

# CRITICAL

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## The future of broadband for utilities

p10

### Almost there

Emergency Services Network programme director John Black gives an exclusive update on the state of the project

p24

### North-western heroes

Exploring a recent deployment delivering satellite comms to a COVID-19 field testing centre for Piedmont essential workers

p30

### New horizons

Ahead of his new role as TCCA CEO, Kevin Graham discusses his plans for the organisation and hopes for the sector

October 2021

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# CRITICAL

COMMUNICATIONS TODAY

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## OCTOBER 2021

6



18



10



31



### 4 Editor's letter

Philip Mason introduces the latest issue of *Critical Communications Today*, which includes two exclusive interviews with major industry figures

### 6 Who, what, where

Hytera helps to secure major conference; industry giant's Olympics commission; Nokia announces New Zealand 5G collaboration; German navy awards communications contract to Motorola; US environment organisation updates comms network

### 8 News

Report: technology can 'transform' public safety; Virve 2.0 device supplier chosen; Airbus to work with Gulf states on cross-border comms; TCCA announces new CEO

### 10 In sight of the finish line

Philip Mason talks to ESN programme director John Black about key learnings from the previously troubled project, as well as his predictions for the future of the market

### 14 LTE's power play

Electricity transmission and distribution network operators are deploying broadband to help them develop the smart grids required to manage distributed energy systems

### 18 New ways, new vigilance

Following TCCA's recent cyber security co-ordination meeting, CCT talks to a variety of industry experts on the challenges presented by the ongoing move from narrowband to mission-critical broadband

### 24 North-western heroes

*Critical Communications Today* talks to the University of Louvain about its ICCA-winning satellite comms roll-out at a COVID-19 testing centre in the Piedmont region of Italy

### 26 The camera eye

Motorola Solutions' head of mobile video, Richie McBride, talks about a recent, major BWV deployment to ambulance crews operating in the UK

### 30 Exploring new horizons

In his first interview since being awarded the position, incoming TCCA chief executive Kevin Graham talks about his plans for the organisation, as well as his hopes for the critical communications sector

### 31 CCW 2021 preview

All you need to know about Critical Communications World, taking place at the beginning of November in Madrid



# Getting back to the world

*Critical Communications Today* editor Philip Mason introduces the new issue, discussing in particular its multiple exclusive interviews with major industry figures

## MISSION STATEMENT

*Critical Communications Today provides the global mission-critical community with insight into the latest technology and best practice required to ensure that its members always have access to the instant, one-to-many wireless communications that can make all the difference in moments of crisis.*

*We are dedicated to providing our readers with the knowledge they need when determining their critical communications strategies and procurements, though delivering up-to-the-minute accurate information on industry trends, developments, and deployments, as well as the latest new products and services. Our journalists are committed to easing out the little details from your peers that will allow you to draw on the industry's collective experience of deploying and implementing new projects and systems.*

*We work to stimulate and focus debates on the topics that matter most and provide our readers with a means to raise their concerns and speak frankly about their work and the lessons they've learned while delivering the devices and networks that the world's blue light organisations depend on.*

Welcome to the latest issue of *CCT*, the leading resource for professionals operating within the critical communications sector.

This is somewhat of a special issue of the magazine, featuring as it does not just one but a pair of exclusive interviews, carried out with two of the most influential personalities currently operating in the sector. The first of these begins on page 10, with Emergency Services Network programme director John Black providing an update on the progress that has been achieved since he arrived at the UK Home Office in July last year.

As long-time readers will know, ESN has had somewhat of a troubled history since the core contracts were awarded all the way back in 2015. According to Black, however, the past year has seen a cultural change within the programme, with renewed focus on the job at hand, alongside – crucially – an increasing emphasis on user engagement.

As well as his comments on ESN itself, however, also of interest is what Black has to say about the likely evolution of the sector, with, according to him, broadband handset manufacturers now starting to take account of 'mission critical' requirements within their products as a matter of course. He also speaks about device-to-device for critical broadband, an issue which looks likely to be a discussion point for the sector for some time to come.

This issue's other exclusive interview (page 30), meanwhile, comes from Kevin Graham, who has recently been appointed as CEO of TCCA, taking over from Tony Gray, who is retiring at the end of this year. Graham is a massively respected figure across the sector, and has some compelling things to say, both about his plans for TCCA and how he believes the industry needs to evolve going into the future.

