



## **HIGH RISE FIREFIGHTING INCIDENTS**

### **SPECIAL CONSIDERATIONS**

**Comms Failure**

**Lift Failure**

**Rising Main Failure**

**Wind Pressure & Ventilation**

**High Rise Sectors**

### **ACTION ON ARRIVAL**

- Ensure adequate resources are requested to implement initial actions, incident plan and contingencies (PDA is 4 pumps, ALP, Command Support Unit (CSU), Ambulance and Police)
- Ensure a scene survey is carried out at the earliest opportunity and consider what is happening now and what is likely to happen
- Refer to 72d / Site Specific Risk Information (SSRI) or any available site plans
- Gather further operational awareness / information from any available alarm systems and by liaising with others
- Identify the number and last known position of any occupants in need of rescue or assistance to evacuate
- Consider the potential for external firespread from combustible external cladding systems
- Establish appropriate sized cordons and restricted areas considering falling debris, downward firespread and sheets of glass that can travel some distance from the building
- Liaise with any available responsible person(s) and commandeer the firefighting / available lifts
- Formulate an incident plan, objectives and command structure and communicate this to the relevant persons
- Establish Command Support at the earliest opportunity
- Communicate the incident situation to other responders via Fire Control using the METHANE message protocol
- Brief everyone on the incident ground regarding current hazards, specific risks and control measures
- Maintain suitable vehicle access routes ensuring the ALP can operate from an effective position
- Apply the JESIP principles and use the Joint Decision Model (JDM)

	<ul style="list-style-type: none"> <li>• Carry out a Dynamic Risk Assessment, identify hazards, evaluate risk and select a safe system of work</li> </ul>
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<table border="1"> <tr> <td style="background-color: #e6e6fa; padding: 2px;"><b>PHASE ONE ACTIONS</b></td> </tr> </table>	<b>PHASE ONE ACTIONS</b>	<p><b>First Appliance</b></p> <ul style="list-style-type: none"> <li>• Secure water supplies from primary hydrant using twinned 70mm hose to the dry riser inlet, via the pump</li> <li>• Gather the following equipment together prior to entering the building: <ul style="list-style-type: none"> <li>• 4 x BA sets</li> <li>• 1 x BAECO board and tabard</li> <li>• Thermal image camera(s)</li> <li>• 5 x 45mm delivery hose</li> <li>• Extinguisher</li> <li>• 2 x Delta Attack 500 branches</li> <li>• Controlled dividing breaching</li> <li>• Methods of entry (door breaking) equipment</li> <li>• Handheld radios / torches</li> <li>• 30m general purpose line</li> <li>• Lift keys</li> </ul> </li> <li>• Do not commit personnel into the building for firefighting activities unless the Incident Commander's Dynamic Risk Assessment warrants that the standard procedure can be relaxed taking into account the identified hazards and the control measures required to manage these hazards.</li> <li>• Identify and communicate a suitable Marshalling Area for oncoming appliances</li> </ul>
<b>PHASE ONE ACTIONS</b>		
<table border="1"> <tr> <td style="background-color: #e6e6fa; padding: 2px;"><b>PHASE TWO ACTIONS</b></td> </tr> </table>	<b>PHASE TWO ACTIONS</b>	<p><b>Second and Third Appliance, FDS Officer</b></p> <ul style="list-style-type: none"> <li>• Assist the crew of the first attending appliance to complete the Phase One tasks</li> <li>• Appoint a Lobby Sector Commander and begin to control and record entry of crews into the building</li> <li>• Establish the command structure by allocating Sectors (an image is available on a link above).</li> <li>• High rise building sectors are designated as follows: <ul style="list-style-type: none"> <li>• Lobby Sector - This is a support sector and would cover operations from the ground floor lobby to the Bridgehead</li> <li>• Fire Sector - This is an operational sector and would be the main area of firefighting and rescue operations. It consists of the floors from the Bridgehead to the fire, the floor(s) directly involved in fire, plus one level above. The Fire Sector Commander will, on most occasions, need to be located at the bridgehead directing operations</li> <li>• Search Sector - This is an operational sector and is located above the Fire Sector, where search, rescue, ventilation and other operations are taking place</li> </ul> </li> </ul>
<b>PHASE TWO ACTIONS</b>		

