

The long wait is finally over for Cornwall

After 15 years with the same incident command vehicle (ICU) the time had come for Cornwall's Fire & Rescue Service to embrace the 21st century in the shape of two ICUs. Jose Sanchez de Muniain caught up with Communications Officer Ian Julian, Engineering & Procurement Officer Mike Clayton, and Primetech's Henry Walker in Truro on the eve of the launch of the new technology, to find out what it will mean for the brigade and the people of Cornwall.



Above: one of two of Cornwall Council's new incident command vehicles. Below: Mike Clayton, Engineering and Procurement Officer.



Things have certainly changed since Communications Officer Ian Julian started in the Fire Service 32 years ago, and more so in the communications arena within which he's been involved for the last 15. In those days the brigade would still be looking at hooking up its ICU to the nearest available landline in order to communicate with control (if no analogue cover provided). Whilst the introduction of an MPT1327 scheme (which replaced the old Home Office AM scheme) did improve things, it was still analogue technology.

The existing ICU had seen much action in the last 15 years (including the Boscastle incident) and considering the sheer size of the area it had been covering – 100 miles end to end – it was time to consider the option. Engineering & Procurement Officer Mike Clayton comments: "We reviewed what we had and we decided to consider two vehicles in order to double our resilience. Our aim was to look at the technologies available this day and age and try to future-proof as much as possible." So what is the result?

The technology

As well as the standard Firelink equipment (mobile data units and Firelink radio) the ICUs carry a cross band repeater. This is something that Ian points out is not a common piece of equipment in the South West. "This gives us the ability to push fireground UHF radio straight to TETRA and into the control room." The normal protocol would be for messages to be forwarded on from the control unit to HQ, but Ian sees some scenarios where direct comms to HQ would be useful. "You could park a vehicle up and leave it running with a skeleton crew. We've had this scenario where we've been involved with a ship, and there was a need for comms links; the vehicle was parked at the top of the hill with the equipment running,

and serving as the link to control using old AM analogue repeaters. We have retained the ability to use it in this type of incident."

But the main benefit of the new technology comes in the form of a satellite broadband link using Primetech's system, which will link to Cornwall Council's network. This is a massive step from the previous situation where risk information would be contained in stand-alone laptops where, as Ian says, "that information would be only as good as the latest upload."

The advent of ICUs is allowing the integration of hydrant, auto and risk information. There are some small issues still to be ironed out as far as data updates are concerned, however. Cornwall Council's network complies to the GCSX (Government Connect Secure Extranet) code, which enables secure interactions between connected local authorities and other GSi connected organisations.

As Cornwall FRS sits within Cornwall Council, any hardware connecting to the network has to comply to GCSX. The MDTs are built in a different way which (at present) prevents connection to the CC network. The issue is now in CLG's hands and Cornwall FRS is hopeful that a quick resolution will be found, especially as Cornwall FRS is not the only brigade in the country to sit within a council. Ian doesn't think it will be a major issue, nevertheless. "It's just that the way the Council build their PCs is different to how Firelink's MDTs are built, and if the Council is to keep its GCSX compliance it has to be sure everything that connects to the network ticks all the right boxes."

The kind of data that Cornwall Fire will be looking to update wirelessly over the network will be mainly hydrant and risk data, as well as the brigade's own internal information system that covers operational procedures etc. "I think chemdata would be too big to put over the

network purely because in some of the smaller stations the connection might just be ADSL. So auto and chemdata will probably be a twice-yearly manual update, which is probably good housekeeping as we'll want to check the terminals are functioning ok."

Cornwall's ICUs will be having their Firelink equipment installed shortly, but broadly speaking Firelink is more or less complete. Mdt1a – the early phase of roll out – is complete, and MDT2 is in the offing. "The TETRA radio system as it stands has been really well received because coverage is far superior to what we had in the past," comments Ian.

Cornwall went over to Airwave Phase B between January and May 2009, so it has now had it for over 12 months. "The feedback – particularly since the introduction of the MDTs – has been brilliant, especially having the hydrant information and the maps. We've had incidents with propane cylinders and being able to draw and print off an exclusion zone for the police has been a real leap," says Ian.