Staying on the subject of TCCA, one final thing to mention is the preview for its Critical Communications World 2021 event, starting on page 31. Readers won't need me to remind them what an interminable grind the past 19 months have been at times, and I for one can't wait to finally get out to Madrid, mixing with colleagues and friends from across the world.

Enjoy the issue. 🎧

**“ The ESN programme has seen a change of culture over the past year ”**

**Philip Mason, editor**



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# Who, what, where

## ASIA



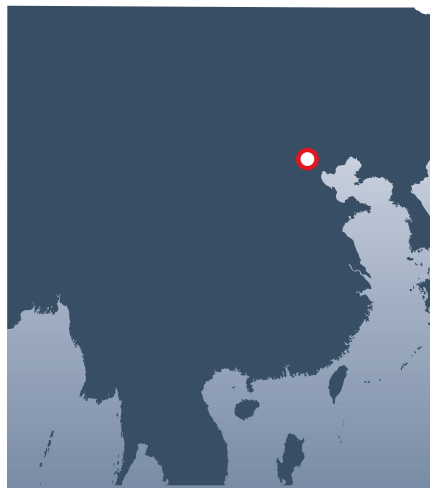
### TETRA deployment helps secure major conference

Hytera has provided TETRA to the most recent meeting of the Council of Heads of State of the Shanghai Cooperation Organisation and the Collective Security Treaty Organisation.

The temporary network included vehicle-mounted base stations, as well as a 'visual command system', providing dispatchers with "a comprehensive view of incident status and available resources".

According to the company, alongside the TETRA technology, Hytera also provided its Major Event Security System to help with event planning.

This enabled "the pre-event scheme, route planning and security to prevent emergencies". The meeting took place in the Tajikistan capital of Dushanbe.



### Industry giant's Olympics commission

Airbus has won the contract to "expand and improve" TETRA coverage at the 2022 Winter Olympics, taking place next February in Beijing.

The agreement has been signed with JustTop, with the improvement being made to the Beijing government shared TETRA network. The company will provide multiple TB3 base stations.

The current network enables radio communication for the city administration, emergency services and water and power supply companies. It will also cover all the Winter Olympics stadiums, as well as the media centre and Olympic Village.

Speaking of the project, a spokesperson for Airbus Secure Land Communications said: "Airbus is ready to [help] secure the Winter Olympic Games."

## AUSTRALASIA



### Nokia announces New Zealand 5G collaboration

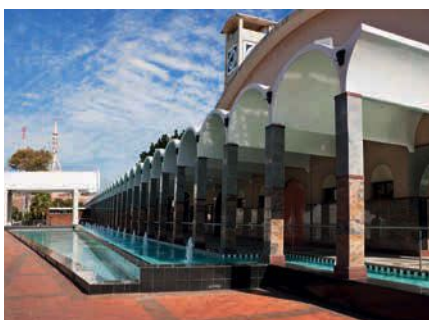
Nokia is collaborating with telecommunications provider Spark on the provision of 5G coverage across New Zealand.

According to figures quoted by Nokia, the roll-out will provide coverage to 90 per cent of the country's population by the end of 2023. The company will provide its latest 5G RAN technology across a large part of the roll-out, while also simultaneously upgrading 4G on the network.

Nokia will be using products from its AirScale radio portfolio, which – again according to the company – "have the potential to help deliver up to 10 times faster data speeds, while consuming much less energy than earlier generations of network equipment". Nokia has already worked with Spark on several other projects.



## AFRICA



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## Botswana government upgrades network

Intracom Telecom has supplied its OmniBAS microwave solution in order to upgrade the Botswana government's telecommunications network.

Delivered in collaboration with local reseller Nextlan Pty, the solution will support "a wide range of broadband services, carrying all telecommunication traffic such as voice, video and data". The network will also be used to backhaul the government's private TETRA network.

John Tenidis, marketing director of Intracom's wireless solutions portfolio, said: "This new project confirms that Intracom Telecom's wireless portfolio is stronger than ever. Our OmniBAS microwave product family has been chosen repeatedly for mission-critical applications and sensitive communications."

## EUROPE



## German navy awards communications contract to Motorola

Motorola Solutions is providing digital communications to 16 vessels and training platforms for the German navy.

The contract – which is worth \$82.3m – was signed with the Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw). According to Motorola, it will deliver "mission-critical communications to support onboard security teams who are responsible for the safety of crews at sea, and the operational readiness of naval vessels".

Each of the 16 vessels will roll out a TETRA network, integrating with the navy's existing IT infrastructure. These will also be interoperable with other German armed forces' communications networks, and those of the country's public safety organisations.

