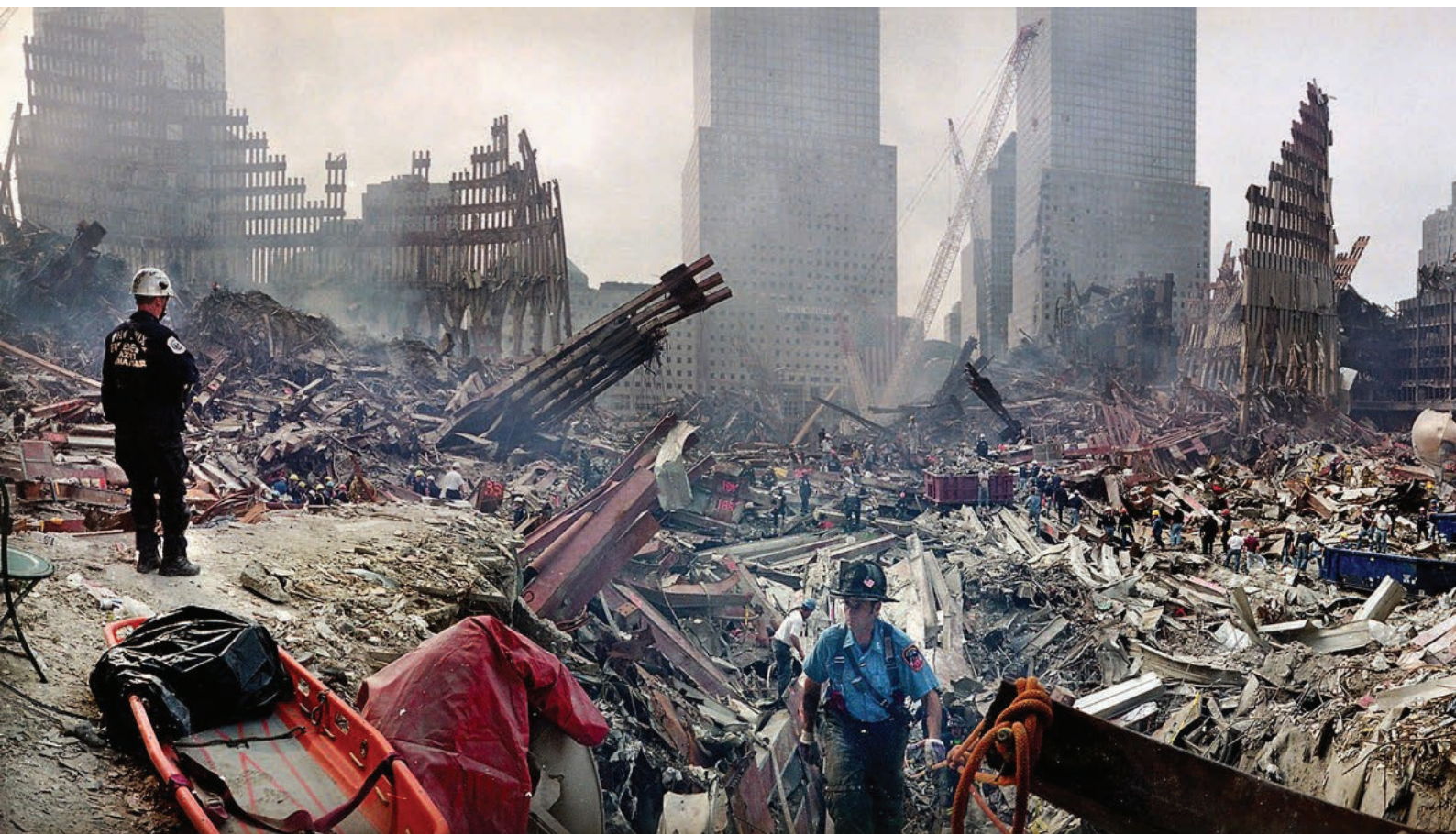


Emergency services response to acts of terror

By Colin Deiner, chief director, disaster management and fire brigade services,
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Anybody who was around on 11 September 2001 will remember where they were when the world was alerted to the three major terrorist attacks that took place in the United States.

