This drill is compliant with and supports the Safety Initiatives developed by the National Fallen Firefighters Foundation.

INSTRUCTOR GUIDE

TOPIC: OFFENSIVE VERSUS DEFENSIVE TACTICS

LEVEL OF INSTRUCTION:

TIME REQUIRED: TWO HOURS

MATERIALS: APPROPRIATE AUDIO-VISUAL MATERIALS

REFERENCES: Fire Department Safety Officer, 1st ed., International Fire Service Training Association; Essentials of Fire Fighting, 4th ed., International Fire Service Training Association; Fire Department Company Officer, 3rd ed., International Fire Service Training Association

==========

PREPARATION:

MOTIVATION: If we are to reduce the number of injuries and line of duty deaths relating to firefighting, we must take a better look at the total fireground picture and not just focus on the fire. The reliance on tunnel vision may cause us to overlook important signals that could change our approach to the incident and result in a less-than-desirable outcome.

OBJECTIVE (SPO):

The firefighter will demonstrate a general knowledge of firefighting tactics and some of the factors that influence an offensive or a defensive fire suppression effort.

OVERVIEW:

<u>OFFENSIVE VERSUS DEFENSIVE TACTICS</u>
* Building Construction
* Operational Readiness
* On Scene Capability
* Risk Benefit Analysis

OFFENSIVE VERSUS DEFENSIVE TACTICS

SPO: The firefighter will demonstrate a general knowledge of firefighting tactics and some of the factors that influence an offensive or a defensive fire suppression effort.

EO 1-1 Describe the basic factors related to building construction that may affect the stability of a structure during a fire.

EO 1-2 Identify elements that must be addressed to improve the operational readiness of responding emergency personnel.

EO 1-3 Identify what on-scene capability that should be available to improve the safety of the work environment.

EO 1-4 Identify the basic element of a risk benefit analysis as it applies to the emergency scene.

I. BUILDING CONSTRUCTION (EO 1-1)

Before making any decision regarding an offensive or defensive operation, it is necessary to understand the impact that the building involved can place on that decision.

A. Types of Building Construction

1. Type I – fire-resistive construction (walls, columns, beams, floors, and roofs made of non-combustible or limited combustible materials)

2. Type II – non-combustible or limited combustible construction (similar to fire-resistive construction except that the degree of fire resistance is lower)

3. Type III – ordinary construction (exterior walls and structural members constructed of non-combustible or limited combustible materials; interior structural members including walls , columns, beams, floors, and roofs completely or partially constructed of wood)

4. Type IV – heavy timber construction (exterior and interior walls and their associated structural members made of non-combustible or limited combustible materials; other interior structural members including beams, columns, arches, floors, and roofs made of solid or laminated wood with no concealed spaces; wood must have dimensions large enough to be considered heavy timber)

5. Type V – wood-frame construction (exterior walls, bearing walls, floors, roofs, and supports completely or partially of wood or other approved materials of smaller dimensions than those used in heavy timber construction)

B. Fire Development

1. Ignition – the period when the four elements of the fire tetrahedron come together and combustion begins; the fire is small and confined to the material first ignited

2. Growth – a fire plume begins to form above the fire which draws or entrains air from the surrounding space into the column; heat level rises and oxygen level begins to decline

3. Flashover – transition between the growth and fully developed stage and is not a specific event such as ignition; conditions in the area change very rapidly as the fire changes from one that is dominated by the burning of the materials first ignited to one that involves all the exposed combustible surfaces within the area

4. Fully Developed – occurs when all combustible materials in the area are involved in fire; maximum heat release based on available oxygen

5. Decay – occurs as available fuel is being consumed and the rate of heat release begins to decline; heat level lower and oxygen level very low

C. Factors Affecting Fire Development

1. Size, number, and arrangement of ventilation openings

2. Volume of the area

3. Thermal properties of the area enclosures

4. Ceiling height of the area

5. Size, composition, and location of the fuel package that is first ignited

6. Availability and location of the fuel packages (target fuels)

D. Effects of Fire on Common Building Materials

1. Wood – reaction of wood to fire conditions depends on the size of the wood and the moisture content

2. Masonry – minimally affected by fire and exposure to high temperatures although the mortar between bricks, block, and stone may be subject to more deterioration and should be checked for signs of weakening

3. Cast Iron – stands up well to fire and intense heat situations but may crack or shatter when rapidly cooled with water

4. Steel – structural members elongate when heated and may fail at approximately 1,000^{o}F

5. Reinforced Concrete – does not perform well under fire conditions and loses it strength and spalls

6. Gypsum – excellent heat resistance and fire retardant properties

7. Glass/Fiberglas – wire-reinforced glass may provide some thermal protection as a separation but for the most part conventional glass is not an effective barrier to fire extension; the material used to bind fiberglass may be combustible and can be difficult to extinguish

E. Indicators of Building Collapse

1. Cracks or separations in walls, floors, ceilings, or roof structures
2. Evidence of existing structural instability such as the presence of tie rods and stars that hold walls together
3. Loose bricks, blocks, or stones falling from buildings
4. Deteriorated mortar between the masonry
5. Walls that appear to be leaning
6. Structural members that appear to be distorted
7. Fires beneath floors that support heavy machinery or other extreme weight loads
8. Prolonged fire exposure to the structural members
9. Unusual creaks and cracking noises
10. Structural members pulling away from walls
11. Excessive weight of building contents

