Large Area Fires

Tactical Implications
Powell Doctrine

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

General Collin Powell, USA
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
- 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.
Reading the Fire

- Compartment Volume
- Ceiling Height
- Opening Size

Consider volume, ceiling height, and opening size when assessing smoke and air track indicators!
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.
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 used 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
Hartin Tactical Rate of Flow

\[ m^2 \times 8 = L/\text{min} \]

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

- Limitations on 3D tactics such as gas cooling (Grimwood 70 m²)
- 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)
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!
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.
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.