

key touch[®]

A man with brown hair, wearing a dark blue jacket and a high-visibility yellow and orange safety vest with 'SECURITY' written on it, is holding a black handheld device. He is standing in front of a white vehicle, possibly a train or bus, with a blue sky in the background.

customer magazine
2/2011

EDR network has
Hungary covered

Users get on board
with RATP's radio
network

Meet the TB3p

Better communications saves lives

WHO'S IN THIS ISSUE?

Want to know a little more about some of the experts who contribute to Key Touch? Look no further.



TAPIO MÄKINEN has undertaken photoshoots for Key Touch Magazine and Cassidian. With his photos, Tapio aims to capture the feelings of places, events and people. Tapio has single digit handicap in golf, practises astanga yoga and is often seen cheering at his boys' basketball matches.



ANKE STURTZEL is a new member in the Key Touch crew. She is now joining the team in her function as press officer. 11 years ago this German fell in love with Paris where she has lived ever since. Anke loves - in addition to taking photos - to rework old furniture in her spare time.



STÉPHANE BRAUDEL has been a Key Touch editor since 2008. Currently working within Integrated Systems marketing in Elancourt, he makes good use of his two masters degrees in engineering and marketing/sales on the PPSL project.



TERO PESONEN's focus is on improving the safety and efficiency of field operations – from public safety to utilities. So it's no surprise that the opportunities presented by mission-critical data have caught his attention.



PIIA NIKULA enjoys amazing opportunities to work with wonderful people all around the globe in organising Cassidian customer events. She loves outdoor activities like horse riding and skiing but also enjoys singing and dancing.



JEAN-MICHEL DUMAZERT juggles his time between Cassidian, his family, scuba diving and being a local councillor. Since September 2010 he's now added to his packed schedule by contributing to Key Touch as TETRAPOL correspondent.



TIINA SAARISTO is Editor-in-Chief for Key Touch and has led the team of editors and contributors since early 2003. Tiina lives with her husband, daughter and cat in Helsinki, where she creates quilts and quilted objects.



AILA KOTILAINEN has been with Key/TETRA Touch more than ten years. Her favourite stories are about people, and she's always keen to make interviews for the magazine. Many photos in the magazine are the result of photoshooting projects she's arranged during the years.

Key Touch 2/2011- May 2011

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2 www.keytouch.info

EDITOR-IN-CHIEF:

Tiina Saaristo
tiina.saaristo@cassidian.com

EDITOR:

Aila Kotilainen
aila.kotilainen@cassidian.com

LAYOUT:

Spokesman Oy

PRINTED BY:

Libris Oy

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The fully integrated public safety communications future

AT CASSIDIAN, we are always impressed by our customers' challenging missions, dealing with the consequences of terrorism, nature's events, or political unrest, as well as happier occasions like the recent UK royal wedding. The bar for security organisations is rising constantly. We see the results of greater investment in security all around us, from security checks at airports, to new video surveillance systems in cities, to biometric passports and more.

It is also clear that close collaboration across organisations is vital to cope with new global challenges, such as cyber-crime, identity protection over the Internet, or protecting critical infrastructure against man-made or natural interference.

Meanwhile, facing tight budgetary constraints, our governmental customers are looking at technologies that can raise the efficiency of routine tasks. There is plenty of scope to achieve this aim by harnessing trends such as mobile computing and connectivity, biometric sensing and smart devices, all of which enable IT processes to run in the field. It's a development that helps to release officers from the chores of office-based paperwork and move them onto the streets.

In such a complex environment our customers can benefit from the integration of systems to provide holistic security solutions and col-

laborative platforms that allow first responders to share incident-related information effectively. Reliable, always-available voice and data communications with increased data capacity are vital.

We expect data applications to become mission-critical. That's why we strive to bring new data capabilities to durable solutions such as TETRA and TETRAPOL, which can deliver voice and data under even the most challenging circumstances. Users are increasingly recognizing the strategic value of instant availability, security and control brought by such infrastructure.

To this end, Cassidian offers a cost-effective software upgrade (TEDS) to boost the capacity of TETRA networks and has teamed up with Alcatel-Lucent to build an LTE 400 MHz mobile broadband data solution for professionals. Something that doesn't exist today. The aim is to use Long Term Evolution (LTE) technology in the spectrum used by public safety and NATO defence customers to complement digital PMR.

This development will enable new situational awareness capabilities with video applications and data-rich mobile applications for field users via our new vehicle-mounted router. The solution will provide the flexibility to take advantage of new data capabilities while allowing roaming into commercial networks and will



additionally provide hot spot tactical communications around the vehicle.

Our vision at Cassidian is to ensure a full-circle security environment in which these critical communications and applications are fully collaborative, secured and controlled. It's what professionals need.

A stylized, handwritten signature in black ink, consisting of a series of loops and a long horizontal stroke extending to the right.

Jean-Michel-Orozco
Vice President,
Head of Sales & Marketing
Cassidian Systems

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TETRA safeguards 1.2 million people at mega skiing fest

The Nordic World Ski Championships in Oslo racked up ticket sales of 270,000 over the course of the 11-day competition, as well as attracting around 50,000 spectators for the opening ceremony and 650,000 fans at the evening ceremonies in the city centre. With a further 300,000 people following events from outside the stadiums and along cross-country trails, a

staggering 1.2 million people attended in one way or another.

"Our mission for the Oslo 2011 Championships was to enthuse and spread winter joy and we can say with conviction that we have achieved this," said Svein Aaser, chairman of the board of the Oslo 2011 organizing committee at the closing ceremony.

The event was a result of 2.5 years preparation, led by the

Oslo 2011 organizing committee which consisted of 40 volunteers. These people dedicated their time and expertise to diverse functions in the event preparation. Svein Magne Karlsen was the committee member responsible for ICT and managing communications. His tasks included the selection and planning of the radio communication system used by the diverse teams of the games or-

Svein Magne Karlsen was responsible for ICT and managing communications at the Oslo 2011 Ski World championships.



100% availability
and 100%
coverage

ganisation. He soon realised that TETRA was the only radio technology available to cope with such a huge celebration of skiing.

Focusing on core tasks

"TETRA as a modern and secure communication solution provides the required capacity and services for managing such a massive event," Mr Karlsen told Key Touch. "However, building and maintaining a radio network is not the core task of the games organisers. That's why we ended up with a solution from TC Connect, using their existing TETRA network that has already been in operation for more than 10 years in the Oslo area. Outsourcing was the right choice."

The TETRA system operated by TC Connect is based on Cassidian technology. The network normally serves about 1,000 users, with Oslo Metro being the largest single customer. During the skiing championship the number of users grew by 650. To ensure sufficient coverage and capacity, TC Connect added an extra base station at Holmenkollen, as well as adding extra carriers to the network.

Security and medical teams, transportation, parking, sports teams, doping, juries and the



organising committee all used Cassidian TETRA radios. Also users from police, fire and ambulance service teams were connected to the system for coordinated communication in case of emergencies. Most of the radios were the new THR9i model, which is robust, weather-proof and includes features such as Lifeguard (man-down) to enhance the personal safety of users.

Getting organised


In addition to providing the TETRA coverage and the radios, TC Connect was responsible for talk group planning in co-operation



with the organisers, as well as radio programming and on-site support during the games. The company also trained around 60 key users who then trained their respective teams to use the radios. The intuitive, mobile phone-like user interface of the radios made the job straightforward.

The organisers wanted 100% availability and 100% coverage during the event, and that's what they got. "Our experience confirms that we made the right choice and the system will be used in other events at Holmenkollen," says Mr Karlsen.

MAPPING OUT FULL-CIRCLE SECURITY



It's often easier to appreciate the benefits of a concept such as full-circle security when we can see it in action. The following scenario is a great example of how comprehensive communications capabilities support public safety.



PICTURE THE SCENE...

An alert comes into the police control room and officers are dispatched to deal with a speeding driver. They're hot on his heels as he crosses the border into a neighbouring country, where local officers join the chase. But the pursuit ends in disaster as the reckless driver enters a tunnel and crashes. The confined space and thick smoke make any rescue attempt much more difficult.

Such a complex situation calls for all-round, seamless co-operation between several different agencies and information systems in control rooms, vehicles and on handheld terminals. It's something we call full-circle security.





1 IN THE CONTROL ROOM...

A call comes in about reckless driving. The dispatcher locates the incident and identifies the nearest available response units using the OM100 mapping application. The map also shows any fire engines or ambulances that are in the area.

Officers are dispatched to pursue the suspect vehicle, which is heading for the border. Their status switches to show they're on a mission.



2 IN THE VEHICLE...

An officer presses the "start pursuit" button on his touch screen panel and away they go.

The on-board camera tracks progress and streams video footage back to the control room.

With the suspect vehicle in their sights and visible to the on-board image capture system, the officers run a vehicle check at the touch of a button. Sure enough, the car is stolen.



3 BEHIND THE SCENES...

The border is coming up fast and the officers will need support from the neighbouring force.

The Inter-System Interface (ISI) between the neighbouring TETRA networks enables controllers to pass on all the relevant information to their counterparts across the border, who can then communicate with the field officers from both forces.

Local officers join the pursuit as it crosses the border.



4 | AT THE CRASH SITE...

The suspect is speeding through a tunnel when disaster strikes and he loses control of the vehicle and crashes.

Officers open a new traffic incident in the FMIS500 application, which results in a call for back-up from fire fighters and medics.

The dispatcher forwards a copy of the tunnel floor plan, together with a photo of the crashed vehicle taken from CCTV footage in the tunnel.

The officers grab their THR9i handheld radios and head into the tunnel on foot. They soon lose touch with the TETRA network, but can still talk to one another in direct mode.

Even in this hazardous and confusing situation, officers can be confident that if any one of them stops moving for too long, the man down function on their radio will alert the rest of the team that they may need help.

A fire engine arrives at the tunnel entrance with a TB3p mini base station on board. Once it's activated, the officers in the tunnel can communicate with the control room via the network again.

Police officers and fire fighters manage to rescue the driver. He seems unhurt, but the paramedics check him over.

Officers use a handheld scanner to read the driver's license and pull up his records so they can be sure who they're dealing with.

SEE IT IN ACTION...

