fire), location of fire.
  – Tactical operations your crew is currently performing.

Slide 3-27

b.   Describe incident conditions (e.g., fire and smoke conditions) and apparent location.

c.   Tell what tactical operation your crew is performing.

d.   Assume and identify Command.

e.   Call for additional resources, if needed.

f.   Assign other responding companies.

TACTICAL COMMUNICATIONS
RESPONSIBILITIES (cont'd)

• All personnel have the responsibility to communicate effectively.
  – Starts with a good BIR by first-in officer.
  – Continues throughout the incident.

Photo/NFA

Slide 3-28

B.   All personnel have the responsibility to communicate effectively.

1.   Starts with a good BIR by first-in officer.

2.   Continues throughout the incident.

TYPES OF TACTICAL
COMMUNICATIONS

• Initial conditions reports.
• Implementation orders.
• Progress reports.
• Reports of safety hazards.

Photo/NFA

Slide 3-29

C.   The types of tactical communications include:

1.   Initial conditions reports.

2.   Implementation orders of the IAP.

3.   Progress reports from officers who are responsible for carrying out the IAP.

4.   Reports of safety hazards or evacuation orders.

TACTICAL BENCHMARKS
- Completion of tactical operations.
- Completion of primary search.
- Stopping the forward progress of the fire.
- When further property loss is stopped, Incident Commander (IC) can begin demobilization.

Photo/NFA

Slide 3-30

D. Subsequent reports/Tactical benchmarks.

    1. It is important to communicate the completion of tactical operations addressing specific incident priorities. As each stage is completed, the IC can redirect resources to the next phase of the incident resolution.

        a. Life safety.

        b. Incident stabilization.

        c. Property conservation.

    2. Completion of primary search (life safety priority) allows a shift of emphasis in tactical operations to incident stabilization.

        a. Transmit: "Primary search of first floor completed."

        b. Resources confining the fire to permit search operations now can be applied to extinguishment.

    3. Stopping the forward progress of the fire allows the IC to shift resources to property conservation.

        a. "Under control."

        b. Some resources assigned to fire attack and ventilation may be reassigned to overhaul and property conservation.

    4. When further property loss is stopped, the IC can begin the process of demobilization, releasing resources for their next assignments.

        a. "Loss stopped."

        b. Resources can be made available and returned to service.

TACTICAL COMMUNICATIONS
RESPONSIBILITIES (cont'd)

• Progress reports from Cos: "report on
conditions."
– Advanced warning to the supervisor as to
when relief crews will be needed.
– If/When resources might be available for
release or reassignment.
– Periodic reports concerning status.
– Conditions, Actions and Needs (CAN)
reports.

Slide 3-31

E.   Progress reports from COs: **"report on conditions."**

    1.   The tactical operations to which they were assigned are having a positive impact (good news).

    2.   Assigned tactical operations are not having a positive impact and why **(bad news).**

        a.   Inform your immediate supervisor of the problem.

        b.   Offer a solution to the problem, along with the bad news. You are usually in the best position to make that determination.

    3.   Additional resources that may be needed.

        a.   Additional crews to assist with the tactical operation.

        b.   Any additional or specialized equipment.

    4.   Advanced warning to the supervisor indicating when relief crews will be needed.

    5.   If and when resources might be available for release or reassignment.

    6.   Periodic reports on the status of the incident and assigned resources.

    7.   Conditions, Actions and Needs (CAN) reports.

REPORTS OF SAFETY
HAZARDS

- Shared responsibility among all personnel.
- Conveys emergency information quickly.

Photo/NFA

Slide 3-32

F.   Reports of safety hazards or evacuation orders. "Emergency traffic."

      1.   All personnel are responsible for communicating when safety hazards are identified and that there could be adverse effects on firefighter safety or the tactical operation.

REPORTS OF SAFETY
HAZARDS (cont'd)

- Confirms personnel safety when the structure has been evacuated.
  - Written procedures should include:
    -- A method to convey information quickly to everyone involved in the incident.

Slide 3-33

      2.   A method to convey emergency information quickly should be established through SOPs/SOGs.

           a.   Written procedures should include a method to convey this information quickly to everyone on the incident.

REPORTS OF SAFETY
HAZARDS (cont'd)

-- Methods, in addition to radio communications, to
   notify personnel of imminent danger and of the
   need to evacuate to safety.
   • Blasts on the air horns.
   • Sirens.
   • Public address (PA) systems.
   • Loud and easily understood devices or equipment.

Slide 3-34

    b.   These procedures should be included as an important part of your department's communications training.

    c.   Written procedures also should include methods, in addition to radio communications, to notify personnel of imminent danger and of the need to evacuate to safety.

         -       Blasts on the air horns.

         -       Sirens.

         -       Public address (PA) systems.

         -       Anything loud and easily understood by all personnel.

REPORTS OF SAFETY
HAZARDS (cont'd)

– Departmental procedures should include a
  method that accounts for the safety of all
  personnel when the structure has been
  evacuated.
  -- Designated reporting locations.
  -- Radio check-off system.
  -- Supervisory confirmation using a Personnel
     Accountability Report (PAR).

Slide 3-35

    3.   Departmental procedures should include a method that accounts for the safety of all personnel when the structure has been evacuated.

        a.   Designated reporting locations.

b.   A radio check-off system.

c.   Confirmation by supervisors that all personnel are accounted for by a Personnel Accountability Report (PAR).

VII.   SIZE-UP REPORT OF FIREGROUND CONDITIONS

SIZE-UP REPORT OF
FIREGROUND CONDITIONS

Subsequent report includes information not
immediately reported and/or information
developed upon
investigation — to be delivered ASAP.

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SIZE-UP PROGRESS
REPORTS

- Progress update reports should be
  communicated ASAP over the radio
  system.
- Continue reporting until fire is under
  control.

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ACTIVITY 3.2

Command Sequence 1-3: Fields Hill

Purpose

Develop a size-up report of fireground conditions, and document progress using the Command Sequence Tactical Chart.

Directions

1. You will be working in small teams for this simulation exercise.

2. A Command Sequence Tactical Chart for each team position is included in your Student Manual (SM).

3. Identify one person to assume the role as the first-due engine CO and another person to assume the role of the team recorder or scribe.

4. The team recorder will record all actions taken by the first-due CO onto the Command Sequence Tactical Chart.

5. The instructor will review the Command Sequence Tactical Chart preparation process with the class.

Part 1

1. View the slides of the Fields Hill fire.

2. Listen to the simulation messages.

3. Complete the Command Sequence Tactical Chart.

Part 2

1. Debrief.

2. Present your Command Sequence Tactical Chart to the class.

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ACTIVITY 3.2 (cont'd)

Command Sequence Tactical Chart

To be completed during simulation.

Tactical Assignment	Assigned To	Progress Report

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VIII. SUMMARY

SUMMARY

- Understanding incident communications.
- The need for effective incident communications.
- The need for a communications model.
- The communications model.

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SUMMARY (cont'd)

- Benefits of using the communications model.
- Tactical communications responsibilities.
- Size-up report of fireground conditions.

Slide 3-53

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APPENDIX

SOFA SUPER STORE FIRE TRANSCRIPT CHARLESTON, SOUTH CAROLINA JUNE 18, 2007

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System Watch Corrected Time	Corrected Time if no System Watch	Time Since Incident Dispatch	Unit or Location	Name	Spoken Words	Comments
CHANNEL 1						
19:15:56		0:06:54	Ladder 5 Engineer	French	Engine 11 charge your line.	May be in SCBA facepiece.
19:15:59		0:06:57	Engine 10 Captain	Villereal	System Watch activation, no audio	
19:16:01		0:06:59	Engine 19 Mobile Radio	Hutchinson	19, 10-8 Dispatcher.	
19:16:04		0:07:02	Dispatch	McIver	10-4, 19, 19:16	
19:16:09		0:07:07	Engine 6 Mobile Radio	Davis	6 is West side	
19:16:11		0:07:09	Dispatch	McIver	10-4, 6	
19:16:16		0:07:14	Ladder 5 Ladderman 1	Thompson	System Watch activation, no audio	
19:16:21		0:07:19	Engine 11 Captain	Johnson	System Watch activation, no audio	
19:16:23		0:07:21	Engine 11 Captain	Johnson	System Watch activation, no audio	
19:16:23		0:07:21	Ladder 5 Ladderman 1	Thompson	Truck 5 to Engine 11, charge that inch and a half	In SCBA facepiece
19:16:28		0:07:26	Ladder 5 Ladderman 1	Thompson	System Watch activation, no audio	
19:16:32		0:07:30	Car 1 Mobile Radio	Thomas	Car 1 10-97 Dispatcher	
19:16:35		0:07:33	Dispatch	Barrineau	10-4, Car, 19:16	
CHANNEL 1						
19:16:39		0:07:37	Engine 11 Suction	Axson	System Watch activation, no audio	
19:16:51		0:07:49	Engine 11 Captain	Johnson	System Watch activation, no audio	
19:16:56		0:07:54	Engine 10 Captain	Villereal	System Watch activation, no audio	
19:16:56		0:07:54	Battalion 4	Aytes	Battalion 4,	
19:16:57		0:07:55	Car 2	Garvin	[inaudible] to Engine 16	PASS in the background.
19:16:58		0:07:56	Engine 10 Captain	Villereal	System Watch activation, no audio	
19:17:01		0:07:59	Battalion 4	Aytes	Battalion 4 to Captain Engine 12	Siren in the background.
19:17:05		0:08:03	Engine 12 Mobile Radio	Hackett	… 12	Siren in the background.
19:17:07		0:08:05	Battalion 4	Aytes	Captain Johnny, I need you to come down and lay a supply line to number 10	Siren in the background
19:17:11		0:08:09	Engine 12 Mobile Radio	Hackett	Where do you want us?	Siren in the background

System Watch Corrected Time	Corrected Time if no System Watch	Time Since Incident Dispatch	Unit or Location	Name	Spoken Words	Comments
19:17:13		0:08:11	Engine 16 Mobile Radio	Benke	System Watch activation, no audio	
19:17:14		0:08:12	Car 2	Garvin	[inaudible] ten, engine 12, lay a supply line to engine 10	Siren in the background
19:17:16		0:08:14	Battalion 4	Aytes	System Watch activation, no audio	
19:17:22		0:08:20	Engine 11 Captain	Johnson	System Watch activation, no audio	
19:17:25		0:08:23	Car 1	Thomas	12 give #10 a supply line	Siren in the background
19:17:28		0:08:26	Engine 12 Mobile Radio	Hackett	Copy	
19:17:30		0:08:28	Engine 15 Mobile Radio	Mulkey	15's coming, 97	Siren in the background.
19:17:31		0:08:29	Engine 16 Captain	Benke	System Watch activation, no audio	
19:17:34		0:08:32	Dispatch	McIver	10-4, 15, 19:17	Siren in the background
19:17:36		0:08:34	Car 2	Garvin	Alright, 16, go to the hydrant	
19:17:39		0:08:37	Engine 12 Mobile Radio	Hackett	Where's 10, alright we got 'em	
19:17:47		0:08:45	Engine 19 Captain	Hutchinson	System Watch activation, no audio	
19:17:49		0:08:47	Ladder 5 Ladderman 1	Thompson	System Watch activation, no audio	
CHANNEL 1						
19:18:00		0:08:58	Engine 3	Waring	Engine 3 to Car 2	Engine 3 was on a detail out of their first-due area.
CHANNEL 1						
19:18:03		0:09:01	Engine 9 Suction	Holt	System Watch activation, no audio	
19:18:04		0:09:02	Car 1	Thomas	System Watch activation, no audio	
19:18:17		0:09:15	Engine 16 Suction	Champaign	System Watch activation, no audio	
19:18:24		0:09:22	Engine 10 Captain	Villereal	System Watch activation, no audio	
CHANNEL 1						
19:18:31		0:09:29	Engine 11 Engineer	Griffin	System Watch activation, no audio	
19:18:57		0:09:55	Engine 10 Captain	Villereal	System Watch activation, no audio	
CHANNEL 1						
19:19:07		0:10:05	Car 1	Thomas	Alright, Engine 6 what's your 20?	20 is short for 10-20 and means location

System Watch Corrected Time	Corrected Time if no System Watch	Time Since Incident Dispatch	Unit or Location	Name	Spoken Words	Comments
19:19:10		0:10:08	Engine 6 Mobile Radio	Davis	In front of station 10	
19:19:10		0:10:08	Engine 12 Engineer	Horn	System Watch activation, no audio	
19:19:12		0:10:10	Car 1	Thomas	I want you to come on and park your truck in the middle of the street on Savannah Highway and come in the front door.	
19:19:14		0:10:12	Engine 10 Captain	Villereal	System Watch activation, no audio	
19:19:18		0:10:16	Engine 6 Mobile Radio	Davis	6 is 10-8	
19:19:20		0:10:18	Dispatch	Barrineau	10-4, 6	
19:19:25		0:10:23				Private call from BC3 to the Engine 3 Captain
CHANNEL 1						
19:19:28		0:10:26	Engine 12 Engineer	Horn	System Watch activation, no audio	
19:19:33		0:10:31	Car 1	Thomas	Car 1 dispatcher, give us the power company	
19:19:36		0:10:34	Dispatch	Barrineau	10-4, Chief	
19:19:36		0:10:34	Engine 16 Captain	Benke	Charge that 2 ½	In SCBA facepiece
19:19:40		0:10:38	Engine 11 Engineer	Griffin	Engineer 11 to Captain 11	
19:19:44		0:10:42	Engine 11 Captain	Johnson	System Watch activation, no audio	
19:19:50		0:10:48	Engine 11 Captain	Johnson	System Watch activation, no audio	
19:17:48		0:08:46				Private call from Engine 3 Captain to BC3
19:19:54		0:10:52	Engine 11 Engineer	Griffin	Engineer 11 to Captain 11	
19:19:59		0:10:57	Engine 11 Captain	Johnson	System Watch activation, no audio	
19:20:00		0:10:58	Car 2	Garvin	What you need, David, he's busy	Not in facepiece, faint siren in the background
19:20:03		0:11:01	Engine 11 Engineer	Griffin	Do you want the 2 ½ charged?	
19:20:05		0:11:03				Private call from Engine 3 Captain to BC3
19:20:05		0:11:03	Car 2	Garvin	Not until you get that supply line charged.	Faint siren in the background.
19:20:05		0:11:03	Engine 11 Captain	Johnson	System Watch activation, no audio	
19:20:07		0:11:05	Engine 16 Mobile Radio	Benke	System Watch activation, no audio	
19:20:07		0:11:05	Ladder 5 Ladderman 1	Thompson	System Watch activation, no audio	
19:20:08		0:11:06	Engine 19 Mobile Radio	Hutchinson	19's, 10-97	Siren in background, last transmission from Engine 19 Captain
19:20:08		0:11:06	Engine 11 Engineer	Griffin	System Watch activation, no audio	