For days and weeks after the cataclysmic events that took place in New York City and Washington DC, the world watched as urban search and rescue teams from throughout the continental USA worked tirelessly in the hope of finding any possible survivors who might still have been trapped in the ruins of the World Trade Centre towers and the Pentagon.

Soon after these events, a new terror threat raised its head, Anthrax. Emergency services were suddenly inundated with call-outs to incidents involving 'white powder'. They rapidly needed to develop safe operating procedures for dealing with chemical, biological, radiological, nuclear and explosives (CBRNE) incidents. Incidents many emergency services had not thought about before.

Six years prior to the events of 11 September 2001, Japan suffered a major terror attack when in five coordinated

attacks, terrorists released sarin gas on several lines of the Tokyo subway during the rush hour, killing 12 people, severely injuring 50 and causing temporary vision problems for nearly 5 000 others.

South Africa had also not been excluded from terror attacks and, although very rare, we did have to deal with incidents such as the Planet Hollywood bombing in Cape Town in 1998. In August 1998 more than 200 people were killed in nearly simultaneous truck bomb explosions in two East African cities; one at the United States Embassy in Dar es Salaam, Tanzania, the other at the United States Embassy in Nairobi, Kenya.

Even though it has been a long time since we have suffered an attack of terrorism in this country and it is regarded as a low risk, we should nevertheless ensure that our state of readiness for the types of emergencies mentioned above is maintained at all times. Acts of terror have escalated massively in recent years and in June 2016 the world was being subjected to a major incident virtually every week ie Orlando (FLA), Istanbul, Dhaka and Saudi Arabia. ▶



In Japan, Tokyo subway passengers collapsed inhaling sarin gas in 1995

- ▶ There is no clear and known evidence that South Africa will be a target and not for a second am I implying that such an attack is imminent. What is important to realise, however, is that acts of terror are not only perpetrated by foreign agents trying to destabilise the government of a country or some militant fundamentalist group. Many of the world's media do, however, attempt to paint all possible terrorists with the same brush. This is not the case. The Tokyo attack in 1995 was perpetrated by Aum Shinrikyo, a Japanese doomsday cult founded by Shoko Asahara in 1984 and was found to have been responsible for another smaller sarin attack the previous year.

Although not a De Facto terrorist attack, the attempted assassination of US President Ronald Reagan on 30 March 1981 was carried out by John Hinckley Junior. Hinckley's motivation for the attack was to impress actress Jodie Foster, over whom he had developed an obsession after seeing her in the film *Taxi Driver*.

The Oklahoma City bomber, Timothy McVeigh, was a Gulf War veteran who sought revenge against the US federal government for its handling of the Waco siege, which ended in the deaths of 76 people exactly two years before the bombing, as well as for the Ruby Ridge incident in 1992. McVeigh hoped to inspire a revolt against the federalist government.

Terrorism should also not be seen as acts by persons with a political or religious motive. Eco-terrorism is defined by the

FBI as "the use or threatened use of violence of a criminal nature against people or property by an environmentally oriented, subnational group for environmental-political reasons or aimed at an audience beyond the target, often of a symbolic nature".

We should also consider the possibility of trans-national terrorism, which in simple terms is the attack by one nationality on an enemy in a third country. The affected country might not necessarily be aligned to the targeted country but merely be hosting a diplomatic mission of that country or allowing businesses of that country within its territory.

It is not the intention of this article to speculate on the possibility of a terrorist attack happening in this country. I am also not qualified to provide an in-depth analysis on the methods and tactics that may be used by any terror groups or individuals intent on perpetrating an act of terror. I merely wish to share some thoughts on the factors that should be considered by emergency services when planning for such an incident.

