



# London's wolf packs

*Earlier this year London Fire Brigade took delivery of the first version of a new command and control system that will dramatically change the way it manages major emergency incidents, involving both its new fleet of mobile command support vehicles and its entire command and control structure. Jose Sanchez visited VectorCommand to find out more.*

*An externally mounted touch screen allows briefings of incident commanders to take place outside the Command Support vehicle, thereby preserving a calm and efficient environment for the command support staff working within.*

London Fire Brigade's new Command Support System (CSS), developed by VectorCommand, is billed as "the world's most advanced suite of advanced emergency command, control, dissemination and display technologies for creating and sharing a common operation picture across all levels of emergency incident command". A bold claim, indeed, and a good reason to investigate further.

Dr Mike Griffin is the technical director of VectorCommand, a company whose roots lie in designing 3D simulation and training systems widely used by fire services and emergency management organisations in the UK and around the world.

"The first point to take note of concerning the Command Support System," says Mike, "is that it has been put together so that it can scale up – for emergencies on the scale of Buncefield or 7/7 – or down.

"The scale up/scale down principles behind CSS come from two streams of thought. First, understandably, 9/11, 7/7 and other major events. Secondly, the realisation that large incidents often start off as relatively small events. The Glasgow airport attack, while serious, did not look like a large incident because in terms of casualties there was only one fatality. But as soon as it occurred, the airport was locked down and everyone who was inside or in waiting aircraft had to be held up and possibly interviewed. That's 4,000 people to process,

out of which statistics say around 100 or so may have medical conditions or requirements. So even at Glasgow airport a small event rapidly became a major event."

So what exactly has London invested in? On the face of it, eight Low Height Mercedes Atego trucks (supplied by AssetCo, the managed services company) based on the footprint of a pumping appliance. They may look like traditional command and control vehicles, but look closely and the differences are quite radical.

The problem with traditional mobile command units – of which London had four – was that they could often be slow to be fully up to speed both before and after arrival at an incident. "A typical command support vehicle can turn up 60 minutes into an incident curve, even though it could have been at around 20 minutes when the incident escalated." London FB decided that this was not acceptable and now has eight Command Support units in strategic locations (plus a spare one for training), each of which aims to arrive at an incident and be operational much faster than previous systems permitted. This has meant not just clever organising of where the units are placed, but also changing the reasons why a unit should mobilise and when. A CSS unit is now dispatched at the time of call to try and catch the curve before a small incident turns into a major one.

Another difference is that they can be crewed by only two people and yet deliver a vast increase in integrated

incident information for commanders. Smart IT has been used to fill the crewing gap. "Emergency services can buy an expensive command unit, stuff it full of IT and then worry about how they are going to use it and whether it is a good idea or not. But the real challenge for this type of requirement is to deal with the first 20 minutes, and that's where London started, working backwards and commissioning the software and vehicle in parallel with this new way of thinking. As far as I know, this approach is unique," says Mike.

If scaling up is necessary to deal with a rapidly expanding incident, additional units can be brought in and clustered in "wolf-packs". Individual units in a cluster can be allocated different specialised functions, such as a briefing room, breathing apparatus management, and Command Support.

Much of the inside of each command support unit comprises conference/meeting space for the incident commander and other support personnel, (up to an additional 11 people), with a large touch screen display for presenting information and conveying decisions. The forward space is for two command support operators carrying out duties such as recording the arrival of pumps and crews and management of the many other resources required for major incidents. Wireless ruggedised PCs are carried in each vehicle for use by sector commanders throughout an incident ground, as well as two wireless-linked mobile cameras for remote incident monitoring.

How can the Command Support System manage with only two command support operators per vehicle? "The only way you can do that is to leverage IT to help you," says Mike. And this is where things get really interesting. "The Command Support System and teams are great consumers and producers of information, so the key is to gather and generate as much data as possible, automatically." The key word is "automatically".

Commanders have a huge amount of information available to them – information that they do not always have time to gather. There are databases that know where hydrants are located. There are databases that contain information on the different types of fire engines that are attending an incident, and the equipment that is on board. Other databases know the training and skills of the people who are on their way to an incident. But up to now, all these databases have not been linked through a single point.

"With the Command Support System we are pulling together all these pools of information and delivering them to the Command Support units and commanders in a way that is instantly accessible, showing who is attending the incident, what equipment they are qualified to use, building information, structural details, risk information, hydrants, and standard operating procedures. We have got to the point where we can provide information with almost no discernible time or resource overheads." The system also links to the despatch database of the emergency service operators, so if "police in attendance" is input, that information is also automatically relayed to the CSS.

While it is highly desirable having a powerful IT tool at an emergency service's disposal, knowing what to do

with it is also essential. "We realised that we could not assume that people with massive amounts of IT expertise would be using the system. It was clear to us that usability was key to its success."

For that reason a touch screen, icon-based interface with easy-to-use buttons was chosen. The operating interface developed was designed not to mirror either the standard Windows interface or more complex command and control operator screens. Instead, the system's opening screen displays the agreed fire service decision-making model, to reinforce a doctrine-based approach to managing major incidents under pressure. In fact, the business process of command and control was explicitly tied to the software. "The modern way of incident command is: you gather information, you think about it, you make plans, and then you communicate and implement plans and review outcomes – and then you start again. And that's what we have mirrored with the software. We have also tied the software to a toolkit, so we can configure it up to any type of incident."

GIS mapping is crucial to all emergency command and control, but even on the mapping side, VectorCommand's efforts concentrated on keeping it simple. "I think some software systems do this badly because the first thing users see is lots of layers. Here we only supply layers if the data is required, and layers can be easily switched off if they are creating unnecessary

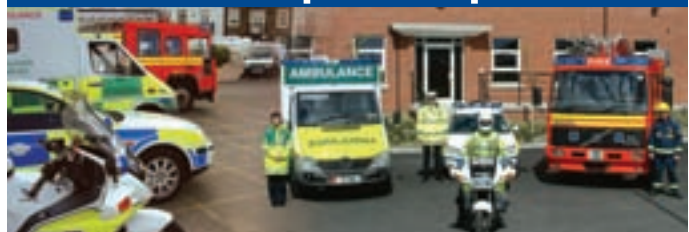
*"Emergency services can buy an expensive command unit, stuff it full of IT and then worry about how they are going to use it and whether it is a good idea or not."*

➔ *Dr Mike Griffin, Technical Director, VectorCommand.*



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*The internal layout is designed to provide a clear meeting and working space combined with a large CSS screen for displaying various views of an incident.*

clutter. We have also prioritised layer data and set it in an order that is obvious and logical.”

The system is designed to be completely interoperable, with eventual integration with FireLink and FiReControl in mind. In fact, Mike says that when the time comes for the switchover it will be seamless.

CSS will work on a normal PC with keyboard and mouse, on a ruggedised, wireless-linked tablet PC in the field and on large touch screens, using thin client systems

such as Citrix, web and 3G phone solutions. The system follows GML/XML Open GIS standards, so it does not matter what GIS system is used. It is therefore OS MasterMap-compliant, and can integrate with SQL servers and Oracle RDBMS. “As soon as you turn CSS on, it automatically detects servers and network systems, and the key information is always presented, using the incident address as the starting point and locating all relevant information based on that address,” says Mike.

Critical to the CSS approach is maximising the efficiency of communications channels: the system can provide updates to the common operational picture to 100 sites or more in less than 1.5 seconds, an immediacy of command and control communication that has not been seen before. Input to the common operational picture, however, is based on operational role and need; but everyone who is qualified can have access to the system at some level, meaning that senior commanders and media personnel, as well as other agencies, can easily find out what is happening on an incident ground. What is more, the chain is resilient. “It will work over wide variety of carriers, so the message will always get through. The only way to get rid of information is to smash every computer in the unit – and even then the data is already replicated in the Fire Authority.”

## SunGard rolls out enhancements

SunGard Public Sector’s DS2000 is the company’s ICCS solution, currently being used by 25 police forces, 20 fire services, as well as all the ambulance trust control rooms in the UK (roll out is ongoing).

Dave Collins of SunGard Public Sector explains that his company was awarded the ambulance trust contract as a subcontractor to Airwaves. “We are providing the control room equipment and radio control terminals, so we have done a fair amount of development work on how the ambulances use communications – which is very different to how the police would typically use them.” The company is also working towards integrating the fire services’ ICCS with TETRA, in readiness for the Firelink project.

A high level of configurability is at the heart of SunGard Public Sector’s ICCS system – a key driver in making it popular with the emergency services. “They do a lot of work with them that we are not aware of. We do the bulk of the up-front configurability and then provide system management training for the final configuration, eg defining user types etc,” explains Dave, adding that he provides 24/7 support on all first and second line systems.

System enhancements are ongoing, with an average of two significant releases per year that are the result of functionality requests by the very active user groups. “We have just released a call-back request process for ambulance customers. This is where the user can enter a code on the radio terminal to request that they be called back. So rather than make a radio

call that interrupts the dispatcher, an email-like message pops up on the screen.”

Another recent request was to enable ambulances to connect to more than one command and control system, as a result of the trust mergers. “Individual trusts have their ICCS and those are being retained at present, so the system had to be changed allowing each ICCS to talk to the others.”

Resilience was something else that was evaluated for the ambulance service’s next generation network. “With VOIP it is possible to have terminals that are not dedicated to a particular communication centre. So in the event that more capacity is needed or to provide resilience the terminals can be told to connect to another communications centre. In the old version there was a hardwired connection. This function is called the ‘multi-homed operator’ and we are deploying it with our ambulance solutions.” Dave Collins admits that it is still early days to talk about DS3000 although SunGard Public Sector is constantly looking at new developments. The fact is it is hard to know what will be the next key driver in the UK. Will it be Tetra2, or a requirement for further collaboration with neighbouring forces? If the latter, then a host of new factors will come into play, such as configuring systems by different vendors so they can talk to each other. “But at the end of the day it will be the business process that will decide what is required in both current and next generation systems.”

*DS2000 is the offspring of DS1000, which was originally designed as a response to communications concerns following an investigation into the Hungerford shooting. While the first generation product focused on telephone integration, the second generation has concentrated on controlling new system requirements such as CCTV image switching and TETRA functionality integration.*