



Missouri Division of Fire Safety
FIRE FIGHTER I & II



**FIRE FIGHTER
SAFETY**



UNIT OBJECTIVES

Upon completion of this unit of study, the student should be able to:

1. Describe a fire fighter's responsibilities involving safety.
2. Describe the major dangers associated with fire fighting.
3. List the health hazards associated with fire fighting.
4. Describe laws, regulations, and standards relating to fire fighter health and safety.
5. Explain the elements of a risk management plan.
6. Explain how fire fighters should deal with personal health issues
7. Describe the purposes of employee assistance and wellness programs
8. List the causes and effects of critical incident stress.
9. Describe and demonstrate the safety precautions needed when working with fire apparatus.
10. Identify the safety hazards encountered in fire stations and when working with tools and equipment.
11. Identify safety precautions necessary when training.
12. Describe and demonstrate the procedures for establishing work areas at various emergency scenes.



NFPA STANDARDS

Successful completion of the information in this section is necessary to fulfill the requirements of the following sections of NFPA 1001-2008:

Fire Fighter I Standard

5.1.1 General Knowledge Requirements. The organization of the fire department; the role of the Fire Fighter I in the organization; the mission of fire service; the fire department's standard operating procedures (SOPs) and rules and regulations as they apply to the Fire Fighter I; the role of other agencies as they relate to the fire department; aspects of the fire department's member assistance program; the importance of physical fitness and a healthy lifestyle to the performance of the duties of a fire fighter; the critical aspects of NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, as they apply to the Fire Fighter I; knot types and usage; the difference between life safety and utility rope; reasons for placing rope out of service; the types of knots to use for given tools, ropes, or situations; hoisting methods for tools and equipment; and using rope to support response activities.

5.3.2* Respond on apparatus to an emergency scene, given personal protective clothing and other necessary personal protective equipment, so that the apparatus is correctly mounted and dismounted, seat belts are used while the vehicle is in motion, and other personal protective equipment is correctly used.

(A) Requisite Knowledge. Mounting and dismounting procedures for riding fire apparatus, hazards and ways to avoid hazards associated with riding apparatus, prohibited practices, and types of department personal protective equipment and the means for usage.

(B) Requisite Skills. The ability to use each piece of provided safety equipment.

5.3.3* Establish and operate in work areas at emergency scenes, given protective equipment, traffic and scene control devices, structure fire and roadway emergency scenes, traffic hazards and downed electrical wires, an assignment, and SOPs, so that procedures are followed, protective equipment is worn, protected work areas are established as directed using traffic and scene control devices, and the fire fighter performs assigned tasks only in established, protected work areas.

(A) Requisite Knowledge. Potential hazards involved in operating on emergency scenes including vehicle traffic, utilities, and environmental conditions; proper procedures for dismounting apparatus in traffic; procedures for safe operation at



NFPA STANDARDS

emergency scenes; and the protective equipment available for members' safety on emergency scenes and work zone designations.

(B) Requisite Skills. The ability to use personal protective clothing, deploy traffic and scene control devices, dismount apparatus, and operate in the protected work areas as directed.

5.3.5* Exit a hazardous area as a team, given vision-obscured conditions, so that a safe haven is found before exhausting the air supply, others are not endangered, and the team integrity is maintained.

(A) Requisite Knowledge. Personnel accountability systems, communication procedures, emergency evacuation methods, what constitutes a safe haven, elements that create or indicate a hazard, and emergency procedures for loss of air supply.

(B) Requisite Skills. The ability to operate as a team member in vision-obscured conditions, locate and follow a guideline, conserve air supply, and evaluate areas for hazards and identify a safe haven.

dismounting apparatus in traffic; procedures for safe operation at emergency scenes; and the protective equipment available for members' safety on emergency scenes and work zone designations.

5.3.10* Attack an interior structure fire operating as a member of a team, given an attack line, ladders when needed, personal protective equipment, tools, and an assignment, so that team integrity is maintained, the attack line is deployed for advancement, ladders are correctly placed when used, access is gained into the fire area, effective water application practices are used, the fire is approached correctly, attack techniques facilitate suppression given the level of the fire, hidden fires are located and controlled, the correct body posture is maintained, hazards are recognized and managed, and the fire is brought under control.

(A) Requisite Knowledge. Principles of fire streams; types, design, operation, nozzle pressure effects, and flow capabilities of nozzles; precautions to be followed when advancing hose lines to a fire; observable results that a fire stream has been properly applied; dangerous building conditions created by fire; principles of exposure protection; potential long-term consequences of exposure to products of combustion; physical states of matter in which fuels are found; common types of accidents or injuries and their causes; and the application of each size and type of attack line, the role of the backup team in fire attack situations, attack and control techniques for grade level and above and below grade levels, and exposing hidden fires.

(B) Requisite Skills. The ability to prevent water hammers when shutting down nozzles; open, close, and adjust nozzle flow and patterns; apply water using direct,



NFPA STANDARDS

indirect, and combination attacks; advance charged and uncharged 38 mm (1½ in.) diameter or larger hose lines up ladders and up and down interior and exterior stairways; extend hose lines; replace burst hose sections; operate charged hose lines of 38 mm (1½ in.) diameter or larger while secured to a ground ladder; couple and uncouple various handline connections; carry hose; attack fires at grade level and above and below grade levels; and locate and suppress interior wall and subfloor fires.