Risk assessment

Terrorism can present itself in many forms. It really depends on the objectives of the perpetrators and the resources at their disposal. I will try to narrow the large spectrum of possible terrorist methodologies down to the ones that will require a response from emergency services. Following an evaluation of attacks that have taken place in recent years the following five scenarios stand out:

Armed attack in urban area

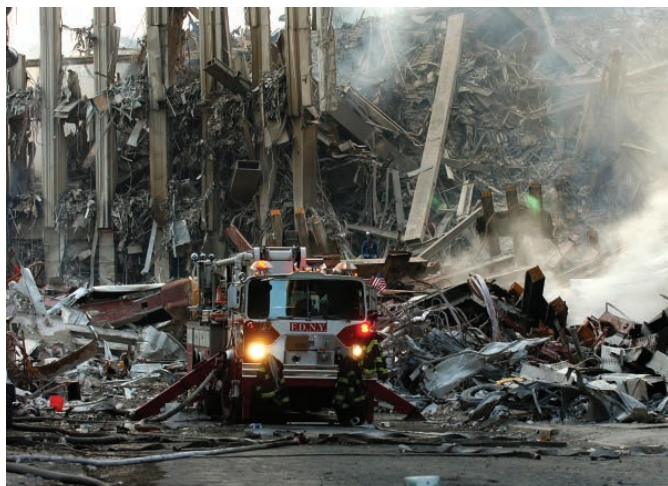
Similar to the attacks that took place recently in Paris, Brussels and Istanbul. These terrorists generally used light automatic weapons and hand grenades to perpetrate their actions. Targets are mostly indiscriminate i.e. general population and passers-by and in recent events we have seen multiple targets being engaged in various locations. As in the Mumbai attack in 2008, a prolonged hostage situation could result that could last several days, thereby delaying the ability of emergency services to reach injured victims.

Explosion

Westgate Shopping Mall collapse (2013), Nairobi and US Embassies in Nairobi/Dar es Salam (1998) and Oklahoma City (1995). These incidents usually result in large scale structural collapse. Military grade explosives are generally not that accessible and for that reason most of these crimes are perpetrated using commercial explosives or agricultural products such as ammonium nitrate (used in the Oklahoma City bombing). In such cases the targets are more discerned and the perpetrators would have left the scene by the time of the detonation. Emergency response to such incidents will involve a prolonged urban search and rescue operation lasting several days and possibly weeks. In the first few hours of the incident, it will generally also be necessary to deal with large numbers of casualties. The possibility of a CBRNE incident might also be present.

Chemical, biological, radiological, nuclear (CBRN) incident

This type of incident could be similar to the Tokyo subway sarin gas incident mentioned above. Contrary to popular belief, a CBRNE incident is not a simple ▶



Acts of terror are in most cases aimed at people

- ▶ exercise and requires highly specialised perpetrators who must have knowledge of how to deploy chemical, biological, radiological or nuclear products as weapons. Due to the fact that the delivery method of the weapon is difficult to transport, it will more likely be dispersed in small quantities and therefore will be released in a confined space in order to maximise its effectiveness. Although a specific target may be in mind, it could, however, cause more widespread collateral damage and in such events the perpetrators of the crime would most probably already have left the scene of the incident by the time of the release. The severity of a CBRNE incident will depend largely on the type of product used and that will also determine the level of specialised response required to deal with it.

Weapons attack on a fixed installation

This could take the form of a rocket or explosive device used to fire at a fixed hazardous installation such as a petrochemical tank farm or oil refinery. Due to the security systems employed and the advanced fire protection in these installations, it will require specialised methods to perpetrate such a crime as it will not be an easy act to perform. There should not be any major loss of life; however, major damage to property could be expected in the event of a large scale incident that would set off a chain reaction of events. The initial emergency response to such an incident will be carried out by the site emergency services who will then be supported by whichever other services they have assistance agreements with before escalating to a national response. The perpetrators of such an event will also most likely leave the scene soon after the attack and that could remove the risk of a follow up attack.

Transit terrorism

These incidents could include any of the above scenarios taking place on a passenger or cargo vessel at sea, in the air or a rail incident and would not necessarily require the intervention of conventional emergency services. A ship on fire or a mass casualty incident could, however, necessitate the movement of emergency personnel to the affected vessel. Incidents such as the Lockerbie aircraft bombing could lead to a number of buildings collapsing and requiring a major emergency response.