	<ul style="list-style-type: none"> <li>• <b>Bridgehead</b> - This is normally two floors below the fire floor, provided they are clear of smoke. It is a location rather than a sector on its own</li> <li>• Establish and test fireground communications to be used</li> <li>• Ensure crews receive a detailed briefing prior to entering the risk area</li> <li>• Liaise with the pump operator to charge the dry riser</li> <li>• All required personnel to enter the building and establish a Forward Command Point at the Bridgehead, ensuring all items of equipment necessary to carry out the tasks, are transported to the location</li> <li>• In the absence of a firefighting lift, personnel should use the stairs unless the Incident Commanders risk assessment suggests otherwise</li> <li>• Personnel should not be committed to the fire floor until hose lines have been charged, Emergency Teams are in position and BA / fireground communications are established</li> <li>• Send informative message to Fire Control when crews have been committed onto the fire floor</li> </ul>
<p><b>PHASE THREE ACTIONS</b></p>	<ul style="list-style-type: none"> <li>• ALP, Fourth Appliance, Command Support Unit (CSU) and FDS Officers</li> <li>• All additional appliances to locate at Marshalling Area</li> <li>• Supporting OIC's and FDS Officers to liaise with the Incident Commander to establish their tasks / roles</li> <li>• Establish a BA Sector to co-ordinate BA operations and resources</li> <li>• Utilise the CSU and supporting personnel to manage the incident</li> </ul>

<p><b>SAFETY CONSIDERATIONS</b></p>	<ul style="list-style-type: none"> <li>• Monitor personnel exposed to extreme temperatures for signs and symptoms of heat stress</li> <li>• Rotate personnel undertaking arduous manual tasks and consider relief and welfare measures to reduce the effect of stress and fatigue</li> <li>• Consider the risks to personnel from manual handling of carrying equipment over long distances (horizontally and vertically)</li> <li>• Ensure a reliable water source is established (dependable source) with enough flow and pressure to supply water at height</li> <li>• Consider large numbers of occupants which could hamper operations and provide large numbers of casualties</li> <li>• Consider varied and uncontrollable fire spread internally and externally due to doors being left open and breaches in the compartmentation</li> <li>• Uncontrollable ventilation at height leading to aggressive fire behaviour</li> </ul>
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	<ul style="list-style-type: none"> <li>• Falling debris affecting those around the building and causing secondary fires</li> <li>• Risk of cable entanglement due to surface mounted lightweight conduit, trunking and cable fixings</li> <li>• Ensure effective communications are established to coordinate internal and external firefighting operations</li> <li>• Review cordon distances as the incident progresses considering wind changes</li> </ul>
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<p><b>ADDITIONAL CONSIDERATIONS</b></p>	<p>The nature of the incident may call for a different level of response to that offered above (e.g. fire on first few lower level floors or known to be out on arrival).</p> <p>It is the responsibility of Incident Commanders to carry out a risk assessment of the incident based upon the information they can gather, and deploy resources accordingly.</p> <p>Additional special considerations may apply and relevant SIP's exist to aid Incident Commanders. Situations that can affect the safety of crews include:</p> <div style="margin-left: 40px;"> <p><b>Comms Failure</b></p> <p><b>Lift Failure</b></p> <p><b>Rising Main Failure</b></p> <p><b>Wind Pressure &amp; Ventilation</b></p> </div>
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<p><b>REFERENCES</b></p>	<p>National Operational Guidance (NOG) - Fires in the Built Environment</p> <p>NOG Scenarios - F4.0 Domestic Fire, IC1.0 All Incident Actions</p> <p>British Research Establishment (B.R.E) Knowledge Sheets</p>
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## HIGH RISE FIREFIGHTING INCIDENTS

**BACK**

### SPECIAL CONSIDERATIONS

### COMMUNICATIONS FAILURE

#### Reasons for Communications Failure:

- Interference from environment
- Incorrect radio procedures (e.g. Wrong channel used)
- Radio equipment failure (e.g. Battery charge lost)
- Interference from positive pressure ventilation (PPV)

#### General Fireground Communication Failure:

- Use runners to re-establish radio communications and distribute new batteries or radios as appropriate
- Consider use of radio booster on Command Support Vehicle – Channel 2

#### Communication Failure between Lobby and Fire Sector:

- The Incident Commander must be informed immediately if there are failures in communication which could affect crews within the risk area
- BA Entry Control Point to be set up in Lobby Sector (however this may depend on the number of floors from the Fire Sector)
- Crew of 2 BA wearers (minimum) who will be 'under air' and with suitable firefighting equipment to proceed to 2 floors below Bridgehead location and will set into the riser from this point
- The Incident Commanders assessment of the risk, and the information provided by the tasked BA wearers, will allow firefighting activities to either commence or will require instigation of a tactical withdrawal of crews until effective communications have been established
- If it is decided that utilising personnel as 'runners' will be an acceptable means of maintaining communications as an interim measure, consideration should be given as to requesting additional resources to facilitate this task

(although the emphasis must be on re-establishing normal means of communication)