5.3.17 Illuminate the emergency scene, given fire service electrical equipment and an assignment, so that designated areas are illuminated and all equipment is operated within the manufacturer's listed safety precautions.

(A) Requisite Knowledge. Safety principles and practices, power supply capacity and limitations, and light deployment methods.

(B) Requisite Skills. The ability to operate department power supply and lighting equipment, deploy cords and connectors, reset ground-fault interrupter (GFI) devices, and locate lights for best effect.

Fire Fighter II Standard

6.1.1 General Knowledge Requirements. Responsibilities of the Fire Fighter II in assuming and transferring command within an incident management system, performing assigned duties in conformance with applicable NFPA and other safety regulations and AHJ procedures, and the role of a Fire Fighter II within the organization.



| NOTES | STUDENT GUIDE |
|-------|---|
| | <p>I. The Dangerous Nature of Fire Fighting (<i>Essentials p. 49</i>)</p> <p>A. Each year fire fighters proudly proclaim that fire fighting is one of the world's most dangerous professions</p> <ol style="list-style-type: none">1. Unfortunately, many of them aren't aware that many injuries are due to carelessness; not just carelessness in the performance of their duties, but failure to follow accepted standards on such things as driving safety, protective clothing, physical fitness, and training2. Fire fighters have the responsibility and the duty to protect themselves so they can protect the public3. Every emergency call is dangerous for fire fighters <p>B. Fire fighter injuries and fatalities</p> <ol style="list-style-type: none">1. In 2007, 80,100 fire fighter injuries occurred in the U.S.<ol style="list-style-type: none">a. 48% occurred on the fireground in firefighting activitiesb. 6% occurred while responding or returning from a callc. 19% occurred on the scene of non-fire emergenciesd. 9% occurred during traininge. 17% occurred during other on duty activities2. Since 1999, more than 100 fire fighters have died each year on duty |



| NOTES | STUDENT GUIDE |
|-------|--|
| | <ul style="list-style-type: none">a. The "Hometown Heroes Survivors Benefit Act" became law in 2003b. This Act presumes that a heart attack or stroke are in the line of duty if the fire fighter was engaged in non-routine stressful or strenuous physical activity while on duty and the fire fighter becomes ill on duty or within 24 hoursc. On Sept. 11, 2001, the largest loss of fire fighters' lives in a single incident in history occurred as a result of the attack on the World Trade Center as 343 fire fighters were killedd. In 2008, 114 fire fighters died in the line of duty<ul style="list-style-type: none">(1) 37% of the deaths occurred on the fire-ground(2) 18% occurred while responding or returning from a call(3) 11% occurred on the scene of non-fire emergencies(4) 8% occurred during training(5) 26% occurred during other on duty activities <p>C. Major dangers associated with fire fighting</p> <ul style="list-style-type: none">1.<ul style="list-style-type: none">a. Heat and thermal stressb. Burned respiratory tract |



| NOTES | STUDENT GUIDE |
|-------|---|
| | <ul style="list-style-type: none">c. Can build up quickly and unexpectedly due to principles of heat transfer and changing conditions within fire building <p>2. Toxic gases and combustion by-products</p> <ul style="list-style-type: none">a.b. Hydrogen chloridec. Hydrogen cyanided. Carbon dioxidee. Hydrogen sulfide <p>3.</p> <ul style="list-style-type: none">a. Limits visibilityb. Excludes oxygen from airc. Hampers rescue efforts <p>4.</p> <ul style="list-style-type: none">a. Possible causes<ul style="list-style-type: none">(1) Large volumes of water poured on and into the structure - can also cause dangerous chemical or hazardous materials runoff(2)<ul style="list-style-type: none">(a) Trusses and beams burned through(b) Mortar joints cracked and loosened |



| NOTES | STUDENT GUIDE |
|-------|---|
| | <p>(c) Supports for overhangs and facades weakened</p> <p>b. Fire fighters must always be alert to the possible indicators of collapse</p> <ul style="list-style-type: none">(1) Large accumulations of water on floors(2)(3) Spongy or soft floors and roofs(4)(5) Walls bowing outward(6)(7) Loud groans and noises from structural members(8) Cracks <p>D. Health hazards associated with fire fighting</p> <ul style="list-style-type: none">1. Traumatic injuries<ul style="list-style-type: none">a. Sprains and strains -b. Wounds, cuts, bruisesc. Dislocations and fracturesd. Shocke. Eye injuries |



| NOTES | STUDENT GUIDE |
|-------|---|
| | <ul style="list-style-type: none">2. Stress injuries<ul style="list-style-type: none">a.b. Environmental stressors:<ul style="list-style-type: none">(1) Severe weather conditions(2) Contaminated atmospheres(3) High noise levelsc.<ul style="list-style-type: none">(1) The sound of the alarm alerting system(2) Interruption of meals and sleep(3) The need for speed when called on(4) Potential danger that awaits on scene(5) Poor work relationships may develop(6) Poor work atmosphere3.<ul style="list-style-type: none">a. Acute or immediate effectsb. Chronic - cumulative effects4. Other health hazards of fire fighting<ul style="list-style-type: none">a. Heart attack and stroke -b. Cancer |