Emergency services operations

Emergency services (fire, rescue, hazmat and emergency medical services) will at all times act in support of emergency services when dealing with acts of terror and therefore have to work closely with their disaster management, intelligence and other security services to ensure that their activities are coordinated in the event of an incident actually happening. The three major response areas to terror attacks would be urban search and rescue (USAR), mass-casualty incidents and chemical, biological, radiological, nuclear and explosive (CBRNE) incidents. We will deal with each area separately and end off with some thoughts on a national approach.

Urban search and rescue (USAR)

"Urban search and rescue is the specialist, technical rescue capability for the location and rescue of entrapped people following a structural collapse," National Urban Search and Rescue Working Group, Australia, October 2002.

I have discussed USAR in a number of previous articles in this magazine and some of my friends and colleagues have also covered some related aspects. I will only deal with USAR in the context of terror attacks here.

Historically, acts of terror that have resulted in structural collapse have been massive and taken several weeks, even months, to deal with. We recall the aforementioned Oklahoma City bombing in 1995, 9/11 and the US embassy bombings in two African cities in 1998. All these operations required the response of specialised USAR task forces to work within the incident command system of the responsible jurisdiction for prolonged periods. In the case of the incidents that took place in the continental US, the incident commanders had access to the full capacity of the American USAR system, which included approximately thirty-two full FEMA/USAR teams consisting of technical rescue technicians, canine and technical search specialists, medical support, structural specialists, hazardous materials advisors, communications teams and logistics support.

In the South African context, we do not have the access to teams of this magnitude. There is, however, a fair level of capability in the larger cities who have in recent times successfully responded to a number of structural collapse incidents in KwaZulu-Natal and Johannesburg. Certain provincial disaster management centres, together with metropolitan fire/rescue services and emergency medical rescue services spend a fair amount of time and money building capacity in this field. South African USAR teams have also responded to a range of (mainly) earthquake responses since 1999, thereby building a solid base of knowledge and experience, which has stood us in good stead. Our membership of the United Nations International Search and Rescue Advisory Group (INSARAG) is also vital in ensuring that our standards are maintained in line with accepted international practices. Since the earthquake disasters in Mexico City in 1985 and Armenia in 1988, the access to foreign disaster response teams has also become more possible.

Should the act of terror be a structural collapse event, a number of important factors will have to be considered when deciding on a strategy.

Is the building viable? There will be a need to evaluate the condition of the structure, its stability, degree of damage and the possibility of finding live victims. A structural collapse caused by an explosion could have different dynamics to that of one damaged by an earthquake. The blast would have projected its force outwards causing structural members to be propelled outwards away from the blast. The resulting vacuum created by the displaced air could also seriously compromise an already damaged building. Explosives could be placed in close proximity to load bearing structures within a building such as pillars or outer walls, which could lead to a complete collapse of the building or a highly unstable situation with the possibility of secondary collapse. You might also have to deal with secondary fires, which started as a result of the explosion. This could further affect exposed reinforcing and other building elements leading to secondary collapse. Another challenge you could face is the presence of large concrete blocks of the structure suspended by reinforcing and still hanging from upper floors. We saw this clearly at Oklahoma City. It could mean that you will not be able to commit rescue teams to the structure until they have been stabilised. This might require binding them to the structure using cabling or a cargo net configuration, depending on the size of the overhang. It should be seen as a last resort to cut them loose from their reinforcing and thereby cause them to drop to the ground. This can only be done if you are sure that no one is still trapped down below and it can be done without injuring anyone or further destabilising the structure.

