

# High-rise Fire-fighting Instructor (HRFI)

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UK Fire Officer Paul Grimwood has researched firefighting experience in high-rise buildings since 1975 and his 28-page report in FOG ATTACK (1991) demonstrates that many incident command systems and Standard Operating Procedures (SOPs) for tall structures are based on out-of-date policies. The author worked on detachment with ten big city fire departments in the USA during the 1990s and attended fires in five of the world's tallest buildings including the World Trade Center, New York City and the Sears Tower in Chicago. He also visited the scenes of past conflagrations at the Interstate Bank in Los Angeles and the Churchill Plaza in the UK where he discussed firefighting operations with firefighters and chiefs who attended these incidents. Using several case histories he explains how incident command systems, a detailed pre-plan (SOP), manpower and equipment logistics are key factors in any successful operation.

A 5,000m<sup>2</sup> fire located high up within the confines of a downtown office high-rise structure is a completely different scenario to the same fire located on the second floor! The logistical demands placed on firefighters have demonstrated that Incident Command needs to function well in advance of actual needs for as a plan is initiated there is a lengthy time delay prior to actioning! At two fires in 1988 (Interstate Bank) and 1991 (Churchill Plaza), US and UK firefighters were faced with office fires on upper levels that demanded a fresh 30 minute SCBA cylinder every 33 seconds for the entire duration of the Interstate fire and similar requirements for a fresh 45 minute cylinder every 80 seconds in the Plaza fire! Similarly in both fires, hundreds of firefighters were required to undertake a wide range of duties, estimated at both incidents as one firefighter for every 25m<sup>2</sup> of fire involvement.

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## Topics covered during the course –

- 1.1 High-rise building construction**
- 1.2 High-rise capitals of the World
- 1.3 Potential for collapse of high-rise structures whilst under fire attack
- 1.4 Tactical advantages and disadvantages of high-rise construction
  
- 2.2 Fire Protection in High-rise Structures**
- 2.3 Reliability of sprinklers
- 2.4 Compartmentation
- 2.5 Pressurization of escape routes
- 2.6 Protection of Escape Routes
- 2.7 Automatic Fire Detectors
- 2.8 Manual Fire Alarms
  
- 3.1 Building Services for Firefighters**
- 3.2 Fire Lifts
- 3.3 Rising Mains
- 3.4 Fixed Ventilation Systems
- 3.5 Smoke Towers
- 3.6 HVAC

**4.1 Air Dynamics in Tall Buildings**

- 4.2 Stack Effects
- 4.3 Wind Effects
- 4.4 Ventilation Effects

**5.1 Compartment Fire Dynamics**

- 5.2 Fire Load
- 5.3 Burning Characteristics
- 5.4 Burning Regimes
- 5.5 Rapid Fire Phenomena
- 5.6 Maximum Fire Intensity

**6.1 Compartment Firefighting**

- 6.2 Basic CFBT Training Concepts
- 6.3 Dynamic Risk Assessment
- 6.4 Fire in the lower regions of a tall building
- 6.5 Fire in the upper regions of a tall building
- 6.6 Spread of fire through tall structures
- 6.7 Firefighting in Large Open-plan Compartments
- 6.8 Firefighting in residential Tower Blocks

**7.1 Incident Command at High-rise Incidents**

- 7.2 Pre-Planning
- 7.3 Public Education & Community Safety Approaches
- 7.4 Reaction Time
- 7.5 Strategic and Tactical Delays
- 7.6 Logistical & Resource Demands
- 7.7 Building Fire Plan
- 7.8 Command Post Structures
- 7.9 Fire Reconnaissance & Investigation (Locating the Fire)
- 7.10 Approaching the Fire
- 7.11 Communication
- 7.12 Accountability

**8.1 Strategy & Tactics in High-rise Buildings**

- 8.2 Offices
- 8.3 Residential Tower Blocks
- 8.4 Other
- 8.5 Known Terrorist Situations
- 8.6 Helicopter Support
- 8.7 Contingency Arrangements
- 8.8 Tactical Innovations

**9.1 HRFI Assessments**

- 9.2 Case Histories
- 9.3 Lectures
- 9.4 Practical Training

**10.1 Practical Training Modules**

- 10.2 Pre-Planning & Community Safety Visits
- 10.3 Reaction Times
- 10.4 Approach & Location Tactics
- 10.5 Strategic & Tactical Delays
- 10.6 Command Post Modules
- 10.7 Incident Command Model
- 10.8 Strategic & Tactical Issues
- 10.9 CFBT
- 10.10 Full Scale Exercise