Cassidian assembled this scenario into their TETRA World Congress stand, where live demos highlighted all these technologies, applications and features.

And even if you could not get along to TWC, Key Touch readers can check out the video online http://www.keytouch.info/features/videos_and_podcasts/





Shenzhen Metro trials pave the way for Universiade

TETRA communications on the Shenzhen Metro will help support the 2011 Universiade sports event

Successful trials have taken place for sections of Shenzhen Metro Line 2 and Line 3. Cassidian is supplying the TETRA networks and equipment to support the Metro project, which will eventually include five lines.

The trial of the first operating section of Line 2 is a major milestone on the way to the delivery of all five Shenzhen Metro lines. The Shenzhen Metro Line 3 project runs for 41 kilometers and serves 30 stations, connecting the inner and outer economic zones and acting as a special line to the venue of the 2011 Universiade sports event. Shenzhen Metro chose Cassidian's TETRA communications solution to support its services during the Universiade following the success of a similar set-up on the Guangzhou Metro during the Asian Games.

Cassidian provided the first TETRA systems for Shenzhen Metro Line 1 in 2004. Since then the communications system has grown in line with the

metro network itself and now includes five switches, 125 base stations and 33 DSC. It serves 3,600 wireless users daily.

The Shenzhen metro lines are built and operated by three companies. With tens of transfer stops throughout the network, it's vital that personnel from different lines and stations can all communicate effectively, regardless of which company they're part of.

The Cassidian system provides seamless communication along all the lines, offering full TETRA functionality as users roam from one line to another. Meanwhile, the virtual private network (VPN) functions supported by the system enable each line to manage its own subscribers and talk groups separately. All group and individual calls are recorded and held centrally so that any problems can be reviewed and rectified in the ongoing effort to improve the quality of the metro system.



Users get on board with RATP's radio network

As well as implementing a TETRA network to help it provide transport services to Paris, RATP is inviting other organisations to run their communications over the network, bringing advanced communications features to a wider audience.

With a large resident population and a huge annual influx of tourists, Paris and its surrounding area needs a transport company that is up to the job. Completing more than 3 billion customer journeys in 2010, RATP is that company, running metro trains, buses, tramways and mass rapid transit for the city.

To support 1,000 trains, 300 stations and 4,500 buses, RATP has a large team of engineering and maintenance personnel, as well as its own 1,000 strong security department. Add in drivers, ticketing and station staff and that's a lot of people who need constant, reliable communications to ensure the transport network runs smoothly.

RATP employees rely on a fully integrated TETRA network from Cassidian, using talk groups that let staff from all areas of the system communicate when needed, both for routine jobs and in an emergency. This is all a far cry from the time when RATP struggled with seven or eight analogue systems that couldn't connect to each other, meaning that people on the buses couldn't talk to the people on the Metro.

Currently, 9,000 users benefit from the TETRA network, a number that is soon to rise up to 15,000, with the addition of the bus fleet.

Advanced TETRA facilities

Stéphane Chouet, Head of business development for communication system for RATP, says: "With TETRA, we have had the opportunity to



Stéphane Chouet



modernise and extend all the internal radio services, such as radio handsets for train drivers moving out of their driving cabin or the possibility of many functional evolutions supporting radical organisational changes for a better RATP performance."

And it's not just useful in supporting everyday, routine work. "This radio network is also a strong asset in case of a major disaster," says Stéphane Chouet. "Its federative and secure features allow real time coordination"



between different departments, both above and below ground."

In addition to the most common TETRA features such as group calls, status and SDS messages, and emergency calls, the security force users benefit from Dynamic Group Number Assignment, as well as being able to activate groups on demand for special events.

As well as employing the system for its own staff, RATP is spreading the good news about TETRA by offering its services to external organisations, bringing the prospect of a further 2,000 to 5,000 users coming on board.

This highlights one of the major advantages: different organisations can use the same TETRA radio network and no-one within or outside the network can eavesdrop. But what if an organisation's structure or members change, changing its data? To safeguard privacy, it must be possible to make amendments without accessing data from all of the other organisations.

This is possible in TETRA systems from Cassidian because they make use of a full Virtual Private Network (VPN), meaning that organisations can share the radio network with no danger of compromising their privacy or security.

Communications expertise

Setting up the network involved several challenges, one of the main ones being to provide adequate underground coverage. Ca-

bles had to be shared between different radio networks, planning and power budgets needed to be managed and there had to be successful handovers in the tunnels. The project met all these challenges and now provides radio coverage for the TETRA network and the National Police Radio TETRAPOL Network.

The second challenge was to capture the users' real needs and translate these into radio features and communication models, concentrating on the 'must have' rather than the 'nice to have'. The last of these challenges involved operations - while new TETRA services were rolled out, the existing analogue networks needed to be maintained, since the maintenance teams were to be operational in a wide range of systems.

"Through meeting and overcoming these challenges, RATP has developed a better understanding of the business of its internal customers, as well as the complex communications environment of urban transportation," says Stéphane Chouet.

Since 2004, when the first of the network's 450 base stations were installed, RATP has developed great experience in designing, implementing and operating its own fixed and radio communication systems. RATP also operates third party systems such as GSM coverage in partnership with the three national mobile operators, as well as the underground TETRAPOL network of the National Police, which shares the same leaky cables as the RATP TETRA network.

There are still challenges to meet as the network develops. Says Chouet: "We need to complete the migration of the new internal users over to the TETRA services, as well as implement voice and data integration to allow traffic information to be carried by the network.

"The last important issue is to open up our dedicated network to external customers. To achieve this, we have developed the Tétracité concept which will give external customers access to high value radio communications services without investing in a dedicated network and infrastructure of their own."

For RATP, opening up their radio network gives a better return on investment with extra commercial revenues, ensuring long term sustainability of a now strategic regional network.



A man with short dark hair, wearing a dark jacket and a bright yellow high-visibility vest, is shown in profile. He is holding a black handheld electronic device with a screen. He appears to be standing next to a dark-colored car, with his hand near the open driver-side door. The background is a blurred outdoor setting, possibly a parking lot or a public area, with some blue and white structures visible.

Making the most of the

DIGITAL REVOLUTION

The ability to share information in multiple formats across multiple organisations will promote public safety without compromise. It's a vision that calls for true interoperability between networks.

Digital communication is revolutionising public safety, with more and more digital information being used in daily operations. Passport information, drivers' and other licences, IDs, vehicle and personal data, medical information, images and videos are all resources that the authorities can draw on, with field officers already checking, changing, querying and com-

paring this sort of information every day.

Even so, many information systems remain isolated in silos. It will take seamless interoperability between systems and the organisations that use them to really make the most of this incredible resource. Whether it's multiple agencies responding to a localised crisis in a community or it's multiple jurisdictions in-



volved in a high speed chase, the need for communication between different networks is clear.

Game-changing data

By 2015, some 90 per cent of mobile traffic will be data, including voice in the form of data. In contrast to the voice calls coming into emergency response centres today, call-takers will therefore need to organise their responses

based a host of different inputs, including text messages and multimedia video clips. More information is an advantage in preparing to deal with an incident, but it's the people in the field that can best take advantage of this rich digital data. Anything from photos and weather alerts to hazardous material information and GPS co-ordinates could influence the mission in the field.

So data must be easily shared within an organisation, but it should also be possible to share it with co-operating organisations when a multi-agency response is called for.

When the networks and media are designed with sharing in mind, the added demand for network capacity must be kept in mind. The volume of mobile traffic is expected to be 20 times higher in 2015 than it is today. High-capacity commercial networks are developing fast, but emergency responders must have systems in place to deal with exceptional situations, where general use, high-capacity routes may well be out of action.

Complementary solutions

Systems will be terribly vulnerable if they are based on a single giant data pipe. Professionals need robust, dynamically scalable information-sharing that can move huge amounts of data and provide narrowband data and voice communication efficiently when needed. In other words, it calls for complementary solutions, with tough, lower-capacity networks that can be relied on to keep delivering mission-crit-

ical voice and data, even when a high-capacity data network is disrupted.

Interoperable communication is again a crucial enabler of this kind of arrangement, but security is also essential.

Genuine interoperability in voice and data is only possible between different organisations when their communications systems are fully integrated with effective interfaces. Networks should also be sufficiently versatile to offer wireless and wired connections as needed. Finally, the data itself must be circulated in a format that is accessible to everyone, so widespread standardisation must be the norm.

Full-circle security

Realising this fully interoperable vision is the key to delivering the broader ambition of modern public safety professionals: full-circle security.

Full-circle security will ultimately deliver a revolution in public safety, but the most economic and efficient way to implement the technologies that will enable this brave new world is evolution based on incremental investments. Incremental development will avoid catastrophic discontinuities and makes it possible to maintain smooth upgrade paths. The communication services that professionals come to rely on will remain available and networks will integrate more easily with new subsystems and services without losing the beneficial features of existing systems.

PICTURE THIS

In principle there are lots of different physical characteristics that can be used to identify individual people, but faces are set to become the gold standard in biometrics, as Juhani Viherlahti, Marketing Director for identity specialist Guiart, explains.

Facing up to **biometrics**



PICTURE THIS

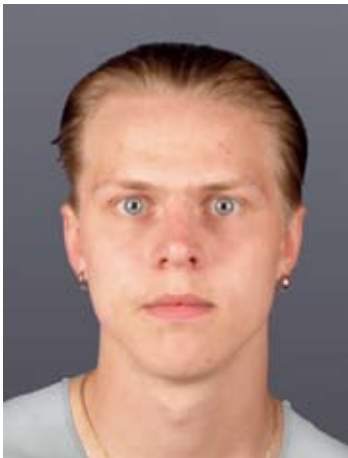
The only sure way to link an individual to the identity on their travel documents is to include unique, tamper-proof information about a physiological characteristic in the documents.

That characteristic is known as a biometric.

While a variety of characteristics could be used in theory as biometrics, the winning contender looks to be the face, especially now that the International Civil Aviation Organization (ICAO) has specified facial recognition as its favoured biometric technology. The ICAO says that a state may also choose to back up facial recognition with fingerprints, irises or both, but it's facial recognition that will form the basis of interoperable identification technologies right around the world.