## NORTH AMERICA



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## US environment organisation updates comms network

The Nevada Bureau of Land Management is deploying BK Technologies P25 handsets.

Speaking of the deployment, BK Technologies' president, Tim Vitou, said: "We're pleased to continue our work with our longstanding partner, BLM Nevada, as they upgrade their portable communications technology. Given the enormous amount of territory [the organisation] is responsible for maintaining and protecting, it is critical that it employs the highest level of dependable communications technology."

According to BK Technologies, 67 per cent of the Nevada landscape – equating to around 48 million acres – is public land. A spokesperson said: "BLM Nevada applies the highest-quality techniques to protect, use, restore and enhance public lands."

# Report: technology can ‘transform’ public safety

A recently published piece of research conducted by Motorola Solutions with Goldsmiths, University of London, has found that the majority of the global population believe increased use of ‘advanced technology’ could have a profound effect on public safety.

According to a statement released by Motorola, the survey on which the *Consensus for Change* report is based was conducted to “uncover how expectations for safety and security are changing, while fuelling public safety and enterprise innovation”.

The company approached around 12,000 members of the public, as well as interviewing 50 public safety agencies, commercial organisations and industry experts across the world. Research was conducted by an independent team, led by Dr Chris Brauer.

Findings included:

- Eighty per cent of respondents want to see public safety “transformed through the use of advanced technology”
- Seventy-one per cent said that technology such as video, data analytics, cybersecurity and the cloud are needed to address “the challenges of the modern world”
- Seventy per cent of respondents said that emergency services should be able to predict risk, again, supported by technology
- Seventy-five per cent were willing to trust the organisations that hold their information, as long as they use it appropriately
- A need for more public engagement, with only 52 per cent of those questioned stating that they would trust artificial intelligence to “analyse situations of threat”.

The research – again, according to Motorola – also identifies three current major trends, demonstrating what the company calls an “inflection point” in how both the public and organisations are thinking about technology and safety. These include the influence of COVID-19 on expectations for public safety, the acceleration of technological innovation engendered by the pandemic, and the demand that technology must be used in “fair, transparent and inclusive ways”.

Commenting on the first two of these findings, Dr Chris Brauer said: “Citizens all over the world are coming to terms with what it means to live with COVID-19 and how it impacts their safety. Our shared experience of the pandemic has made

us realise that technology can play a far greater role in keeping us safe and has increased our understanding of why public safety and enterprise organisations need it to respond to new threats.”

Motorola Solutions senior vice-president and chief technology officer, Mahesh Sapharishi,

said: “The pandemic fuelled the need to use technologies in different ways, in order to address new challenges within a rapidly evolving environment.

“We also saw an accelerated adoption and modernisation of technologies, with significantly compressed implementation timelines. This research profiles the extraordinary ways that public safety and enterprise organisations continue to adapt to changing policies and needs.”

Sapharishi continued: “As technology continues to quickly evolve, it is critical for organisations to ensure that their advancements



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are built, and understood, to be human-centric. For example, artificial intelligence should be designed in a way that respects human decision-making and considers the public’s input and needs, while allowing users to make better-informed decisions and respond to complex threats. By designing advanced technologies to be assistive, we ensure that the decision-making remains the sole responsibility of humans.”

Geographic markets involved in the research included Australia, Germany, Italy, Malaysia, the Nordics, Singapore, Spain, Taiwan, the UK and the United States.

## Virve 2.0 device supplier chosen

Goodmill Systems has been accepted by Erillisverket as a Virve 2.0 equipment supplier. This will enable the company to provide its vehicle routers to Finnish public safety user organisations.

Speaking of the development, CEO of Goodmill, Topias Uotila, said: “It is important for us to be at the forefront of this development [of mission-critical broadband], not only because many of our current customers will be Virve 2.0 users in the future, but also for the contribution [that the network will make] towards a safer Finland. A vehicular multichannel router is one of the most important pieces of telecommunications equipment.”

CEO of Erillisverket, Timo Lehtimäki, said: “The next generation of public safety services in Finland, Virve 2.0, will be a joint

effort between Erillisverket and selected partners. This will safeguard the continuity of daily operations of national critical infrastructure, thereby ensuring that public safety authorities can operate smoothly in all situations.”

Erillisverket began the procurement process for Virve 2.0 last year, announcing the appointment of Elisa and Ericsson as respective providers of its radio access network and core systems. Following this, it published a request for information relating to end-user devices concerning “the types of devices that users want or expect to use, and the type of devices that manufacturers intend to provide”.

