

Walking the dog – preparing for the ‘Big One’:

Firefighting considerations when responding to major fire incidents

By Colin Deiner, chief director, disaster management and fire brigade services, Western Cape Government

Managing large-scale incidents requires effective incident command systems and clear communication among responding units, agencies and jurisdictions



“**M**ake pumps many.” This term from a previous era of our fire services conjures up vivid memories among older firefighters and officers of the radio call, usually the first arriving unit on a major incident that required a larger-than-normal response. Every firefighter who has spent more than a few years in this job will recall ‘the big one’.

Major structural fires have become more prevalent in recent years and the need to effectively plan for such incidents and focus on the specifics of escalating resources has become an integral part of any fire department.

So, what would the ‘Big One’ be? Major incidents involving structural fires are typically categorised

based on their scale, impact and complexity. Let’s also appreciate that what could be regarded as a major fire in one jurisdiction might not be the same for a larger service. Much depends on the availability of resources, specialist skills, water supply and various other factors.

The general types of structural fires that could be classified as major incidents should include:

Multiple-alarm fires

These are fires that require the response of multiple firefighting units and resources due to their size, spread and potential for causing significant damage.

High-rise fires

Fires in high-rise buildings present

unique challenges due to the height of the building, the potential for rapid fire spread and the need for effective evacuation and rescue operations.

Industrial fires

Fires in industrial complexes, factories, warehouses or chemical plants can be major incidents due to the hazardous materials involved, the potential for explosions and the complexities of managing such incidents.

Wildland-urban interface fires

These are fires that occur at the interface between wildland areas and urban or suburban developments. They can quickly escalate due to the proximity to flammable vegetation and the challenge of protecting both natural and built environments.

Tunnel or underground structure fires

Fires in tunnels, subway systems or underground facilities can be major incidents due to limited access, the potential for smoke spread and difficulties in evacuating and accessing the fire.

Structural collapse incidents

When a structural fire leads to the collapse of a building or part of a building, it becomes a major incident due to the potential for multiple casualties, the need for search and rescue operations and the complex logistics of managing the scene.

Historic or iconic buildings

Fires in historic or iconic

structures often require special attention due to their cultural and historical significance, as well as the challenges posed by their construction materials and layouts.

Hospital or healthcare facility fires

Fires in hospitals or other healthcare facilities can be major incidents due to the vulnerability of patients, the need for safe evacuation and the importance of maintaining critical medical services.

Residential fires in dense urban areas

Fires in densely populated urban areas can become major incidents due to the potential for rapid fire spread, evacuation challenges and the need for coordinated response from multiple agencies.

Multi-structure fires

Fires that involve multiple buildings or structures, such as apartment complexes, townhouses or connected commercial buildings, can be major incidents due to the difficulties in containing the fire and protecting nearby structures.

School or educational institution fires

Fires in schools or other educational institutions can be major incidents when they threaten the safety of students, staff and surrounding neighbourhoods.

The common denominators

Each of the above examples will have its own unique planning priorities and challenges. Wildland-urban interface fires will require the deployment of units over a large area and have multiple command zones, while hospital or healthcare facility fires might require complex evacuation procedures.

Each of these incidents must, therefore, be planned for individually, taking these priorities into account. However, there are a number of elements that most major incidents will share among responding services. These elements often play a significant role in shaping the challenges and response strategies during such incidents:



Major fires and incidents can have a profound impact on the affected community

Scale and intensity

Major fire incidents are characterised by their size and intensity. These fires tend to cover a significant area and involve substantial fuel loads, leading to rapid and expansive fire growth.

Resource intensity

The magnitude of major fires often requires a large number of firefighting resources, including personnel, equipment, apparatus and specialised teams. Mutual aid and coordination with neighbouring agencies may be necessary to meet the resource demands.

Potential for fire spread

Major fires have the potential to spread quickly due to factors such as wind, building construction and available fuels. This rapid spread can challenge firefighting efforts and evacuation operations.

Structural stability hazards

The involvement of structures in major fire incidents presents added complexities. High-rise buildings, industrial facilities and other complex structures require specialised tactics for firefighting, search and rescue and evacuation.

Safety and evacuation considerations

Protecting the safety of occupants and emergency responders is a top priority in major fire incidents.

Evacuation plans, traffic management and crowd control become crucial elements of the response.

Incident command

Managing large-scale incidents requires effective incident command systems and clear communication among responding units, agencies and jurisdictions. Coordination is essential to avoid confusion and ensure efficient resource deployment.

Logistics

Major fire incidents demand logistical support to ensure that responders have access to food, water, rest areas and equipment maintenance. Establishing staging areas and rehabilitation stations is important for sustaining firefighting efforts.