System Watch Corrected Time	Corrected Time if no System Watch	Time Since Incident Dispatch	Unit or Location	Name	Spoken Words	Comments
19:20:14		0:11:12	Engine 10 Captain	Villereal	System Watch activation, no audio	
19:20:25		0:11:23	Engine 15 Engineer	Wescott	System Watch activation, no audio	
CHANNEL 1						
19:20:31		0:11:29	Engine 12 Engineer	Horn	Water coming 10	
19:20:38		0:11:36	Battalion 3	Ackerman	System Watch activation, no audio	
19:20:41		0:11:39	Battalion 3	Ackerman	Captain 3 stand by for a page	
19:20:46		0:11:44	Engine 19 Engineer	Baity	System Watch activation, no audio	
19:20:52		0:11:50	Car 2	Garvin	System Watch activation, no audio	
19:20:55		0:11:53				Private call to Engine 3 Captain from BC3
19:20:55		0:11:53	Engine 12 Engineer	Horn	[inaudible].. to dispatch, we need PD we got people running over the hose.	
19:20:59		0:11:57	Dispatcher	McIver	That's Affirmative. They 're enroute.	
19:21:00		0:11:58	Dispatcher		System Watch activation, no audio	
CHANNEL 1						
19:21:04		0:12:02				Private call to BC3 from Engine 3 Captain
19:21:05		0:12:03	Car 2	Garvin	System Watch activation, no audio	
19:21:20		0:12:18	Engine 11 Captain	Johnson	System Watch activation, no audio	
19:21:21		0:12:19	Engine 15 Captain	Mulkey	Engine 15 to Car 2	In SCBA facepiece
19:21:22		0:12:20	Car 2	Garvin	System Watch activation, no audio	
19:21:26		0:12:24	Engine 16 Suction	Champaign	System Watch activation, no audio	
19:21:26		0:12:24	Engine 11 Captain	Johnson	System Watch activation, no audio	
19:21:26		0:12:24	Car 2	Garvin	16, what about that supply line?	
19:21:27		0:12:25	Engine 11 Captain	Johnson	System Watch activation, no audio	[inaudible voices]
19:21:29		0:12:27	Engine 15 Captain	Mulkey	System Watch activation, no audio	[inaudible voices]
19:21:32		0:12:30	Engine 16 Suction	Champaign	System Watch activation, no audio	[inaudible voices]
19:21:34		0:12:32	Car 2	Garvin	System Watch activation, no audio	[inaudible voices]
19:21:38		0:12:36	Engine 16 Suction	Champaign	System Watch activation, no audio	[inaudible voices]
19:21:39		0:12:37	Engine 10 Captain	Villereal	System Watch activation, no audio	[inaudible voices]
19:21:40		0:12:38	Engine 12 Suction	Henry	System Watch activation, no audio	[inaudible voices]
19:21:41		0:12:39	Engine 16 Mobile Radio	Wittner	[inaudible] ...a hydrant chief	
			Unknown		[inaudible voices]	Possibly in SCBA facepieces.

System Watch Corrected Time	Corrected Time if no System Watch	Time Since Incident Dispatch	Unit or Location	Name	Spoken Words	Comments
19:21:50		0:12:48	Engine 6 Mobile Radio	Davis	6, 10-97	Siren in background.
19:21:52		0:12:50	Engine 9 Suction	Holt	System Watch activation, no audio	
19:21:53		0:12:51	Dispatcher	Barrineau	10-4, 6, 19:22	
19:21:57		0:12:55	Engine 10 Captain	Villereal	System Watch activation, no audio	[inaudible voices]
19:21:58		0:12:56	Engine 15 Captain	Mulkey	System Watch activation, no audio	[inaudible voices]
19:21:59		0:12:57	Engine 12 Captain	Hackett	System Watch activation, no audio	[inaudible voices]
19:22:05		0:13:03	Engine 10 Captain	Villereal	System Watch activation, no audio	[inaudible voices]
19:22:08		0:13:06	Engine 12 Suction	Henry	System Watch activation, no audio	[inaudible voices]
19:22:16		0:13:14	Engine 16 Suction	Champaign	System Watch activation, no audio	[inaudible voices]
19:22:21		0:13:19	Engine 12 Nozzle	LeMacks	System Watch activation, no audio	[inaudible voices]
19:22:28		0:13:26	Engine 12 Suction	Henry	System Watch activation, no audio	[inaudible voices]
					[inaudible] …OHAHO700 on a black Jeep Cherokee [inaudible] Mallery Street to Park Street	This transmission appears to be a radio transmission by a law enforcement officer from Saint Simons Island, Georgia. Charleston Police Department Communications has reported receiving audio from Georgia due to a phenomenon called "skip". Saint Simons Island has a Mallery Street that intersects with a Park Avenue. Communications for Saint Simons Island has confirmed that this is their traffic.
19:22:33		0:13:31	Engine 11 Engineer	Griffin	Engine 11, Engineer 16	
19:22:36		0:13:34	Engine 10 Captain	Villereal	System Watch activation, no audio	
19:22:39		0:13:37	Engine 16 Mobile Radio	Wittner	Go ahead	
19:22:41		0:13:39	Engine 11 Engineer	Griffin	I'm half way	
19:22:44		0:13:42	Engine 16 Mobile Radio	Wittner	10-4, I'm trying to get you a supply line, I gotta find a hydrant	
19:22:48		0:13:46	Engine 11 Engineer	Griffin	10-4	
CHANNEL 1						
19:23:09		0:14:07	Car 1	Thomas	Alright, Larry, how we looking inside the store?	
19:23:16		0:14:14	Car 2	Garvin	Chief, I'm trying to get back to it now	In SCBA facepiece
CHANNEL 1						

System Watch Corrected Time	Corrected Time if no System Watch	Time Since Incident Dispatch	Unit or Location	Name	Spoken Words	Comments
19:23:18		0:14:16	Engine 16 Captain	Benke	System Watch activation, no audio	
19:23:30		0:14:28	Car 2	Garvin	Car 2 to Captain of Engine 11	In SCBA facepiece, PASS device in prealert in the background
19:23:35		0:14:33	Engine 19 Engineer	Baity	System Watch activation, no audio	
19:23:44		0:14:42	Engine 12 Suction	Henry	System Watch activation, no audio	
19:23:49		0:14:47	Engine 10 Engineer	Butler	Engine 12 you sending us some more water?	
19:23:55		0:14:53	Engine 12 Engineer	Horn	Affirmative	
19:24:02		0:15:00	Engine 10 Captain	Villereal	[PASS alarm]	
19:24:09		0:15:07	Battalion 5	Lloyd	Battalion 5 is 10-97	
19:24:09		0:15:07	Car 1	Thomas	System Watch activation, no audio	
19:24:10		0:15:08	Engine 16 Captain	Benke	System Watch activation, no audio	
19:24:12		0:15:10	Dispatch	McIver	10-4, Battalion 5, 19:24	
19:24:14		0:15:12	Dispatch	Barrineau	Dispatcher to Engine 3 relocate to 16 and 19, Engine 3 go to 16 and 19, per Car 3	
19:24:22		0:15:20	Engine 3	Waring	Engine 3 read	
19:24:22		0:15:20	Car 2	Garvin	[inaudible] ...we need that 2-1/2 ...	Likely in SCBA facepiece., C2 begins to talk, if overridden by Dispatch and then completes his message after dispatch completes its "10-4" message
19:24:25		0:15:23	Dispatch	Barrineau	10-4	Dispatcher takes priority over portable Car 2
19:24:29		0:15:27	Car 1	Thomas	[inaudible] ... to Engine 12	
19:24:35		0:15:33	Car 1	Thomas	Car 1 to Engineer 12	
19:24:35		0:15:33	Engine 16 Mobile Radio	Wittner	System Watch activation, no audio	
19:24:37		0:15:35	Engine 12 Engineer	Horn	Go ahead Chief	
19:24:45		0:15:43	Car 1	Thomas	Car 1 to the engineer in 12	
19:24:48		0:15:46	Engine 12 Engineer	Horn	Go ahead Chief	
19:24:50		0:15:48	Car 1	Thomas	Alright give us 50 more pounds on the supply line, 50 more pounds on that supply line	
19:24:57		0:15:55	Engine 12 Engineer	Horn	50 pounds, coming.	
CHANNEL 1						
19:25:13		0:16:11	Engine 10 Engineer	Butler	12, I'm down to a quarter.	
19:25:15		0:16:13	Engine 16 Suction	Champaign	System Watch activation, no audio	

System Watch Corrected Time	Corrected Time if no System Watch	Time Since Incident Dispatch	Unit or Location	Name	Spoken Words	Comments
19:25:18		0:16:16	St. Andrews Engine 2	Bush	St. Andrew's Engine 2 and Rescue 1 to City of Charleston	
19:25:19		0:16:17	Ladder 5 Ladderman 1	Thompson	System Watch activation, no audio	
19:25:26		0:16:24	Car 1	Thomas	Car 1 to 12, did you give me my 50 pounds?	
19:25:29		0:16:27	Engine 12 Engineer	Horn	That's affirmative	
19:25:33		0:16:31	Ladder 5 Ladderman 1	Thompson	System Watch activation, no audio	
19:25:34		0:16:32	Engine 10 Captain	Villereal	System Watch activation, no audio	
19:25:37		0:16:35	Engine 16 Suction	Champaign	System Watch activation, no audio	
19:25:38		0:16:36	Car 1	Thomas	Car 1 to Engine 12	
19:25:40		0:16:38	Engine 16 Suction	Champaign	System Watch activation, no audio	
19:25:41		0:16:39	Engine 12 Engineer	Horn	[inaudible] I've got 50 pounds to you	
19:25:41		0:16:39	Engine 10 Captain	Villereal	System Watch activation, no audio	
19:25:45		0:16:43	Car 1	Thomas	Alright, give me 50 more pounds on the supply line	
19:25:45		0:16:43	Engine 11 Captain	Johnson	System Watch activation, no audio	
19:25:47		0:16:45	Engine 16 Suction	Champaign	System Watch activation, no audio	
19:25:49		0:16:47	Engine 12 Engineer	Horn	System Watch activation, no audio	
19:25:51		0:16:49	Engine 12 Engineer	Horn	... 50 pounds on the supply line	
19:25:53		0:16:51	Car 1	Thomas	50 more on the supply line	
19:25:59		0:16:57	Engine 12 Engineer	Horn	Affirmative, 50 pounds	
19:26:07		0:17:05	Engine 11 Engineer	Griffin	Engine 11, Engineer 16	PASS in the background.
19:26:13		0:17:11	Car 2	Garvin	System Watch activation, no audio	
19:26:17		0:17:15	Engine 16 Mobile Radio	Wittner	Water coming	
19:26:20		0:17:18	Engine 11 Engineer	Griffin	System Watch activation, no audio	

CHANNEL 1

System Watch Corrected Time	Corrected Time if no System Watch	Time Since Incident Dispatch	Unit or Location	Name	Spoken Words	Comments
19:26:35		0:17:33	Dispatch	McIver	Dispatcher to Car 1	Barrineau can be heard in the background initiating call with trapped worker
19:26:38		0:17:36	Car 1	Thomas	Go ahead	
19:26:40		0:17:38	Dispatch	McIver	10-4, Be advised we're getting a 911 call stating that there is a person trapped in the building, at the back of the building, at the back of the building.	
19:26:41		0:17:39	Battalion 5	Lloyd	System Watch activation, no audio	

System Watch Corrected Time	Corrected Time if no System Watch	Time Since Incident Dispatch	Unit or Location	Name	Spoken Words	Comments
19:26:49		0:17:47	Ladder 5 Ladderman 1	Thompson	System Watch activation, no audio	
19:26:51		0:17:49	Car 1	Thomas	10-4	PASS in background.
19:26:53		0:17:51	Ladder 5 Ladderman 1	Thompson	System Watch activation, no audio	
19:26:59		0:17:57	Car 2	Garvin	Car 2 to Car 1.	Not likely in facepiece.
19:27:01		0:17:59	Car 1	Thomas	Go ahead, Chief	PASS in background.
19:27:03		0:18:01	Engine 10 Captain	Villereal	System Watch activation, no audio	
19:27:03		0:18:01	Car 2	Garvin	System Watch activation, no audio	
19:27:04		0:18:02	Outside Agency		... to the City of Charleston, City PD's got us...	
19:27:05		0:18:03	Engine 11 Captain	Johnson	System Watch activation, no audio	
19:27:06		0:18:04	Engine 16 Mobile Radio	Wittner	water coming to you	
19:27:12		0:18:10	Ladder 5 Ladderman 1	Thompson	System Watch activation, no audio	
19:27:18		0:18:16	Engine 12 Suction	Henry	System Watch activation, no audio	
19:27:19		0:18:17	Engine 15 Nozzle	Thomes	System Watch activation, no audio	
19:27:44		0:18:42	Ladder 5 Ladderman 1	Thompson	System Watch activation, no audio	
			Unknown		[inaudible – possibly "lost inside" or "trapped inside"]	vibralert sound
TELEPHONE						
	19:27:44	0:18:42		McIver	Yeah. 'cause I said he's in the back of the store.. I.. well ... I don't know..wait a minute. [Inaudible in background]	Chief Thomas can be heard in the background on channel one talking about the rear door (192755) McIver and Hawkins are likely listening to channel one during the pause and hear a more detailed description of the trapped person's location on that channel.
	19:28:07	0:19:05		Hawkins	There you go. That's good stuff	
	19:28:09	0:19:07		McIver	Okay	
	19:28:10	0:19:08		Hawkins	Alright, bye.	
	19:28:11	0:19:09		McIver	Alright	
CHANNEL 1						
19:27:51		0:18:49	Car 1	Thomas	Car 1 to Car 2	