Victims: Acts of terror are in most cases aimed at people. A structure that is attacked by using explosives will generally have significant numbers of victims. These victims will be medically classified according to their degree of injury and, from a rescue perspective, be classified from their degree of entrapment. The Nairobi and Dar es Salam bombings produced a large number of victims that, although injured, were not trapped or partially trapped. They are relatively easily accessed and can be moved to the medical treatment area without too much challenge. These people are also normally accessed by first arriving medical crews who often do not have the required protective clothing to move over a structure presenting the numerous hazards that are found on a collapsed structure. It is therefore important to include all responders in your planning and to ensure that each person knows exactly what their role would be and what their limitations are. You will obviously also have a number of spontaneous 'rescues' being carried out by civilians in the immediate vicinity of the scene. The first arriving incident commander needs to take a clear and strong control of the scene and audibly be able to communicate with such people, directing them where to go and what to do.

Your next class of victims (classified by degree of entrapment), those who are partially trapped, will be able to be rescued by trained emergency services rescue



The Oklahoma City bombings in 1995

crews. These units should start arriving on scene quite soon and will be kept in a staging area until released by the security services. It is when you move to the victims that are entombed in the structure that you will require the services of a USAR task force. These teams take longer to respond and should only start arriving in force several hours into the incident. It is important that the incident command still stays in the hands of the overall incident commander and does not get transferred to the USAR task force commander. He/she has to concentrate on the collapse rescue activities and can't be saddled with the responsibility of managing the larger incident. Many ►

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The collapse of three floors of Nairobi's Westgate Mall during the terrorist siege in 2013

- ▶ times incident commanders who have not yet worked with USAR teams become overwhelmed by what they see happening and doubt their capacity to manage the incident further. This should be guarded against.

You will have to deal with a number of deceased victims and although this will not be your first priority, you will be expected to remove the bodies with as much care as possible. This will present a range of challenges. Consider that a major act of terror will be a world-wide news event you will have to deal with large numbers of news teams and television camera crews covering the various activities. Should there be trapped bodies in full view of the public and media but not prioritised for immediate removal (due to the complexity involved), precautions should be taken to prevent them from being viewed by bystanders or appearing on television news bulletins.

Incident complexity: The larger and more complex the incident, the longer it might take to complete and the more specialised resources might be needed. Firstly, try to determine the scale and complexity of the scene. A major shopping mall or multi-storey building collapse will last several days and could even be of several weeks duration. This will require multiple USAR units, lighting systems, equipment maintenance workshops, construction vehicles staff welfare structures, crew rotations etc. When it is determined that you will be dealing with a prolonged incident you should immediately establish a multi-agency command system and start anticipating the resources that will be required. A logistics and finance branch must form part of your command team and be tasked with the provision of your needs here.

Assistance: Depending on the magnitude of the incident it might be necessary to request assistance from neighbouring states or the international USAR community. The INSARAG system has in recent years evolved to such an advanced level that certain teams could respond internationally within a few hours of being activated and arrive in country on the same day as when the incident occurred. Managing international USAR teams will require the command team to be aware of the arriving team's

capacities and requirements. It is not good enough to try and gain this understanding when the incident has already happened and the help is on the way. A number of training courses and exercises are presented by INSARAG that will adequately prepare potential affected countries' agencies to manage this component. You will also potentially have to deal with volunteer agencies that will be offering assistance for various reasons. It is important that these organisations are carefully managed. Many of them are primarily geared to respond to more conventional structural collapses and will also not be privy to any confidential information, which might require a certain level of security clearances. This could create a problem when they are included in briefings.

CBRNE

While the vast majority of hazardous material incidents are caused by accident (or negligence), CBRNE incidents are deliberate acts aimed at hurting or killing people and disrupting society. Examples of CBRNE incidents can include:

- The deliberate and malicious release of toxic hazardous materials
- The malicious poisoning of targeted individuals through poisoning of food, livestock or crops
- The placement of explosive devices or devices capable of releasing hazardous materials in a position including water where it can cause death or injury
- The combining of explosive devices to radiological or other hazardous sources with the objective of dispersing the source over a large area and thereby contaminating a broader area and
- Threats, hoaxes or the generation of false alarms with the aim of causing panic.

As with structural collapse there are a lot of similarities between CBRNE incidents and normal hazmat operations, however, a few factors will exist that will make it unique. These include:

- Increased public safety risk
- Need for higher security during the incident
- Increased risk to emergency services
- Risk to public and international confidence on the affected country and
- Higher complexity of response.

