

# Enchanted Circle Regional Fire Association

## Model Operating Procedures

### *Water Supply and Fire Stream Management*

#### **Purpose**

This procedure is intended to guide Company and Command Officers in determining water supply needs, and selecting appropriate hose size and nozzle configurations. It establishes predetermined minimum flow capabilities for *offensive interior* attacks in *residential* and *commercial* buildings, and suggested minimum rates for *defensive* attacks.

In fire suppression operations, it is the application of water to burning fuels that extinguishes the fire. Rapid knockdown of the fire depends on an adequate water supply and adequate gpm flow rates from the attack lines. Delayed or inadequate water supply and/or inadequate attack line flow rates leads to increased risk to firefighters and occupants of the building, and greater fire loss.

#### **Water Supply**

First arriving engine companies approaching a scene with any evidence of a working fire should preplan for a secure water supply. This will typically require one of the three following actions:

- In an area served by a pressurized hydrant system, the first arriving engine company should lay in their own supply line (*a supply line is a minimum 3" or larger*).
- In an area not served by a pressurized hydrant system, and a fire building with poor access, the first arriving engine company should lay in a supply line from a location with adequate access for a supply pumper and water tender shuttle.
- In an area not served by a pressurized hydrant system and on-site draftable water or good access for a water tender shuttle, the first arriving engine company should deploy hard suction hose and/or portable tanks.

#### **Fire Stream Selection**

The selection of hose size and nozzle type will be determined by the building class (*residential* or *commercial*) and the selected strategy (*offensive* or *defensive*). The selected fire stream should meet the following criteria:

- Adequate rate (gpm) of application to rapidly overcome the energy production of the fire.
- Of adequate reach and penetration to reach the seat of the fire.
- Create as little disturbance to thermal stratification as possible (*interior offensive* operations)

A straight stream pattern from a combination nozzle or a solid bore stream is the fire stream of choice in interior fire attack. Straight or solid bore streams have the advantage of penetrating heated atmospheres to reach the seat of the fire, while providing the least disruption to the thermal "layering" commonly encountered in these attacks. Use of fog patterns will usually be avoided because they disrupt this thermal layering bringing hotter gasses down to floor level, and they produce great amounts of steam which causes a much greater potential for burns of victims and firefighters.

#### **Residential and Commercial Classifications**

The classification of "Residential" is determined by room sizes and fuel load that would be typical of a single family residence. It would also apply to certain business occupancies that have small rooms and light to moderate fuel loading.

The classification of "Commercial" as used in this standard, implies large room spaces and/or heavy fuel loading (stock, storage, etc.).

### **Minimum Fire Flows for Interior Residential Attack**

Any attack line used in an interior attack at a residential type structure shall be capable of flowing a minimum of 150 gpm. Preconnected attack lines shall be flow tested in their standard preconnected configuration (hose size, length, and nozzle) to assure that it meets this minimum and to identify typical pump pressure required to produce the minimum flow. 1 3/4" attack lines will be typical.

### **Minimum Fire Flows for Interior Commercial Attack**

Any attack line used in an interior attack at a commercial type structure shall be capable of flowing a minimum of 250 gpm. Preconnected attack lines shall be flow tested in their standard preconnected configuration (hose size, length, and nozzle) to assure that it meets this minimum and to identify typical pump pressure required to produce the minimum flow. 2 1/2" attack lines with 1 1/8" solid bore tips operating at 50 psi nozzle pressure will be typical.

### **Offensive Interior Attack Fire Stream Considerations**

An offensive attack with hose lines and nozzles capable of adequate gpm flow should knock down the fire rapidly. If an interior hose line has been operated for 10 seconds without knocking down the fire, make an adjustment. Either the stream is not reaching the fuels that are burning, or the hose line/nozzle combination is not delivering an adequate flow rate to extinguish the fire. Change locations or get a bigger line.

### **Engine Mounted Master Streams**

Engine mounted master streams (deck guns) should be capable of flowing a minimum of 750 gpm. Solid bore tips offer the advantage of greater reach, better penetration, a more intact stream and lower operating pressure than an equivalent combination nozzle set to straight stream.

### **Elevated Master Streams**

An elevated master stream has the advantage of large flow volumes and the ability to reach otherwise inaccessible fire. Elevated master streams should be capable of flowing 1000 gpm.