## SHROPSHIRE FIRE AND RESCUE SERVICE

SPECIFIC INCIDENT PROCEDURE



SIP NUMBER **SIP-022**

VERSION 3

LAST REVIEWED 22-June-2017

# HIGH RISE FIREFIGHTING INCIDENTS

**BACK**

### SPECIAL CONSIDERATIONS

#### LIFT FAILURE

Lift failure may affect high rise firefighting operations in several ways:

- Occupiers / residents may be stuck in the lift
- Firefighters and equipment may get stuck in lift
- Lift failure without any occupants

Actions to take on lift failure:

- Use the stairs. Alternative methods of getting equipment aloft include hauling and using the ALP where access allows
- Using alternative methods will increase the time taken to move personnel and equipment and increase physical exertion; take this into account consider resources carefully
- If personnel are stuck in the lift prioritise the importance of their rescue with firefighting operations
- If this priority is lower and those trapped are in a safe position treat this as a separate incident and deploy or make up for a crew to release them
- If priority is high, ensure redeployment of resources does not affect firefighting operations in the Fire sector
- Bear in mind if the lift needs to be moved the lift motor room may be involved and will almost certainly be situated above the fire



## **HIGH RISE FIREFIGHTING INCIDENTS**

**BACK**

### **SPECIAL CONSIDERATIONS**

### **RISING MAIN FAILURE**

Failure of a rising main constitutes a major risk to crews in the building and will severely restrict the fire-fighting and rescue operations which can be carried out. Several factors may contribute to the rising main failure:

- Vandalism of the rising main
- Neglect and lack of testing
- Landing valve could be open elsewhere or may have failed
- Failure at supply - either pump or hydrant

Actions to take following a rising main failure:

- Ensure all relevant personnel are informed of the situation eg. Sector Commanders, pump operators, those within the risk area
- If firefighting water supplies are affected, withdraw teams immediately to a safe position (e.g. back to the Bridgehead) and inform Fire Control that a Tactical Withdrawal is in operation
- Establish the cause - runners can be used to find a faulty / open landing valve etc. but only where it is safe to do so
- Fire will develop uncontrollably without a water supply. Consider tactical ventilation where possible to influence fire behaviour
- If the appliance pump is faulty, utilise the 2nd appliance in attendance. Do not waste time troubleshooting
- If there is a water mains failure at the hydrant, local risk knowledge should identify a back-up main or secondary source (open water) which is independent from the primary source
- Severn Trent Water can augment supplies – request through Fire Control

- If no quick measures can be taken to restore the existing riser, an alternative riser must be established

**Establishing an alternative rising main:**

- Internal or external options available. Use external options first although depending on the building involved, this may not be possible
- ALP can be an excellent tool for this task. Two ALP's may be required if one is already being used elsewhere. Re-establishing water to the firefighting teams is a priority so the initial ALP should be re-deployed immediately for this task
- Anticipate arduous working conditions especially if an internal replacement is used
- Maintain good communications at all times in order to best co-ordinate actions

**Bear in mind that any replacement rising main established will offer inferior performance to the one built into the building. This is due to main diameter and distance along with the associated friction loss etc. At a large fire, in a commercial building for example, several additional rising mains may have to be established.**



## HIGH RISE FIREFIGHTING INCIDENTS

BACK

### SPECIAL CONSIDERATIONS

#### WIND PRESSURE AND VENTILATION

Incident Commanders should be aware that any increase in the supply of oxygen to a fire will accelerate the development of the fire. Experience has shown that where ventilation is not properly controlled or co-ordinated, firefighter safety has been compromised and serious consequences have followed.

##### Wind Driven Fires

Where windows have failed through exposure to heat, allowing external wind to affect the speed and direction of fire development, firefighters located in the flow path between the air inlet and air outlet are potentially in great danger, as temperature layering balances out across all levels, floor to ceiling.

##### Coanda Effect

The 'Coanda Effect' is described as the tendency of a stream of fluid or gas to stay attached to a nearby surface rather than follow a straight line in its original direction. This is commonly considered to occur at high rise fires.

The Coanda Effect will encourage the venting products of combustion to be drawn back towards the face of the building, which will generate fire spread to other compartments or areas of the structure.