CBRNE incidents will require a more specialised response as the perpetrators of such acts will try to 'make it more difficult' for emergency responders by masking the identity of the 'weapon' by changing the identification signage, odourising it or packaging it in a different container. If possible these products will also be placed in locations where their properties will cause the most damage as possible eg confined spaces and low-lying areas for higher density gasses. The very real risk also exists whereby perpetrators will activate a device and plant a second device that will only be activated after the arrival of the first responders.

The diversity of products that can be used to perpetrate CBRNE incidents is what will make responding to these incidents so challenging. You will most likely have to deal with large casualty numbers requiring immediate

decontamination and medical attention. The risk of mass fatalities could also be possible. Access into the hot zone could be severely limited due to the type and nature of contamination present and hence the need for protective clothing that might not be readily available. The fact the perpetrators will attempt to mask the identity of the product will mean that specialised equipment could be required to identify it and its hazards.

CBRNE response

It might only become obvious that you are responding to a CBRNE incident sometime after arrival on scene. What might look like a hazmat incident might be a terror attack. Upon arrival you could find a number of dead or distressed people, birds or animals. A number of people could be presenting unexplained signs of skin irritation, nausea, vomiting, disorientation, breathing difficulties, unconsciousness or even death.

The presence of hazardous materials at a site that is not relevant to the particular product will be a good indicator that it could be a terror attack. These products could be characterised by strange odours, vapour clouds and irritating atmospheres.

Obviously any information provided by eye witnesses could provide valuable information as to the origin of the contaminant.

Due to the complexity of the incident, the establishment of a multi-agency command team will be the top priority. As opposed to the mass-casualty and USAR operations, the transition from a crime scene to an emergency operations scene might not be so clearly defined. Fire service hazmat teams might have to act immediately in conjunction with the police to stabilise the incident and this could require a positive action to neutralise the hazardous material. A clear and distinct command process will be critical here.

Following a trigger event or if a CBRNE incident is suspected, a structured response must follow. Ideally safe routes of approach must be decided upon and a primary staging area established. The early plan of action should be structured in such a way that responders entering the hot zone will be staggered in order of the task they have to perform. Obviously if the perpetrators are still on scene, the police tactical teams will have to neutralise the threat before any emergency services can enter. Should the scene be unsafe due to a toxic or other life threatening atmosphere still being present, it will be necessary for hazmat intervention teams to enter the scene first. This could be a very challenging set of decisions that will need to be taken and for that reason the initial response must include suitably experienced officers.

A thorough and deliberate reconnaissance of the entire scene will have to be carried out by representatives of both security and emergency services. Understand that the perpetrators of such crimes will deliberately try to cause maximum damage and that could include concealing 'weapons'. It could take specialised detection equipment and a high level of observance to ensure the entire scene is safe.



The Planet Hollywood bombing in Cape Town in 1998

The next steps will include controlling the source of the contamination or 'weapon', rescue and patient triage, decontamination and casualty management, which will include on-scene emergency care and transfer to appropriate medical facilities who would have the capacity to manage special cases.

Preplanning: policemen, paramedics and fire fighters
The complexity of a CBRNE incident will require a complex and sometimes complicated command system. It must be done well in advance where response procedures and responsibilities are clearly defined.

Determine who will be responsible for the removal of dead bodies, how evidence will be protected during rescue, triage and hazmat operations. The decontamination of evidence is a major problem. How do you decontaminate evidence without destroying fingerprints etc? Will security services have to don chemical protective clothing to perform certain functions and are they trained to do so. Are there any arrangements in place to handle contaminated bodies?

It must be appreciated that many of these issues will have to form part of policy that will have to be determined with all stake holders.

Mass-casualty incidents

Mass casualty incidents are generally defined as, "any incident in which emergency medical services resources, such as personnel and equipment, are overwhelmed by the number and severity of casualties". The above definition is, however, impractical for making decisions about patient triage and the volume of responders required for the prehospital emergency care phase. This will also be of little assistance in determining capacity requirements of receiving hospitals. Many emergency medical services approach this challenge by evaluating their own capacities throughout the EMS value chain and then put numbers to their own definitions.

The uncertainty of the nature of an act of terror would make a precise definition very difficult. Terrorism is a different kind of trauma to the conventional mass transit ►



The collapse of three floors of Nairobi's Westgate Mall during the terrorist siege in 2013

- ▶ accident or crowd related incident. According to research conducted in Israel, the blunt, penetrating and blast injuries suffered by terrorism victims are a unique type of trauma and the need for multiple surgeries to deal with poly trauma patients will be a major consideration. The length of hospital stay will generally be longer for victims of terrorism than eg motor vehicle accidents. Victims of terrorist bombings are likely to suffer multiple penetrating wounds from high-velocity projectiles that may impact various major body regions. The potentially large number of victims will make the management of the triage very difficult. You will inevitably have a number of victims who are suffering from perceived light injuries leaving the scene in the ensuing panic only to present themselves to hospitals sometime later. Some of these hospitals might not be included as receiving hospitals in the original mass-casualty response plan and could not be geared to manage a large number of injured patients.

EMS priorities should be the rapid identification and control of severe external haemorrhaging, airway management and rapid transport to the designated trauma unit for the emergency. The EMS commander must determine a 'flow' of operations which will allow crews to move a patient rapidly through the process and the 'Join the back of the line' and repeat the process upon their return to their designated zone.

In many cases the EMS commander will not have the luxury of time to conduct a thorough triage process. Rapid scene evacuation might be necessary and this could necessitate a simpler form of patient assessment and treatment of patients necessitating a secondary triage area away but in close, safe proximity to the scene where patients could be more thoroughly assessed and despatched to the appropriate facility.

EMS operations at USAR operations will be more protracted and will differ from mass-shooting or bombing incident specifically in terms of injuries and access to victims. The medical post might have to be in place for many days where it will be necessary to rotate staff at various intervals. Medical crews will also have to move into collapsed

structures on various occasions to assist in the extrication of patients. Medics should specialise in the management of a patients entrapped for an extended period and be able to spend a long time with the rescue crew as structural entrapment releases could last several hours.

The medic must also be in a position to direct the release from the perspective of the patient.

The EMS command must also be prepared to assist the many other responders working on a collapsed structure. Rescuers working in a confined area for an extended time are prone to experiencing various degrees of mental stress and trauma. They could also suffer from heat exhaustion and other related problems. It will become the role of the EMS sector to deal with this.

A CBRNE incident will test the capabilities of the EMS command. The 'weapon' and its harmful properties might not be immediately known to the EMS command and it will be critical that an effective system of detection and identification of the product exists and is implemented early on. All the reference material related to the product and its hazards and the medical management of contaminated victims must be readily available to the command team. This will form the basis for all extended operations.

A national response

The magnitude and complexity of a terrorist attack will require a massive response by so many role players and will solicit media coverage on an unprecedented scale. Other than the obvious requirements of such an incident, it will be critical to provide the agencies working on scene with the necessary resources to effectively deal with the incident and return the situation back to normal as soon as possible. This entails more than the provision of equipment in strategic areas. Take for example the use of hazardous chemicals detection equipment. If the teams on scene are using a specific product and communicating it to a forensic laboratory a thousand kilometres away, they must both be on the same page. This entails them having the same equipment, the same reference materials and the same understanding of the product used as a weapon. The only way this can be achieved is through a single source and this can only be done through a nationally driven process. Patient reporting systems need to be the same. Work periods of the various command structures must be such that information flow is not hampered in any way.

A national incident command system will be vital for the management of the incident at its various levels. We need to appreciate that the responsibility of command will change throughout the various phases of the operation. The first phase will in all likelihood be under the control of the security services and this could gradually be transferred to an EMS commander and then to a rescue commander. A more strategic command will most probably also be implemented at a national level.

We need to work together on this. ▲