Public acceptance is one of the reasons that the ICAO has opted for facial biometrics. Facial photographs don't disclose information that the vast majority of us routinely let other people see every day. In other words, a facial photograph is already socially and culturally accepted internationally. Facial images are also collected and verified routinely as part of the MRP (Machine Readable Passport) application form process in order to produce a passport to Doc 9303 standards, which is the key standard for travel documents published by ICAO.





A good-quality photograph can be downloaded over a TETRA network in a matter of seconds.

TETRA services for biometric acquisition

Digital technology is changing how police, fire departments and forensic investigators use photographs in their daily work. Images can be transmitted in seconds and the long-term consumable cost savings are significant when they use digital technology.

Standardisation is critical to achieve interoperability between different agencies, and ISO standards form a solid platform on which to build technologies to support law enforcement and border control systems. For example all digital cameras produce JPEG standard format digital images. Similarly, the standard fingerprint format called WSQ is used to save ePassport fingerprint images on the passport microchip. Most

identity documentation follows the same standards as travel documents.

Quality delivers speedy recognition

High quality facial photographs are essential if automatic border controls are to operate quickly and smoothly. It's therefore important to take high quality, standard format facial images in order to prevent the database from becoming polluted with difficult-to-read images.

In addition to overall facial images and fingerprints, other characteristics such as scars, marks and tattoos are also important for identification in law enforcement. TETRA networks make it easy to

send a wide range of images, ranging from views of the crime scene to biometrics.

Reliable digital technology

Security is essential to safeguard all this information as it flows between field units and dispatchers. TETRA networks can send images or other biometrics of missing persons, suspects or other individuals securely to the server. A good-quality photograph can be downloaded over the TETRA network in a matter of seconds so that all the relevant people can have almost instant access to essential information.

The impact of fast data

TETRA Release 2 introduced the TETRA Enhanced Data Service (TEDS) to support data intensive applications. TEDS speeds up biometric data transfer to two or three seconds per image. It takes less than 10 seconds to send a standard package of a facial image and two fingerprints using TEDS. In contrast, a colour image transmitted over a legacy TETRA network can take between 10 and 20 seconds, depending on the available bitrate. It then takes the same time again to send the fingerprint information.

In a fast-moving situation, TEDS can make all the difference.





NEW ZEALAND QUAKE

– quick response from Cassidian



Both landline and cellular communications networks were disrupted by a devastating earthquake that hit New Zealand on February 22, 2011. This left emergency rescuers relying heavily on the Cassidian CORP25 Land Mobile Radio (LMR) public safety radio system – which remained 100% operational throughout the quake and its many aftershocks -- to co-ordinate their response.

The powerful 6.3-magnitude earthquake struck near Christchurch, which is the country's second largest city with a population of 386,000. It brought down buildings, power lines and most forms of communication.



Within hours of the quake, emergency rescue and relief workers from all over the country came flooding into the Christchurch area, which increased traffic on the CORP25 network beyond its licensed capacity. This prompted Tait Radio Communications – the prime integrator when the system was originally deployed – to ask Cassidian to increase the capacity

of the system. Within three hours Cassidian was able to increase the Subscriber User licenses from 1700 to 2200. Two days later an additional request for 500 licenses came in, which Cassidian processed in under 20 minutes. A third call came 12 hours later for five additional channels, which again, Cassidian delivered in record time.

"We feel honored to have played a part in helping Tait and the New Zealand Police respond to the crisis in Christchurch. It is very rewarding to know that our forces were able to come together with the singular goal of helping those in need, and that the software-based nature of our P25 solution enabled us to react as swiftly as we did to the requests for more capacity," says Chuck Sackley, General Manager, Cassidian Communications, Land Mobile Radio.

The CORP25 network was installed in 2008 for the New Zealand Police, a national agency that handles more than 600,000 emergency calls a year. It currently covers three major regions in New Zealand – Wellington, Auckland and Canterbury, where Christchurch is located.

ASTRID helps Belgian bus services run smoothly



Transport controllers in the Belgian towns of Liège and Verviers can communicate seamlessly as transport operator TEC becomes the latest organisation to join ASTRID, which is one of the world's most extensive public safety radio networks.

The adoption of ASTRID communications means that communication between buses and controllers as they shuttle between the two towns is now seamless, so changing drivers, controlling schedules and following up in the event of a breakdown are all much easier.

Each day, several hundreds of TEC buses pass through the Place Saint-Lambert in the centre of Liège, and Yves Corin is responsible for coordinating the operation from his control cabin in collaboration with the TEC control centre: "I must remain constantly in contact with the dispatchers and over the old communication system, we could not always understand what the other part was saying. Now that we use ASTRID, life is so much simpler."

While Mr. Corin works from the control cabin on Place Saint-Lambert, Jean-Luc Huppen is one of a team of controllers who drive between 100 and 200km per day around the transportation network to monitor the different routes. "We must take care that the transportation network func-



tions throughout, from Liège and Verviers to Maastricht in the Netherlands and Aachen in Germany. For example, I deal with cars parked at bus stops and plan alternative routes if there has been an accident or a demonstration. In the event of a storm, ice or snow, we drive all the routes to make sure that they are passable.”

ASTRID is also helping Mr. Huppen: “We must be in constant contact with the dispatchers. Before, we often did not understand what they said and it was very irritating. We had to use mobile phones instead, but it was expensive. Today, everything is perfect. We hear and understand each other and we are more effective. There’s also a talk group that allows us controllers to communicate between ourselves.”

Wide coverage

The Liège-Verviers TEC controllers have been using 40 ASTRID radios almost 24 hours a day since summer 2010. Dispatchers also have a few. As well as improving the quality of communications, ASTRID has also boosted coverage to reach across the transport network as far as the Dutch and German borders. The old analogue network only allowed the controllers to communicate in the downtown

area of Liège. And it’s not just the controllers who are benefiting from ASTRID. Reliable communications throughout the bus routes is improving the safety of drivers.

Ready for anything

For the moment, the Liège-Verviers team only uses ASTRID for voice communications, but TEC is considering the use of GPS positioning and short data messaging.

Other planned improvements include coordinating TEC operations with the police forces and fire and rescue services during major events such as the City Parade or the Outremeuse Festival. The 2012 Tour de France will begin in Liège.

“ASTRID will allow us to communicate easily with all authorities,” says Michel Schoonbroodt, operational director of TEC Liège-Verviers. “In these kinds of events, it is essential to coordinate the knowledge from transportation personnel with the police forces. We also wish to reinforce our collaboration to deal with disasters, even if we’re only a minor player in these situations.” For example, TEC helped to evacuate residents and bussed in fire fighters when there was a major gas explosion in the centre of Liège in January 2010.



Vital statistics for TEC in Liège -Verviers:

- ➔ 11 bus depots
- ➔ 214 lines measuring 4,181 kilometres
- ➔ 129,520,443 passengers per annum
- ➔ Nearly 4,855 stops
- ➔ 633 buses cover 40,518,292 km per year
- ➔ 1,825 employees
- ➔ 40 portable radios
- ➔ Three talk groups for everyday use and one for incidents

EDR network has Hungary covered

One of the leading established TETRA networks in Europe, Hungary's EDR continues to be a focus for innovation. Visitors to TETRA World Congress can see how the network is being developed to handle data communications

As the operator of one of the world's more advanced public safety TETRA networks, Hungary's EDR, Pro-M is constantly looking to advance the network's capabilities. At TETRA World Congress 2011, Pro-M co-operates in a demonstration of TETRA Enhanced Data Service (TEDS), the professional mobile radio (PMR) standard for wide-band data. TEDS enables information-intensive data, such as images and video, to be transmitted routinely to and from the field. The operator is also exploring the possibilities to further develop TETRA towards broadband.

EDR is used by the police, customs, fire brigades, disaster prevention, ambulance services and other organisations. The network first began operations back in April 2006 in the Budapest area. This was followed by a rapid roll-

out that saw Pro-M achieve national coverage by the end of the year, a month ahead of schedule.

Today around 270 base stations continue to provide coverage for some 42,000 terminals across the country. Cassidian has supplied the exchanges, base stations and a large number of terminals. The scale of the operation makes EDR one of the leading TETRA radio systems in Europe.

EDR has already improved the Hungarian authorities' ability to deal with unexpected situations, according to Miklós Takács, senior TETRA advisor at Pro-M: "EDR significantly improves the internal communications within user organisations and enables efficient communication between these bodies. Very high availability greatly contributes to our enhanced response capability and improved efficiency of cooperation."



Miklós Takács,
senior TETRA
advisor at
Pro-M

He adds that data security is another major advantage: "EDR ensures automatic protection of information carried over the radio system. Not only the quality but also the security of communication can reach a much higher standard thanks to air interface encryption and end-to-end encryption."

Coverage is the third big win delivered by EDR, with the nationwide network even covering hard-to-reach areas such as metro tunnels. Air-ground-air (AGA) cells of the network provide sufficient coverage also for air-to-ground communications.



Managing the six-month Hungarian EU presidency is a major challenge for the EDR network, which must support the accompanying security operations as delegates descend on the country for their political and diplomatic meetings.

The planned presidential programme includes a summit, a meeting of foreign ministers and a meeting between the government and the

Serving the Hungarian EU presidency

EU, as well as 17 informal ministerial meetings and 217 sub-ministerial meetings. The majority of the events will take place outside Budapest to avoid transport congestion, and Pro-M's professionals have been busy installing the necessary communications at the key venues, such as the Royal Castle at Gödöllő, the Museum of Ethnography and the Anna Grand Hotel in Balatonfüred.

Improved coverage and capacity in and around Grassalkovich Castle in Gödöllő to help communication between the National Police Headquarters, the Republican Guard Regiment, the Anti-Terror Centre, the

ambulance and the Disaster Relief Service. Communications have also been reinforced along the M31 trunk road to Gödöllő.

Organisers expect between 35,000 and 40,000 foreign visitors during the six-month presidency. Many of them will be flying in via Ferihegy Airport. EDR network operator Pro-M, is therefore supporting the airport with communications at the Crisis Management Centre and a vehicle tracking system for the airport ambulance service. The company has also provided indoor coverage for devices inside the new terminal building at Budapest Airport.