II. OPERATIONAL READINESS (EO 1-2)

Before any response can be made to an incident, there are several factors that must be considered and addressed in order to have a safe and effective response

A. Training – are the personnel responding on the incident trained to carry out the duties and responsibilities that are expected to be assigned

1. Drivers trained to get the apparatus to the scene and back to quarters safely, position it for maximum utilization, and operate the pump or the ladder quickly and efficiently
2. Officers trained to perform the size up, develop an overall strategy, devise tactics to implement the strategy, lead an aggressive yet safe suppression, and coordinate any activities assigned
3. Firefighters trained to perform the duties to which they will be assigned in a safe and effective manner
4. Safety officer to maintain the overall safety of the incident scene

B. Staffing – is there adequate staffing to carry out the duties and responsibilities that the unit will be assigned in a safe and efficient manner

    1. Staffing on the apparatus to make an initial attack or provide support for an engine crew

    2. Staffing arriving on more than one piece of apparatus to make up necessary minimum staffing for an assignment

    3. Length of time it will take to have adequate staffing on the scene to initiate an interior attack while maintaining a rapid intervention team in place

C. Apparatus

    1. Adequate apparatus response based on the hazard involved

    2. Potential for delay in arrival of some of the units due to road conditions, weight and size limitations, travel distances, or units not being staffed immediately

    3. Need for specialized apparatus due to the particular hazard

    4. Apparatus access the location on all sides

D. Incident Operations

    1. Incident command system in place and everyone be trained on its application and use

    2. Chief officer responding to assume overall scene command

    3. Adequate radio frequencies available to a working incident

    4. Standard operating procedures in place to provide a guide for the placement of responding units, provide for the establishment of a rapid intervention team, include personnel accountability, and provide for firefighter rehabilitation

    5. Establish an initial fire attack of 100 GPM with 2 minutes of arrival

    6. Backup line capable of producing at least 200 GPM in place in place within a reasonable time

    7. Personnel ready mentally and physically for the incident

8. Mutual aid agreements in place to acquire resources that may not be available within the department

E. Pre-Incident Planning – has information been collected on buildings especially those with the potential for a large loss of life or property (target hazards)

1. Occupant protection

a. Location and number of exits

b. Location of escalators and elevators

c. Location of windows and other openings suitable for rescue access

d. Special evacuation considerations such as disabled occupants, very old or very young occupants, and large number of occupants

e. Location and areas of safe refuge

f. Flammable and toxic interior finishes or processes

2. Potential life hazards to firefighters

a. Flammable or combustible liquids

b. Toxic chemicals

c. Explosives

d. Reactive materials

e. Radioactive materials

f. Processes performed in the building that are inherently dangerous

3. Physical condition of the structure

a. Structural components that may fail during a fire

b. Construction materials that might lose their strength when exposed to fire

c. Ornamental building fascia, awnings, and marques

d. Unsupported partitions or walls

e. Roof construction

f. Conditions in the building that can become dangerous during a fire

g. Stacked or high-piled storage

h. Heavy objects on the roof that can cause roof collapse

i. Heavy equipment that may fall through a floor or cause the floor to collapse

j. Building features that may confuse or trap firefighters during a fire

k. Large open areas

l. Dead-end corridors or hallways

m. Open vats, pits, or shafts

n. Openings into underground utility shafts or tunnels

o. Multilevel floor arrangement

p. Maze-like room divisions or partitions

q. Alterations that disguise the original construction

III. ON SCENE CAPABILITY (EO 1-3)

A. Size-Up

1. Size-up is accomplished by doing a complete 360-degree walk-around of incident scene noting condition of emergency, potential hazards to personnel, and deployment of resources

2. At structural fires, incident commander notes type of construction in order to visualize fuel or fire loading and identify potential weak points

3. Stage is the fire in and next likely stage

4. Length of time the fire has been burning and the impact it has had on the building (if the fire has been burning freely for 20 minutes, consideration should be given to a defensive attack)

5. Condition of the structure

6. Complete walk-around may not always be possible due to terrain, fire or hazardous materials spread, traffic congestion, building size, or other congestion situations

B. Establishing Control Zones

1. Control zones allow for accounting of victims, efficient use of personnel accountability system, and prevention of non-emergency personnel from endangering themselves

2. Establishing control zones at incident helps to organize scene into three manageable areas

    a. Restricted area or hot zone - Area where incident is occurring; only personnel directly involved in operation and who are fully equipped with protective clothing and SCBA are allowed into this area

    b. Limited access area or warm zone - Area immediately outside hot zone occupied by personnel and equipment that are supporting hot zone personnel; access to area is limited to personnel supporting operation and who are wearing protective clothing and SCBA

    c. Support area or cold zone - Outermost ring around incident where command post, information officer location, rehab area, and staging area are established; beyond cold zone, outer perimeter is established to provide crowd control and prevent unauthorized personnel from entering