Media and social media

Major fires often attract significant media coverage and public attention. Fire departments must provide accurate and timely information to the media and public to manage expectations and prevent misinformation. They must also have the capacity to post updated information on identified social media platforms to ensure that they stay ahead of the potentially damaging and hazardous fake news that will be posted by sensation-seeking individuals.

Mutual aid

Collaboration with neighbouring fire

Major fire incidents



Wildland urban interface fires can quickly escalate due to the proximity to flammable vegetation

material storage sites and areas prone to wildfires and the wildland/urban interface. Understand the unique challenges these hazards present and develop strategies to address them.

In a recent previous article, I have spoken at length about mutual aid agreements. Mutual aid agreements with neighbouring fire services and other emergency response agencies must define protocols for requesting and providing assistance during major incidents that overwhelm local resources. It is important that such an agreement includes the types and number of resources available at each participating service and what the requesting service can expect when it calls for assistance.

- ▶ departments, emergency services, law enforcement and other agencies becomes essential in major incidents to pool resources, share expertise and manage the incident effectively.

Incident duration

Major fire incidents can extend over extended periods due to the complexities of fire suppression, overhaul, investigation and recovery efforts. Maintaining operational readiness and personnel well-being throughout the incident is critical.

Fire cause investigation

Determining the cause and origin of major fires is important for insurance claims, legal purposes and prevention efforts. Fire investigators may be involved in gathering evidence.

Impact on surrounding community

Major fires can have a profound impact on the affected community, including the displacement of residents, economic losses and emotional distress.

Environmental impact

Depending on the location and materials involved, major fires can result in environmental contamination, air quality issues and ecological damage.

Recovery and rehabilitation

After the fire is contained, recovery efforts include supporting affected individuals and businesses, facilitating insurance claims and rebuilding damaged areas.

Debriefings

Major incidents provide opportunities for learning and improvement. After the incident, fire departments should conduct thorough debriefings and incorporate lessons learned into future training and pre-planning.

Planning for the 'Big One'

As mentioned earlier, all incidents will have their specific risks and will, therefore, require specific planning. The common denominators, however, will form the basis of your department's standard operating procedures (SOPs) and each one should be considered individually. Pre-planning is essential for fire services to effectively respond to major incidents, including large-scale structural fires. By establishing comprehensive plans and strategies in advance, fire services can improve their readiness, coordination and response capabilities.

Start by conducting a thorough assessment of your response area to identify potential hazards, including high-risk buildings, industrial facilities, hazardous

Typing of resources is a very effective system that we have used in the Western Cape Province for many years now. If you are calling for pumpers to provide a certain volume of pumping capacity, that's what you want to see turning up.

I recall being involved in the pre-planning team for a major international airport emergency response plan. We presented our plan to the fire chiefs in the region and stressed the importance of identifying the vehicles and equipment that would be pertinent to a wide-body aircraft incident and ensuring that only those units responded. One of the chiefs in the group wasn't so enamoured with the idea and said that "everybody should send everything they have". I suppose the feeling was that we shouldn't hold back on help and that we should do all we can to save as many lives as possible. If you are dealing with an air crash, you need an air crash tender. The incident commander will have a specific plan and that plan requires specific resources.

This brings me to incident command. Ensure that personnel are trained in the Incident Command System (ICS) used by the departments within your mutual aid system and understand their roles and responsibilities within the system. Your ICS will

provide a standardised framework for managing incidents of all sizes and complexities and must be scalable to allow the first-in incident commander to escalate command when necessary. Reliable communication systems and protocols to ensure effective communication among responding units, incident command, mutual aid partners and other relevant agencies must also be agreed upon and implemented throughout all potential responding services. This includes both radio and digital communication systems.

In the event that you do have special risks, such as petrochemical tank farms that will require an automatic activation of your mutual aid agreement, ensure that the assisting service has sufficient information about the risk and copies of the pre-plans. This should include command post locations, the availability of water sources for firefighting operations in different areas, hydrant locations, water storage tanks and the need for alternative water supply methods.

Responding to the 'Big One'

Your Pre-determined Attendance (PDA) section of your SOP will dictate which resources must respond as part of the initial turnout. Depending on the risk, it should also determine the support services (police, EMS, environmental) that must respond.

As fire services, we tend to be rather good at training and exercising among ourselves but seldom do we include our local law enforcement and other services in our planning. Law enforcement agencies working directly with the fire service of a particular jurisdiction must have an 'Emergency Services Support Plan', which should outline their roles and responsibilities during major incidents. These responsibilities will include:

Incident security: Establishing a perimeter to secure the incident scene and protect responders.