The Virve 2.0 mission-critical broadband network will replace the current Finnish TETRA-based system, Virve.



# Airbus to work with Gulf states on cross-border comms

Airbus has signed a memorandum of understanding with the secretariat-general of the Gulf Cooperation Council (GCC) to “boost cross-border security and co-operation between GCC nations”.

According to a statement issued by the company, the project will begin with an initial proof-of-concept implementation taking place between two GCC members. The MoU signing took place at the ongoing Dubai 2020 Expo, taking place between this October and March next year.

Speaking of the plans for the project, a spokesperson for Airbus said: “The proof-of-concept agreement will allow Airbus to test the interconnection of public safety critical networks on, and between, the territories of two Gulf nations.”

The MoU was signed by Major General Hazaa Ben Mbarek El Hajri, who is the GCC’s assistant secretary of security affairs. Airbus Secure Land Communications was represented during the signing by its head of Middle East, Africa and Asia Pacific, Selim Bouri.

Bouri said: “We will use [our] Inter-System Interface to connect the two critical communication networks and pave the way for better, faster and more effective collaboration between border security forces from the GCC nations.

“We will leverage the modern features of our TETRA systems to strengthen cross-border communication between public safety agencies, which is crucial at a time when we are facing numerous border security challenges.”

He continued: “Under [the] agreement, our team of experts will test the key technical and operational aspects of this endeavour while deploying the highest levels of availability, privacy and security.

“Airbus is working towards supporting the digital transformation objectives of the GCC and



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is developing a detailed strategy. We welcome our partnership with the secretariat-general of the GCC and we thank them for their trust in our technology.”

The Gulf Cooperation Council is a regional, intergovernmental political and economic union made up of Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates. Headquartered in Riyadh in Saudi Arabia, the organisation was formally established in 1981.

## TCCA news

TCCA has announced Kevin Graham as its new CEO, taking over from current chief executive Tony Gray, who is set to retire at the end of this year. Graham will take over from 1 January 2022.

According to a statement from the organisation, Graham will join TCCA for a three-month transition period, starting at the beginning of October. He will work together with Gray to ensure a “thorough and seamless handover”.

Based in Melbourne, Australia, Graham is founding chair, and has remained a director of TCCA’s Australasian Critical Communications Forum since 2001. He has extensive experience in the critical communications sector and has worked for and with many TCCA member organisations.

Speaking of the appointment, a TCCA spokesperson said: “With more than 40 years’ experience in the communications industry, Kevin’s skills encompass

engineering, sales and marketing and executive management. Through his global consultancy and advisory services, he has [also] accumulated a thorough understanding of standards organisations, regulators, industry associations and academia.”

Mladen Vratonjić, chair of TCCA’s board, said: “Kevin will be joining us at an inflection point in our sector – as the potential of 5G begins to crystallise; as the roll-out of critical broadband networks advances around the world; and as the importance of TETRA and other narrowband networks is reinforced as the continuing foundation for critical communications services.

“We look forward to Kevin building on Tony’s many significant achievements during his tenure as chief executive, providing continued commitment to our members, and taking TCCA forward into its next phase of development.”

In other TCCA-related news, the

organisation has recently published a white paper looking at the potential role played by 5G in the delivery of critical communications. According to a statement, the document addresses a number of key questions raised by the critical communications community, including how 5G compares to 4G LTE, what the initial use-cases might be, the expected impacts on user operations, and the likely market availability of solutions.

Chair of TCCA’s Broadband Industry Group and lead author of the white paper, Ericsson’s Jason Johur, said: “While 4G LTE delivered a paradigm shift in critical communications versus previous technology generations, 5G brings evolutionary change in terms of speed, latency, security, breadth of use-cases and quality of service.”

To read our exclusive interview with Kevin Graham, turn to page 30 of this issue.

# In sight of the finishing line

**Philip Mason** talks to ESN programme director **John Black** about key learnings from the previously troubled project, as well as his predictions for the future of the critical communications market

## **Can you give me an update on the progress of the Emergency Services Network? What's the current state of play?**

Honestly, I'd say that we're really getting to the sharp end of this project now, particularly over the course of the last year or so. There have been some interesting experiences and technical challenges, as well as some resets, but we are now very focused on getting ESN over the line.

One of the first things I asked the team for when I came on board in July of 2020 was focus. We know what we've got to get done, and we've got a plan as to how to do it. The job now is to deliver.