| NOTES | STUDENT GUIDE |
|-------|---|
| | <p>II. Fire Service Safety Standards (<i>Essentials p. 51</i>)</p> <p>A. When injuries or deaths occur, regulations are established to reduce future risks</p> <ol style="list-style-type: none">1. As areas of risk are identified, regulations should be formulated to limit the hazards involved <p>B. National Fire Protection Association: NFPA 1500, <i>Standard on Fire Department Occupational Safety and Health Program</i></p> <ol style="list-style-type: none">1. Specifies the minimum requirements for any fire department's safety and health program2. NFPA 1500 topics include:<ol style="list-style-type: none">a. Safety and health-related policies and procedures<ol style="list-style-type: none">(1) Requires departments to develop:<ol style="list-style-type: none">(a) An organizational plan(b) A risk management plan(c) A safety and health policy(d) Establish a safety and health committee(e) Appoint a designated health and safety officer(2) A safety program must address all anticipated hazards and nonemergency issues such as substance abuse(3) The program must include appropriate SOPs |



| NOTES | STUDENT GUIDE |
|-------|--|
| | <ul style="list-style-type: none">b. Training and education: c. Fire apparatus, equipment and driver/operators<ul style="list-style-type: none">(1) Apparatus must meet the appropriate NFPA standard for safety design and equipment(2) All personnel riding in apparatus must be seated and securely belted whenever the vehicle is in motion d. Protective clothing and equipment: e. Emergency operations<ul style="list-style-type: none">(1) Departments must use an incident management system including a personnel accountability system(2) Rapid intervention and rehabilitation is required at emergencies(3) A post-incident analysis is required for all emergency operations f. Facility safety<ul style="list-style-type: none">(1) Fire department facilities must be designed to meet NFPA 101, <i>Life Safety Code</i>(2) Fire stations must also be smoke-free environments |



| NOTES | STUDENT GUIDE |
|-------|---|
| | <ul style="list-style-type: none"><li data-bbox="716 411 1214 443">g. Medical and physical requirement<ul style="list-style-type: none"><li data-bbox="764 489 1382 594">(1) NFPA 1500 requires medical evaluations for fire fighter candidates and then evaluations annually<li data-bbox="764 642 805 674">(2)<li data-bbox="716 753 1325 785">h. Member assistance and wellness programs<ul style="list-style-type: none"><li data-bbox="764 831 1395 978">(1) Departments must have member assistance program to help fire fighters with substance abuse, stress, and personal problems that affect job performance<li data-bbox="764 1026 1386 1131">(2) A wellness program must be established to help personnel with health-related problems<li data-bbox="667 1173 1369 1247">3. Fire fighter's responsibilities involving safety are outlined in NFPA 1500<ul style="list-style-type: none"><li data-bbox="716 1293 1390 1398">a. Each fire fighter must comply and participate in the department's occupational safety and health program<li data-bbox="716 1446 1386 1551">b. All personnel engaged in emergency operations shall be trained adequately for their assigned duties<li data-bbox="716 1600 740 1631">c.<li data-bbox="716 1751 1349 1824">d. Personnel involved in structural fire fighting shall wear full protective clothing |



| NOTES | STUDENT GUIDE |
|-------|---|
| | <ul style="list-style-type: none"> e. Self-contained breathing apparatus shall be used whenever entering a hazardous or potentially hazardous area f. <p>4. Other NFPA standards related to safety and health</p> <ul style="list-style-type: none"> a. NFPA 1521, <i>Standard for Fire Department Safety Officers</i> b. NFPA 1403, <i>Standard on Live Fire Training Evolutions</i> c. NFPA 1971, <i>Standard on Protective Ensemble for Structural Fire Fighting and Proximity Fire Fighting</i> d. NFPA 1981, <i>Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services</i> <p>5. NFPA 1500 requires that all incident management systems include a risk management plan</p> <ul style="list-style-type: none"> a. This plan sets criteria to make tactical decisions based on assessing the benefits to be gained compared to the risks involved b. IFSTA Principles of Risk Management <ul style="list-style-type: none"> (1) Activities that present a significant risk to the safety of members shall be limited to situations where there is a potential to save endangered lives |



| NOTES | STUDENT GUIDE |
|-------|---|
| | <p>(2) Activities that are routinely employed to protect property shall be recognized as inherent risks to the safety of members, and actions shall be taken to avoid these risks</p> <p>(3) No risk to the safety of members shall be acceptable when there is no possibility to save lives or property</p> <p>(4) Three key points about the principles:</p> <ul style="list-style-type: none">(a) Team integrity is vital to safety and must always be emphasized(b)(c) Fire fighters should not be committed to interior offensive fire fighting operations in abandoned or derelict buildings that are known or reasonably believed to be unoccupied <p>c. The International Association of Fire Chief's "10 Rules of Engagement for Structural Firefighting"</p> <p><u>Acceptability of Risk</u></p> <ul style="list-style-type: none">(1)(2) All interior fire fighting involves an inherent risk(3) Some risk is acceptable, in a measured and controlled manner(4) No level of risk is acceptable where there is no potential to save lives or savable property |