System Watch Corrected Time	Corrected Time if no System Watch	Time Since Incident Dispatch	Unit or Location	Name	Spoken Words	Comments
19:27:53		0:18:51	Car 2	Garvin	Go ahead Chief	
19:27:55		0:18:53	Car 1	Thomas	Alright, we got the door open to this back building now. We've got a stacked tip inside. Ahh, tell me what you got in there.	PASS in background. Chief Thomas is referring to the warehouse as the back building.
19:28:03		0:19:01	Car 2	Garvin	They told me at first, Chief, that he left but now they realize he's in the building	
19:28:08		0:19:06	Car 1	Thomas	Just do what we can do.	PASS in background.
19:28:10		0:19:08	Car 2	Garvin	10-4	
CHANNEL 1						
19:28:19		0:19:17	Dispatch	Barrineau	Chief, he's going to be in the very back and is going to be beating on the wall with a hammer. I just talked to him on the phone and then we got cut off. He's going to be in the rear of the building.	
19:28:29		0:19:27	Car 2	Garvin	10-4	
CHANNEL 1						
19:28:42		0:19:40	Car 2	Garvin	Car 2 to any available fireman that's in front up by number 11	PASS in background, not in SCBA facepiece.
19:28:53		0:19:51	Car 2	Garvin	Car 2 to Engineer number 11	PASS in background.
19:28:58		0:19:56	Battalion 5	Lloyd	System Watch activation, no audio	
19:28:58		0:19:56	Engine 11 Engineer	Griffin	System Watch activation, no audio	
19:29:00		0:19:58	Engine 16 Suction	Champaign	Which way out?	In SCBA facepiece.
19:29:02		0:20:00	Engine 11 Engineer	Griffin	Water's coming right now	This is most likely when the 2-1/2 line through the front door was charged.
19:29:03		0:20:01	Engine 16 Suction	Champaign	[inaudible] ...way out	In SCBA facepiece.
19:29:07		0:20:05	Engine 16 Suction	Champaign	System Watch activation, no audio	There are a total of nine radio activations by Firefighter Champaign, many with no discernable audio
19:29:11		0:20:09	Engine 16 Suction	Champaign	System Watch activation, no audio	
19:29:15		0:20:13	Engine 16 Suction	Champaign	System Watch activation, no audio	
19:29:24		0:20:22	Engine 16 Suction	Champaign	System Watch activation, no audio	
19:29:30		0:20:28	Engine 16 Suction	Champaign	System Watch activation, no audio	
CHANNEL 1						
19:29:35		0:20:33	Engine 16 Suction	Champaign	[inaudible] which way out	
19:29:42		0:20:40	Engine 16 Suction	Champaign	Everybody out.	In SCBA facepiece, maybe vibra-alert.

System Watch Corrected Time	Corrected Time if no System Watch	Time Since Incident Dispatch	Unit or Location	Name	Spoken Words	Comments
19:29:49		0:20:47	Engine 16 Suction	Champaign	[inaudible]	
CHANNEL 1						
19:29:59		0:20:57	Engine 11 Engineer	Griffin	Engineer 11 to Car 2	PASS in background.
19:30:02		0:21:00	Car 2	Garvin	I've got some help back here	Likely in the rear of the building?
19:30:03		0:21:01	Engine 10 Captain	Villereal	System Watch activation, no audio	
19:30:06		0:21:04	Engine 11 Engineer	Griffin	...2 ½ charge	
CHANNEL 1						
19:30:15		0:21:13	Engine 16 Suction	Champaign	We need some help out	
19:30:20		0:21:18	Engine 16 Captain	Benke	System Watch activation, no audio	Last transmission from Engine 16 Captain
19:30:22		0:21:20	Engine 16 Suction	Champaign	System Watch activation, no audio	
19:30:22		0:21:20	Ladder 5 Ladderman 1	Thompson	This is Thompson. We need some help. [inaudible]	Vibra-alert in background, another voice in facepiece in background. – Maybe "Help!" at the end – Identified by voice, no System Watch record for Thompson, may be on Mulkey portable radio
19:30:22		0:21:20	Engine 15 Captain	Mulkey	System Watch activation, no audio	Last transmission from Engine 15 Captain
19:30:27		0:21:25	Car 303	O'Donald	303 to Car 1	
19:30:31		0:21:29	Engine 16 Suction	Champaign	[inaudible] ...firefighter. Needs some help out. Lost connection with the hose.	In facepiece, vibra-alert in background, may be Champaign
19:30:41		0:21:39	Car 1	Thomas	Car 1 to Dispatcher	PASS in the background
19:30:44		0:21:42	Dispatch	McIver	Go ahead	
19:30:45		0:21:43	Car 1	Thomas	What's my closest unit to the 76?	PASS in the background
19:30:51		0:21:49	Unknown		[inaudible] ... I'm in the building....	Likely in SCBA facepiece.
19:30:51		0:21:49	Engine 16 Suction	Champaign	System Watch activation, no audio	
19:30:52		0:21:50	Dispatch		System Watch activation, no audio	
19:30:55		0:21:53	Battalion 3	Ackerman	System Watch activation, no audio	
19:30:58		0:21:56	Car 2	Garvin	Car 1, we trying to get in to this guy now	
19:31:03		0:22:01	Car 1	Thomas	10-4. Car 1 to Dispatcher, what's my closest unit to the 76?	
19:31:08		0:22:06	Dispatcher	McIver	Engine 3 is relocating to Station 16	
19:31:08		0:22:06	Dispatcher		System Watch activation, no audio	
19:31:08		0:22:06	Engine 16 Suction	Champaign	[inaudible]	Possible in facepiece

System Watch Corrected Time	Corrected Time if no System Watch	Time Since Incident Dispatch	Unit or Location	Name	Spoken Words	Comments
19:31:11		0:22:09	Car 1	Thomas	Alright, tell number 3, I want them to come to the 76 and I want them to lay the line to the aerial ladder, a line to the snorkel	
19:31:14		0:22:12	Engine 12 Suction	Henry	System Watch activation, no audio	
19:31:19		0:22:17	Battalion 5	Lloyd	Car 5 to Dispatcher, we got the man	
19:31:19		0:22:17	Engine 16 Suction	Champaign	[inaudible, possible "what?"]	
19:31:23		0:22:21	Dispatcher		System Watch activation, no audio	
19:31:24		0:22:22	Car 2	Garvin	System Watch activation, no audio	
19:31:25		0:22:23	Dispatcher		System Watch activation, no audio	
19:31:25		0:22:23	Engine 16 Suction	Champaign	System Watch activation, no audio	
19:31:28		0:22:26	Engine 16 Mobile Radio	Wittner	16 Dispatch. Ahh, tell PD they need to stop traffic going eastbound on a, or northbound on 17 from Wappoo to Randall, [inaudible] on the supply line	
19:31:29		0:22:27	Engine 16 Suction	Champaign	Can you hear me dispatch?	In facepiece
19:31:42		0:22:40	Car 2	Garvin	Car 2 Dispatcher. Get me EMS to this 20, please	PASS in background.
19:31:43		0:22:41	Ladder 5 Engineer	French	System Watch activation, no audio	
19:31:46		0:22:44	Dispatch	McIver	Affirmative , they are already in route	
19:31:46		0:22:44	Car 1	Thomas	… what I want you to do when you get here, is come past Sofa Super Store and lay a line to Ladder 5	PASS in background.
19:31:48		0:22:46	Engine 16 Suction	Champaign	System Watch activation, no audio	
19:31:50		0:22:48	Ladder 5 Engineer	French	System Watch activation, no audio	
19:31:55		0:22:53	Engine 19 Suction	Drayton	System Watch activation, no audio	On Channel 2
19:31:56		0:22:54	Engine 3	Waring	Engine 3 to Car 1, we're coming down 526 right now	Siren in background.
19:32:00		0:22:58	Car 1	Thomas	10-4. When you get here, umm, just past Super Sofa Store, in the parking lot next door, James Richardson's gonna set it up.	PASS in background.
19:32:02		0:23:00	Engine 16 Suction	Champaign	System Watch activation, no audio	
19:32:07		0:23:05	Ladder 5 Engineer	French	System Watch activation, no audio	
19:32:11		0:23:09	Engine 3	Waring	10-4, Chief	
19:32:12		0:23:10	Engine 16 Suction	Champaign	System Watch activation, no audio	
19:32:15		0:23:13	Ladder 5 Engineer	French	[inaudible] Mayday	
19:32:19		0:23:17	Car 303	O'Donald	Car 1…	Full message was – Car 1 somebody's calling a mayday
19:32:20		0:23:18	Unknown		[inaudible] for a message	PASS device sounding in the background

System Watch Corrected Time	Corrected Time if no System Watch	Time Since Incident Dispatch	Unit or Location	Name	Spoken Words	Comments
19:32:20		0:23:18	Engine 16 Suction	Champaign	System Watch activation, no audio	
19:32:24		0:23:22	Car 1	Thomas	Go ahead	
19:32:28		0:23:26	Unknown		I love you	PASS in the background
19:32:28		0:23:26	Ladder 5 Engineer	French	System Watch activation, no audio	
19:32:33		0:23:31	Car 303	O'Donald	[inaudible] Everybody stay off the radio.	Possible backup alarm in the background, likely Ladder 5 backing up
19:32:40		0:23:38	Engine 16 Suction	Champaign	In Jesus Name, Amen.	PASS in the background, likely not in facepiece. Likely Champaign

UNIT 4:
BUILDING CONSTRUCTION AND FIRE BEHAVIOR FACTORS

TERMINAL OBJECTIVE

The students will be able to:

4.1   *Identify the types of building construction, how fire behavior reacts with each type, and how the knowledge can provide for firefighter safety.*

ENABLING OBJECTIVES

The students will be able to:

4.1   *List the five building classifications, and explain the characteristics of each.*

4.2   *Recognize the strengths and concerns for each building construction type.*

4.3   *List and explain the critical fire behavior factors and how they relate to tactical operations, given a scenario.*

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**UNIT 4:
BUILDING CONSTRUCTION
AND FIRE BEHAVIOR
FACTORS**

Slide 4-1

ENABLING OBJECTIVES

- List the five building classifications, and explain the characteristics of each.
- Recognize the strengths and concerns for each building construction type.
- List and explain the critical fire behavior factors and how they relate to tactical operations, given a scenario.

Slide 4-2

I.   **BUILDING CONSTRUCTION CLASSIFICATIONS**

BUILDING CONSTRUCTION
CLASSIFICATIONS

- Understanding the strengths, concerns and specific characteristics of construction types is critical.
- As structural elements become weakened, gravity will take over and pull the building down.

Slide 4-3

A.   The Company Officer (CO) is responsible for determining if it is safe to send firefighters inside a structure and, based on interior conditions, determine how long they can remain inside. Understanding elements of the varied construction types is critical to safe and effective operations.

    1.   Each construction type has strengths and concerns (i.e., pros and cons). Each type reacts differently when burning, making fire flow and involvement predictions possible.

        It is important to note that the type of construction cannot be distinguished simply by looking at the exterior of the structure. Interior features such as weight bearing walls, floors and ceilings must also be considered.

    2.   As structural elements become weakened, gravity will take over and pull the building down.

BUILDING CONSTRUCTION CLASSIFICATIONS (cont'd)

- Type I: fire-resistive.
- Type II: noncombustible.
- Type III: ordinary construction.
- Type IV: heavy timber.
- Type V: wood frame.

Slide 4-4

B.   Buildings may be grouped into one of five common classifications, or a combination of two or more.

    1.   Type I: fire-resistive.

    2.   Type II: noncombustible.

    3.   Type III: ordinary.

    4.   Type IV: heavy timber.

    5.   Type V: wood frame.

TYPE I: FIRE-RESISTIVE

Photo/National Fire Academy (NFA)

Slide 4-5

C. Fire-resistive construction.

Generally, construction elements are steel with fire protective coating applied or reinforced concrete. Floors are also designed to limit fire spread. This construction type has been proven to withstand complete contents destruction and remain structurally sound.

TYPE I: FIRE-RESISTIVE
(cont'd)

Photo/NFA

Photo/NFA

Photo/NFA

Slide 4-6

TYPE I: FIRE-RESISTIVE
(cont'd)

Photo/NFA

Photo/NFA

Slide 4-7

TYPE I: FIRE-RESISTIVE
(cont'd)

Photo/NFA

Slide 4-8

1.   No structural steel is exposed, and all vertical openings are protected with approved doors. Structural steel often is protected by encasing, sprayed-on protection, or membrane ceilings, which provide a three-hour minimum rating.

2.   Exterior walls generally will be curtain walls, meaning they do not support the structure. They could be precast, lightweight concrete, aluminum, glass or other construction material. Exterior wall supports could be made of reinforced concrete.

3.   Exterior and interior nonbearing walls will have a varying degree of fire resistance.

4.   Stairwells are enclosed in fire-resistive materials and cordoned off behind approved doors.

5.   Floors may be poured-in-place concrete, prefabricated slabs, or other material that provide fire resistance.

6.   Roof construction may be similar to that used for floors.

7.   Fire spread via the exterior of a building is a prime concern.

   a.   From a window to the window above.

   b.   Through the gap between floor and exterior curtain wall, also known as autoexposure.

ONE MERIDIAN PLAZA

Photo/NFA

Slide 4-9

8.   Fire-resistive (high-rise) buildings are typically constructed with a center-core design. The outside periphery of the building, with windows, is available for coveted office space, apartment living, store fronts, etc. In office buildings, there generally is little compartmentalization and open floor plans are common.