The ICUs will have two MDTs, one smaller eight-inch screen on the front (where the standard size doesn't fit), and a 12-inch screen in the back.

Additional technology on the vehicle is a Sky TV screen on the outside ("we want to keep people out of the vehicle") and an on-board generator that can be pulled out and man-handled if necessary away from the vehicle with a connecting "umbilical" cord. The generator will be invaluable to prolong communications during long operations as well as to provide back-up power for non comms-related equipment.

Three firefighters will be deployed in each ICU (including the driver) and as such three PCs are inside. The responsibilities are divided between manning the information from/to the council network (on a dual PC/sat screen); manning the radio and coordinating the fireground communications, including the cross band repeater; and lastly, booking people in and out, keeping tally of the crew on the fireground.

Henry Walker from Primetech comments that the benefit of satellite broadband technology to Cornwall Fire & Rescue Service is that it brings whatever applications the crew would have back in the office, to wherever the Incident Command Units are deployed throughout the County.

Budget restraints have limited what technology can be included in this latest roll out, but Henry demonstrates some of the other options that may be taken up in the future. These include the ability to set up a private mobile GSM network, which in the absence of network coverage or in situations where security/privacy is paramount, authorised users have the ability to make calls, using their standard mobile phone handset, to other users at the incident and if necessary make and receive calls, all of which are recorded for audit/training/accountability purposes, to and from the terrestrial network via the satellite link.

Another possibility is a secure, auto-meshing portable wireless network, which allows the creation of a "bubble" network for additional wireless devices such as PDAs and laptops to be used outside of the vehicle. These small wireless units can be placed anywhere, on top of a roof for example, creating a range in excess of 1km. Auto-meshing

means that they can be daisy-chained with each other to extend the range. They can be dropped around a building for example, and are built into a body pack, so a first responder can wear the wi-fi unit on a belt round his waist with a head cam, and transmit live video back to the incident command unit.

The big news from Primetech, however, is the launch of the new Micro-Sat Lite, which brings affordable, minimal weight satellite technology to both smaller first responder vehicles and larger ICUs.

Extremely simple to operate, the fully automated, self-seeking satellite system can be easily installed onto smaller vehicles due to its low weight (only 18kg). "Some satellite systems are heavy between 60-100kg – remember what a mobile phone looked like 25 years ago and compare them to the phone in your pocket today. The Micro-Sat Lite is operated by the push of a single button, and is possibly the fastest pointing system in the UK, typically taking just 40 seconds to acquire its target spacecraft, with network access granted shortly afterwards. The system does not require a computer or laptop to assist with deployment and its performance should not be underestimated, because with an 80cm antenna and powerful 6 watt transmitter the system can be deployed to deliver high speed satellite broadband anywhere in the UK and RoI."

The satellite system

Henry points out that Primetech satellite services carry a quality of service (QoS) guarantee, underwritten by their service providers (BT) who provide a state of the art iDirect network from within a secure UK-based earth station: "Which means our clients receive a contractual commitment on data throughput each and every time a system is deployed, and when used in conjunction with cutting edge VPN and WAN optimisation technology the network will be able to withstand multiple deployments, should the need arise."

In terms of usage and cost, it does vary according to the individual contract, but a base figure would be £250 upwards per month, with no excess fee for usage.

"We use WAN optimisation technology because the benefit to the customer is enormous; rather than having to pay for a bigger pipe (more bandwidth), we transfer data in an intelligent manner through the existing pipe."



"It is quite a step forward for them because they will have the office with them, and they can even make VOIP calls over the satellite if they need to."

➤ Henry Walker, Primetech.

"From our side, there are two of us in the IT department and one of us will champion each of the stations involved, so they will have a single point of contact if there is a problem."

➤ Ian Julian (left), Communications Officer, Fire Brigade Headquarters, Cornwall County Council.

Incident command units

Primetech's Henry Walker holds the portable wireless network unit, which enables a "bubble" network for additional wireless devices within a 1km radius.

The first time data is sent over an optimised link the operation occurs in "normal" time, however during subsequent transmissions optimisation kicks in and only data that has changed, is resent, thereby reducing transmission time considerably. "From an end user perspective it feels like data is being sent at a much higher bandwidth rate, in reality less data is being transferred.