VIRVE COMMUNICATIONS SAVES LIVES



The idea that better communications saves lives is much more than a theory for medical teams at the North Karelia Central Hospital in Finland. It's something they know about personally since they embraced the use of digital radios on the VIRVE network. "At least two lives have been saved thanks to this," says Jari Hirvonen from the department of emergency medicine. "I know because I was there."

Today there are around 580 VIRVE users at the North Karelia facility, with 48 radios in constant use.

It wasn't always like that, however. Back in 2008 almost no one at the hospital knew how to use digital communications. The organisation had 30 radios, but 29 of them were in storage while the other was rotated between the 10 people who knew a little about how to use it. The hospital realised that people wouldn't be able to use the radios in a crisis if they didn't use them regularly in their day-to-day operations, so a decision was taken to get people trained up and making the most of the advantages on offer with the VIRVE technology.

The hospital purchased a TETRAsim classroom simulator system which, in the hands of two employees acting as trainers, has proven its power in ensuring the competence of users.

From a modest beginning the scheme soon snowballed, as personnel increasingly recognised how the radios could help them in their daily operations. Today, training in the use of the radios is part of the standard induction process for medics and many other new staff at the hospital.

A range of features are now used routinely, including group calls, emer-

gency calls, SDS and status messages, individual calls and IP packet data. Some users are also trained in using the radios in DMO mode. The TETRAbook "phonebook" feature guarantees that numbers are always up to date.

Several applications have proved especially helpful, such as the Merlot location app, which shows where mobile emergency response units are in real time and enables medics to estimate more accurately when patients will be arriving.

Life saving at times of trauma

Setting up a trauma alert group has also helped the most critical patients by removing significant delays in assembling the teams needed to care for them. At least one patient each week generates a trauma alert. The talk group includes emergency medical care workers, surgeons, anaesthetists, operating theatre, X-ray and laboratory staff.

Some 15 people are assigned to the trauma alert group at night and 19 in the day. Before the advent of VIRVE, it would have taken between 15 and 19 minutes to call everyone individually using a cell phone. Now everyone is alerted at once. "This is a huge saving of time," says Mr Hirvonen. "26% of patients arriving at

Jari Hirvonen from the
North Karelia Central Hospital,
department of emergency
medicine

this hospital require attention within 30 minutes, so it can mean the difference between life and death.”

Faster communication also makes routine procedures run more efficiently at the hospital. For example, lab technicians used to be called to take a specimen using a cellphone. Now that the call goes out instantly using VIRVE, hospital managers estimate this alone saves around 500 working hours per year.

Other benefits include improved personal safety, since staff can reach colleagues at the touch of a button. Information security and confidentiality is also improved, since VIRVE is only used by the Finnish authorities. This means that misdialling a number will not result in information being sent anywhere else, which was always a possibility with the public cellular network.

Future potential for the system

All these benefits far outweigh the fact that the VIRVE radios are a little bulkier than mobile phones. The only other drawback mentioned by users is the lack of a wireless, hands-free option, which can be a challenge where medics are trying to keep their hands sterile.

The hospital has a “wish list” of possible features that could be in-

cluded in the system in future. “We’d like to be able to get real-time vitals such as EKG readings from the field,” says Mr Hirvonen. “We’d also like to be able to send pictures from the scene of an incident. This will help people understand the situation as they approach the scene, and help doctors back at the hospital understand the possible injuries and prepare to treat patients effectively when they arrive.”

The North Karelia Central Hospital covers a local population of

around 173,000. The 580 VIRVE users include personnel from across the organisation, such as doctors, theatre staff, laboratory technicians, emergency medics, x-ray technicians and other, technical personnel. The department of emergency medicine no longer uses GSM at all.





AN EYE IN THE SKY

Remote controlled flying gadgets may be more familiar to most people as the robotic toys on every kid's Christmas list, but Unmanned Aerial Systems (UASs) have enormous potential to provide an "eye in the sky" for public safety authorities looking to see the big picture.

WHAT IS A UAS?

UASs range from small, lightweight micro- and mini-UASs up to high-altitude, long-endurance (HALE) aircraft. Most micro- and mini-UASs are launched by hand or using a small catapult rather like a rubber band. More specialised vertical-take-off-and-landing UASs do not require any special launch apparatus since they can hover.

UASs are fully autonomous: they follow a flightplan defined before or during flight by the operator. Some aerial vehicles require constant piloting from the ground. These are not true UASs and they cannot be operated without clear visual contact.

HOW CAN UASS PROMOTE PUBLIC SAFETY?

A bird's eye view provides field commanders with complete situational awareness, and unmanned systems provide this "eye in the sky" at lower cost than manned planes and helicopters.

UASs can be used where it's too risky or inhospitable for humans to operate, such as hostile or contaminated areas. They can also be small and light enough to reach spaces that manned aircraft could not physically enter.

The biggest barrier of taking full advantage of UASs is unfinished regulation. In many cases a closed air space is still needed to operate advanced UASs in civil areas.



UASS AND THE POLICE

- Real-time images and video from the air
- Observe and help control crowds at large events
- Use covertly to monitor suspects in siege and hostage situations
- Search for a missing person
- Support technical crime scene investigation with pictures of the scene
- Surveillance of highway traffic
- Create up-to-date maps of specific geographical areas



UASS AND FIRE AND RESCUE SERVICES

- Get the big picture in an emergency situation
- Search for "hot spots" on the roof to track the spread of a fire
- Deploy airborne sensors to measure chemical traces
- Monitor the spread of oil spills in coastal areas
- Monitor massive deforestation and river or sea pollutions



Command centre puts Everyone and everything in the picture

Cooperation is vital for emergency organisations. With a new command and control system currently under development, Cassidian aims to bring controller and field personnel together in a single 'virtual control centre.' With a complete overview of incident status literally at their fingertips, personnel can interact and react more easily, more efficiently and more quickly than ever before.

Voice communications have been the operational backbone of police and emergency forces for many years. Although vital and effective, voice based radio is now being augmented by a new breed of multimedia terminals, which would allow command centre staff and field personnel to exchange a wealth of visual data. Next-generation systems will encourage greater co-operation between public safety organisations, thanks largely to the rise of IP-based networks.

With the need to make more cost-effective use of human resources also driving the technology, there is a growing demand for a system that can combine number plate recognition, video and still photography, text reports, location data and fast access to databases into one overarching system that keeps

everyone informed as a security or emergency situation develops.

Just such a system is now being developed by Cassidian. Known as a Virtual Command & Control Centre for Crisis Management, or VC4M, it allows a virtual dialogue between all decision makers during a crisis situation, allowing them to take action as events occur.

Currently in the prototype stage, VC4M presents users with a 2D map on a touch sensitive screen, showing the location of people, equipment and incidents, amending and updating the situation as events unfold. Interactive icons represent all resources, from critical places such as railway stations, schools, and public buildings, to patrol vehicles and CCTV cameras.

The sheer simplicity with which information is presented visually and can be managed with a simple



Global Security

In our continuing series of articles, Key Touch® describes the major homeland security concepts, based on Cassidian's unique experience in the Global Security business. Cassidian can manage the conception, realisation and delivery of turnkey solutions for border security, large event management, emergency response, critical site and infrastructure security.

touch, will transform the way that incidents are handled.

Alarms become intelligent

Documents, videos and pictures from people at the scene can be shared easily, while the system also controls voice communications and messaging with field teams. As well as communicating with 'in-house' staff, the system can also receive alarms from private organisations such as banks and shops as well as integrate images from a CCTV network.

The system allows the command and control centre to receive an 'intelligent alarm' with a video sample showing the event. Command centre staff can then assign the nearest or most relevant unit to investigate the incident. The same user friendly interface gives them complete PMR capabilities allowing them to set up conferences with field units, speak

to individuals or exchange text messages. Using an appropriate broadband network, they can access video clips and send samples to patrols in the field, who can also send video of events as they happen.

Powerful facilities in the field

Patrol vehicles are equipped with a camera placed on the dashboard, filming everything that the patrol members can see in front of their vehicle. The patrol members access the system using a touchpad on the passenger side of the vehicle. Based on a 3D map, the touchpad provides the patrol with a wide range of information, including topographical data that allows them to see such things as height of buildings and the best place to intercept suspects.

Using a touchpad with interactive icons, the patrol has easy access to a variety of different resources. The

touchpad also allows the user to fill in documents that can be enriched with pictures taken from the camera and sent to the command and control centre in the form of an alarm or report. By equipping the touchpad with functionalities such as RFID reading or finger print scanning, users can assess passports and identities. The camera can also have automatic recognition systems such as licence plate reading.

As it develops, the VC4M system will respond to the changing needs of safety and security forces, both technically and operationally. Providing a common operational picture that is both up to date and based on relevant information, VC4M will offer decision makers and field forces better visibility on situations, both at a local and much wider scale.

Changing chairs

Bruno Chapuis from the French Gendarmerie has taken the helm of the TETRAPOL Users' Group, which meets during Cassidian's Secure Network operators' and Users' Conferences (SNUCs).

Mr Chapuis took over from Miloš Andrlje in February 2011 in the SNUC in Seville, which hosted around 440 delegates. The TETRAPOL Users' Group typically meet in a closed session at SNUCs so they can discuss the features and functions of their networks and radios in detail.



Passing the baton: Bruno (right) will build on Miloš' (left) success in helping TETRAPOL users learn from each other

French fire fighters are the first to benefit from Cassidian's latest innovations in automatic vehicle location. New capabilities make operations simpler for field officers and dispatchers...and save costs for the brigade

Finding French fire fighters in the field

The automatic vehicle location (AVL) application for TETRAPOL is becoming more flexible. Advanced new capabilities are already enabling French fire brigades to pull off the frequently difficult task of saving costs and improving operations at the same time.

The latest release of Cassidian's AVL application for TETRAPOL helps user organisations to customize the system to make use of the positioning equipment that suits them best – in terms of both cost and operation. There are three major developments that enable the improvements.

A trio of advances

First, most of the AVL systems from Cassidian deployed today use a GPS control box connected to the TETRAPOL radio. This box forwards the location of the vehicle to the AVL server. The new approach enables the fire brigades to use the GPS systems that come pre-installed in the fire fighting vehicles, or another commercial GPS receiver, rather than the specialist GPS control unit for AVL.