TYPE I: STRENGTHS

Photo/NFA
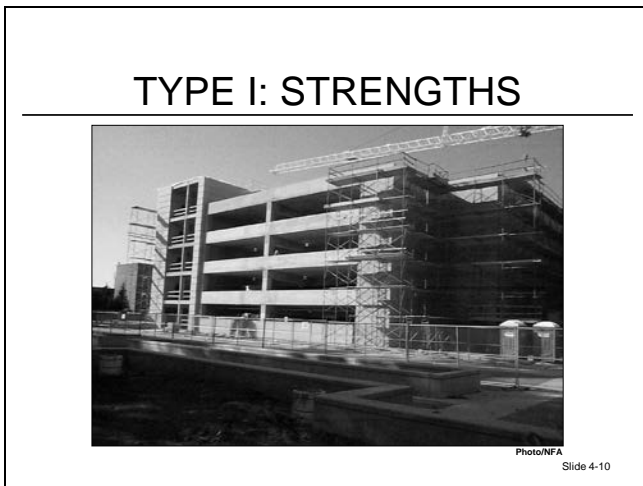
Slide 4-10

D.   Strengths of fire-resistive construction and concerns related to firefighting operations.

TYPE I: STRENGTHS (cont'd)

What are the strengths of fire-resistive construction?
- Record your answers in your Student Manual (SM).

Slide 4-11

TYPE I: CONCERNS

Photo/NFA
Slide 4-12

TYPE I: CONCERNS (cont'd)

What are the concerns fire-resistive construction related to firefighting operations?
- Record your answers in your SM.

Slide 4-13

1.   Firefighters need to open walls on the floor or floors above the location of the fire to stop a fire between a curtain wall and the building structure.

2.   Fighting fires in vertical shafts in the building are more difficult due to their probable concealment in the interior walls. A good prefire plan and building blueprints will assist in locating these shafts so they may be opened.

3.   Fires in large open areas must be attacked with master stream devices to get maximum reach and cooling.

4.   The spread of flames from floor to floor on the outside of the building is known as autoexposure.

TYPE II: NONCOMBUSTIBLE

Photo/NFA

Slide 4-14
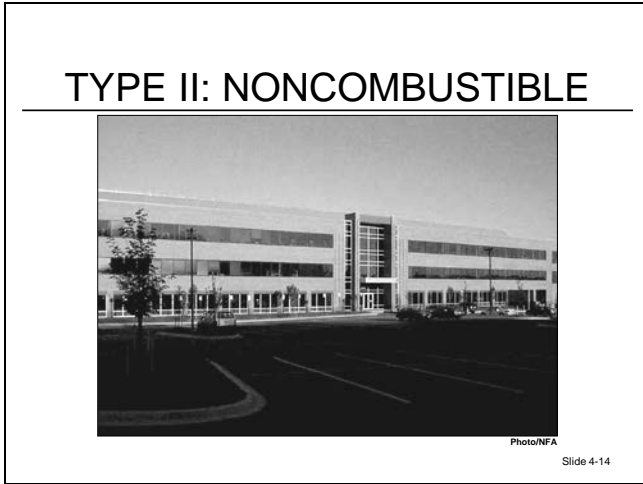
E.   Noncombustible construction.

1.   A completely noncombustible building is one in which unprotected structural steel is exposed to the effects of fire.

Completely noncombustible refers only to structural materials, not to interior finish and contents.

2.   Structural framework is made of steel that is bolted, riveted or welded together. Steel is attached easily and can be assembled quickly. It is very popular in commercial and industrial structures.

3.   Susceptible to expansion, distortion or relaxation of steel members from heat, resulting in early collapse under fire conditions.

4.   Wall enclosures may be masonry, steel, aluminum, glass or other material.

Once wall coverings are in place, it may be difficult to determine if structural elements are exposed or protected.

5.   The floor and roof support systems will usually be lightweight bar joists, trusses or other lightweight steel.

TYPE II: STRENGTHS

Photo/NFA
Slide 4-15

F.   Strengths of noncombustible construction and concerns related to firefighting operations.

TYPE II: STRENGTHS (cont'd)

What are the strengths of noncombustible construction?
• Record your answers in your SM.

Slide 4-16

TYPE II: CONCERNS

Photo/NFA
Slide 4-17

TYPE II: CONCERNS (cont'd)

What are the concerns of noncombustible construction related to firefighting operations?

• Record your answers in your SM.

Slide 4-18

TYPE III: ORDINARY CONSTRUCTION

• Exterior walls and structural members are approved noncombustible/ limited combustible materials (usually masonry).

Photo/NFA

Slide 4-19

G.   Ordinary construction.

1.   An ordinary construction building will have masonry exterior walls (usually brick) and wooden structural members and interior construction.

a.   Slide 4-19 shows the building under construction.

TYPE III: ORDINARY
CONSTRUCTION (cont'd)

- Interior members are wood.
- Modern styles of Type III structures are seen in strip malls.

Photo/NFA

Slide 4-20

b.   Slide 4-20 shows the completed exterior of the building in Slide 4-19.

2.   The building generally will not exceed six stories and most often will be two or three stories in height, often called "Main Street, USA." Owners used to have businesses on the first floor and residences on the second floor.

3.   The exterior consists of masonry walls. The floor and roof supports are usually wood, but other materials such as steel bar joists may be found.

FIRE-CUT BEAMS
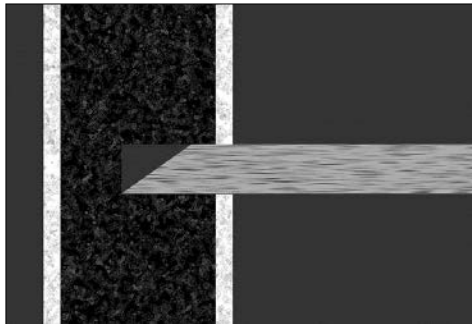
Photo/NFA

Slide 4-21

FIRE-CUT BEAMS (cont'd)

- Cut on an angle known as a "fire cut."
- Allows structural member to fall out of the wall socket without toppling the entire wall.

Photo/NFA

Slide 4-22

4.   Floor and roof decking most frequently will be wooden boards, tongue-and-groove boards, plywood, or composition board.

5.   Masonry wall between two buildings may share wall sockets for floor joists and roof rafters.

FIRE-CUT VERSUS SQUARE-CUT BEAMS
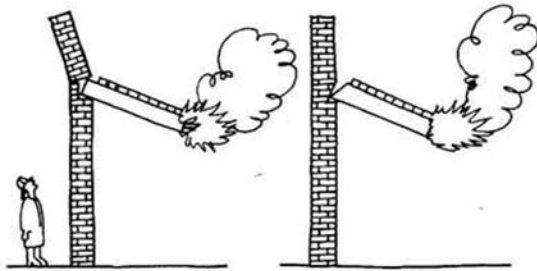
Square-cut beam   Fire-cut beam

Slide 4-23

TYPE III CONSTRUCTION —
NEW STRIP MALL
Formerly, it was common to use steel roof
and was Type II.

Photo/NFA
Slide 4-24

6.   Parapet walls, cornices, overhangs, loads on walls, signs, and marquees or other heavy items must be considered for the safety of those working underneath as seen in Slide 4-24, new strip mall.

7.   Prefire planning should indicate critical construction features.

a.   Signs of deterioration.

b.   Floor loading.

c.   Fire load.

d.   Structural modifications.

e.   Remodeling.

TYPE III: STRENGTHS

Photo/NFA
Slide 4-25

H.   Strengths of ordinary construction and concerns related to firefighting operations.

TYPE III: STRENGTHS (cont'd)

What are the strengths of ordinary construction?

• Record your answers in your SM.

Slide 4-26

TYPE III: CONCERNS

Photo/NFA

Slide 4-27

TYPE III: CONCERNS (cont'd)

What are the concerns of ordinary construction related to firefighting operations?

• Record your answers in your SM.

Slide 4-28

SAFETY CONCERNS FOR
FIREFIGHTERS

Photo/NFA   Photo/NFA

Photo/NFA   Photo/NFA
Slide 4-29

TYPE IV: HEAVY TIMBER
CONSTRUCTION

- Portions of walls are noncombustible or limited combustible materials (usually masonry load-bearing walls).
- Interior members are solid or laminated wood.

Photo/NFA

Slide 4-30

TYPE IV: HEAVY TIMBER
CONSTRUCTION (cont'd)

- Modern styles of Type IV constructions are masonry wall structures (churches, gymnasiums).

Photo/NFA

Slide 4-31

I.   Heavy timber (mill-type) construction.

        1.   Masonry (noncombustible) exterior walls and structural members of substantial timber construction.

a.   Minimum dimension of structural wood supports, 8 inches by 8 inches for columns, beams, girders and arches.

b.   All exposed wood has a minimum dimension of 2 inches.

c.   Commonly found in older factories and mills.

HEAVY TIMBER/MILL CONSTRUCTION

Slide 4-32

HEAVY TIMBER

Slide 4-33
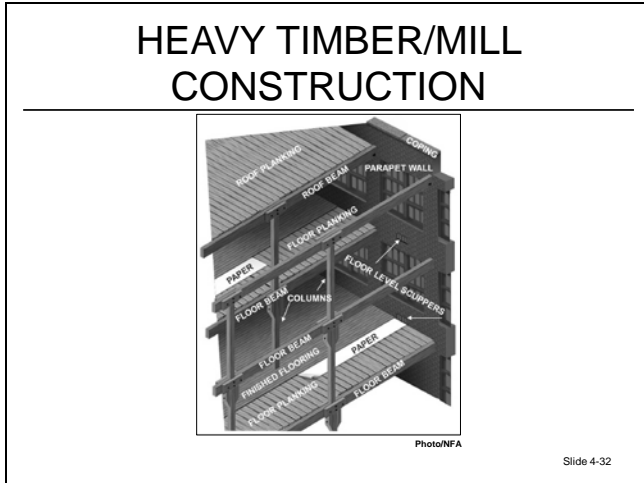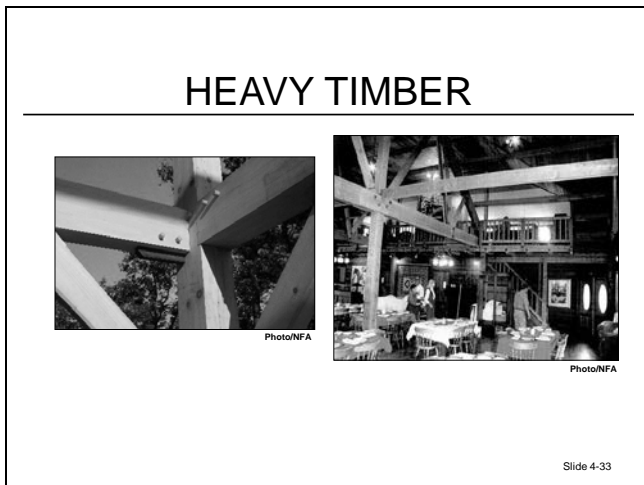
2.   Wood floors generally are a minimum thickness of 3 inches. Precautions should be taken at the scene. The floors may be oil soaked from years of supporting heavy machinery with lubricating oils.

3.   Roof supports will be wood with minimum dimensions of 4 inches by 6 inches and a minimum roof decking thickness of 1 1/8 inches.

4.   Exterior walls are masonry, usually brick. At the bottom, these walls could be as much as 36 inches thick. As walls rise, they diminish in size, since they carry less load.

5. Support timbers of large mass will burn slowly and stay strong for a long time before being destroyed.

6. Prefire planning should indicate critical construction features.

    a. Heavy floor loads.

    b. Fire load.

    c. Capacity of stock for water absorption.

    d. Building modifications.

7. Fires in this classification, once they get away from initial efforts, will tend to be staggering.

    a. Large open interior area.

    b. Unprotected vertical shafts.

    c. Potential for rapid fire development.

8. Typically scuppers, or drains, were installed at floor level on exterior walls to allow water to run off floor via an opening in the wall should a sprinkler operate. Generally, the floors were treated to prevent water from seeping to the floor below.

TYPE IV: STRENGTHS

Photo/NFA   Photo/NFA   Photo/NFA
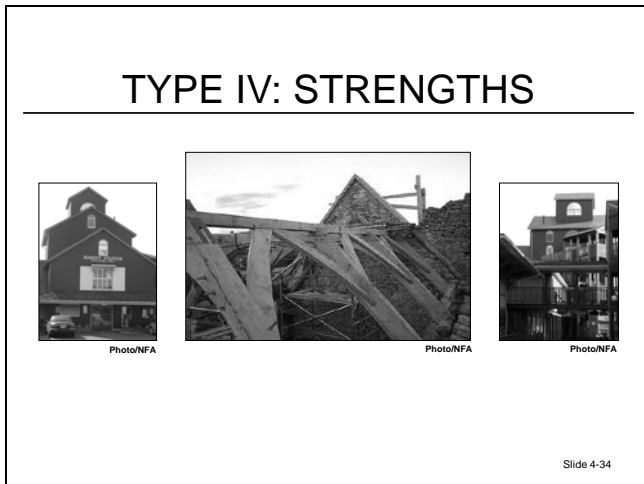
Slide 4-34

J. Strengths of heavy timber construction and concerns related to firefighting operations.

TYPE IV: STRENGTHS (cont'd)

What are the strengths of heavy timber construction?

• Record your answers in your SM.

Slide 4-35

TYPE IV: CONCERNS
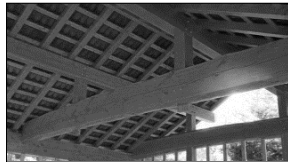
Photo/NFA   Photo/NFA   Photo/NFA

Slide 4-36

TYPE IV: CONCERNS (cont'd)

What are the concerns of heavy timber construction related to firefighting operations?

• Record your answers in your SM.

Slide 4-37

TYPE V: WOOD FRAME

Photo/NFA
Slide 4-38

K.   Wood-frame construction.

1.   Walls, floors and roof structure are of wood framing. The combustible properties of the structure will cause it to lose its load-carrying capacity at a fire incident.

2.   Post-and-beam construction has a frame of substantial dimension wood and is sided with a lightweight covering such as wood boards. Pressure treated poles can be used in place of combustible posts to extend the life of the frame in a fire.

a.   Commonly used for barns, sheds and storage buildings.

b.   May be used in dwellings and other occupancies.