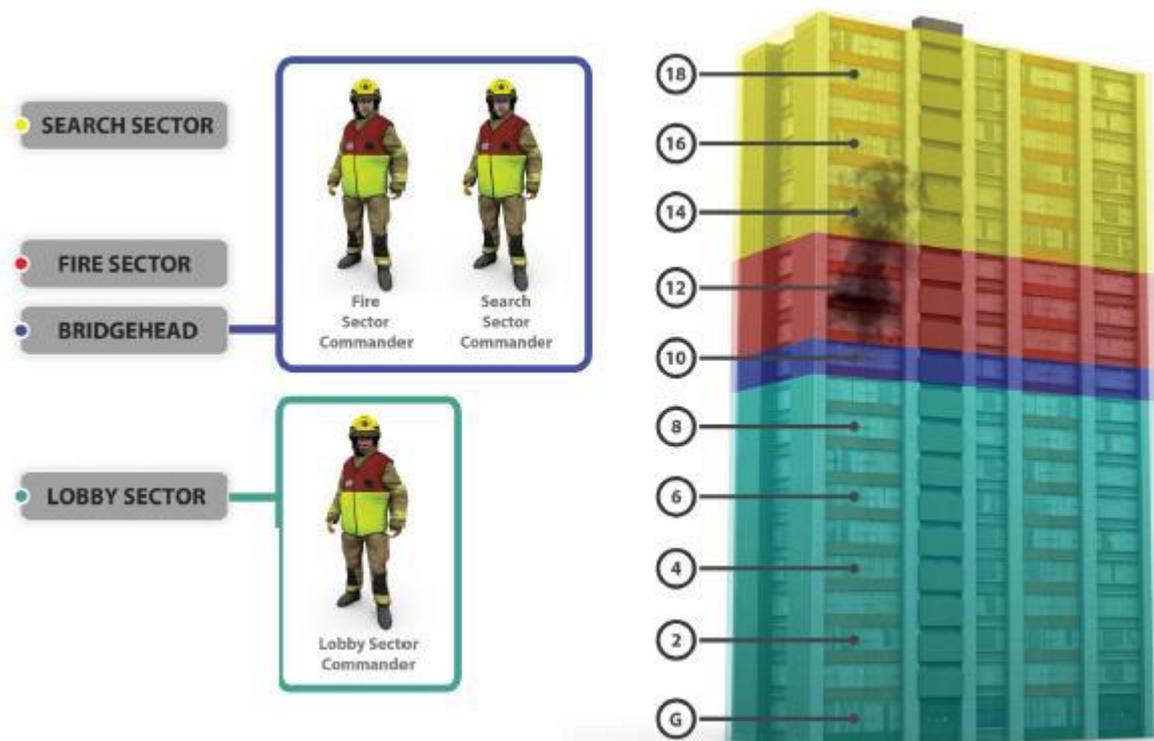
Uncontrolled ventilation can increase negative pressure in lobbies and stairwells causing the smoke and flame front to be drawn into areas that should be protected.

##### Actions:

- Incident Commanders, Fire and Search Sector Commanders should be aware of the prevailing weather conditions. This should form part of the briefing for teams entering the risk area
- Plans for tactical ventilation should be considered and used when needed. All personnel should be aware of any ventilation actions
- The ALP can be used to assist in tactical ventilation efforts

- **Be aware of the built-in ventilation facilities unique to every building. This included automatic stairwell vents. Gain control of these immediately**
- **Beware of falling objects moving large distances, especially if there is glass falling from height which can 'plane' and travel long distances if winds are strong**
- **Crews should be aware of the risks of negative pressure in the stairwells and lobby areas. The use of PPV ventilation can assist in protection from this by pressurising the stairwells preventing smoke penetration. This requires careful management of stairwell doors to maintain the pressure within the stairwell alone**

## High Rise Sectors



### Fire sector

This is an operational sector and would be the main area of firefighting and rescue operations. It consists of the floors from the bridgehead to the fire, the floor(s) directly involved in fire, plus one level above. The fire sector commander will, on most occasions, need to be located at the bridgehead directing operations.

### Bridgehead

This is normally two floors below the fire floor, provided they are clear of smoke. It is a location rather than a sector on its own. If the distance from the ground floor lobby to the bridgehead is more than two or three floors and spans of control require it, the use of a lobby sector should be considered.

### Search sector

This is an operational sector and is located above the fire sector where search and rescue, ventilation and other operations are taking place. Where possible, the search sector commander should be located at the bridgehead with the fire sector commander. If this is not possible, they should be located one floor below the bridgehead, or where not practical, the nearest suitable alternative location.

### Lobby sector

This is a support sector and would cover the area of operations from the ground floor lobby to the bridgehead. The lobby sector commander will act as the coordinator of all the logistics needed by the fire and search sector commanders.

The lobby sector commander would also co-ordinate all operations beneath the bridgehead. This includes salvage and ventilation.

The lobby sector commander is normally located at the building access point. This system of sectorisation provides for flexibility. There may be times when other approaches are needed for example, it may be necessary to have more than one sector per floor in a complex building, or a large high rise building may require two firefighting sectors, each with its own bridgehead. These may be operating in different stairwells with an operations commander co-ordinating from the lobby area.