| NOTES | STUDENT GUIDE |
|-------|---|
| | <p>(5) Fire fighters shall not be committed to interior offensive fire fighting operations in abandoned or derelict buildings</p> <p><u>Risk Assessment</u></p> <p>(1) All feasible measures shall be taken to limit or avoid risks through risk assessment by a qualified officer</p> <p>(2) It is the responsibility of the Incident Commander to evaluate the level of risk in every situation</p> <p>(3) Risk assessment is a continuous process for the entire duration of each incident</p> <p>(4) If conditions change, and risk increases, change strategy and tactics</p> <p>(5) No building or property is worth the life of a fire fighter</p> <p>d.</p> <p>(1) If a fire fighter is injured while trying to extinguish a fire or save a victim, he or she cannot help others in danger</p> <p>(2) Fire fighters will also have to aid other injured fire fighters and will be unavailable to help other victims</p> |



| NOTES | STUDENT GUIDE |
|-------|---|
| | <p>C. Occupational Safety and Health Administration (OSHA) is the federal regulatory agency responsible for the health and safety of employees in the workplace</p> <ol style="list-style-type: none">1. Code of Federal Regulations 29 CFR 1910.15G - OSHA Fire Brigade Standard2. Federal OSHA regulations apply to federal employees who fight fires, private-sector employees, and incorporated volunteer fire protection associations<ol style="list-style-type: none">a. Federal OSHA has no jurisdiction over state and local government employees unless a state adopts OSHA standardsb. However, an agency may be held to OSHA standards in a civil court3. National Institute for Occupational Safety and Health (NIOSH)<ol style="list-style-type: none">a. Performs research to support OSHA activitiesb. Tests and approves SCBA4. Environmental Protection Agency (EPA) - Superfund Amendments and Reauthorization Act (SARA)<ol style="list-style-type: none">a. Requires both the community and employee right-to-know concerning hazardous materialsb. Requires the implementation of an Incident Management System on hazardous materials incidents |



| NOTES | STUDENT GUIDE |
|-------|---|
| | <p data-bbox="570 411 1403 443">III. Fire Service Safety and Health Program (<i>Essentials p. 59</i>)</p> <p data-bbox="618 489 1365 558">A. Each department should establish a fire fighter safety and health program to:</p> <ol data-bbox="667 604 1382 825" style="list-style-type: none"><li data-bbox="667 604 1382 674">1. Prevent injuries, deaths, illnesses, and exposure to hazardous atmospheres and contagious diseases<li data-bbox="667 720 1065 751">2. Prevent equipment damage<li data-bbox="667 795 1279 825">3. Reduce accidents and hazardous exposures <p data-bbox="618 871 1377 940">B. Fire fighting is a physically demanding and dangerous job</p> <ol data-bbox="667 987 1393 1854" style="list-style-type: none"><li data-bbox="667 987 1393 1056">1. Fire fighters need upper-body strength and endurance<li data-bbox="667 1102 1393 1203">2. Flexibility is necessary to use equipment and heavy tools, work in awkward positions, and move victims<li data-bbox="667 1249 1312 1281">3. Personal health as a fire fighter must include:<ol data-bbox="716 1327 1360 1854" style="list-style-type: none"><li data-bbox="716 1327 1360 1358">a. Stay informed about job-related health issues<li data-bbox="716 1404 1328 1436">b. Wear personal protective equipment (PPE)<li data-bbox="716 1482 740 1514">c.<li data-bbox="716 1591 740 1623">d.<li data-bbox="716 1711 1377 1780">e. Take measures to prevent exposure to airborne and bloodborne pathogens<li data-bbox="716 1824 1146 1854">f. Use proper lifting techniques |



| NOTES | STUDENT GUIDE |
|-------|---|
| | <ul style="list-style-type: none"><li data-bbox="716 449 1360 516">g. Clean and disinfect equipment used in patient care<li data-bbox="716 562 1377 630">h. Maintain a regular exercise program for physical fitness<li data-bbox="716 676 1325 743">i. Maintain a diet low in cholesterol, fat, and sodium<li data-bbox="716 789 732 823">j. <p data-bbox="618 905 1252 938">C. Employee assistance and wellness programs</p> <ul style="list-style-type: none"><li data-bbox="667 982 1377 1050">1. Departments can help its personnel and their families with an Employee Assistance Program (EAP)<li data-bbox="667 1096 1321 1163">2. An EAP can give help with problems that will affect job performance:<ul style="list-style-type: none"><li data-bbox="716 1209 976 1243">a. Substance abuse<li data-bbox="716 1289 1008 1323">b. Personal problems<li data-bbox="716 1369 841 1402">c. Stress<li data-bbox="716 1449 911 1482">d. Depression<li data-bbox="716 1528 862 1562">e. Anxiety<li data-bbox="716 1608 1016 1642">f. Financial problems<li data-bbox="667 1675 1398 1743">3. A wellness program can help personnel with health-related problems:<ul style="list-style-type: none"><li data-bbox="716 1789 878 1822">a. Nutrition<li data-bbox="716 1869 935 1902">b. Hypertension |



| NOTES | STUDENT GUIDE |
|-------|---|
| | <ul style="list-style-type: none">c. Tobacco use cessationd. Weight controle. Physical conditioning <p>4. Referral to the EAP can be voluntary from a fire fighter or mandatory from a supervisor</p> <p>5. Critical incident stress (CIS) management is an important area where fire fighter may need assistance</p> <ul style="list-style-type: none">a. CIS is a natural occurrence among fire fighters and results from a particularly traumatic or disturbing incident beyond normal stress<ul style="list-style-type: none">(1)(2)(3) Fire fighter being seriously injured or killed(4) Children being injured or killedb.c. The effects of unresolved stress can increase and can appear immediately or long after the incident occurredd. On scene effects of CIS include:<ul style="list-style-type: none">(1)(2) Anger(3) |



| NOTES | STUDENT GUIDE |
|-------|--|
| | <p>(4) Frustration</p> <p>e. Delayed effects of CIS include:</p> <ul style="list-style-type: none">(1) Feelings of guilt or responsibility(2)(3) Drug or alcohol abuse(4) Insomnia or sleep disturbances(5) <p>f. Personnel should be encouraged to discuss their feelings following a particularly traumatic incident</p> <p>g. A full debriefing session for involved personnel should be held within 72 hours of a traumatic incident with qualified individuals</p> <p>h. If left untreated, effects of CIS can lead to a more serious condition known as Post-Traumatic Stress Disorder</p> <p>IV. Safety on Apparatus (<i>Essentials p. 63</i>)</p> <ul style="list-style-type: none">A. Almost 25% of all fire fighter injuries occur while on fire apparatusB. Enroute to and from the scene<ul style="list-style-type: none">1.2. Always use all handrails when mounting vehicles3. |



| NOTES | STUDENT GUIDE |
|-------|---|
| | <ul style="list-style-type: none">4. Never ride on the tailboard of any vehicle5. Seat belts and safety bars must be used whenever the apparatus is in motion6. <p>C. At the scene</p> <ul style="list-style-type: none">1.2. Wait for a complete stop before unbuckling3.4. Always use caution around all vehicles <p>V. Fire Station Safety (<i>Essentials p. 65</i>)</p> <p>A. Many times, hazards in the fire station are over looked</p> <ul style="list-style-type: none">1. Fire station hazards not only endanger fire fighters but visitors as well2. Station injuries not only cause pain but also can embarrass the department and be costly3.4. Station hazards should be identified and corrected before an accident occurs |



| NOTES | STUDENT GUIDE |
|-------|--|
| | <p>B. Sprains and strains are the most common injuries occurring in the fire station</p> <ol style="list-style-type: none">1. Many such injuries are caused by improper lifting techniques<ol style="list-style-type: none">a. Not only do improper lifting techniques cause injuries but equipment may also be damagedb.c. Avoid using only the back musclesd. If an item is too heavy or bulky for one person to lift, personnel should always get assistance2. The second most common injuries are caused by slips and falls<ol style="list-style-type: none">a. Slips and falls are caused by poor footing on:<ol style="list-style-type: none">(1) Slippery surfaces(2) Objects or substances on floors(3) Inattention to footing(4) Uneven surfacesb. To prevent such incidents, good housekeeping is vital<ol style="list-style-type: none">(1) Spills must be cleaned immediately(2) Loose items, electrical cords, and equipment should be properly stored |



| NOTES | STUDENT GUIDE |
|-------|--|
| | <p>(3) Areas should be well-lighted so that any hazards can be readily seen</p> <p>C. Safety with tools and equipment</p> <ol style="list-style-type: none">1. Precautions with small hand tools<ol style="list-style-type: none">a.b. Avoid loose clothingc.d. Follow manufacturer's instructionse. Inspect tools before usef. Inspect and clean tools after use2. Power saws<ol style="list-style-type: none">a.b. Never force a saw beyond its design limitsc. Wear proper protective equipment, such as gloves, eye and hearing protectiond. Avoid using power saws in potentially flammable atmospherese. Keep bystanders out of the work areaf. Follow manufacturer's proceduresg.h. Use extra caution when carrying a saw overhead |



| NOTES | STUDENT GUIDE |
|-------|--|
| | <p>VI. Safety in Training (<i>Essentials p. 67</i>)</p> <p>A. Safety must be stressed in all training situations so that it becomes automatic in emergency situations</p> <ol style="list-style-type: none">1. Fire fighters must be proficient in a variety of emergency operations situations2. Much of fire training is spent refining and expanding on basic skills mastered in the past3. Additional training is necessary when new procedures and equipment is introduced4.<ol style="list-style-type: none">a. Physical discomfort and illness can make someone less alert and more prone to injuryb. Some personnel will not admit they are ill or unable to continue trainingc. Instructors and everyone involved in the training exercise should always watch every fire fighter for indications of illness or overexertion5. Weather conditions can affect fire fighter safety during training<ol style="list-style-type: none">a. Fire fighters should be dressed appropriately for weather conditionsb. Rain, snow, or ice can create additional hazards during training6. Horseplay and any other unprofessional conduct must not be allowed during training and can cause accidents and injuries |