BALLOON FRAME

Balloon-frame construction allows fire to travel uninterrupted.
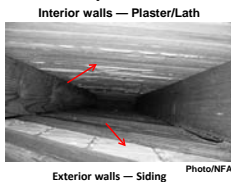
Interior walls — Plaster/Lath

Exterior walls — Siding   Photo/NFA

Exterior siding removed   Photo/NFA
Slide 4-39

3.   In balloon frame construction, studs run from the foundation to the roof.

        a.   Used extensively in many parts of the country until the late 1930s for residential and light commercial.

        b.   Floor joists are nailed to wall studs allowing for fire extension in any direction.

        c.   Fire extension must be scrutinized aggressively in this type of structure.

PLATFORM FRAME

Photo/NFA

Slide 4-40
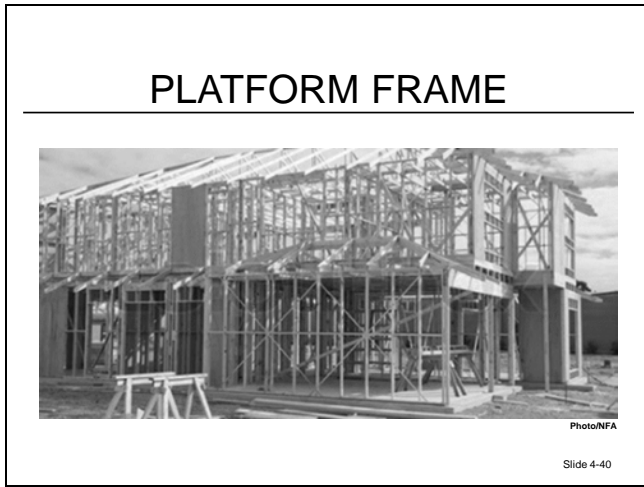
4.   In platform frame construction, the walls of each successive story are built on a platform formed by the preceding floor. It is assembled one floor at a time.

        a.   Platform wood-frame construction has been popular since the 1940s.

        b.   The joists for the deck may be full-dimension lumber or of lightweight construction.

        c.   Once the floor/deck is in place, wall studs are placed on it with a sill at the bottom of the wall and a plate at the top.

        d.   Platform frame construction provides a natural fire barrier for vertical extension within walls.

5.   Openings in walls for water, sewer, ventilation, or heating/air-conditioned pipes create vulnerabilities for fire extension.

6.   Multifamily dwellings frequently will have extensive vertical openings and void spaces that provide potential extension routes.

a.   Kitchen, bath, and dryer vents, plumbing, electrical, and heating/ air-conditioned ducts can provide multiple avenues of vertical extension.

b.   Double walls for sound deadening between dwelling units also can contribute to rapid fire spread.
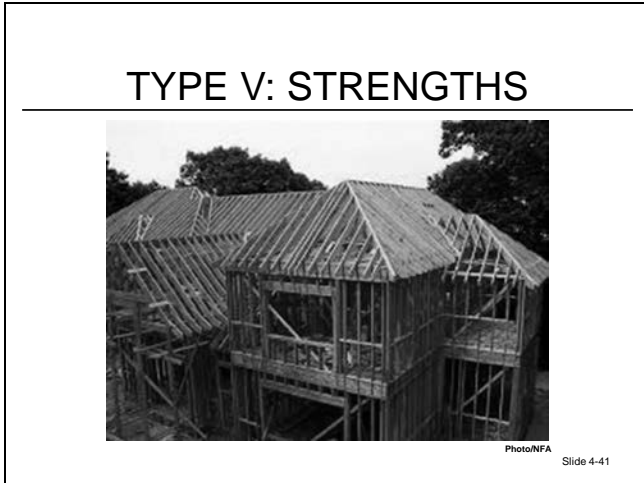
TYPE V: STRENGTHS

Photo/NFA
Slide 4-41

L.   Strengths of wood-frame construction and concerns related to firefighting operations.

TYPE V: STRENGTHS (cont'd)

What are the strengths of wood-frame construction?
• Record your answers in your SM.
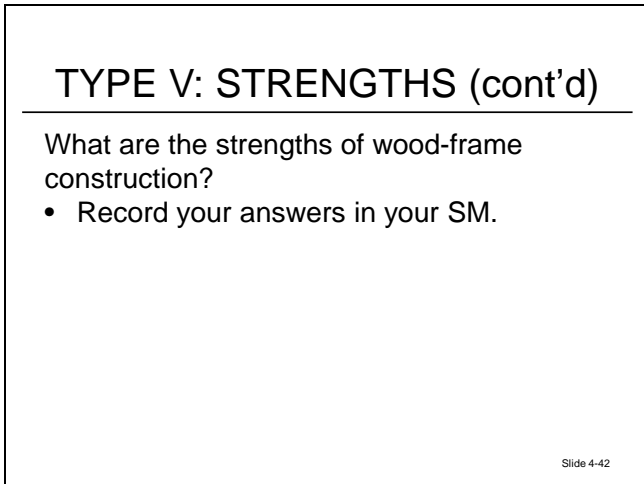
Slide 4-42

TYPE V: CONCERNS

Photo/NFA

Slide 4-43

TYPE V: CONCERNS (cont'd)

What are the concerns of wood-frame construction related to firefighting operations?
• Record your answers in your SM.

Slide 4-44

TYPICAL LIGHTWEIGHT TRUSS CONSTRUCTION

Photo/NFA   Photo/NFA

Slide 4-45

LIGHTWEIGHT
CONSTRUCTION

Slide 4-46
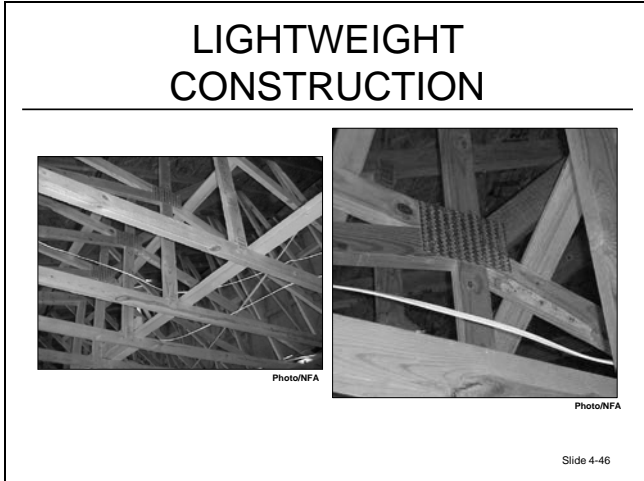
M.   Lightweight construction.

   1.   Typical lightweight truss construction. Lightweight wood or metal supporting members provide a substantial clear floor area when used to support floor and/or roof assemblies.

   2.   Typical lightweight commercial truss construction.

WOOD TRUSS: AFTER
EXPOSURE

Slide 4-47

   3.   Wood truss: after exposure.

WOOD I-BEAM

Photo/NFA

Photo/NFA

Slide 4-48
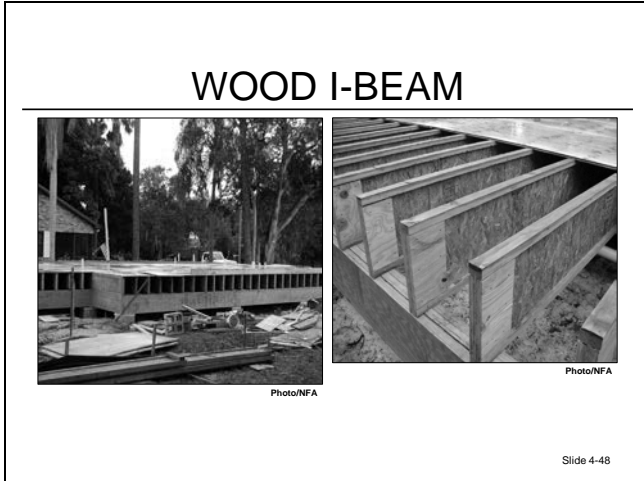
4.   Wood I-beam — lightweight "sandwich beams" or "I joists" are:

    a.   Typically constructed of 3/8-inch plywood sandwiched into 2-inch by 3-inch top and bottom chords.

    b.   Typically this assembly is used for floor joist and roof rafters.

    c.   Typically laminated.

GUSSET PLATES

Photo/NFA

Photo/NFA
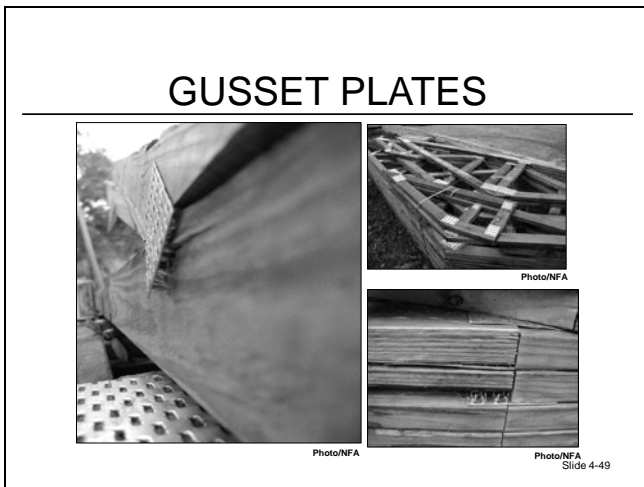
Photo/NFA
Slide 4-49

5.   Gusset plates.

    Trusses may collapse in less than five minutes when involved in fire.

LIGHTWEIGHT
CONSTRUCTION (cont'd)

Photo/NFA

Photo/NFA
Slide 4-50

N.   Strengths of lightweight construction and concerns related to firefighting operations.

LIGHTWEIGHT
CONSTRUCTION (cont'd)

Lolly Column   **Steel Studs**

Photo/NFA

Photo/NFA
Slide 4-51

TRUSS CONNECTIONS —
GUSSET PLATES

The teeth of the gusset plate penetrate 3/8 inch into the surface of the wood truss member.
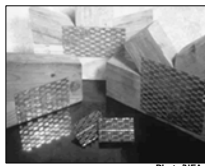
Photo/NFA

Photo/NFA

Photo/NFA
Slide 4-52
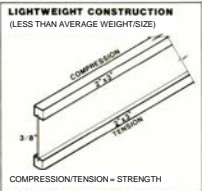
O.   Truss connections — gusset plates.

        The teeth of the gusset plate penetrate 3/8 inch into the surface of the wood truss
        member.

P.   Lightweight construction — definition.

        1.   Lightweight construction does not derive its strength from size. It is
                obtained from multiple members that are constructed in a compression-and-
                tension mode.

        2.   Additionally, the strength of the individual structural member is dependent
                on the sum total of the other members; thus, if one member fails, other
                members may fail.

LIGHTWEIGHT CONSTRUCTION —
CONVENTIONAL CONSTRUCTION

Conventional construction
uses structural members
that depend on size for
strength. The greater the
span for a structural
member, the larger it has to
be to support a given load.

CONVENTIONAL CONSTRUCTION
(OF TRADITIONAL DESIGN)

4 x 8

SIZE = STRENGTH

Slide 4-55

Q.   Lightweight construction — conventional construction.

       Conventional construction uses structural members that depend on size for strength.
       The greater the span for a structural member, the larger it has to be to support a
       given load.

COLLAPSE HAZARDS AT
STRUCTURE FIRES

Lightweight construction,
wood I-beams.
• Wood I-beams provide
  plenty of surface to fuel a
  fire but very little mass to
  resist it.

Photo/NFA

Slide 4-56

R.   Collapse hazards at structure fires — lightweight construction, wood I-beams.

       1.   Wood I-beams provide plenty of surface to fuel a fire but very little mass to
              resist it.

COLLAPSE HAZARDS AT
STRUCTURE FIRES (cont'd)

• "Engineered"
components such as
wood I-beams and floor
trusses can collapse in
less than 10 minutes of
fire exposure.

Photo/NFA

Slide 4-57

2.   "Engineered" components such as wood I-beams and floor trusses can collapse in less than 10 minutes of fire exposure.

FRANCIS L. BRANNIGAN ON
TRUSSES

• "The bottom chord of a truss is under tension. It's like you are hanging on a rope. If the rope gets cut, you will fall. So it is with a truss."
• "Failure of one element of a truss may cause the entire truss to fail; failure of one truss can cause other trusses to fail."

Slide 4-58

S.   Francis L. Brannigan on trusses:

1.   "The bottom chord of a truss is under tension. It's like you are hanging on a rope. If the rope gets cut, you will fall. So it is with a truss."

2.   "Failure of one element of a truss may cause the entire truss to fail; failure of one truss can cause other trusses to fail."

OTHER CONSTRUCTION MATERIALS

- Structural insulated panels (SIPs) are another interesting composite.
- Expanded polystyrene sandwiched between two sheets of oriented strand board (OSB).

Photo/NFA

Slide 4-59

T.   Other construction materials.

    1.   Structural insulated panels (SIPs) are another interesting composite.

    2.   Expanded polystyrene sandwiched between two sheets of oriented strand board (OSB).

STRUCTURAL INSULATED PANELS

Photo/NFA

Slide 4-60

    a.   SIPs.

      -      SIPs with siding in place.

      -      SIPs — finished interior.

      -      SIPs — roof overhang.

STRUCTURAL INSULATED PANELS (cont'd)

Photo/NFA

Slide 4-61

STRUCTURAL INSULATED PANELS (cont'd)

SIP — with siding in place

Photo/NFA

Slide 4-62

STRUCTURAL INSULATED PANELS (cont'd)

SIP — with siding in place

Photo/NFA

Slide 4-63

STRUCTURAL INSULATED PANELS (cont'd)

SIP — finished interior

Photo/NFA

Slide 4-64

STRUCTURAL INSULATED PANELS (cont'd)

SIP — roof overhang

Photo/NFA

Slide 4-65

I-STAIR — A NEW BUILDING CONSTRUCTION HAZARD

A new type of stair construction for residential buildings. Found by the City of Wyoming (Michigan) Fire Department. Constructed using two-by-fours for the main support. Triangles hold the stair riser and tread in place. The metal on the bottom of the tread and riser is essentially a gusset plate, similar to truss gusset plates.

Slide 4-66

I-STAIR

• Prebuilt installation is simple and fast.
• No layout or cutting stringers.
• No hanger boards.
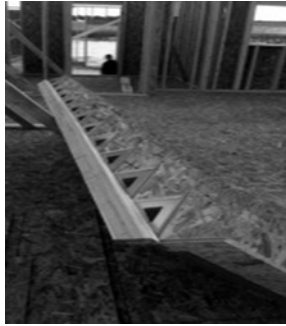
Photo/NFA
Slide 4-67

b.   I-stairs include:

-        Galvanized steel stringer brackets, nailed to two-by-four stringers with 1 1/2-inch joist-hanger nails.

-        Galvanized steel hinge-gusset, pressed with 50-ton to 3/4-inch OSB treads and risers.

I-STAIR (cont'd)

• Tread risers.
• Glued or screwed to steel hangers.

Photo/NFA
Slide 4-68

I-STAIR (cont'd)

• Solid and safe during construction.
• Code compliant immediately at installation.

Photo/NFA
Slide 4-69

- Tread-rise gusset glued or screwed to brackets.

- Five-sixteenths-inch by 4-inch lag screws for bolting to wall studs.

- Water shield for under basement stringers.

c.   Depending on the code in your jurisdiction, these stairs may not be enclosed.

-       For example, your code may say that these stairs have to be enclosed in living areas. If the basement is not finished, these stairs will not be enclosed.

OTHER CONSTRUCTION MATERIALS (cont'd)

• These structures are called insulated concrete forms (ICF).
  – ICF may contain many voids, utility runs, and foam block spacers for fire spread.

Photo/NFA
Slide 4-70

3.   These structures are called insulated concrete forms (ICF).

a.   ICF may contain many voids, utility runs, and foam block spacers for fire spread.

OTHER CONSTRUCTION
MATERIALS (cont'd)

- ICF.
  – May be identified by
    thickness of walls.

Photo/NFA

Slide 4-71

b.   May be identified by thickness of walls.

OTHER CONSTRUCTION
MATERIALS (cont'd)

- Rebar installed
  vertically, and void
  poured with
  lightweight concrete.

Photo/NFA

Slide 4-72

U.   Rebar installed vertically, and void poured with lightweight concrete.

II. FIRE BEHAVIOR FACTORS

FIRE BEHAVIOR
FACTORS

- Heat release.
- Thermal stratification.
- Rollover.
- Flashover.
- Backdraft.

Slide 4-73

A. Making informed and proactive decisions about fire behavior and structural stability results in a successful and safe outcome to an emergency incident.

HEAT RELEASE

Contingent upon:
- Type of fuel.
- Physical arrangement of fuel.
- Rate of conversion to a gas.

Photo/NFA

Photo/NFA

Slide 4-74

B. Heat release.

1. British thermal unit (Btu): One Btu is the amount of heat required to raise the temperature of one pound of water one degree.

2. Heat of combustion is the amount of heat released by a substance when it is completely consumed by fire. (Refer to the slide for common materials and their heat values.)

3. Heat release is contingent upon:

a. Type of fuel.

- Average for one pound of wood is 7,000 Btu.

- Average for one pound of plastic is 14,000 Btu.

    b.   Physical arrangement of fuel.

    c.   Rate of conversion to a gas (unless already in a gaseous state).

4.   Amount of heat to be absorbed for extinguishment is reciprocally connected to the application rate of water. (More water reduces the temperature of the fire.)

THERMAL STRATIFICATION

Slide 4-75
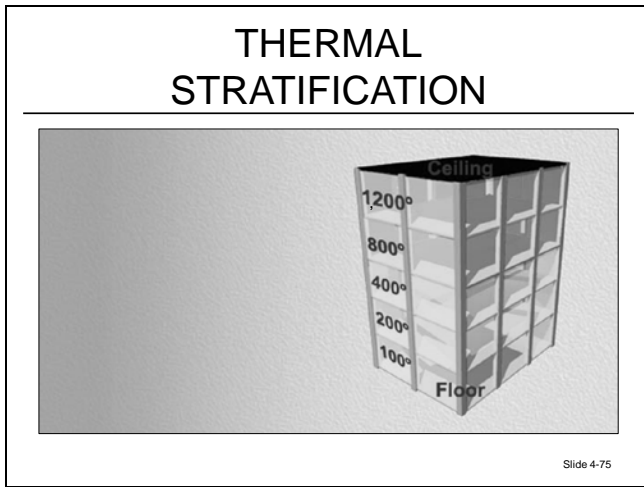
C.   Thermal stratification.

1.   The layering of heat in an enclosed area with the highest temperature at the ceiling and the lowest temperature at the floor and its covering.

2.   With full protective equipment, it may be difficult to detect high temperatures at ceiling level.

THERMAL STRATIFICATION (cont'd)

Photo/NFA
Slide 4-76
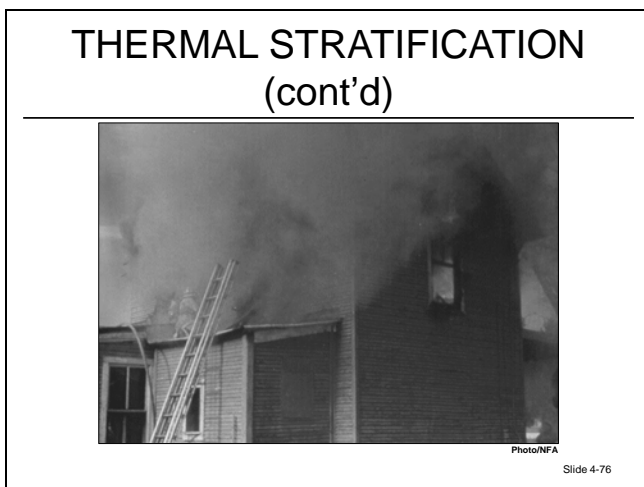
3.   Air currents, operation of fire streams, or ventilation may influence thermal stratification. Changing the thermal balance can cause temperatures to increase beyond the point of survival. Full protective gear must be worn by all firefighters.

4.   As products of combustion rise and cool, they may become less buoyant and stop rising, as in the stairwell of a high-rise building.

ROLLOVER

Photo/NFA

Slide 4-77

D.   Rollover.

ROLLOVER (cont'd)

- Fire spreads along horizontal surfaces within a structure.
- Fire extends rapidly along ceiling within a room or hallway.
- Rollover fire could be 10 to 20 feet ahead of the main fire.

Slide 4-78
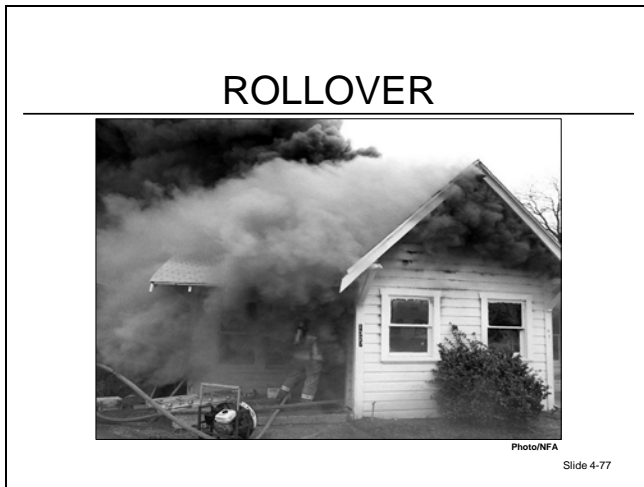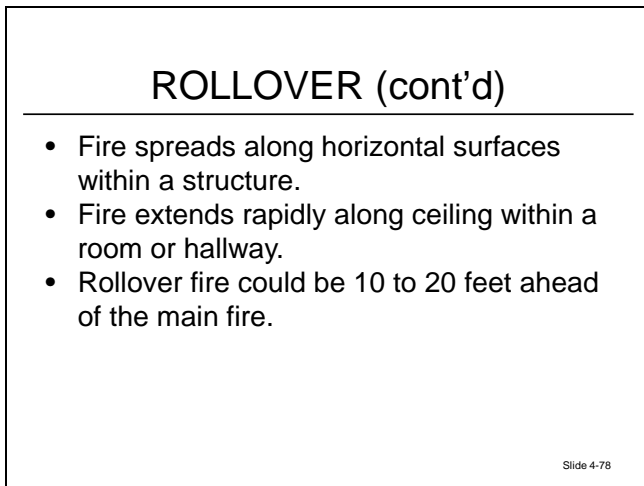
1.   Fire spreading along horizontal surfaces within a structure. Large amounts of oxygen are consumed by the fuel, limiting oxygen levels in the upper areas of the room causing the horizontal movement.

2.   Fire extending rapidly along the ceiling within a room or hallway. The fire could be 10 to 20 feet ahead of the main fire.

FLASHOVER

- Combustible material heated to ignition temperature causing simultaneous combustion.
- Ignition can happen while firefighters are in the room.
- Flashover warning signs.
  - Intense smoke buildup.
  - Intense heat buildup.

Slide 4-79

E. Flashover.

    1. Combustible material in fire area heated to its ignition temperature causing simultaneous combustion.

    2. Ignition can happen while firefighters are in the room.

FLASHOVER (cont'd)

- Free-burning fire in room or adjacent area.
- Rollover.
- Unburned articles starting to smoke.
- Fog pattern turning to steam a short distance from the nozzle.

Slide 4-80

    3. Flashover warning signs.

        a. Intense smoke buildup.

        b. Intense heat buildup.

        c. Free-burning fire in room or adjacent area.

        d. Rollover.

        e. Unburned articles starting to smoke.

        f. Fog pattern turning to steam a short distance from nozzle.

FLASHOVER PREVENTION

- Ventilation.
- Water application.

Photo/NFA

Slide 4-81

F.   Flashover prevention.

1.   Use ventilation to reduce the heat of the interior of the structure.

2.   Apply water to reduce the intensity of the rapidly developing fire through cooling.

BACKDRAFT POTENTIAL

Photo/NFA

Slide 4-82

G.   Backdraft.

BACKDRAFT POTENTIAL
(cont'd)

Smoke explosion.
- Oxygen is depleted.
- Gases react with oxygen causing explosion.
  – Mixture in excess of 12.5 percent products of combustion and low concentration of oxygen.
  – High temperatures in excess of 1,150 F and low concentration of oxygen.
  – Confined spaces.

Slide 4-83

Also known as a smoke explosion. Backdraft occurs in conditions where oxygen has been depleted. Gases such as carbon monoxide develop and react with oxygen causing an explosion.

1.   Ignition of a rich (high concentration of fuel in excess of 12.5 percent, low concentration of oxygen) mixture of products of combustion upon introduction of air into a confined space.

2.   High temperatures (in excess of 1,150 F (621.1 C)) and low oxygen concentration within a confined space result in the production of large amounts of carbon monoxide, a flammable product of combustion.

3.   Backdraft may involve a whole structure or a confined space within a structure.

BACKDRAFT WARNING
SIGNS

- High velocity smoke extruding from building.
- Hot , heavy smoke, called "lazy smoke."
- Pushing brown/yellowish smoke.
- Building appears to be "breathing."

Slide 4-84

4.   Backdraft warning signs.

      a.   High velocity smoke extruding the building.

    b. Hot, heavy smoke, sometimes described as lazy, coming from the building.

    c. Pushing brown/yellowish (or darker) smoke.

    d. Building may appear to be breathing, with the smoke pushed outward and fresh air sucked inward.

BACKDRAFT PREVENTION

- Ventilation high in structure (first priority).
- Ventilation low in structure may result in backdraft explosion.

Photo/NFA   Slide 4-85

H. Backdraft prevention.

    Ventilation high in the structure (preferably from highest point) to reduce the probability of backdraft.

    1. **Ventilation is the first priority.** Ventilation removes flammable products of combustion and reduces the temperature.

    2. Low ventilation of the structure may result in a violent backdraft explosion.

III.   FIRE TRAVEL FORECASTING

A.   The travel of fire in structures can be predicted based upon several factors.

FIRE, SMOKE AND HEAT
TRAVEL

- Determined by:
  - Building construction.
  - Building layout.
  - Fuel load.
  - Built-in fire protection.
  - Air-handling system.
  - Fire department ventilation efforts.

Slide 4-86

1.   Fire, heat and smoke travel is determined by:

a.   Construction of building.

b.   Building layout.

c.   Fuel load.

d.   Built-in fire protection systems.

-    Sprinklers.

-    Heat detectors.

-    Smoke detectors.

-    Ansil systems.

e.   Air-handling systems.

f.   Fire department ventilation.

FIRE, SMOKE AND HEAT
TRAVEL (cont'd)

- Building construction.
  - Combustible materials.
  - Voids.
  - Type/Classification of construction.
- Building design and layout.
  - Heating, ventilating, and air conditioning (HVAC) system.
  - Penetration of firewalls and separation walls.

Slide 4-87

2.   Building construction.

        a.   Combustible materials.

        b.   Voids.

        c.   Type/Classification of construction.

3.   Building design and layout.

        a.   heating, ventilating, and air conditioning (HVAC) system.

        b.   Penetration of firewalls and separation walls.

FIRE, SMOKE AND HEAT
TRAVEL (cont'd)

- Fuel load.
  - Structure itself.
  - Contents.
- Built-in fire protection features.
  - Sprinklers.
  - Automatic smoke vents.
  - Fire door.

Slide 4-88

4.   Fuel load.

        a.   Structure itself.

        b.   Contents.

    5.   Built-in fire protection features.

        a.   Sprinklers.

        b.   Automatic smoke vents.

        c.   Fire door.

HOW FIRES EXTEND

- Room to room.
  – Unprotected door openings.
  – Heat conduction through steel beams.
  – Burning through walls.
- Floor to floor.
  – Unprotected stair openings.
  – Windows and vertical extensions.
  – Burning through floors.

Slide 4-89

B.   How fires extend.

    1.   Room to room.

        a.   Through unprotected door openings.

        b.   Conduction of heat through steel beams.

        c.   Burning through walls.

    2.   Floor to floor.

        a.   Through unprotected stair openings.

        b.   Burning through windows and vertical extensions.

        c.   Burning through floors.

HOW FIRES EXTEND (cont'd)

- Building to building.
  - Combustible common walls.
  - Radiant heat.
  - Flying embers.

Slide 4-90

3. Building to building.

    a. Through combustible common walls.

    b. Radiant heat.

    c. Flying embers.

NEED TO FORECAST FIRE TRAVEL

- Accurate forecasting leads to successful operations.
- Enables officer to make realistic decisions.

Photo/NFA

Slide 4-91

C. Need to forecast fire travel.

    1. Accurate forecasting can lead to successful operations.

    2. Enables officer to make realistic decisions on placing resources. Using the known factors of fire travel, the Incident Commander (IC) can direct resource placement at the incident scene.

NEED TO FORECAST FIRE
TRAVEL (cont'd)

- Continual forecasting
  enables Incident
  Commander (IC) to
  make adjustments.
- Part of the initial and
  continual size-up
  processes.

Photo/NFA

Slide 4-92

      3.   Continual forecasting enables IC to make educated adjustments.

      4.   Part of the initial and continual size-up processes.

FIRE TRAVEL ASSESSMENT

- Where is the fire
  now?
- Where is smoke
  showing?
- What is there to stop
  the fire?

Photo/NFA

Slide 4-93

D.   Forecasting fire travel can be accomplished by the following assessments.

      1.   Where is the fire now?

      2.   Where is smoke showing? Remember where there is smoke, there is heat.

      3.   What is in place to stop the spread of fire and smoke?

            a.   Firewalls?

            b.   Fire-resistant material?

FIRE TRAVEL ASSESSMENT
(cont'd)

• Where are signs of
increasing heat or
unusual signs of
building reaction to
fire?

Photo/NFA

Slide 4-94

4.   Where are some of the signs of increasing heat?

5.   Are there unusual signs of building reaction to fire, signs of paint
        discoloration due to heat, or signs of melting tar on roofs?

ACTIVITY 4.1

Forecasting Fire Travel

Purpose

Review construction features and fire and smoke development, and predict fire travel patterns.

Directions

1.   You will be working in small groups.

2.   The instructor will assign each group one construction type. You will be asked to review the features of the building/construction type your group has been assigned. Your group also will be asked to make predictions of how fire will travel within this structure.

3.   Your group will record your predictions on paper.

4.   Your group will select a representative to explain to the class how fire would travel in this building.

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IV.   SUMMARY

SUMMARY

- Building construction classifications.
- Fire behavior factors.
- Fire travel forecasting.

Slide 4-101

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UNIT 5:
PREINCIDENT PLANNING

TERMINAL OBJECTIVE

The students will be able to:

5.1   Explain why preplanning is important to both the safety of the firefighter and community risk reduction.

ENABLING OBJECTIVES

The students will be able to:

5.1   Calculate the required fire flow for given structures using the National Fire Academy (NFA) fire flow formula.

5.2   Identify and apply critical preplan information for target hazards given a Quick Access Prefire (QAP) Plan.

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**UNIT 5:
PREINCIDENT PLANNING**

Slide 5-1

ENABLING OBJECTIVES

- Calculate the required fire flow for given structures using the National Fire Academy (NFA) fire flow formula.
- Identify and apply critical preplan information for target hazards given a Quick Access Prefire (QAP) Plan.

Slide 5-2

I. PREINCIDENT PREPARATION

PURPOSE OF PREINCIDENT PREPARATION

- Improve incident scene management.
  - Strategy.
  - Tactics.
  - Safety.
  - Coordination.
- Assist in resource evaluation.
  - Required resources.
  - Available resources.

Slide 5-3

Preincident preparation is a cyclical process that involves information gathering, analysis, documentation and plan maintenance. The purpose of preincident preparation is to improve incident scene management.

A.   Establish effective incident scene management.

       1.   Assist in determining strategy.

       2.   Assist in selecting proper tactics.

       3.   Promote safety and coordination.

B.   Provide resource evaluation.

       1.   Determine required resources.

       2.   Determine available resources.

PURPOSE OF PREINCIDENT
PREPARATION (cont'd)
- Help determine mode of operation.
  - Offensive.
  - Defensive.
  - Offensive/Defensive.
  - Defensive/Offensive.
- Help determine fire load.
- Provide for structural evaluation.
- Firefighters' safety.

Slide 5-4

C.   Determine the mode of operation.

       1.   Offensive — sufficient resources.

       2.   Defensive — insufficient resources.

       3.   Offensive/Defensive — a situation that is likely to change to a defensive operation due to inability to control the fire.

       4.   Defensive/Offensive — a situation that starts defensively, maybe with some master streams, but can turn offensive when the major fire is knocked down.

D.   Evaluate the fire load — an indicator of fire intensity.

E.   Provide for structural evaluation — an indicator of fire spread.

F.   Assist with firefighters' safety.

II.   PREFIRE PLANNING

PREFIRE PLANNING

• Gathering/Analyzing information about:
   – Building/Structure.
   – Occupancy.
   – Area.
   – Hazards.
   – Built-in fire protection.
• Used to develop an Incident Action Plan (IAP).

Photo/National Fire Academy (NFA)

Slide 5-5

A.   What is prefire planning?

    1.   Gathering and analyzing information about:

        a.   The building.

        b.   The occupancy.

        c.   The area.

        d.   The hazards involved.

        e.   The built-in fire protection.

    2.   Prefire planning is used to help develop the Incident Action Plan (IAP) at emergency incidents.

    3.   Preincident information includes any useful information that may affect decisions or actions taken by fire department personnel during an emergency incident.

B.   Prefire planning prepares the Company Officer (CO) with a foundation to make the best risk assessment. A prefire plan is best prepared in advance and made available for use by the CO to prepare a proactive strategic approach en route to an emergency.

The prefire plan is a comprehensive assessment of the building construction, including construction techniques used in the response area, burn characteristics of materials used in the structure, building occupancy, potential hazards, and built-in fire protection that may be used in the structure.

C.   Who should perform prefire planning?

   1.   Fire departments that want to be able to operate in a proactive manner on the incident.

   2.   COs who understand that prefire planning is essential for safe and effective operations.

D.   The Quick Access Prefire (QAP) Plan form.

```
┌─────────────────────────────────────────┐
│      QUICK ACCESS PREFIRE                │
│        PLAN (cont'd)                     │
│  ─────────────────────────────────────  │
│  Captures risk assessment information on │
│  community hazards and resources needed  │
│  to address them. The QAP Plan contains: │
│    • Initial resources required.         │
│    • Estimated fire flow based on levels │
│      of involvement.                     │
│    • Fire behavior predictions, potential│
│      strategies, and anticipated problems│
│      for quick analysis.                 │
│                                          │
│                             Slide 5-8    │
└─────────────────────────────────────────┘
```

1.   The QAP Plan is a method of capturing the risk assessment information on hazards in the community and the needed resources to address a problem if it should occur. It contains initial resources required, estimated fire flow based on levels of involvement, fire behavior predictions, potential strategies to use, and anticipated problems in an at-a-glance format for quick analysis on the way to an incident.

2.   Reviewing the QAP Plan en route to the incident prepares the CO to make quick decisions upon arrival on the scene. Having a good estimation of the resources that may be needed allows the CO to request additional resources early and better manage the safety of occupants and firefighters.

```
┌─────────────────────────────────────────┐
│      QUICK ACCESS PREFIRE                │
│        PLAN PURPOSE                      │
│  ─────────────────────────────────────  │
│    • Memory-jogger for better decisions. │
│    • Incident scene safety data.         │
│    • Floor plan/Plot plan for access.    │
│    • Can be absorbed in 30 to 60 seconds.│
│                                          │
│                                          │
│                                          │
│                                          │
│                             Slide 5-9    │
└─────────────────────────────────────────┘
```

E.   Purpose of the QAP Plan.

1.   Provides first-in officers with sufficient data to make better decisions (memory-jogger).

2.   Provides incident scene safety data.

3.   Provides floor plan/plot plan for access data.

> ## QUICK ACCESS PREFIRE PLAN PURPOSE (cont'd)
>
> - For first-in officers.
> - Important scene data in an easily readable format.
> - Does not replace a more detailed prefire plan for complex facilities.
>   – Add as cover sheet for complex plans.
>   – Used to make sound, early decisions.
> - Training reference for target hazards.
>
> Slide 5-10

4.   Can be read and absorbed in approximately 30 to 60 seconds. It is a single page summary of the detailed prefire plan.

5.   While the QAP Plan is critical to on-scene management, it is not meant to take the place of the more detailed prefire plan for a complex structure.

   a.   Keep the complex plan for use in extended attack operations.

   b.   Add the QAP Plan as the cover sheet for the complex plan to help the first-in officer make sound, early decisions.

6.   A point of reference for the CO to evaluate company strengths and weaknesses and tailor training to target hazardous operational areas where additional training is needed.

> ## BUILDINGS THAT REQUIRE PREFIRE PLANS
>
> - Target hazards first.
>   – Large casualty risk.
>   – Large economic impact.
>   – Unique hazards.
> - Other complex structures.
>
> Slide 5-11

F.   What buildings require a prefire plan?

     1.   Primary — target hazards, such as buildings or other facilities with:

          a.   Large casualty risk/life loss potential.

          b.   Large monetary/economic impact if lost in a fire situation.

          c.   Unique risks/hazards, such as hazmat stored in the building.

     2.   Secondary — based on building complexity, create prefire plans for other structures in the response area. Base those plans on:

          a.   Complexity.

          b.   Economic value.

III.   FIRE FLOW REQUIREMENTS

FIRE FLOW REQUIREMENTS
STAGES OF FIRE

Photo/NFA

Slide 5-12

A.   The various stages of fire development are:

     1.   Ignition — the time when heat, oxygen and fuel cause a chain reaction that allows initial combustion to occur.

     2.   Growth — thermal up-drafting is created by the amount of heat being generated. This allows oxygen at the seat of the fire to feed fire growth.

     3.   Flashover — the stage between growth and fully developed. Surrounding fuels are heated to the point where there is enough heat to ignite all combustibles simultaneously.

4.   Fully developed — all combustible materials in the area are burning based on air available for combustion.

5.   Decay — as oxygen levels diminish, heat release slows, allowing temperature and oxygen levels to lower.

FIRE FLOW REQUIREMENTS

- Fires extinguished by absorbing the heat with water.
- Application of water will:
  - Absorb heat.
  - Reduce temperature.
  - Extinguish fire.

Slide 5-13

B.   A common way to extinguish a structure fire is adding water to absorb the heat. The fire is extinguished by lowering the temperature below the ignition temperature of the burning materials.

C.   It is important to remember that the two components to extinguishing a fire and reducing the temperature are the use of adequate supplies of water combined with proper ventilation.

D.   To extinguish a structure fire, the amount of water (gallons per minute (gpm)) must exceed the heat (British thermal units (Btu)) being produced.

1.   Once we have a method to estimate how much heat (in Btu) is being produced by the fire, we can apply sufficient water to absorb more heat than the fire is producing.

2.   Fire flow calculations can be made using the NFA fire flow formula.

DVD PRESENTATION

"NFA FIRE FLOW FORMULA"

Slide 5-14

IV. FIRE FLOW FORMULA

FIRE FLOW FORMULA

• Calculates theoretical fire flow.
  – Large amounts of heat absorbed.
  – Reduces temperature below ignition temperature.
  – Fire is blacked-out, ready for overhaul.

Slide 5-15

A.   Knowledge of fire flow is required for effective decisions on the number of handlines and personnel to extinguish a fire.

B.   This formula is intended to calculate the theoretical fire flow for interior fire attack.

1.   Large quantities of heat are absorbed as water is vaporized.

2.   Reduce the temperature of the burning materials below ignition temperature.

3.   The fire is blacked-out and ready for overhaul.

FIRE FLOW FORMULA (cont'd)

- With high percentages of involvement, interior operations are not possible.
  – One hundred percent involvement answer is theoretical.
  – Starting point for realistic flow rate.
  – Starting point for defensive operations.
  – Tactical operations must be evaluated.

Slide 5-16

C.   With high percentages of involvement, interior operations are not possible.

     1.   One hundred percent involvement answer is theoretical.

     2.   The basic formula for 100 percent involvement is used as a basis for calculating realistic flow rate for interior attack.

     3.   Flow rates for high percentages of involvement provide a starting point for defensive operations.

     4.   The effect of tactical operations must be evaluated and the rate of application adjusted as necessary.

D.   Origin of the formula.

     1.   Empirical formula developed by an NFA development team.

     2.   Study of fire flows at fire situations.

BASIC FIRE FLOW FORMULA

$$\frac{L \times W}{3} = \text{gallons per minute (gpm)}$$

Photo/NFA

Slide 5-17

E.   Basic fire flow formula: (L x W)/3 = gpm.

FIRE FLOW FORMULA (cont'd)

- Flow for one floor fully involved.
- Estimate length/width to nearest 10 feet.
- Multiply (L x W), then divide by 3.
- Theoretical fire flow for 100 percent involvement.

Slide 5-18

1.   Needed fire flow (NFF) for one floor fully involved.

2.   Estimate length/width of building to nearest 10 feet.

3.   Multiply (L x W), then divide by 3.

4.   This is the theoretical fire flow for 100 percent involvement of one floor.

USING THE BASIC FORMULA

gpm = $\frac{L \times W}{3}$

gpm = $\frac{40' \times 30'}{3}$

$\frac{1,200'}{3}$ = 400

fire flow = 400 gpm

40 ft.   30 ft.
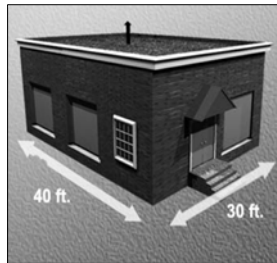
Photo/NFA

Slide 5-19

USING THE BASIC FORMULA
(cont'd)

- Quick calculations at the scene.
- Calculates water required for:
  – Confinement.
  – Extinguishment.
  – Backup lines.

Photo/NFA

Slide 5-20

5.   Used for quick calculations at emergency scenes.

Preincident calculation for common structure sizes assists in developing skills in incident estimation of required fire flow.

6.   This formula calculates the water required for confinement, extinguishment and backup lines based on an evaluation of actual fire flow.

FIRE FLOW FORMULA (cont'd)

- Fully involved.
  1,000 gpm.
- 50 percent involved.
  500 gpm.
- 25 percent involved.
  250 gpm.

Photo/NFA

Slide 5-21

F.   Multiple stories.

1.   If additional floors or perhaps a basement are occupied areas, the fire flow for additional floors must be included.

2.   Fire flow: fire floor x number of floors.

3.   Example:

a. Two-story dwelling: basement and attic not finished off and not occupied. Fire on first floor.

b. Calculate 500 gpm first floor x 2 floors = 1,000 gpm total flow for 100 percent involvement

---

EXPOSURE PROTECTION

- Up to four floors above fire in a fire-resistive building.
- Buildings or other objects.
  - 0 to 50 feet — usually an exposure.
  - 50 feet to 100 feet — could be an exposure.
  - 100 feet or more — usually not an exposure.

Photo/NFA

Slide 5-22

FIRE FLOW FORMULA (cont'd)

- Exposure protection.
  - gpm = $\frac{L \times W}{3}$ x 25 percent for each exposure.
  - Fire building = $\frac{30 \text{ feet} \times 100 \text{ feet}}{3}$ = 1,000 gpm.

Photo/NFA

Slide 5-23

G. Exposure protection.

1. Buildings or other objects that may be threatened by a fire in the target building are considered exposures.

a. Up to four floors above in a fire-resistive building.

b. Less than 50-foot separation — usually considered an exposure.

c. 50-feet to 100-feet separation —could be an exposure.

d. Over 100-foot separation — usually not an exposure.

e.   You must make final determination based on observed conditions.

FIRE FLOW FORMULA (cont'd)

– Exposures:
  -- Side Alpha = 75 feet.
  -- Side Bravo = 20 feet.
  -- Side Charlie = 60 feet.
  -- Side Delta = 15 feet.

Photo/NFA

Slide 5-24

2.   Buildings or fire areas within a building that have a zero-separation distance, but have a rated firewall with all openings protected with a rated closure, are considered exposures.

3.   The formula calculates gpm required to keep a fire from extending to an exposure.

FIRE FLOW FORMULA (cont'd)

– 1,000 x 25 percent (Exposure Bravo) = 250 gpm.
– 1,000 x 25 percent (Exposure Delta) = 250 gpm.
– Total exposure protection

Photo/NFA

Slide 5-25

4.   The exposure rate is 25 percent of the "basic fire flow" of the involved structure, regardless of the height of the fire building or exposure of each side of a fire building with exposures. A fire building with more than one exposure building on a side would still be calculated at 25 percent per side with exposures.

5.   Example calculation for a building with a required fire flow of 1,000 gpm and two exterior exposures.

FIRE FLOW REQUIREMENTS

EXPOSURE Bravo	FIRE BUILDING 1,000 gpm	EXPOSURE Delta

- Base flow = 1,000 gpm.
- Exposure Bravo = 250 gpm (25 percent).
- Exposure Delta = 250 gpm (25 percent).

Slide 5-26

FIRE FLOW REQUIREMENTS (cont'd)

	EXPOSURE Charlie No Flow Required	
EXPOSURE Bravo 250 gpm	FIRE BUILDING	EXPOSURE Delta 250 gpm
	EXPOSURE Alpha No Flow Required	
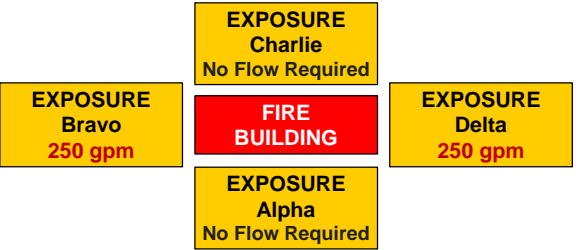
Slide 5-27

PERCENTAGE OF INVOLVEMENT

gpm =

$\underline{L \times W}$ + exposure x percent of involvement.
    3

Fire building: Exposures:
1,000 gpm   Bravo and Delta
                        500 gpm (25 percent)

Slide 5-28

PERCENTAGE OF INVOLVEMENT (cont'd)

- 100 percent involvement = 1,500 gpm required.
- 75 percent involvement = 1,125 gpm (1,500 x 0.75).
- 50 percent involvement = 750 gpm
- (1,500 x 0.50).
- 25 percent involvement = 375 gpm
- (1,500 x 0.25).

Slide 5-29

CALCULATION: INTERIOR EXPOSURE

- Add 25 percent of the (L x W)/3 total for each floor above the fire floor.
- Consider a maximum of five floors.
- Use the calculation of the following slides to determine the needed fire flow (NFF) to combat interior exposure situations.

Slide 5-30

CALCULATION: INTERIOR EXPOSURE (cont'd)

gpm =
  [(L x W)/3]+interior exposure charge
  [(60 x 80)/3] + [0.50 x (60 x 80)/3)]
  1,600 + (0.50 x 1,600)
  1,600 + 800 = 2,400
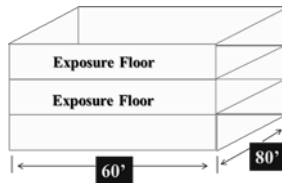
Slide 5-31

CALCULATION: INTERIOR EXPOSURE (cont'd)

- NFF = 1,600 gpm x 25 percent involvement of first floor.
- NFF = 1,600 x 0.25 = 400 gpm.
- NFF = 1,600 x 0.50 = 800 gpm exposure protection.

Exposure Floor
Exposure Floor
1st floor 25% involved
60' 80'
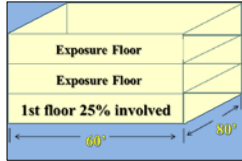
Slide 5-32

CALCULATION: INTERIOR EXPOSURE (cont'd)

- Note: 1,200 gpm should provide sufficient water to knock down the fire and provide lines on the second and third floor for extension control.

Exposure Floor
Exposure Floor
1st floor 25% involved
60' 80'
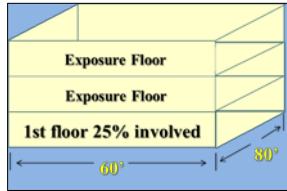
Slide 5-33

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ACTIVITY 5.1

Quick Access Prefire Plan

Purpose

Provide an overview of the NFA's QAP Plan.

Directions

1.   Review the floor plan for "Bill's Men's Shop," which is a two-story, ordinary constructed building.

2.   Follow the instructor's directions to complete the QAP Plan for 1233 Main Street.

3.   You will have approximately 25 minutes for this activity.

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ACTIVITY 5.1 (cont'd)

Floor Plan/Plot Plan
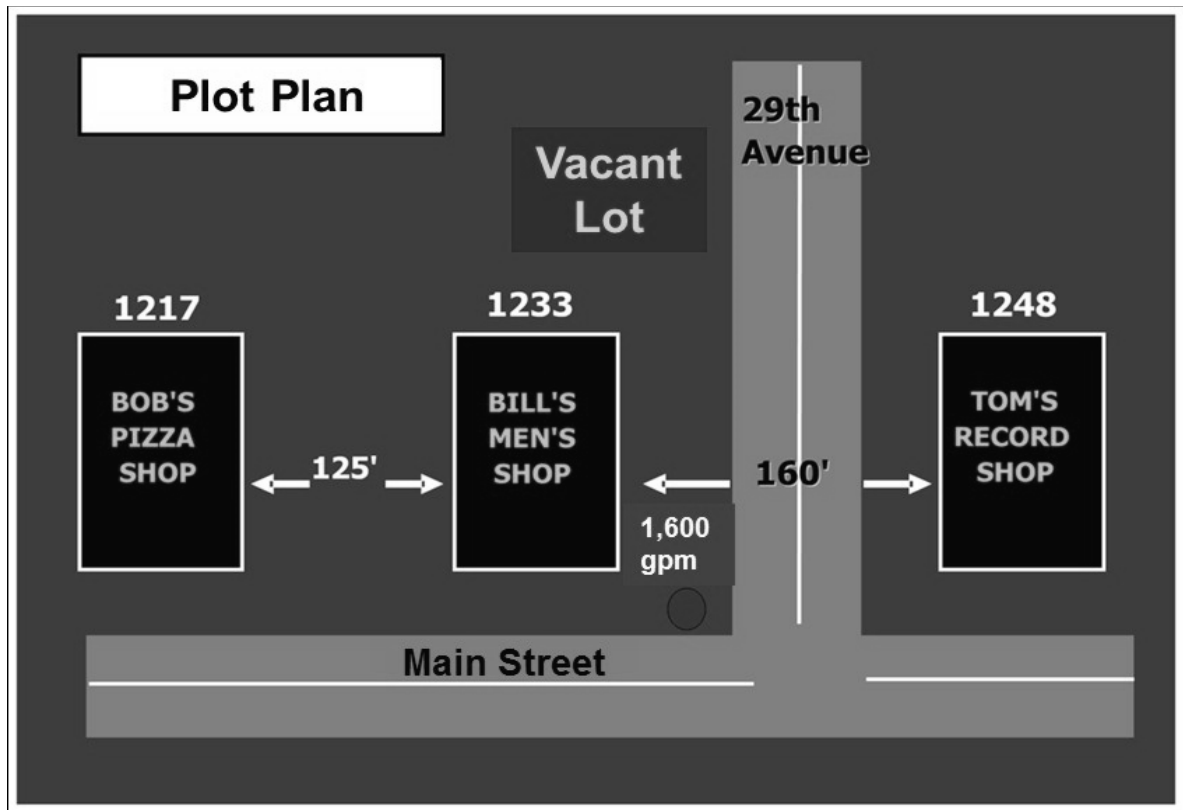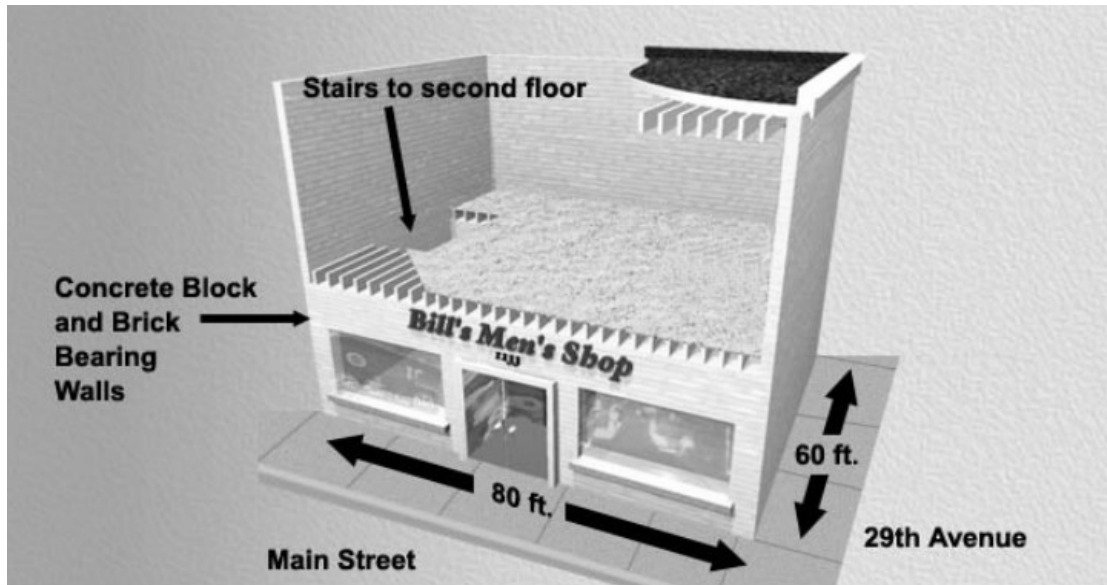
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ACTIVITY 5.1 (cont'd)

Quick Access Prefire Plan

Building Address:
1233 Main Street

Building Description:

Roof Construction:
Built up (tar and paper) over 2-inch boards

Floor Construction:
1-inch boards over 2-inch by 10-inch joist

Occupancy Type:
Mercantile "Bill's Men's Shop"

Initial Resources Required:

Hazards to Personnel:

Location of Water Supply:

Available Flow:

	Estimated Fire Flow			
Level of Involvement	*25%*	*50%*	*75%*	*100%*
Estimated Fire Flow				

Fire Behavior Prediction:

Predicted Strategies:

Problems Anticipated:

☐ **Standpipe:**   ☐ **Sprinklers:**   ☐ **Fire Detection:**

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V.   SUMMARY

SUMMARY

- Preincident preparation.
- Prefire planning.
- Fire flow requirements.
- Fire flow formula.

Slide 5-38

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ACRONYMS

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ACRONYMS

BIR	Brief Initial Report
Btu	British thermal unit
CAN	Conditions, Actions and Needs
CO	Company Officer
EMS	Emergency Medical Services
EMTs	emergency medical technicians
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
gpm	gallons per minute
HVAC	heating, ventilating, and air conditioning
IAP	Incident Action Plan
IC	Incident Commander
ICFs	insulated concrete forms
ICS	Incident Command System
IDLH	immediately dangerous to life and health
IG	Instructor Guide
KSAs	knowledge, skills and abilities
LODD	line-of-duty death
LPG	liquefied petroleum gas
NFA	National Fire Academy
NFF	needed fire flow
NFPA	National Fire Protection Association

NIOSH	National Institute for Occupational Safety and Health
NIST	National Institute of Standards and Technology
OSB	oriented strand board
PA	public address
PAR	Personnel Accountability Report
PIA	post-incident analysis
PICO	"Preparation for Initial Company Operations"
PIV	post indicator valve
PPE	personal protective equipment
psi	pounds per square inch
QAP	Quick Access Prefire
RECEO-VS	**R**escue, **E**xposures, **C**onfine the fire, **E**xtinguish, **O**verhaul, **V**entilate, **S**alvage
RIC	Rapid Intervention Crew
SAW	Student Activity Worksheet
SCBA	self-contained breathing apparatus
SIP	structural insulated panels
SLICE-RS	**S**ize-up, **L**ocate the fire, **I**dentify and control flow path, **C**ool space from safest location, **E**xtinguish fire, **R**escue, **S**alvage
SM	Student Manual
SMART	**S**pecific, **M**easurable, **A**ttainable, **R**elevant and **T**ime sensitive
SOGs	standard operating guidelines
SOPs	standard operating procedures