Second, the fire brigades can use AVL with handheld radios for the first time, thanks to software that allows users to connect the radios to commercial GPS receivers, either by wire – thanks to a micro-loudspeaker with embedded GPS receiver – or using Bluetooth. This will enable dispatch-



ers to keep track of radio users when they leave their vehicles, which will improve safety.

Third, a new web-based AVL display solution eliminates the need for specialized AVL display units in the control room. All that's needed is a web browser. This approach makes it much easier to integrate the AVL display with the existing Computer Aided Dispatching (CAD) system. This would previously have required a separate interface with the AVL server, entailing greater complexity and higher costs.

Taken together, these developments mean that the fire services can customise the AVL solution using its own components to raise the efficiency of its operations and lower its investments.

Keeping track of location

The most obvious benefit of AVL is that dispatchers can keep track of the position of their field officers. Each brigade is currently located within its geographical administrative area solution, or department, but the system enables AVL servers to communicate, so a national CAD could be instigated if needed.

Keeping track of status

French fire fighters commonly use status messages to keep the control centre up to date. The AVL solution makes this much simpler by enabling officers to transmit that they're "on the road", "on site" or even "on the way to the hospital" with a single press of a button. Up to ten common status

messages can be used in this way, eliminating the need for an officer to scroll through a menu, which can be difficult in emergency situations.

Dispatchers can see at a glance if a vehicle in the field can take on a new mission. This can be a huge time saver for dispatchers, who can use deploy vehicles that are already close to a new incident. They can then use the "mission order" feature to send all the necessary information out to the team so they can carry out the new mission safely without coming back to base.

Feedback on the new location capabilities from the French fire fighters has been highly positive so far. Watch out for further developments from Cassidian as the evolution of AVL continues.

IDRs

give instant
extra
coverage

SOLUTIONS

An Independent Digital Repeater (IDR) is an easy and cost efficient way to provide tactical, standalone radio coverage almost instantly. Now a new generation of IDRs enables TETRAPOL users to connect several IDRs together to provide wider coverage. It also provides data capabilities and provides field officers with a vital link to the control centre.

IDRs can be deployed by one person in under a minute without any site preparation. They're housed in a compact case complete with all the accessories needed for a rapid deployment. The existing 2G IDRs are entirely standalone and only offer voice communications over a single channel. The new 3G versions from Cassidian allow several IDRs to connect together for wider coverage.

They also provide data capabilities, opening up the possibility of using applications such as GPS positioning in IDR mode.

Create coverage

All kinds of organisations already benefit from IDRs, which are a much more cost-effective way of providing tactical coverage than deploying conventional base stations.

For example, around 200 IDRs are in use in the Brazilian Proamatec authority network. This makes it possible for officers to deploy coverage as needed in a vast country where it would be too expensive to roll-out a permanent network. Officers therefore deploy IDRs whenever they need to establish secure group communication beyond the reach of the main regional TETRAPOL networks.

In another good example, three IDRs were deployed in Haiti to provide emergency communications for rescue workers in the wake of 2010's devastating earthquake.

The latest announcement from Cassidian overcomes some of the limitations of these existing IDR solutions. First, users can now interconnect several of the new, 3G IDRs via an IP link, making it possible to provide wider, multi-cell coverage.

Second, it enables the interconnected IDRs to exchange tactical data with each other, making it possible to visualise the positions of the radios within the coverage area and allowing users to swap SMS messages.

The third innovation enables IDRs to incorporate Radio Access Gate software and communicate with the dispatcher. Previous generations of IDR only enabled field radio users to talk to each other. This lifeline to the

control centre combines with the arrival of data to enable dispatchers to monitor the position and operational status of field personnel who are using radios covered by a 3G IDR. The control centre can use the information to keep track of how an incident is evolving.

Build resilience

Security forces and other agencies operating in critical situations need to be able to rely absolutely on their communications network, and the 3G IDRs provide an extra fall-back facility.

The first level of fall-back occurs if a base station loses touch with the main network but is still functioning as a standalone unit. Dispatchers can access the communications within the standalone cell using direct radio access. If the base station itself is out of order, a 3G IDR can be deployed rapidly to provide a second fall-back solution.

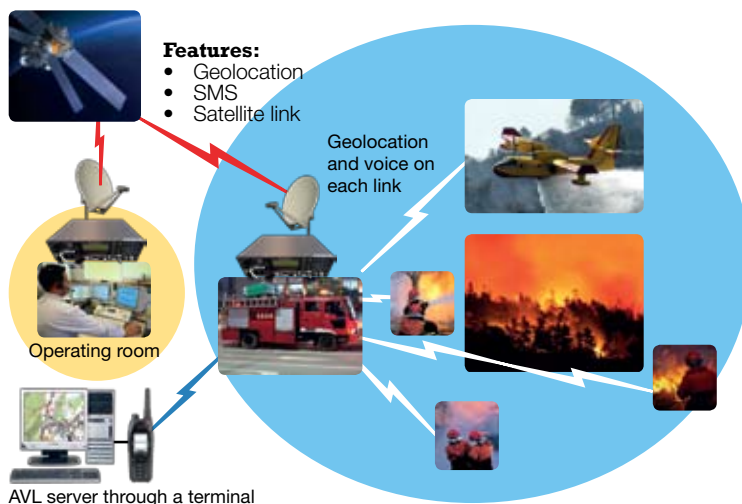
Indoors and out

IDR solutions for outdoor deployments are already widely used (in Brazil and Haiti, for instance), but the other new development announced by Cassidian is a solution for indoor applications. This provides tactical coverage for teams called to work in locations such as tunnels or car-parks, for instance or may be used to provide a low-cost, permanent extension to the normal network coverage.

Officers can switch between the main TETRAPOL network and the IDR cell simply by switching channels on their radios.

These developments are the latest improvements in IDRs from Cassidian, but they will not be the last. The company is already working on developing greater continuity of radio communication between regional TETRAPOL networks and the tactical coverage provided by the IDRs.

Interconnection of field IDR cell with the IDR cell of the crisis cell at the control room





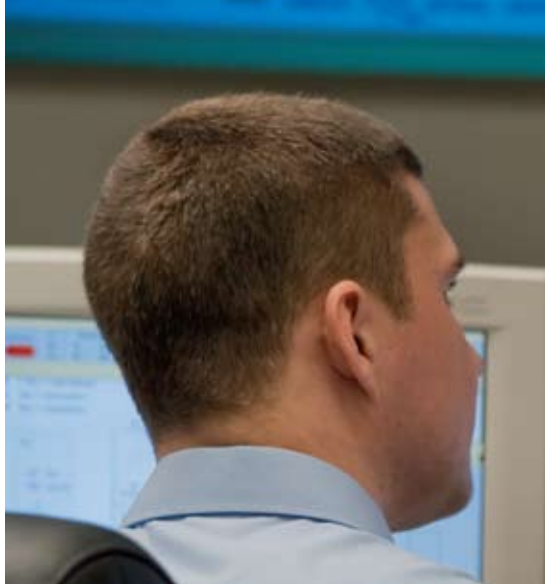
One radio, two users, many uses

It often happens that two people want to use the radio at the same time in an ambulance or fire-engine. For example, the co-driver might talk with the control room or operations leader while the paramedic may need to call the hospital for details about the patient's treatment.

Instead of the cost of separate TETRA radios for each user, there is another way: one TMR880i mobile radio with two CUR-3 control units, connected by Split-box.

Developed by Cassidian partner TC Connect of Sweden, Split-box is a small device with two connections for the control units and one connection for the radio. Needing no external power or additional devices, Split-box allows one CUR-3 mounted on the dashboard, for example, and another in the rear of the vehicle. A user who needs to use the radio simply presses the PTT and becomes the active user and can talk.

An example of customers having found this solution useful and efficient for their operation is the regional fire service in Burgenland, Austria. By using Split-boxes they can make more out of their TMR880i radios installed in the fire engines.



Public safety digital radio networks are renowned for providing secure, high-availability mobile communications for personnel in the field, who rely on them in emergency situations when commercial communication networks could be overwhelmed. What's less well-known is that these professional radio networks often provide the most secure and cost-effective way to deliver information from fixed points, such as flood, radiation or fire protection systems, which also need to get their messages through in any circumstance.

National networks based on TETRA and TETRAPOL digital radio typically serve multiple public safety agencies that already demand mission-critical performance. Alarms and other fixed systems can therefore enjoy the same mission-critical benefits without having to build in extra back-up systems. Linking all the fixed data points into an established national network also makes integration easier because the same interface design can be used to integrate each fixed point into the network, rather than having to carry out multiple integra-

Beyond mobility

– radio transport for fixed monitoring

tion projects to integrate with multiple carriers. Using an existing shared network is also an extremely cost effective transport solution compared with building and operating an independent network.

The Finnish authorities have long embraced this way of using the VIRVE network. The national network is already used by the Radiation and Nuclear Safety Authority (STUK) to collect data from its nationwide network of dose rate monitoring stations. VIRVE also acts as a secure transmission path for civil protection sirens, fire station alarms, burglar and fire alarms on government buildings and hospital alarms.

Other countries have now spotted the potential of using their radio networks in this way. In Hungary, for instance, the proposed system will monitor radiation, while the UAE wants to use its radio network to transmit public warnings via sirens, screens and road signs. Fixed burglar alarms in shops is another proposal for UAE, as is providing communication between ambulances and fixed management systems in hospitals.

In fact, many countries could follow the VIRVE example and replace

their current system of transmitting radiation readings via land-line and GPRS to a more reliable TETRA-based carrier. The same approach could be used for road administration, flood monitoring and alarms, fire stations and civil protection stations.

STUK is the responsible authority for monitoring radiation in Finland. It has several different ways of monitoring radiation in the environment but only the dose rate monitoring network reports in real-time. Dose rate monitoring results are needed so that timely action is taken to protect people in an affected area. This requires reliable communication in all situations.

Tracking radiation levels

Finland's Radiation and Nuclear Safety Authority (STUK) is the country's largest user of packet data on the VIRVE network. Its dose rate monitoring network uses VIRVE to transport monitoring results from an extensive network of fixed monitoring points around the country. Every ten minutes, the monitors check radiation levels and trigger an alarm if the level in any seven-day period exceeds a pre-set threshold. To increase redundancy, monitoring results are sent to three independent systems.

