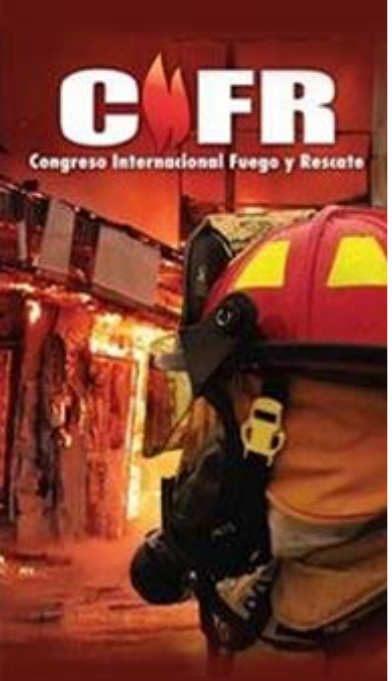

Large Area Fires

Tactical Implications

Valdivia, Chile
January 2010

CFBT-US
Not just what and how, but why!

Powell Doctrine

- Necessity to commit troops;
- Compelling risk posed by inaction
- Overwhelming resource application
- Clear exit strategy

General Collin Powell, USA

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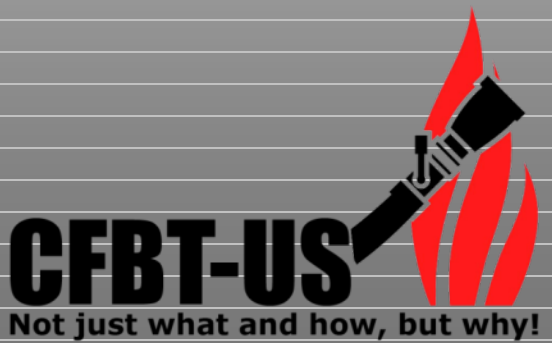
Learning Outcomes

- Recognize the influence of compartment size on fire development.
- Identify how compartment and building size influence tactical flow rate.
- Explain impact of building size on tactical operations



Size & Compartmentation

- Fire develops more quickly in a small compartment.
- Highly compartmented buildings may slow fire spread.
- Large compartments contain more air and may have a substantial fuel load.

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Reading the Fire

- Compartment Volume
- Ceiling Height
- Opening Size

Consider volume, ceiling height, and opening size when assessing smoke and air track indicators!

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Tactical Flow Rate

- Heat release rate (HRR) is the fire's power
- Effective and efficient flow rate is the firefighter's power

Tactical flow Rate (TFR) is the flow required to effectively and efficiently achieve fire control

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Estimating Tactical Flow Rate

- Estimating flow requirements on the fireground is generally based on experience.
- Flow rate formula provide a simple means to estimate required flow under non-emergency conditions
- There are multiple methods that can be use to estimate tactical rate of flow:
  - Iowa Formula (Indirect Attack Only)
  - US National Fire Academy (Direct Attack Only)
  - Grimwood Tactical Rate of Flow
  - Hartin Tactical Rate of Flow

Estimating Tactical Flow Rate

Hartin Tactical Rate of Flow

$$m^2 \times 8 = L/min$$

This method assumes not more than a 2 m ceiling height, if the ceiling height is higher, the formula must be adjusted to account for the larger compartment volume.

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Tactical Implications

Large, and particularly large, enclosed buildings present a number of serious tactical implications:

- Limitations on 3D tactics such as gas cooling (Grimwood 70 m^2)
- Greater potential for disorientation (Mora Disorientation Study)
- Increased resource and time requirements for fire control and ventilation
- Impracticality of residential tactics for primary search (Worcester)

Tactical Operations

Fire Control

- Strategic mode and strategies before tactics! Consider value, time, & size.
- If offense is indicated, take the fire first and control the fire environment.
- Consider a direct attack from the closest point of entry in enclosed structures.
- Multiple lines working together may be necessary to control the environment
- Have clear trigger points for disengagement!

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Tactical Operations

Tactical Ventilation

- Consider resource availability and capability in selecting ventilation tactics.
- Vertical ventilation may be effective, but large buildings require extremely large exhaust openings.
- Positive pressure ventilation in large structures may require multiple, large blowers.
- Positive pressure may be used as both a ventilation and anti-ventilation tactic.

Tactical Operations

Primary Search

- ***Do not apply residential tactics in large area buildings!***
- It is unlikely that you will be able to effectively search large area buildings if victim location is unknown.
- Search with a hoseline to maintain orientation and for self-protection.


OTAVA
0-19
0-16
ruohonjuo

ed.hartin@cfbt-us.com
1 (503) 793-1296

http://www.cfbt-us.com