3. Other types of protective zones include collapse zone, which is located in hot zone near walls or structures

    a. Collapse zone should be equal to one and a half times height of building

    b. Established if structural integrity of building becomes questionable

C. Fire Fighting Strategies and Tactics

1. Fire fighting strategies and tactics include placement of apparatus, use of attack and support hoselines, ventilation procedures, rescue operations, and forcible entry operations

2. Tactics may include carrying any and all of the following duties in the order presented:

    a. Rescue including associated search and removal of victims

    b. Exposure protection – interior and exterior exposures

c. Confining the fire

d. Extinguishing the fire

e. Overhaul after the fire has been knocked down

3. While the five duties are being carried out in priority order, ventilation and salvage should also be taking place

4. If there is a confirmed rescue to be made, the initial responders may have to carry out that rescue without a rapid intervention team being in place; if not, no interior attack should be initiated until the rapid intervention team is in on the scene, in place, and ready if needed

5. Necessary personnel and apparatus arrived on scene and ready for operation

IV. RISK BENEFIT ANALYSIS (EO 1-4)

A. Managing the Risks

1. Incident commander must perform a risk analysis to determine what hazards are present, what are risks to personnel, how can risks be eliminated or reduced, what are chances that something may go wrong, and what benefits are gained based upon strategy employed

2. By incorporating risk management into incident management system, basis of emergency incident risk management is built on

a. Regular assessment of conditions

b. Essential decision making

c. Tactical design

d. Routine evaluations and modifications

e. Procedural command and management

3. As an incident continues, incident commander must routinely evaluate incident action plan and modify it as necessary

4. Risk assessment ensures that all members operating on incident scene understand incident action plan and are conforming to it

5. Risk assessment should be conducted periodically throughout incident, especially when strategic objectives are reached

    a. Primary search completed

    b. Fire knocked down

    c. Patient extrication completed

    d. Hazardous material spills or leaks contained

6. Risk management should consider the following decision-making model

    a. Each emergency response is begun with the assumption that they can protect lives and property

    b. They will risk their lives a lot, if necessary, to save savable lives

    c. They will risk lives a little, and in a calculated manner, to save savable property

    d. They will not risk their lives at all to save lives and property that has already been lost

B. Strategies in Use at an Incident Scene

1. When goal is to extinguish a fire, incident commander must decide on an offensive, a marginal, or a defensive strategy based on his evaluation of situation

2. An offensive strategy is an aggressive attack on fire is based on stage of fire, its location, structural integrity of building, available resources, etc.

3. Marginal strategy, sometimes referred to as transitional or rescue strategy focuses on saving of human life

    a. Marginal strategy is a drastic choice and may result in violation of such safety procedures as "two-in/two-out rule"

    b. Charged hoselines are advanced for purpose of supporting rescue and protecting crews, not for fire extinguishment

4. Defensive strategy is implemented when stage of fire is advanced or an interior attack would be too dangerous; hose streams are directed at preventing spread of fire beyond initial site, and fire is allowed to burn itself out

C. Defensive Mode

1. Intended to isolate or stabilize the incident so that it does not get any worse

2. May mean sacrificing the building on fire to save others that are not involved

3. Generally involves an exterior attack

4. May be chosen because there are no resources available to conduct a safe and effective an offensive attack

5. Burning building may not be worth the risk to firefighter

    a. Building abandon or derelict

    b. Building so heavily involved in fire that no reasonable expectation that anyone inside could survive

    c. Too few firefighters to mount an effective attack

D. Offensive Mode

1. Involves taking direct action to mitigate the problem

2. Includes an aggressive interior attack by one or more engine companies

3. Involves a reasonable chance that occupants inside the building are still alive

4. If there are occupants still unaccounted for and that may be trapped inside but still be alive, then an offensive mode is indicated

E. Planning for Protective and Supportive Resources

1. Incidents that occur during civil unrest may require an increase in police protection for fire fighting forces

2. To implement the incident action plan, procedures should be in place and communicated to all personnel as part of standard operating procedures and area emergency management system

3. Long-term events or those occurring during adverse weather conditions may require additional logistical support

4. Procedures for acquiring auxiliary power and lighting for night operations must also be in place

F. Other Considerations

1. Is the building under renovation that would cause questioning the structural stability

2. Is truss construction involves, especially the use of lightweight trusses

3. Can the fire be controlled and extinguished safely or is it a controlled burn

4. Can the available personnel continue the operation that is currently being undertaken or are replacement personnel needed

REVIEW: It would be good to review articles on incidents where there may have been a firefighter injury or death to see if there are any lessons to be learned regarding offensive or defensive operations.

OFFENSIVE VERSUS DEFENSIVE TACTICS
* Building Construction
* Operational Readiness
* On Scene Capability
* Risk Benefit Analysis

REMOTIVATION: It is better to err on the side of safety and make sure that the number priority on the fire scene, the emergency responders, are not placed in a situation where life is traded for saving property. No property is worth the value of a firefighter's life. We should also not be in a situation of potentially trading the lives of firefighters for the lives of victims who may not be savable.

ASSIGNMENT:

==========

EVALUATION: