First responders rescuing casualties during Exercise Orion

Getting the bigger picture

Portable 360 degree video recording confers numerous time, cost and efficiency benefits for those planning and dealing with emergencies on the front line, as Iestyn Armstrong-Smith reports

As the UK government's austerity drive results in fewer fire, police, and ambulance staff on the ground, such benefits are, perhaps, becoming ever more crucial to delivering an effective service in difficult circumstances.

Lessons from the past

The Buncefield oil storage facility disaster in 2005 highlighted the need for better planning and more intelligence about potentially dangerous and hazardous environments. Fortunately, there were no fatalities, but more than 40 people were injured; there was significant damage to both commercial and residential properties, and a large area around the site was evacuated on emergency service advice. However, the fire burned for several days, destroying most of the site and emitting large clouds of black, noxious smoke and fumes.

If a 360 degree video survey had been available, perhaps the general condition of the Buncefield site would have been more transparent to those in charge, and the problems that led to the explosion could have been addressed, thereby avoiding its subsequent environmental and social impact.

We also live in times when the UK is under constant threat from acts of terrorism. Terrorists will target areas where they can do most

harm and, according to top security personnel, an attack is almost inevitable. Using 360 degree videos it would be possible to model the effect of explosives and incendiaries on high risk targets such as multi-occupancy buildings, public areas, etc.

360 degree videography represents a step change in emergency planning and management by giving responders imagery that will help them tackle a situation as efficiently and as safely as possible.

Spherical views

One company spearheading the use of 360 degree video services, systems, production consultancy and software is SphereVision based in Shepperton[1]. One of its unique tools is vMap360 video mapping software that integrates 360 degree video with maps, floor plans and aerial views for sharing across a wide range of a web browser-enabled devices. As well as desktop PCs, laptops and tablets, these include projectors, smartglasses and headmounted displays (such as Oculus Rift, Durovis Dive and Zeiss Cinemizer. The company has also developed iOS and Android apps for Google Cardboard.

Mark Senior, Business Development Manager, describes how SphereVision can benefit first responders.

"Our software and interactive web and mobile viewers for 360

The SphereVision vMap360 system integrates video with maps, floor plans, etc., to give first responders a comprehensive view of an unfolding situation

3600 SphereVision video still from Exercise Orion

degree video and stills have many applications. For example, vMap360, allows first responders to explore buildings, remote sites and factory locations, from any type of device – whether in the office, in-vehicle, portable or worn about the person. It can also be used with 360 degree projectors, such as those produced by Igloo Vision. Importantly, it enables first responders to gain valuable situational awareness before they enter a building so that they are more prepared to deal with what they might find," he says.

"Using a 360 degree video integrated plan or map viewer, first responders can build up their awareness of an environment and its hazards. Training scenarios can be developed and exercises recorded using portable SphereVision systems. First responders can run through a series of exercises or tactical rehearsals. After making decisions, they and their instructors can analyse their actions."

Post-event analysis
According to Mark Senior, the technology is also useful for providing post-event visual information to commanders, planners, assessors and crash scene investigators. It enables the user to perform scene analysis from several different angles and on a frame-by-frame basis.

"This technology virtually eliminates missing any 'outside of the frame' information associated with standard or fixed cameras. 360 degree video gives you a complete record for future analysis at inquests, inquiries and courtroom presentations. It can be used with other technologies such as point cloud visualisation to give a complete awareness of an environment after a serious incident," he says.

"The system has already proven its worth in the USA with the New York State Office of Fire Prevention and Control. Brian Rousseau, then Deputy Fire Chief said '...using this significantly improves our response capabilities' so we are confident of its utility to British emergency services too."

Worst case scenario
In 2010, the company was called on to provide its 360 degree video expertise for Exercise Orion, the UK's first and largest EU-funded civil protection exercise. Led by Hertfordshire FRS, the exercise tested the nation's response to an "unthinkable" disaster to the limit and involved teams from Germany, Italy, Spain, Denmark, Norway and Sweden, as well as the United Arab Emirates[2].

Mark Senior takes up the story. "This was a major exercise in which we captured video footage to help analyse the response to the various scenarios caused by the earthquake: fire and rescue teams were busy putting out fires, containing and sealing off dangerous structures, and treating and rescuing casualties. The 360 degree video gave full visibility of events to the command control centre and proved particularly useful in analysing how the multinational force of professionals coped with its workload."

How it works
There are two ways of collecting the 360 degree video data; either by purchasing a hands-free backpack recording system from SphereVision, or by contracting SphereVision's media partner, TX360, to collect the data.

The video is then processed automatically with SphereVision's batch renderer and exported to vMAP360 software to create "PlanViews". These link the video to maps, floorplans and other important information that can help the first responder. It is also possible to add hotspots by linking to additional media content such as videos, photos, documents and spreadsheets. These will highlight features such as generators and chemical stores that could prove particularly hazardous during a fire, for example.

The video also shows what has actually been built and changed externally and internally compared to the original building plans/blueprints. It will also soon be possible to annotate a PlanView with information collected at the scene says Mark Senior.

Incident management
Another SphereVision development, Reporter 360, promises to help with managing the aftermath of an incident. Originally created for live news reporting. Mark Senior believes it will prove a useful asset for command and control centres as it can be set up to transmit a real-time, all-round view of the incident scene.

"With a live 360 degree view, command control centre personnel can see how the incident is being handled by the emergency response team. It puts them at the heart of the action, and enables them to provide more timely assistance as they can physically see people being rescued or casualties hidden by fallen debris and so on. It is the best way to get a high definition spherical view of what is happening to deal with the incident quickly, safely and as efficiently as possible," he says.

"The technology is also useful for follow up health and safety investigations as it captures everything at once and provides a true record for evidence. The video is time stamped and will show if anything has been moved, for example. It is just a simple process of reviewing the video to confirm the truth."

[1] http://www.spherevision.com/

[2] http://www.hertsdirect.org/docs/pdf/o/orionreport

Iestyn Armstrong-Smith is a freelance technology writer and consultant to The Marketing Edge (www.themarketingedge.org) and can be contacted by email at robertpeeluk@outlook.com

Although there were no fatalities, the Buncefield oil terminal fire in 2010 highlighted the need for the better planning and management of potential disasters