Crowd and traffic control: Managing crowd movement, traffic flow and access to the incident area.

Evacuation assistance: Assisting

with evacuations, particularly in law enforcement-sensitive situations. **Scene preservation:** Preventing tampering, looting and unauthorised access to the incident scene. **Public information:** Providing updates to the public and media regarding safety and security measures (road closures, alternative routes, etc).

Evacuation will always be a difficult task and you must appreciate that most people needing to be evacuated (especially members of the public) will have no prior experience of evacuation and there will probably be a great deal of confusion as to where to go and what to do. Evacuation can't be an afterthought and should be part of your initial actions. Obviously,

it will be a lot easier and better organised if the incident occurs in a commercial or industrial complex where people are required to practice evacuation procedures periodically. Develop evacuation plans for different types of incidents, considering factors such as safe evacuation routes, transportation needs and coordination with law enforcement and other agencies.

Staging resources at a major fire is a critical aspect of firefighting operations. Staging involves strategically positioning firefighting personnel, equipment and other resources in a designated area near the incident site. This helps to efficiently manage and coordinate the firefighting efforts while ensuring the safety of responders. ▶

High-rise fires present unique challenges due to the height of the building, the potential for rapid fire spread and the need for effective evacuation and rescue operations



Industrial fires can be major incidents due to the hazardous materials involved, the potential for explosions and the complexities of managing such incidents



- ▶ Staging is divided into specific types: primary staging and secondary staging.

Primary staging is the initial phase of deployment during an incident. It involves positioning resources in a designated staging area that is strategically located relative to the incident site. The primary staging area is typically closer to the incident than the secondary staging area. Resources staged in the primary staging area are ready for immediate deployment to address the initial needs of the incident. This phase focuses on quickly containing the incident and preventing further escalation. The resources staged in the primary area often include first responders, initial attack firefighting crews and other essential personnel. These resources can engage in initial firefighting efforts, evacuation and other critical tasks. Because the situation is rapidly evolving in the early stages of an incident, primary staging resources need to be adaptable and capable of responding to changing conditions.

Secondary staging is the subsequent phase of resource management that occurs as the incident progresses and requires a more sustained and organised approach. It involves establishing a larger, more comprehensive staging area farther from the incident site. Secondary staging allows for better organisation of resources, personnel and equipment. It's a more controlled environment where resources can be assigned specific tasks, rotated and provided with

necessary support. Resources in secondary staging might include specialised teams, additional equipment and personnel for long-term operations. These resources can support tasks like building containment lines, providing medical support or managing logistics.

Before staging resources, establish a command post where incident commanders and other key personnel can gather to manage the firefighting operation. This post serves as the central hub for communication, decision-making and resource coordination.

Initial actions must include evaluating the fire's size, behaviour, potential for spread and the required resources based on these factors. Develop an incident action plan that outlines the overall strategy and objectives for the firefighting operation and identifying suitable staging areas that are strategically located in relation to the incident site. These areas should have good access to the fireground, provide a safe distance from the fire and allow for the efficient deployment of resources.

Having a pre-determined resource grouping policy written into your mutual aid agreement will allow you to divide resources into specific groups based on their functions. Common groupings include engines, water tenders, hand crews, aircraft, medical teams and specialised equipment. This grouping ensures that resources are readily available for deployment as needed.

Safety will always be paramount. Ensure that staging areas are located upwind and uphill from the incident to minimise the risk of rapid fire spread and smoke inhalation. Personnel should also be briefed on safety protocols and specific risks they should look out for in their specific zone before being deployed. To help maintain an accurate account of available resources and ensure that personnel are not unaccounted for during firefighting operations, a system for tracking resources entering and leaving the staging areas must be implemented. Not only will this provide an account of available resources but it could also ensure that all personnel are accounted for.

Logistics management during a major incident is crucial. Consider implementing a rotation and rehabilitation schedule for personnel. Firefighters need rest, hydration and medical evaluation during extended operations. If operations are going to continue over an extended period of time, ensure that sufficient lighting is made available, which will support safe activities during hours of darkness.

Finally, we must always appreciate that firefighting operations are dynamic and can change rapidly. Plans may need to be adjusted based on shifts in fire behaviour, resource availability or changing weather conditions.

In closing

Despite the many challenges and risks that will present, the single most important factor for an incident commander to consider during a major incident is safety, both the safety of responders and the safety of the public.

The ultimate goal of any incident response is to mitigate the impact of the incident while ensuring the well-being of everyone involved. This includes firefighters, emergency personnel, affected communities and even the incident commander themselves.

Be safe. ▲