



# Satellite comms aids efficiency in flood response

*Satellite communications helped Gloucestershire Fire and Rescue Service cope with the widespread flooding that affected their county during the summer months. Dawn Davison-Read talks to Rob Lacey, Head of IT and Communications, Gloucestershire Fire Service, about the brigade's foresight, and she reports on how the solution enabled an improvement to the incident command.*

**G**loucestershire Fire and Rescue Service's involvement with satellite communications began some five years ago, and since then satellite technology has become an integral part of their major incident management, as explained by Rob Lacey, Head of IT and Communications, Gloucestershire Fire Service, "Once we had begun to utilise satellite communications in large incident command, we quickly realised the benefits it would bring to our command unit, such as video and remote access, and perhaps more importantly the flow of information in real time, which is essential when managing an incident on a significant scale such as the floods during the Summer of 2007."

Gloucestershire first installed satellite connectivity on their Incident Command Unit, a large bus that has been converted especially for large incident management. The ability to access the Internet, email and HQ-based systems from the vehicle proved a valuable addition. It soon became apparent that the enhanced communication facilities could greatly assist incident commanders and help support the entire command structure. Because of this, the decision was made to acquire a second system, but built into a trailer.

Primetech refurbished and installed all the equipment within ten days of the request from Gloucestershire FRS, as Henry Walker, Primetech, explained, "Since Gloucester had its own trailer, the timescale was literally ten days – if we were to build a trailer from scratch then the average delivery times would be about six weeks."

Continuing Lacey said, "Whilst our command unit is great, we found ourselves in a situation where having a more manoeuvrable and easily deployed system was

beneficial. The command unit is well suited to environments where you need both connectivity and a place to work. However, there are downsides to using a large vehicle – for a start, you need staff members with a relevant PCV licence to drive it.

"In addition to which, the command vehicle may be unable to gain access to certain locations in the county due to its size. Introducing a second system installed in a trailer, which can simply be towed via a standard car, provided additional resilience and efficiency to the brigade."

## ➔ A complete communications package

Discussing the communications element, Lacey explained that prior to the satellite solution, the brigade had laptops with GPRS access and laptops with an access database or chemdata installed. However the service had never had the real time communications and high bandwidth that having a satellite system provided.

"We can now pretty much do anything we want that is office based," added Lacey. "Some of the simplest applications are what we use the most, such as Internet access and email, which have brought untold benefits to incident management."

Gloucester also utilises video applications via remote cameras, and in actual fact has a camera mounted on top of the command vehicle to provide incident commanders with a clear picture of the surrounding areas involved in the incident. The trailer (and command unit) is also used for charging fire ground batteries if required and enables the use of WiFi communications as and when needed by operational staff.

*During the July floods, Gloucestershire Shire Hall was closed, so emergency planners and other GCC staff decamped to Tri Service Headquarters for five days.*

The transmission of mobile data can also be applied over the satellite system if required, but as pointed out by Lacey, one of the most important aspects to the solution is the ability to work remotely. "In the event of any incident, information can be fed to remote operational staff which certainly helps with incident management, and the incident command can be extended to several locations if required."

In addition to the benefits that the satellite communications brings in terms of information management via email and Internet access, Henry Walker of Primetech believes that the WiFi technology incorporated within is underestimated in its capability. "As Rob said, there is nothing magic about it, providing you have power, but the equipment we are providing is aimed at the first responder. We can provide first responders with a wireless network within 20 seconds. But having provided the network the question is what you're going to do with it. I believe it extends the incident command vehicles capabilities inasmuch as the operatives on the ground have constant communications – if they want it – with their command vehicle."

### ➔ Efficient use during the floods

The ability to build the satellite communications solution within a lightweight trailer proved invaluable to the brigade during the floods. Lacey explained, "The areas around Tewkesbury and the Mythe pumping station were inundated with water – my operational colleagues therefore decided to set up a Strategic Holding Area at Strensham Services on the M5. All of the resources that came in from all over the country were taken to Strensham and deployed from there."

Thanks to excellent support from Roadchef and Travelodge, the brigade was able to use the conference room in the services, which ultimately became the sector command centre for Tewkesbury and Mythe incidents. "This is where the trailer came into its own," added Lacey. "Our command unit was deployed at the Walham and Castle Meads incidents in Gloucester, where the vital substations were under threat from rising river levels. We took the trailer to the services at Strensham, simply parked it outside, ran a couple of wires in and within two hours we had a full command office up and running. The trailer ultimately provided us with full Internet access, email and access to all the information held at HQ – basically everyone involved in the strategic holding area. And the briefings held with local representatives and so forth were all able to be conducted from there. I believe that this was the first time this sort of contingency holding area scenario has been used in anger."

Many forms of information management were carried out in Tewkesbury sector command. The recording of incident logs, resources, emails and voice communications were all performed on laptops from the holding area. This information could be sent to HQ in real time, even imagery that was being received from the RAF was being sent to the holding area, enabling incident commanders to act upon the data without having to be at the HQ. In addition, all the information was available to other agencies involved in the flood response if required.

### ➔ Sharing with other agencies

Gloucestershire Fire and Rescue Service is part of the Community Safety Directorate of Gloucestershire County Council. During the July floods, Gloucestershire Shire Hall was closed, so emergency planners and other GCC staff decamped to Tri Service Headquarters and worked there for five days. Lacey adds "The IT recovery for the entire county was here, all of the emergency management staff were here, and ongoing, reliable connectivity was paramount.