The main transport mechanism is TETRA IP packet data, with SDS as a backup. Combining the two systems brings availability up to nearly 100%.

Each terminal on the monitoring network has a unique IP address. Using TCP/IP makes it easy to add or remove terminals as needed.

The fixed terminals upload readings to the VIRVE network every 10 minutes. Furthermore, because the communication is two-way, STUK can apply software updates and other control measures remotely.

DID YOU KNOW ...

how to make text messages longer?

Do you believe that text messages over TETRA can include only 120 characters, which is the length of this blue sentence? This is old history. With Cassidian terminals you can combine messages to allow longer texts of up to 399 characters (the length of this blue and green text together), which are quicker and easier to send and receive than separate short messages. And the radios do all the work!

That's because the sending radio automatically divides a long message into two or three parts and sends them individually. The receiving radio puts the parts back together and shows them all as one message. The whole process is seamless for the user.

The joining together of messages applies to normal text messages. In languages using Arabic, Chinese, Korean or Cyrillic script, the complete message can include 198 characters.

Meeting competing demands for voice and data capacity

What separates Joe the police officer from regular, off-duty Joe? Probably a lot of things, but communication is certainly one of them. Joe may spend lots of time on-line while off-duty, but a malfunction in his domestic broadband connection isn't life-threatening. At work it's critical.

Professionals must be able to trust the availability and security of information if they're going to rely on it in the field. That's why so many public authorities have invested in building TETRA and TETRAPOL networks for voice. But today's professionals increasingly expect to be able to access data on the move, just like they do over commercial networks, and mission-critical networks are evolving to meet that need.

Joe the police field commander, for instance, wants his field commanding solution to show the current position and status of each unit accurately, without impeding his ability to contact his officers using voice. The same applies to critical information for Hans the fire chief or Susan, the head of the trauma unit.

A TETRA network can easily deliver the level of availability that Joe, Hans and Susan expect during normal operations. But during a major disaster, the level of network traffic can grow exponentially and demands a smart solution to prevent disturbance between voice and data services.

The TETRA Enhanced Data Service (TEDS) is the TETRA feature that can bring data-centric field operations to life. Its new extension – Direct Access – can bring even more benefits.



What is the answer?

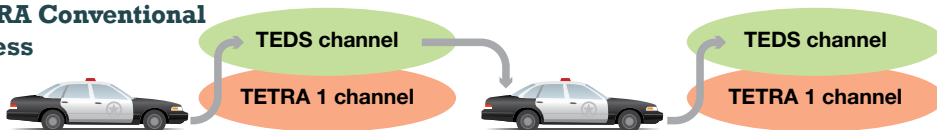
With TEDS Direct Access, TEDS data services are independent from voice services and have separate Quality of Service (QoS). TEDS data radios receive and send data directly on the TEDS channel, never using the same resources as the talk groups and individual calls. Like a motorway and a high-speed railway running in parallel, the different types of traffic will not impact on each other.

TEDS Direct Access will be part of the ETSI TETRA standard and the Cassidian Fortecor® TEDS implementation.

So for Joe or Hans, applications such as automatic vehicle location keep them up-to-date with the latest situation using a TEDS data radio such as the Xerigo™ 3, while a Cassidian TMR880i or similar TETRA voice radio provides critical voice contact. Similarly, an ambulance transmits vital patient information such as an ECG trace to Susan at the hospital, while the paramedic can talk to the team via a voice call.

Conventional or Direct Access

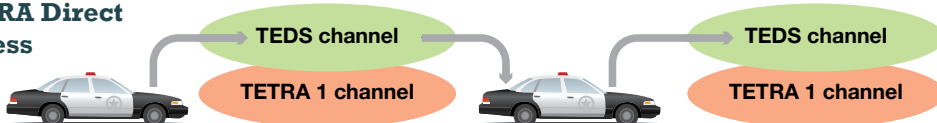
TETRA Conventional Access



With TETRA Conventional Access, every TETRA radio terminal registers on the Main Control Channel. According to the service it needs, it is directed to traffic channels (TCH) for voice calls, to packet data channels (PDCH) for packet data transfer, and to the TEDS channel for high speed data. This mechanism is called TETRA Conventional Access.

Best for: Voice+data terminals such as TEDS capable handportables.

TETRA Direct Access



Using TEDS Direct Access, a radio will not register on the TETRA MCCH but directly on the TEDS carrier. As long as the TEDS service is available, the radio will do cell re-selection from one TEDS carrier to another without ever visiting the conventional TETRA side.

Best for: Devices dedicated to data, such as TEDS data radios.

Smoothing the way for the

Smart Grid

The Smart Grid concept for power distribution promises to deliver major cost and environmental benefits, as well as a more robust, high quality power supply. Realising this vision demands secure communications.

The first key characteristic of the Smart Grid is intelligence. The power distribution system should sense system overloads and reroute power automatically to prevent or minimise outages. It should also be able to respond autonomously to manage supplies more quickly and efficiently than human operators.

Efficiency is next, with the Smart Grid able to meet rising consumer demand without added infrastructure. It should also accommodate energy from the entire range of potential sources and be sufficiently flexible to integrate new technologies as they come on line.

The Smart Grid will eliminate sags, spikes and other disturbances in the quality of power, as well as being more resilient to attacks and natural disasters.

Ultimately, the Smart Grid will play its part in delivering significant environmental improvements.

Supporting the concept

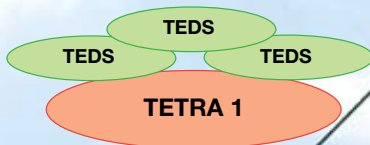
Communications provide critical support for the Smart Grid. For example, smart routing and smart devices can even out peaks in power consumption and enable utility companies to reduce excess capacity and redundancy in the generation network, but only if they can “talk” to one another. Reduced redundancy also has the potential to increase the vulnerability of supplies to disruption, and only real time information-sharing can mitigate this risk. The gradual shift from fewer, larger generators towards many smaller contributors is another factor that will drive up signalling traffic.

Dedicated TETRA networks are more resilient to disruptions such as natural disasters, accidents and cyber attacks than other networks. This is critical since disruptions to power supplies can have huge consequences, both economically and in human terms.

Because TETRA is wireless, it's also a very cost-efficient way of deploying last-mile connections. Initially this will be important for smart metering and environmental sensing and it will become increasingly important later on as distributed power generation demands more signalling. If a company opted to build a dedicated LTE network on commercial frequencies, the cost of the frequency licence could be more than the investment in a Cassidian TETRA TEDS network and terminals.

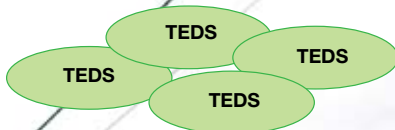
Options for TETRA

Utility companies can deploy TETRA communications in several ways.



Option 1 is to build their own voice and narrowband data TETRA network and deploy high-speed data (TEDS) in selected areas using dedicated single carrier TEDS Direct Access base stations.

Option 2 is to build a TEDS network dedicated for data.



In this network, voice services could be activated when required. Single carrier TEDS Direct Access base stations are a very cost-efficient solution for data, and selected carriers can be configured remotely to provide voice cover.

Option 3 is to subscribe to a shared, public safety TETRA network. This provides ubiquitous voice coverage for maintenance personnel. Spectrum efficiency and a lower total cost of ownership are also advantages. Network sharing requires the ability to prioritise critical services both between and within organisations, while the Smart Grid demands an ability to build additional data-oriented capacity to bypass any bottlenecks. Cassidian supports all these requirements.

TETRA for every phase of the Smart Grid

The Smart Grid is evolving in phases, beginning with smart metering, progressing to smart traffic management and ultimately achieving full integration into an intelligent, distributed system. At the same time, utility companies want to maintain voice coverage for engineers working in the field.

Smart Grid data traffic will soon accumulate to a point where it tests the data transmission capacity of TETRA networks designed for voice and narrowband data. Existing voice networks will have been designed to provide wide coverage for relatively few users, so they probably won't provide sufficient data capacity in the longer term.

TB3p mini-base stations provide a solution. They're small enough to fit into existing equipment rooms and

equipment cabinets, and the resulting site costs are therefore negligible. The TB3p can operate in TEDS Direct Access mode so that a single carrier TB3p base station can provide up to eight times the SDS capacity and up to 40 times the IP packet data speed of standard TETRA Main Control Channel or single slot packet data service.

Xerigo™ 3 TEDS data radios provide the data link between the base station and the grid elements. The number of TB3p cells can readily be increased to meet practically any capacity requirement. Furthermore, as the TB3p cells are not on hill-tops, the same frequency can be used nearby without interference, providing greater spectrum efficiency.



Easy and safe reporting of radiation information over Rakel

Cassidian TETRA radios are being used to make the reporting of radiation readings quicker, easier and more accurate. Developed by Cassidian distributor TC Connect, the application uses Sweden's RAKEL network to report radiation levels to the Swedish Radiation Safety Authority (SSM), which is responsible for regular monitoring of radiation levels throughout the country.

Should an accident occur, each municipality in Sweden has a dose rate meter for measuring and reporting the radiation values of a particular location at regular intervals, or when requested.

So far, each municipality has reported the measurement values manually to SSM. To make the procedure more effective, both to reduce the time for the measurements and

to minimize the risk of inaccurately reported figures, the new solution has the ability of sending measurements as SDS messages to a central point at SSM.

A Java™ application allows the user to enter the measured radiation value directly into a message template. The message, including the measured value and the actual time and location, is sent to a predefined address. The time stamp is received automatically from the TETRA network and the location is read from the radio's built-in GPS.

A development of the solution is already underway. This connects the dose rate meter directly to a TETRA radio, allowing the measurement value to be transferred automatically from the instrument. TC Connect has built a portable water and shock-proof housing for the equipment which can be placed at a measurement location. The application can be set to send the value at regular intervals for a predefined period. This solution is very valuable since it can work autonomously and can therefore be placed unattended in a radiation area and report the measured values continuously.

