

INSTRUCTOR GUIDE

TOPIC: HOW GOOD IS YOUR SIZE UP?

LEVEL OF INSTRUCTION:

TIME REQUIRED: TWO TO THREE HOURS

MATERIALS: APPROPRIATE AUDIO-VISUAL MATERIALS

REFERENCES: FIRE DEPARTMENT COMPANY OFFICER, 3RD EDITION, IFSTA;
ESSENTIALS OF FIRE FIGHTING, 4TH EDITION, IFSTA; MANAGING COMPANY
TACTICAL OPERATIONS: DECISIONMAKING, NATIONAL FIRE ACADEMY

PREPARATION:

MOTIVATION: The size up of a structure fire by the initial arriving officer sets the tone for the eventual outcome of the incident. Being able to read what has happened and what will happen after arrival affects the deployment of resources and the ultimate safety of all personnel operating on the scene.

OBJECTIVE (SPO): 1-1

The individual will demonstrate a basic understanding of size up for a structural fire incident.

OVERVIEW:

HOW GOOD IS YOUR SIZE UP?

- * Pre-arrival Information
- * Structure Involved
- * Fire Conditions
- * Scene Priorities
- * Risk Assessment

HOW GOOD IS YOUR SIZE UP?

- SPO 1-1 The individual will demonstrate a basic understanding of size up for a structural fire incident.
- EO 1-1 Demonstrate an understanding of the information that can be obtained prior to arrival at the emergency scene.
- EO 1-2 Demonstrate an understanding of how the fire building can affect size up decisions.
- EO 1-3 Demonstrate an understanding of how fire conditions can affect the size up decisions.
- EO 1-4 Demonstrate an understanding of the scene priorities that must be addressed during the size up process.
- EO 1-5 Demonstrate an understanding of the risk assessment that must be made during the size up process.

This drill should be conducted as an interactive session for not only operational officers but all operational personnel. Each participant may have something to contribute to the drill as well as the scene size up.

Before starting it may be appropriate to make sure that everyone understands what size up is. It is considered to be an evaluation or assessment of the situation and is a continuing process that begins prior to the incident and continues after the conclusion of the incident when lessons learned from the incident can be incorporated into future planning.

A. PRE-ARRIVAL INFORMATION (EO 1-1)

1. Building pre-fire plans, if available
2. Area maps with access and water source information
3. Type of occupancy and potential occupancy level
4. Weather conditions
5. Time of day and day of week
6. Apparatus responding (may indicated delayed arrival)
7. Minimum staffing (if such a standard exists)

B. STRUCTURE INVOLVED (EO 1-2)

1. Type of structure
 - a. Residential
 - b. Mercantile
 - c. Manufacturing
 - d. Educational
 - e. Health care
 - f. House of worship
2. Construction
 - a. Fire resistant
 - b. Non-combustible

- c. Ordinary
 - d. Heavy timber
 - e. Wood
3. Access points and obstacles to access
 4. Designation of sides, exposures, and floors
 5. Potential hazards
 - a. Structural collapse (collapse zone based on height of building)
 - b. Closed containers
 - c. Utility service

One of the first things that may need to be done is to make a quick check of the building so that a view of as many sides of the building as possible is made.

It may be necessary to stage responding apparatus near the scene until all the necessary information about fire location and potential rescues is known.

C. FIRE CONDITIONS (EO 1-3)

1. Location of smoke and fire (if visible from the exterior)
2. Color of smoke and flames
 - a. White smoke – hay, forest, vegetable composition, phosphorous
 - b. Yellow smoke – nitrate film, sulphur, sulphuric acid, smokeless powder
 - c. Black smoke – petroleum base, rubber, tar
 - d. Red flame – petroleum base
 - e. Blue flame – alcohol (small quantities)
 - f. Orange flame – alcohol (large quantities)
3. Intensity of fire
4. Fire impact on structure

5. Water requirements
 - a. One cubic foot of oxygen will produce 535 BTU's of heat
 - b. Normal air contains 20% oxygen
 - c. Flame production arrested at 14% oxygen
 - d. Oxygen available to produce heat is 7%
 - e. Seven percent of 535 BTU's is 37 BTU's of heat released for each cubic foot of normal air
 - f. Example: area 37.5' x 20' by 10' is 7,500 cubic feet
 - g. 7,500 cubic feet times 37 BTU's produces 277,500 BTU's
 - h. To raise the temperature of 1 pound of water 1°F requires one BTU
 - i. If one pound of water at 62°F is raised to 212°F liquid, 150 BTU's would be required
 - j. When one pound of water at 212°F is converted to steam, an additional 970 BTU's are absorbed
 - k. The total number of BTU's absorbed in converting one pound of water at 62°F to steam is 1,120 BTU's
 - l. Water weighs 8.33 pounds per gallon
 - m. One gallon of water, when converted to steam, will absorb 9,330 BTU's (8.33 times 1,120)
 - n. If the area produces 277,500 BTU's and each gallon of water absorbs 9,330 BTU's when converted to steam, 30 gallons of water would be required to control the fire (277,500 divided by 9,330)
 - o. The water should be applied in no longer than 30 seconds
 - p. Flow rate would be 60 gallons per minute
 - q. A safety factor of 25% should be considered making to total flow rate 75 gallons per minute (60 times .25 = 15 plus 60)
 - r. Shortcut method is cubic feet divided by 100

6. Resource requirements

- a. Engines (pumping capacity, water, or fire fighting equipment)
- b. Support units (trucks, squads, others)
- c. Tankers
- d. Emergency medical service
- e. Command staff
- f. Rehab
- g. Specialty units
- h. Personnel
- i. Contingency planning (personnel and apparatus uncommitted and available if needed)

D. SCENE PRIORITIES (EO 1-4)

1. Rescue

- a. Those in immediate danger
- b. Those near the danger area
- c. Others

2. Exposures

- a. Other parts of the structure
- b. Other structures
- c. Livestock and other property
- d. Environment

3. Confinement - number, size, and placement of lines

4. Extinguishment – number, size, and placement of lines

5. Overhaul
6. Ventilation
 - a. When – immediately for rescue or delayed until fire attack is ready
 - b. Where – vertical or horizontal
 - c. How – positive pressure, negative pressure, natural, hydraulic)
 - d. Coordination with fire attack
7. Salvage
8. Acronym – RECEO VS

E. RISK ASSESSMENT (EO 1-5)

1. Condition of structure – offensive or defensive operation
2. Risk versus benefit
 - a. Risk a lot to save a lot
 - b. Risk little to save little
 - c. Risk nothing to save nothing)
3. Expected outcome – can the structure be saved

REVIEW:

HOW GOOD IS YOUR SIZE UP?

- * Pre-arrival Information
- * Structure Involved
- * Fire Conditions
- * Scene Priorities
- * Risk Assessment

REMOTIVATION: Size up is a combination of available information, experience, and knowledge that result in formulating certain decisions on the emergency scene. Quick decisions based on the size up can impact the outcome of the incident.

ASSIGNMENT: None.