"As it was, our normal ground based connectivity stayed available, but it was reassuring to know that we could call on satellite broadband to back up our Internet connectivity if necessary." Lacey also pointed out that any partnering agency – if it has its own laptops – could access communication via the brigade's satellite links to ensure continuity of service.

### ➔ Resilience

Discussing the benefits of the satellite solution over 3G, Lacey pointed out that 3G wasn't available at a standard that could effectively be utilised across the county. Whilst the brigade does have GPRS, as Lacey explained, it is mobile phone dependent and whilst they have ACCOLC SIM cards, speed and reliability are issues. "Satellite communications are not locally dependent," added Lacey, "and whilst we have mobile phones, I wouldn't like to depend on GPRS access. Furthermore, speed is a major issue because you can't send moving images such as those of a decent quality that we received during the floods from the RAF." In terms of resilience Lacey believes you really get what you pay for. "We are using commercial grade networks, we are not in a position to launch our own satellite or buy dedicated bandwidth, but business continuity-wise we looked very closely at the service we use and believe it is totally suitable for our needs."

Discussing how Tewkesbury would have been managed differently if the satellite communications had not been available, Lacey believes that even with the use of laptops, staff would have had to rely on accessing other people's

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➔ Rob Lacey, Head of IT and Communications, Gloucestershire Fire Service



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email facilities – which would not have been efficient and more importantly the brigade would have been reliant on other organisations. “During a conversation with our Deputy Chief Fire Officer, he said to me we needed to keep working when nobody else can – and he’s absolutely right. These solutions allow us to be independent to the best of our financial ability.”

Even had there been power failure, the trailer, with its built-in generator and considerable battery, would have enabled those dependent on it to maintain working conditions and communications. “We are completely self contained with the trailer and it is the same with our command unit. And should the generator fail – well, our trailer can also be run from a car battery or even a wind turbine or solar panel,” added Lacey.

### ➔ Lessons for the future

Prior to the floods, Gloucestershire Fire Service had never experienced the need to set up a new office in a completely unrelated building and maintain secure access to all information. The trailer enabled this and as added by Lacey, “In fact, we could have been anywhere, it didn’t matter, even in a field. This is not something we could have achieved without satellite communications. We knew we might have to – and we knew we could do it with satellite broadband – which is why the trailer was purchased.

“Since the floods, we have now prepared a ‘grab pack’ so in the event of any incident we now have a box at the ready which contains eight laptops, surge protected power supplies, data cabling, network switches etc, which ultimately means we are even more prepared to set up an office of whatever configuration and locate it wherever it is needed, in an instant.”

Lacey also believes that whilst other brigades have satellite solutions, until the system is actually used in anger, the benefits are not fully highlighted. “We are also very lucky here at Gloucestershire,” added Lacey, “because we have a very strong link between the operational side of communications and IT. This essentially means that many of the initiatives we instigate within IT have a direct bearing on operational communications and incident command, and vice-versa. This environment enables us to achieve a number of solutions jointly, for instance the command vehicle can also be used as a secondary control room if required. We can see exactly what is occurring on control room systems via our satellite units if we need to, and conversely staff in Control can

watch the incident remotely from our live feed cameras.”

Lacey strongly believes that the solution has altered the way in which the brigade deals with large incidents, not in operational procedure, but in the way that the sheer amount and quality of information that can be made available to officers in charge so that they can make informed decisions.

“Without good communications, important information from HQ may well have to be delivered to an incident by hand using a vehicle. That can take a long time, and when much of the county is flooded, may become impractical. The reality is that no longer do you have to rely on people driving around the county with important documents, but the data is instantly accessible via email. Or indeed, there is no longer a requirement to locate a fax machine and then receive reams of data on paper. Now, if we have an incident, Control will take a screen dump from the mobilising system about all attending officers and appliances and email it to the command unit. Prior to this facility, operators would need to read out the information over the air – so in addition to speed we are also saving large amounts of radio time and allowing operators to concentrate on receiving and managing calls.”

Gloucestershire Fire Service has also looked closely at its voice communications since the floods, and has found that point-to-point communication was sometimes quite difficult. Mobile telephone networks were creaking, and main scheme radio is not used for direct communication between incident sites. To reduce the reliance on mobile telephony and create simple, dependable voice links, the brigade is looking to increase its fire ground communications ability using other means. There are many radio-based options available, and good communications at up to ten miles have been tested.

### ➔ And to the future

Gloucestershire Fire and Rescue Service is now looking to improve its communications at Strategic Holding Areas. By definition, any area used for a Strategic Holding Area will be large, and perhaps geographically dispersed. At Strensham services for example, the north and southbound service areas are a mile distant, and GFRS has developed the means of connecting them together. Lacey explains “Our sector command was on the northbound carriageway, and the Strategic Holding Area was on the southbound. The ability to connect both sides together would certainly have provided enhanced operations.

Therefore we are looking at options to connect both sides of the motorway via wireless bridging and tactical masts. Although this is a very simple project, it is very exciting in terms of what we will be able to achieve. It’s an idea that can easily be transferred to other large, open areas”

The brigade is also looking at an online web based incident management system, explained Lacey, “This will enable instant updates both at holding areas and HQ, plus an audit trail can be activated. With incident logging, sector command can see in real time what is actually occurring. At the moment, incident logs are kept in word documents or similar. I’d like to put them online, so they can be viewed in real time from anywhere with the correct secure access.”

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