| NOTES | STUDENT GUIDE |
|-------|--|
| | <p data-bbox="618 411 894 443">B. Live fire training</p> <ol data-bbox="667 489 1398 1703" style="list-style-type: none"><li data-bbox="667 489 1398 562">1. Fire fighter training must be as close to reality as possible to minimize surprises at emergencies<li data-bbox="667 604 1398 751">2. An important aspect of fire fighter training is live fire exercises to enable personnel to experience not only how to extinguish a fire but see how fire actually burns and reacts<li data-bbox="667 793 691 825">3.<li data-bbox="667 909 1398 1014">4. All live fire training exercises should be conducted strictly following the requirements of NFPA 1403, <i>Standard on Live Fire Training Evolutions</i><ol data-bbox="716 1056 1398 1703" style="list-style-type: none"><li data-bbox="716 1056 1398 1203">a. Site preparation: all potential hazards must be cleared from any structure before it can be used for live fire training (asbestos, utilities, structural deficiencies)<li data-bbox="716 1245 1398 1703">b. Safety:<ol data-bbox="764 1329 1398 1703" style="list-style-type: none"><li data-bbox="764 1329 1398 1402">(1) A student-to-instructor ratio must not exceed 5:1<li data-bbox="764 1444 1398 1518">(2) A safety officer and an instructor-in-charge must be appointed<li data-bbox="764 1560 1398 1633">(3) Humans cannot be used as simulated victims<li data-bbox="764 1675 805 1707">(4) |



| NOTES | STUDENT GUIDE |
|-------|--|
| | <p>c. Prerequisite training: all participants must have completed basic fire training including fire behavior, PPE, fire fighting tools, and tactical operations</p> <p>d. Water supply: separate water supplies are required for attack and backup hoselines</p> <p>e. Training plan:</p> <p style="padding-left: 40px;">(1) A training plan must be prepared and a briefing held with all involved</p> <p style="padding-left: 40px;">(2) Participants must walk through the building before any fires are set</p> <p>f. Fuel: flammable liquids are prohibited in acquired structures or burn buildings not specifically designed for their use</p> <p>g. Ventilation: there must be a means to prevent flashover or backdraft required</p> <p>VII. Safety at Emergency Operations (<i>Essentials p. 69</i>)</p> <p>A. Fire fighters must be continuously prepared for any emergency and have all equipment ready for immediate use</p> <p style="padding-left: 40px;">1. Fire fighters must never operate in any way that makes them part of the emergency or create a new one</p> <p style="padding-left: 40px;">2. Being prepared involves not only with needed equipment but also being prepared mentally and physically</p> |



| NOTES | STUDENT GUIDE |
|-------|--|
| | <p data-bbox="618 411 1354 520">B. The first-arriving fire officer at any emergency must assume command and set up an appropriately-sized incident management system</p> <ol data-bbox="667 562 1354 1661" style="list-style-type: none"><li data-bbox="667 562 1354 982">1. The critical factors he or she must consider are:<ol data-bbox="716 646 1354 982" style="list-style-type: none"><li data-bbox="716 646 1354 709">a.<li data-bbox="716 716 1354 758">b. The nature and extent of the emergency<li data-bbox="716 789 1354 831">c. The scene type, arrangement, and access<li data-bbox="716 863 1354 905">d. Available resources<li data-bbox="716 936 1354 978">e. Any special hazards<li data-bbox="667 1020 1354 1661">2. Based on these factors, the overall strategy to control the incident will be either offensive or defensive<ol data-bbox="716 1178 1354 1661" style="list-style-type: none"><li data-bbox="716 1178 1354 1398">a.<ol data-bbox="764 1325 1354 1661" style="list-style-type: none"><li data-bbox="764 1325 1354 1398">(1) All personnel working in the hazard zone must work within the incident action plan<li data-bbox="764 1440 1354 1482">(2)<li data-bbox="764 1556 1354 1661">(3) Fire fighters inside the hazard zone must be within voice, vision, or physical contact with each other at all times |



| NOTES | STUDENT GUIDE |
|-------|---|
| | <ul style="list-style-type: none">b. Defensive operations involve setting the hazard zone boundaries with a potential collapse zone and then keeping all personnel out of those boundaries<ul style="list-style-type: none">(1)(2) Fire fighters should never be injured working in a defensive mode3. Any emergency situation will involve some level of risk to fire personnel but this can be minimized by:<ul style="list-style-type: none">a. Working within the incident action planb. Assessing the situation and maintaining situational awarenessc. Wearing appropriate PPEd.e. Following all SOPsf. Maintaining communications with othersg. Doing a risk/benefit analysis for every actionh.i. Using a personnel accountability systemj. Having rapid intervention crews standing byk. Setting up rehab on extended operations |