Rakel beats the saboteurs

January saw criminal gangs target copper cable around the Norrbotten area of Sweden, causing thousands of Comhem cable customers to lose their TV, Internet and telephone connections. Telia and Tele2 were also targeted, leading to problems for mobile phone customers. Through it all, the Rakel public safety network continued to

work as usual throughout the disruption caused by the thieves.

"The Rakel network is not as fragile," says Marko Fagerström, at MSB who is responsible for the network roll-out. "It has been built with both backup power and alternative transmission routes, so it can withstand extreme conditions."



Rakel safeguards Sweden's power distribution

“Without electricity, we lose the ability to handle a crisis,” says Thord Eriksson, director of preparedness and security at Svenska Kraftnät.

Svenska Kraftnät is the national agency responsible for promoting the use of the Rakel public safety communications network in the electricity and energy sector, and Mr Eriksson is clear about the potential advantages: “The availability of communications is key – both in everyday activities when the electricity network needs maintenance or repairs, and in a crisis situation when the continued distribution of electricity will allow society to handle the situation and minimise the consequences.”

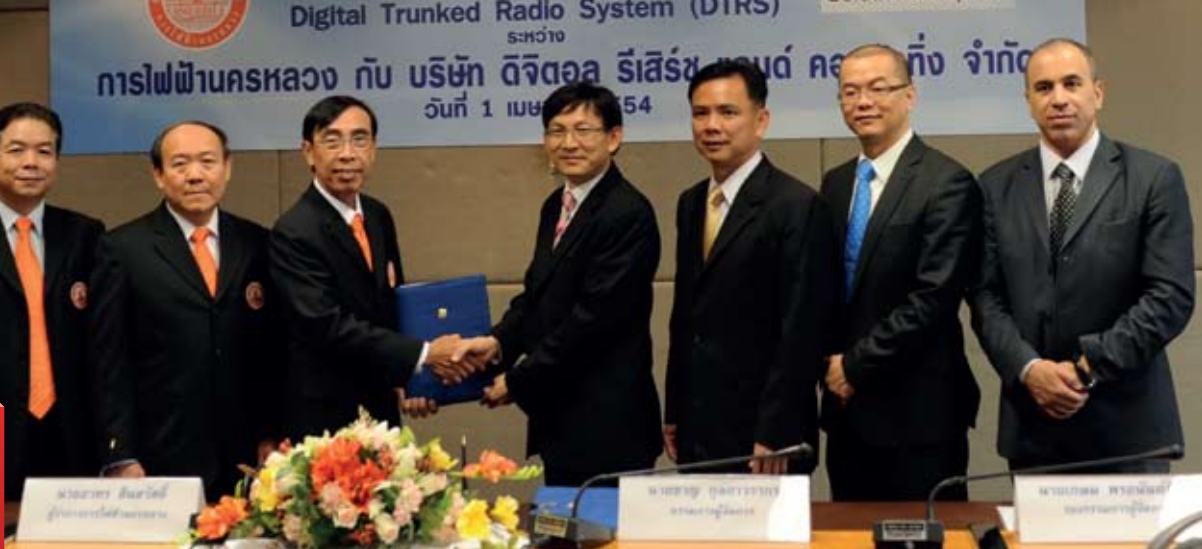
Fortum was the first commercial body to use Rakel. The company distributes electricity to 1.3 million customers and has used Rakel in its field operations in Hälsingland since 2007. Fortum has grown to its current position by acquiring several different operators, each of which used to have a different radio communication system. Rakel has changed all that. “It is a great benefit to be able to simultaneously deliver a real-time picture of the situation in the electricity network and reach 20 control rooms in the chain of distribution at once,” says Jan-Olof Olsson, Rakel project manager for Fortum.

He adds that one of the biggest benefits of switching to Rakel so far has been improved personnel safety: “We need to know where everyone is, how their work is progressing and that they make their way back safely. Rakel increases the safety of those who work under difficult circumstances, perhaps alone or in the middle of the night.” He adds that the company doesn’t

feel that commercial cellular services are reliable enough for such critical applications.

Because Rakel is used by multiple user organisations, it also gives Fortum more flexibility when working with external partners, and all the company’s field operatives are now Rakel users. “The next nut to crack is to adopt Rakel in the operations centre in Karlstad,” says Mr Olsson. The centre typically takes around 500 calls per day. The communication system therefore needs to be able to handle recorded messages, call queuing and call sourcing.





Thailand's Metropolitan Electricity Authority switches to digital with TETRA

Thailand's Metropolitan Electricity Authority (MEA) is replacing its analogue communication system with a digital TETRA network. A contract has been awarded to Digital Research and Consulting (DRC) who will undertake the implementation using a platform from Cassidian.

The new, turnkey TETRA network will provide voice and data communications for MEA, including applications for automatic vehicle location, voice recording and picture transmission. It will interface efficiently with MEA's PABX telephone system and IT network.

Cassidian is supplying, testing and commissioning one switch, 17 base stations, 13 dispatcher workstations, 500 handheld radios and 1,250 mobile terminals as part of the deal. Deliveries are

expected to begin later this year and the project is scheduled for completion around 18 months after the deal was signed in April.

The network will initially serve some 1,800 users and will be able to support at least 5,000 when needed. It will cover the entire area served by MEA, including the Bangkok, Nonthaburi and Samut Prakarn provinces. MEA serves over three million customers of all sizes, from residential consumers to businesses, local government and NGOs.

The deal marks Cassidian's first major network project in Thailand, but the contract reflects the company's position as a leading communications supplier in the global power supply market.

"This is a very important project for Cassidian, since it is the first Cassidian TETRA system to

be deployed in Bangkok," says Galvin Wong, CEO APAC. "We are keen to explore more business opportunities in Thailand and APAC."

As a contractor for MEA, DRC has a proven track record of administering multiple implementations effectively and within budget constraints and time schedules.

"Through more than ten years of experience in telecom projects, we plan to complete the MEA project earlier than scheduled," says Charn Kulthavarakorn, DRC Managing Director. "With Cassidian's cooperation we are committing to an 18-month aggressive project timeframe."

Cyberabad police launches 3,600km² TETRA network



Andhra Pradesh's chief minister has inaugurated the Cyberabad Police TETRA network. The 3,600 square kilometre network was delivered by Cassidian and its Indian value-added reseller, Sanchar Telesystems.

The network comprises nine base stations and can initially accommodate about 500 users. It provides voice and data/image transmission, including an Automatic Vehicle Location (AVL) system.

"The Cyberabad Police are among the first police organisations in India to use a secure TETRA communication network of this size and functionality," said police commissioner S. Prabhakar Reddy. "This new communication system will enable the Cyberabad Police to better coordinate their resources in the event of any emergency or developing law and order situation within the Cyberabad Commissionerate region surrounding Hyderabad."

Inauguration of Parliament network in New Delhi

The Indian Parliament's secure TETRA communication network is now fully operational.

This is the first public safety network in India that combines encrypted TETRA voice, data, automatic vehicle location (AVL), image transfer, database access and voice/data recording. It's also software-upgradable to the high-speed data capability (TETRA Enhanced Data Service, TEDS) in the future.

The system was supplied by Cassidian's local value-added reseller Sanchar Telesystems Limited and inaugurated on 19 November 2010 by the Honorable speaker of the house Smt. Meira Kumar.



First order from Metro in India

The Delhi Metro Rail Corporation has ordered nearly 1,400 THR880i TETRA terminals through Cassidian's local value-added reseller, Sanchar Telesystems Limited.

The Delhi Metro network currently includes five lines, running 110 kilometers in total. A planned expansion is set to more than double the total length in service next few years.



What you liked best in Key Touch 1/2011

Once again we asked our readers to pick their favourite article. "TETRA radios beat the big chill" rocked the polls and was clearly the article that provoked the most interest. One reason must have been the fact that professionals living in the northern hemisphere witnessed some really chilling weather conditions over the winter.

First runner-up was "TETRA at skiing world championships", which discussed how TETRA technology helped to co-ordinate events at the Nordic World Ski Championships in Norway this February. The second runner-up article was called "Did you know...about flash messages?". Flash messages have certainly proved useful for many professionals working in the field.



UP

Co-operation
Simpler and smaller
Cloud computing
Goulash
Using common sense

FEEDBACK WINS PRIZES

DOWN

Organisational silos
Ego-centricity
Multi-slot packet data
Quasi-efficiency
Asparagus

Tell us what you think about our latest issue by voting for the best article in this edition.

Go to **www.keytouch.info** and share your views by voting in the poll. You can win a prize too!

MEET THE TB3p THE WORLD'S SMARTEST, SMALLEST TETRA BASE STATION

INTRODUCING THE TB3p TETRA MINI BASE STATION. SELF-CONTAINED, EXTREMELY SMALL AND EASILY TRANSPORTABLE. DESIGNED FOR THE ENVIRONMENT, ENGINEERED WITHOUT COMPROMISE.

Smallest carbon footprint.

The TB3p's power consumption is about 40 W, which is less than 10% than that of a conventional macro base station.

Remote management.

There's no need to visit the TB3p in person. It can be operated and maintained over a remote connection.

Packs a punch. The TB3p offers exactly the same powerful features as its big brother, from TEDS to air-interface encryption and from Type 1 Handover to base station fallback.

Happy anywhere. TB3p base stations do not need a costly site so they can save big money. Base station site rentals and transmission costs typically account for up to 80% of operating costs.

Easy to deploy.

The TB3p is easy to deploy for standalone or temporary coverage.

Data-ready. Thanks to its TEDS capability, the TB3p can provide coverage in data hot-spots.

Mind the gaps. Use the TB3p to provide indoor coverage or plug gaps in the outdoor network.

Ready for anything. The TB3p comes pre-configured, so setting it up requires no RF expertise.



Unveiled for the first time at TWC 2011 the TB3p crams big functionality into a tiny package with a tiny power consumption.

A group of mounted police officers on horses in an indoor arena. The officers are wearing dark blue uniforms and helmets. The horses are brown and white. The arena has a light-colored floor and a white wall in the background.

MOUNTING UP TO DEFEND PUBLIC SAFETY

Mounted police are an elite bunch, with just eight officers teamed up with horses in Helsinki, for example. So what does it take to be a good mounted police officer?

Most police officers can acquire the necessary riding skills for mounted work with the right training, so what the team is really looking for are people with the right temperament for a successful career as a mounted officer. Mounted police may be few in number but they have an extremely high public profile, so excellent people skills are essential, as is great concentration, since they



must be able to control a large and powerful animal safely in the middle of a crowd.

Riding proficiency is also needed, so the Finnish authorities provide up to three weeks of intensive training for less experienced riders and everyone takes a placement test before they're allowed to mount up on patrol. Their riding skills are honed even



further by riding lessons twice a week, developing specialist manoeuvres such as jumping and dressage.

Special animals too

Riders are just one part of the overall patrol unit, and it also takes a special kind of horse to do police work. The animals must be calm and healthy, with feet that can stand up to the wear and tear of spending most patrols walking on hard surfaces such as tarmac.

They're also big, with the vast majority being more than 170cm at the shoulders. The Finnish force buys horses with the right physical attributes on the open market, but that's just the start. They then need intensive training to get used to dealing with sudden noises, traffic and crowds without becoming stressed.

Horses and riders have a demanding schedule. Riders routinely undertake a shift that includes five hours of riding in the

summer and two or three hours in winter.

Unlike other field officers, the mounted officers are typically deployed in pre-planned operations, rather than being called on to handle emergencies. For example, all eight riders are used to support the Winter Classic hockey match at the Helsinki Olympic Stadium. They take part in the parade and help to manage the crowd around the main gate. This means that they're also on hand



**Horses and riders
engage positively with
the public at fairs and
other public events**

crowds. In fact, officers report that being on horseback offers the apparently contradictory benefits of making them generally more approachable than when they're in a vehicle and giving them more authority when dealing with members of the public who aren't quite so friendly.

Communication in the saddle

Whether they're "meeting and greeting" or controlling a hostile demonstration, good communication is essential for mounted officers, as it is for all police personnel on field operations. However, the laptop-based POKE

field command system used by vehicle-based officers in Helsinki is impractical for users on horseback, so the mounted team use hand-held TETRA radios for voice and status messages over the VIRVE network. Some officers also use accessories that allow them to operate their radios hands-free.

The biggest challenge for the radios is cold weather, since the riders patrol all year round and low temperatures can lead rapidly to depleted battery power. Fortunately, the structure of the typical day enables regular battery charging.

to intervene if any trouble starts up during the match.

It's also common for the horses and riders to make "celebrity" appearances at fairs and other public events, where they engage positively with the public who enjoy any opportunity to get some hands-on contact with these magnificent animals.

The added height of mounted patrols makes it easier for officers to see and be seen compared to officers on foot, especially in





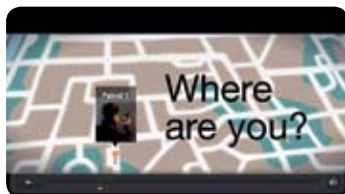
Videos help you stay one step ahead

Sit back, have a cup of coffee and view our essential PMR-related videos on the KeyTouch® website.

They are all here: http://www.keytouch.info/features/videos_and_podcasts/



Protecting agents in the field is the aim of the Lifeguard feature available in THR8, THR9i and THR9 Ex radios. The application automatically recognizes if the radio isn't moving or if it remains in a horizontal position (i.e. officer down) for an excessive time. **Check out the video called "Lifeguard" in the videos section of the online version of Key Touch.**



Did you know that your THR8, THR9, THR9i and THR9 Ex radios provide automatic positioning between radio users during a call? **Watch the "Where are you" video to discover more.**



How will the PMR market evolve to serve its different user groups? **Take a look at the Fortecor® section** to see Chief Superintendent Antti Jeronen talk about how communications could help the police face challenges today and tomorrow.

The same video section provides deeper insights into communications for security forces. **Go to the video called "High speed data market and trends" to learn more.**

These are just a few examples that will keep you updated on current topics. Please take a look at other illustrative videos at our website at www.keytouch.info

The future of mobile apps over PMR

Some applications would be welcome on any mobile radio

Just as smartphone apps have arrived with a bang on commercial networks, professional users will soon be able to access a variety of on-line communication tools over PMR networks.

Sometimes a simple communication link to the command centre is all a field officer needs, but there is a growing need for smart applications to support more efficient, flexible working practices.

In the not-so-distant future, role-oriented communications, live reporting and intelligent task management will all be available, thanks to a plethora of value-adding applications that can be tailored and customised to meet the needs of different organisations. Some future applications might literally mean the difference between life and death, while others will simply make another hard day at the (mobile) office a little more comfortable.

There is also a growing need for PMR terminals to communicate with other kinds of devices such as biometric passports, RFID tags, information database devices and so on.

Imagine the possibilities...



MAPPING MARK-UP

Leaders can mark-up the maps on their terminal screens with routes or search areas and send them to the team. Think urban rescue operations.



CALL ON THE CLOUD

Field officers can access tactical information remotely, such as the history and profile of a suspect in a hostage negotiation. This cloud-based approach reduces the need for data storage on the terminal.



VIDEO AGGREGATOR

A command centre can pull together civilian video clips of an incident from the web and send them out to field officers, enabling them to see the situation from multiple perspectives.



TIME FOR A BREAK

Even the most rugged field agent has to eat. The "find a restaurant" app on commercial smartphones is a great example of the kind of application that could benefit professional radio users just as much as the rest of us.

PICTURE THIS

Failure is not an option

While using digital technology to track down a doughnut may seem trivial, the big difference between commercial apps and PMR apps is that many of the emerging professional apps will be mission-critical. Reliability is the key consideration in potentially life-threatening situations, and only digital PMR can meet that need.

Where to next for

Interoperability that enables different agencies to work seamlessly together is the future of emergency communications, according to Terry Hall, Second Vice President of APCO International and Chief of Emergency Communications at the York County Regional Emergency Communication Center in Virginia.

Who is Terry Hall?

Terry Hall is the Chief of Emergency Communications for the York-Poquoson-Williamsburg Emergency Communications Center in Yorktown, Virginia. Mr Hall manages the regional 9-1-1 center, and is the technical systems manager for the regional P25 radio system that encompasses six localities.

Mr. Hall served as a deputy with the Sheriff's office for seven years, and worked for 15 years in the fire services. He has received the Virginia Governor's Award for Excellence for leadership and commitment to public safety communications, APCO International's Director of the Year, and State EMS awards of excellence.

Recognized as a leader, not only in Virginia, but across the United States, Mr. Hall is often called upon as an expert on issues concerning public safety, emergency communications and emerging technologies.

emergency calls?

The York County centre is one of the largest regional 911 handling facilities in Virginia serving over 150,000 inhabitants, and over a million visitors a year. It's a great example of the seamless approach advocated by Mr. Hall because it covers York County and the neighbouring cities of Poquoson and Williamsburg, and James City County as well as Gloucester, and provides seamless mutual aid throughout Hampton Roads Virginia. "With one call to 911 you can now reach three law enforcement forces and three fire departments, and have immediate access to eleven mutual aid fire companies and three neighbouring law enforcement agencies" he says.

York County was the first 911 centre to deploy Phase 1 and Phase 2 technology under the Enhanced 911 programme. Phase 1 enables call centre personnel to identify the radio cell from which a caller is ringing, while Phase 2 attempts to pinpoint the actual location. Nevertheless, over 70% of incoming emergency calls currently originate from cell phones and currently over 30% do not provide accurate call data, so Mr. Hall predicts that Geographic Information System (GIS) technology will be deployed in the future to make this easier.

Lessons from crises

Mr. Hall has been involved in emergency communications for more than 20 years and has seen first-hand how greater co-operation between agencies can help in the most difficult situations. As a past member of Urban Search & Rescue and a current member of a Disaster Medical Assistance team for instance, he has been deployed to help in the aftermath of hurricanes such as Katrina, Rita, and Gustav.

The lessons from Katrina in particular sparked a shift in emergency communications, leading to \$7.5 million of new investment. This resulted in the

deployment of a shared P25 public safety network overlaid by ORION technology that gives each authority its own interface with the merged system. The next step is to establish a single virtual Public Safety Answering Point (PSAP), which is where all the calls coming into the system will be processed.

This co-operative approach has both operational and funding advantages, according to Mr. Hall. "We now have improved emergency management between the Coast Guard, military, state and local authorities," he says. "At the same time, cost efficiency has become more important, while open solutions and a vendor ecosystem promotes competitive procurement processes."

Beyond voice and text

Looking ahead, the other big trend is towards IP enabled technologies, which will allow new applications and improve operational effectiveness. For instance, mapping and video will become commonplace alongside voice and text transmissions, predicts Mr. Hall. Voice over IP (VoIP) presents added challenges for emergency responders since it makes it more difficult to locate callers in trouble. However, the National Emergency Number Association's (NENA) i3 plan aims to explore the IP connection between callers and the PSAP to glean even more useful information.

Ultimately, the same "anything, anywhere on any device" philosophy that is already the norm among many commercial broadband users will spread to emergency organisations, according to Mr. Hall. Emergency workers will expect to use multimedia applications over any device, both in the dispatch centre and in the field.

TB3p in action

Fire and rescue services need indoor coverage when tackling incidents in buildings, tunnels or other underground areas. They need a cost-effective, temporary solution.

In the era of analogue systems, German fire services installed analogue base stations, leaky RF cables and/or indoor antennas in big buildings so they were ready to be activated if a fire broke out. Fire chiefs would open the locked control panel and flip the switch to provide indoor voice coverage for officers working inside.

With flexible TETRA systems from Cassidian, flipping the control switch gives access to the full range of secure voice and data services that are available throughout the network, rather than simple analogue voice.

Any TB3 series base station from Cassidian, flipping ready to be switched on in an emergency. The TB3p mini base station is an ideal choice, since it's small, affordable and energy-efficient.

The base station is automatically connected to the control switch - for example, via an ISDN link - by using Piccos (E1/So converters), or via an IP connection.

It's also possible to set up a base station in Standby mode. If there is a fire alarm, the alarm can automatically activate the base station. Alternatively, if there is a TETRA radio connected to the base station, command and control could turn it on remotely. Either way, the firefighters would find they have indoor coverage when they arrive at the scene - and they would not have to access the control panel.