Gloucestershire Fire and Rescue Service, adds Henry, have made the decision to install the Micro-Sat Lite onto a Mercedes Vito IT, telecoms and resilience support vehicle. They are also due to start WAN optimisation trials from local stations to the Service HQ where expensive leased lines have been ceased.

Implementation and procurement

The whole procurement process in Cornwall from specification to delivery took less than 12 months – no small achievement – largely due to the fact that all parties involved were Cornish.

The chassis was supplied by the local Mercedes dealer in Truro, the vehicle build was carried out by Bott in Bude, and the satellite system installed by Primetech in Bodmin.

Engineering and Procurement Officer Mike Clayton explains that just having one vehicle had caused problems in the past. "When it came to servicing then potentially we didn't have a vehicle and we'd made do with various 'workarounds' but they were not an ideal solution, even for a rural service which doesn't necessarily have a large number of calls. We wanted to have two and when it came to the costings we found we could do it."

Mike first identified the type of contract that was going to be used for the purchase – in this case an old Firebuy contract for special vehicles which had been migrated from an old FSPA contract. "Time was of the essence because that contract was due to expire." Once the vehicle was identified the local Mercedes dealer agreed to become the main contractor, which meant a one point of focus for payment by the fire service. The fact that all the parties involved were local meant that from the moment the order was signed to delivery only took six months.

The vehicle model chosen is a 518 Mercedes Sprinter. "What attracted us was the size of the vehicle and the size of the vehicle track. As far as we were concerned the long wheelbase with extra high roof, and the power to weight ratio, was significantly better than most of the others on offer. Coupled with that it comes as standard with ESP, ABS, and other safety features." And because it is highly manoeuvrable, adds Mike, it is perfectly suited to Cornwall's terrain.

The two ICUs will be "live" from September onwards (although one will be ready in July). They will be posted at opposite ends of Cornwall, one in the east in Launceston and one in the far west in St Just, which should mean incident travel time anywhere in the county of around 30 mins.

Fire services will be acquainted with the unpredictability of ICU deployment – it could be days or weeks. However, Ian thinks that the technology available in the new ICUs will result in a rise in their deployment in Cornwall. "Now that the communications on them is more advanced – in particular the satellite link to the back-office system for incident support – they will no doubt be called out more



often, even for jobs that are not massive."

And the fact that there are two ICUs will enable the possibility of posting one vehicle at the bottom of a scene (bearing in mind many villages are down steep cliffs by the sea) and another vehicle at the top. "Previously we often had to deploy a vehicle at the top in order to maintain communications. Now we will have the ability to bring in a comms infrastructure to the centre of a village," says Mike.

Training

Familiarisation with the new equipment begins soon and Ian is aware that the training curve may be steep. "But we've tried to simplify it as much as possible in that the PCs are no different to what personnel have in the station and logging into the network will be exactly the same. The radio and cross band repeater may need a degree of training, but the crews have a drill night every week so it will be part of that procedure.

"From our side, there are two of us in the IT department and one of us will champion each of the stations involved, so they will have a single point of contact if there is a problem."

Henry points out that Primetech will also be involved in the training but little knowledge is needed as far as the satellite system is concerned, as the whole system operates at the push of a button.

Dave King is the lead officer on training as regards ensuring the command structure is adhered to. "We'll be doing audits every three months to ensure they are maintaining competencies and recording the appropriate messages and the interoperability with other agencies."

Dave is looking to have the retained side of the fire service fully involved with the ICUs, but on the caveat that they fulfil the relevant competencies. "I introduced workbooks with the old ICU so the retained side could receive extra training on them to build their working knowledge. And I am looking to do the same thing here. It is easier to do when it is a station supported by whole-time firefighters, but we'll see how it works in a retained station."

Dave regards the introduction of the ICUs as a huge step forward. "I have been pushing this since Boscastle. I was running the control room that day and we lost all communications. We had one phone line running into a doctor's surgery, and the police took that over." Those days will now, hopefully, be over and Cornwall Fire and Rescue Service will be in a position to protect its community more effectively.

Dave King is the lead officer on the training of the new equipment, and will be pushing for retained firefighters to also use the new technology.