| NOTES | STUDENT GUIDE |
|-------|--|
| | <ul style="list-style-type: none">l. Using emergency escape techniques when neededm. Maintaining discipline and team integrity when in a hazard zonen.o. Always keeping in mind that everybody on the fireground takes care of everybody else <p>C. Scene management will reduce confusion, limit the number of people near the emergency scene, and is vital to the safety of everyone involved</p> <p>D. Safety precautions at roadway emergency scenes</p> <ul style="list-style-type: none">1. Additional hazards at roadway emergencies:<ul style="list-style-type: none">a. Trafficb. Reduced water supply where many such fires occurc. Possibility of unknown contentsd. Stability of vehicles2. Fire personnel should be trained on how to work next to motor vehicle traffic in a way that minimizes their vulnerability3. Federal Rule 634.3 states, "All workers within the right-of-way of a Federal-aid highway who are exposed either to traffic (vehicles using the highway for purposes of travel) or to construction equipment within the work area shall wear high-visibility safety apparel. |



| NOTES | STUDENT GUIDE |
|-------|---|
| | <p>Fire fighters or other emergency responders working within the right-of-way of a Federal-aid highway and engaged in emergency operations that directly expose them to flame, fire, heat, and/or hazardous materials may wear retroreflective turnout gear that is specified and regulated by other organizations, such as the National Fire Protection Association. Fire fighters or other emergency responders working within the right-of-way of a Federal-aid highway and engaged in any other types of operations shall wear high-visibility safety apparel."</p> <ol style="list-style-type: none"> a. Includes responders to incidents within the highway right-of-way, and law enforcement personnel b. Safety vests must meet the Performance Class II or III requirements of the American National Standards Institute/International Safety Equipment Association c. Minimum requirements include use of fluorescent yellow-green, orange-red, or red background material with 360 degree reflective visibility <p>4. Exiting apparatus at a roadway emergency scene</p> <ol style="list-style-type: none"> (1) (2) Open the door partially and again check for approaching traffic (3) (4) Close the door |



| NOTES | STUDENT GUIDE |
|-------|--|
| | <p>(5) Maintain a low profile along the side of the apparatus with your eyes on the approaching traffic direction</p> <p>5. Apparatus placement at a roadway emergency scene</p> <ul style="list-style-type: none">a. The primary apparatus should work the scene and stage for functional useb. Secondary apparatus should stage as necessary to protect the scene and provide traffic controlc.d. Angle the apparatus so that the front tapers in the desired direction of transition and protects emergency workers from traffice. Block only those lanes occupied by the incident, possibly one additional lane for the safety and work environmentf. Unless blocking a lane, turn off all unnecessary lighting to reduce distractiong. Position apparatus to maximize sight distance when near hills or curvesh. Turn the steering wheel so the vehicle will turn away from the incident and responders if it is strucki.j. Do not commit unnecessary apparatus and personnel to the scene |



| NOTES | STUDENT GUIDE |
|-------|---|
| | <ul style="list-style-type: none">5. Traffic control zones<ul style="list-style-type: none">a.<ul style="list-style-type: none">(1) Used to warn and alert drivers that their normal driving pattern needs to be altered(2) Advanced warning must remain located upstream from the rear of the congestionb. Transition area: used by drivers to alter their normal driving pattern, such as changing lanes or stoppingc. Buffer space: short section of roadway between the transition area and the emergency work aread.<ul style="list-style-type: none">(1) Immediate area where responders are operating(2)e. Termination area: where drivers can resume normal driving patterns6. Traffic control techniques<ul style="list-style-type: none">a. Deploy traffic cones upstream from the blocking vehicle, tapered at an angle from the corner of the emergency vehicleb. NFPA 1500 requires a reflective highway safety sign as an advanced warning anytime a fire department vehicle is used in a blocking mode with the wording: "EMERGENCY SCENE AHEAD" |



| NOTES | STUDENT GUIDE |
|-------|--|
| | <p data-bbox="716 411 959 443">c. Use of flaggers</p> <p data-bbox="764 485 1317 558">(1) When signaling approaching traffic, a flagger should:</p> <ul data-bbox="813 600 1382 936" style="list-style-type: none"><li data-bbox="813 600 1382 674">(a) Face the traffic and stand on or near the roadway shoulder<li data-bbox="813 716 1357 747">(b) Always have an escape route planned<li data-bbox="813 789 854 821">(c)<li data-bbox="813 905 1382 936">(d) Use both a paddle sign and hand signals <p data-bbox="764 978 1357 1052">(2) Distance of flagger upstream from emergency work area</p> <ul data-bbox="813 1094 1252 1356" style="list-style-type: none"><li data-bbox="813 1094 1252 1125">(a) 35 mph speed limit = 130 feet<li data-bbox="813 1167 1252 1199">(b) 40 mph speed limit = 170 feet<li data-bbox="813 1241 1252 1272">(c) 55 mph speed limit = 335 feet<li data-bbox="813 1314 1252 1346">(d) 65 mph speed limit = 485 feet <p data-bbox="618 1398 854 1430">E. Control zones</p> <ol data-bbox="667 1472 1406 1850" style="list-style-type: none"><li data-bbox="667 1472 1406 1629">1. The concept of control zones was developed for hazardous materials incidents but should be used for various types of emergency scenes for the safety of fire personnel and the public<li data-bbox="667 1671 1357 1850">2. Perimeter control: a definitive area/space where emergency workers can operate without interference from spectators, which takes into consideration the hazards of the incident, weather, and topography |



