

# Royal Berkshire FRS live with Command Support System

*Royal Berkshire Fire and Rescue Service, the brigade which had to deal with the massive Windsor Castle fire in 1992, is the first UK fire service to go live with VectorCommand's Command Support System. Stephen Prendergast of VectorCommand looks at how the Command Support System is being introduced into the service, the brigade's thinking on incident command, and its search for the optimum combination of communications bearer and other technologies for improved fireground management.*

*Left to right: Alan Newcombe (left) and Olaf Baars in front of one of the touch screen displays showing the Command Support System; Iain Cox (CFO, left) and Olaf Baars (Deputy CFO) at the launch of Royal Berkshire FRS's two new mobile incident command vehicles at Windsor Castle in January 2009.*



**W**hen Windsor Castle, the world's largest inhabited castle, caught fire in November 1992, Royal Berkshire's Fire and Rescue Service found itself battling one of the largest and most devastating fires in recent UK history.

Following the fire, important lessons were learnt about the need to improve the management of large numbers of firefighting resources across a wide area in a high risk and high pressure environment. When Royal Berkshire FRS launched its two new mobile incident command vehicles in January this year, it chose VectorCommand's Command Support System as the command, control and communications system to provide robust, large incident end-to-end incident management. Very appropriately, Windsor Castle was the launch venue.

At the launch, Chief Fire Officer Iain Cox, and Deputy Chief Fire Officer Olaf Baars made it very clear that the experience and lessons of the Windsor fire had been major influences when the service was defining the specifications and capabilities of their next generation vehicles and systems. In Olaf Baars' words: "It was during the tragic fire at Windsor Castle in 1992 that the need for a specialist Incident Command Unit to enhance the authority's command support capabilities was first identified. These new vehicles represent a very significant step change in the Command Support capability available to our officers. We

wanted to equip this environment with the very best information systems and communications technology available. This enables us to support operational commanders making what are sometimes very difficult decisions in challenging and dynamic circumstances.

"These vehicles will provide a 21st-century platform for incident command, not only in terms of their technological capabilities for supporting operations but because of their capacity to act as multi-agency command centres, linking directly to police and other emergency response organisations. People have been talking about interoperability for many years but I believe that we are the first to be able to demonstrate true multi-agency interoperability at this level."

Royal Berkshire FRS consulted with other local emergency services during the specification and design process for the vehicles and systems.

"VectorCommand has been supplying command training simulation applications to this authority and many other fire and rescue services around the world for many years. They have a unique understanding of the fire and rescue service; they understand incident command and have produced a command support application that is unrivalled. Together with the London Fire Brigade we are proud to be the first fire and rescue service to deploy this powerful application.

"These vehicles provide the most advanced Command



*The new mobile incident command vehicles feature technologies provided by Excelebrate Technology, and vehicle construction by W H Bence.*

Support Capability deployed anywhere in the fire service, I am pleased to say that we do not have to deal with so many large incidents that the Incident Command Unit is in constant use. However, quite simply, this is a resource that is second to none and it should be used as often as possible," added Baars.

Even before their formal launch the two vehicles had been used to support response to a number of different incidents – including three significant fires, a factory explosion and a major flooding.

With the Command Support System Royal Berkshire FRS can link geospatial information with other different types of dynamic incident information, such as still and live streamed imagery within a single interface, creating a much more timely, accurate and comprehensive common operational picture in support of improved decision making.

The Command Support System helps the service's senior commanders and support staff as they attempt to gather information quickly, understand better what is happening throughout an incident – ie achieve situational awareness, especially if it is happening over a large area or in multiple locations – and make well informed and effective command decisions.

Critically, the system has been designed to have an intuitive, icon-based touch screen interface, making it easy to understand, learn and use by non-technical users. It can be used easily by commanders at all levels, not just

technical personnel.

Other technologies specifically developed for emergency services and integrated within the Command Support System include:

- messaging and conferencing;
- access to organisational databases (for hydrants, water sources, risks, personnel, etc);
- clear graphical representation of organisational assets and structures;
- integrated web access;
- automatic incident logging;
- electronic whiteboard planning screens.

Currently, if any of these different types of data and functionality are available, they tend to be scattered throughout disparate, non-integrated systems that may be difficult or impossible to share, access or deploy.

Using the Command Support System, fire and other emergency commanders and support staff at any location can now see across multiple incidents, assess risks, drill down into individual incidents to see what is happening in the field (through live streaming incident cameras), and assess and discuss individual commanders' electronically shared plans for coping with specific emergency events. Commanders will also be able to allocate personnel and other resources dynamically within an integrated asset management system (which accesses despatch systems and resource databases), and share incident communications and instructions wirelessly.



*The Command Support System will be demonstrated on the VectorCommand stand at the Bapco exhibition, London, 21/23 April 2009, and a technical paper will be presented at the conference.*

## An intro to the technology, by Alan Newcombe, Royal Berkshire FRS

Our two new Incident Command Vehicles have been designed and equipped to reduce the setup time for incident command units arriving at an incident. We plan to put the Command Support System on all front line pumping appliances. This will mean all crews and officers will be familiar with and using the system on a daily basis. It will be a business-as-usual process, not something only used at large incidents. On our new incident command units, the bearer concept for equipment on the unit (LAN) is as follows:

- On station the communications from the units (data) uses a wireless bridge to our existing LAN/WAN;
- When mobile to an incident or just mobile they will use 3G/GPRS;
- When parked at an incident they will use 3G/GPRS or Satellite;
- If Satellite and 3G/GPRS are not available they will use wireless links to the second vehicle that can access satellite/3G/GPRS;
- If possible, for technical or

physical reasons, we will use (with permission) a wireless bridge to existing broadband (this may be domestic or commercial).

If wireless is compromised for technical reasons we will use limited cable link to existing broadband.

For video:

- Video streaming from a mast on each command unit with both thermal and optical imaging controlled by fixed wire;
- Video streaming from aerial device's video/COFDM with remote control from Peli-case control (wireless) using data bearer to link vehicles;
- We are also looking for a low-cost IP camera for adhoc deployments.

We are currently doing a lot of work in fireground data bearers.

Currently we have wireless 802.11a, b, g, and a node to extend the distance. This is still not as good as we would like so we are about to test 802.11n multi-path. We hope this will give us better distance, at best x 2.5,

and multi-path around buildings. The concept we are looking at is a MESH using 802.11n on each pumping appliance, and in-fill if required with 802.11n portable nodes or mounted on other vehicles.

The limitation of output means the better solution may come from WiMax or WiMax/802.11n in combination. 3G/GPRS is the other method we will use when coverage permits, to give more distance from command unit to laptop.

We plan to use ruggedised wireless laptops on the fire ground, with battery belts for extended running or an inverter from appliance power systems to charge in place.

The master for command and control will be the unit at the incident. The reality is that radio/wireless communications can be compromised so we should plan for that event where possible. The extended view of the Command Support System over a data network means it will be possible to give access to anyone, anywhere if they have network communications.