| NOTES | STUDENT GUIDE |
|-------|--|
| | <ul style="list-style-type: none">3. Commonly broken down into zones<ul style="list-style-type: none">a.<ul style="list-style-type: none">(1) Immediate hazard area where mitigation takes place(2)(3) Size of area will vary depending on the nature of the incidentb.<ul style="list-style-type: none">(1) Immediately outside of the hot zone(2) For personnel directly supporting those in the hot zone(3) Access should be limitedc.<ul style="list-style-type: none">(1) Directly outside the warm zone(2)(3) Witnesses and family members of victims can be located hered. Crowd control line<ul style="list-style-type: none">(1) Outer boundary of cold zone(2) Control line for the general public |



| NOTES | STUDENT GUIDE |
|-------|---|
| | <p>F. Personnel accountability (<i>Essentials p. 74</i>)</p> <ol style="list-style-type: none">1. Each department should develop a standardized system of accountability for use at every incident2. Personnel accountability is necessary in case of:<ol style="list-style-type: none">a.b.c. Serious accident3. The Incident Management System will help account for personnel<ol style="list-style-type: none">a. Command must know at all times who is working in a hazard zone to determine who may be missing or trapped when a situation changes for the worstb. Fire fighters have died in situations where they were not known to be missing until it was too late4. Types of accountability systems<ol style="list-style-type: none">a.<ol style="list-style-type: none">(1) Each fire fighter is issued a personal identification tag(2) Tags are left at a designated location on a control board or identification chart (command post, apparatus compartment, accountability officer)(3) When leaving the fireground, personnel retrieve their tags |



| NOTES | STUDENT GUIDE |
|-------|--|
| | <ul style="list-style-type: none">b.<ul style="list-style-type: none">(1) Can provide more accountability for those within the hazard zone(2) Tags are given to an accountability officer as personnel enter the hazard zone<ul style="list-style-type: none">(a) Their entry times are recorded(b) The expected time of exit is also recorded based on the lowest SCBA pressure reading(c) A quick check of all PPE is also conducted before entryc.<ul style="list-style-type: none">(1) Each fire fighter is issued a tag with their information electronically recorded(2) When on scene, tags are touched to the control box, which electronically records their presence(3) Personal Accountability Reports are automatically conducted electronically <p>G. Safety precautions at fire emergency scenes</p> <ul style="list-style-type: none">1. Interior fire fighting operations are inherently dangerous situations and always require personnel to be alert and ensure all safety precautions are taken |



| NOTES | STUDENT GUIDE |
|-------|--|
| | <p>2. Interior operations safety techniques:</p> <ul style="list-style-type: none">a. Look over the building's exterior to locate windows and doors that could be used as escape routesb. Wear full PPE including SCBAc. Work as a teamd. Take any needed tools and equipment alonge.f. Remain in radio contact with personnel outside of the buildingg. Always have a hoseline or lifeline inside of the hazard zone as a guide to safetyh. Pay attention to the immediate surroundings and identify safety threatsi. Know the procedures for calling a "Mayday" to get immediate help when trapped or disoriented inside a fire buildingj.k. Look and listen for signs of collapsel.m. Never freelance |



| NOTES | STUDENT GUIDE |
|-------|--|
| | <ul style="list-style-type: none">3. Emergency escape operations<ul style="list-style-type: none">a. Involves breaking through doors, windows, or walls if necessary to escape a life-threatening situationb. Can be necessary in the event of:<ul style="list-style-type: none">(1) Sudden changes in fire behavior, such as flashover or explosion(2) Collapse(3) Loss or disoriented in a smoke-filled building and running out of air4. Rapid intervention crews (RIC)<ul style="list-style-type: none">a. Anytime fire fighters are working in an atmosphere that is immediately dangerous to life or health, they must work in teams of two or moreb. _____ : two fully trained and equipped fire fighters must be standing by outside of the atmosphere or building when two others are insidec. RIC members must be ready to enter immediately to rescue the entry teamd. RIC members may be assigned other support duties as long as they can immediately abandon those assignments when needed for rescue |



| NOTES | STUDENT GUIDE |
|-------|--|
| | <p>VIII. Fire Fighter Safety Summary</p> <p>A. Fire fighters have the responsibility and the duty to protect themselves so they can protect the public</p> <ol style="list-style-type: none">1. Fire fighters are no good to anyone if they become part of the emergency instead of controlling it2. Gone are the days of the "smoke-eater" and super-hero fire fighters who rush inside a burning building with no protection and no regard for their own safety <p>B. Always remember that you did not start the fire, you did not put the victims in that situation, and you are not obligated to sacrifice yourself in a heroic attempt to extinguish a fire or save a victim - especially not to recover a body</p> |