## **Was the scope of the project – what you needed to get done – not clear prior to your arrival?**

It was, but we've now done an awful lot of work with our user community so that they're comfortable and confident with that scope too.

I'd say that we've still got a bit of work to do in the coverage space, but apart from that, everything's been agreed in principle and is currently going through users' governance processes. We're making really good progress when it comes to the technology.

## **What progress has been made on the delivery side? You mentioned coverage – could you go into that, as well as devices and the control room piece?**

Dealing with coverage first, most of the required 950 additional masts [as distinct from EE's commercial network] are built and activated. At the same time, there's still quite a lot of work to do when it comes to rural locations, particularly regarding the acquisition of the sites and connecting them up. We're well over halfway through that journey, though.

In terms of devices, we now have handheld and fixed vehicle solutions, as well as for ESN Air, which is the air-to-ground element of the project. We've also made some really good progress in the control room space over the course of the past year. A big part of that has been figuring out the interworking with the existing Airwave solution.

## **The handheld devices for the project were procured several years ago. Given the fast-moving nature of the broadband market, is there a danger that those Samsung products are starting to become obsolete?**

The device world does move faster than our project timescales, and that is certainly a challenge that we need to address.

The handheld solution that we procured two years ago is indeed coming to the end of its life, meaning that we've had to carry out discussions with the suppliers about how we move forward. That in turn has needed to be fed back into communication with the users, because whatever we procure obviously also has to work for them.

What we have currently is a set of devices that work, and which will ultimately allow us to get through testing, which in itself is extremely positive. The other really encouraging thing we're seeing when it comes to the handheld solution is that price points seem to be coming down significantly, which will, again, stand us in good stead going forward.

## **The programme is currently engaged with testing the Direct 2 handheld product, which provides interworking between ESN and Airwave. What's next when it comes to the device piece?**

There are several products in our sights at the moment. The first is ESN Connect, which enables emergency services to just access data, without having to use a commercial network. There's considerable interest in that, for instance from the UK Ambulance Radio Programme (ARP).

On the mission-critical push-to-talk (PTT) side, we've got Direct 2, which you mentioned. That is currently with a small number of users for testing and in production. The next two iterations are ESN Beta and ESN Version 1.0, the first of which we're in the middle of testing at the moment.

Mass transition onto the network will ultimately take place following the roll-out of ESN Version 1.0, built on Kodiak version 12. Beta operates on version 11, which is missing certain critical user features.

## **What's the current timeline for rolling out ESN Version 1.0?**

Mass transition for the first user organisations is due to





ESN programme director John Black

start at the beginning of 2024. Between now and then, the programme will be massively focused on testing, as well as integration of the control room side.

To be honest, there really isn't much more that we need to accomplish when it comes to functionality, so the task now becomes proving the safety which is so critical to our users. After the testing we'll have a further year during which operational evaluation will be carried out by the organisations themselves. That will be centred around specific scenarios, large-scale events or incidents and so on.

We're having to balance carrying the work out as quickly as we can, in order to switch off Airwave, with the absolute need to ensure safety. We won't take any chances, and we've made that very clear to the users.

#### **What's the situation when it comes to device-to-device? Is the Home Office looking at any kind of workaround?**

Device-to-device is interesting, and obviously, there's currently a lot of speculation around it. From our point of view, we know that it's a clear requirement from the user side and that we need to pursue it.

That said, we still have the question of what that requirement is ultimately going to look like. My experience with other large technology programmes is that expectations are often driven by the way the current system works rather than by the actual capabilities of the new system, and we need to be mindful of that.

The key to the device-to-device piece will be to try out some solutions, by getting them into users' hands and finding out what works. At the moment, we're still looking at a solution in which that component is delivered through TETRA frequencies rather than local LTE. One potential workaround is building that capability into a remote speaker mic sitting on the officer's vest, with the main device in their pocket.

We've actually had a go at procuring a solution in this area, which, frankly, was not very successful. The real challenge – at least in that case – was not so much the technology as finding a supplier willing to make an upfront investment on the basis of future volumes. We're currently

looking to see if there's a financial model which can get us to the point of putting something in the field.

#### **With that in mind, earlier on in the interview you mentioned that the cost of procuring commercial devices for public safety is starting to drop. Is that also a matter of increased volumes?**

There are a couple of factors in play with that, the first being that the cost of the technology overall is coming down, simply in the natural run of things. The same technology comes at a cheaper price point year on year, and we're seeing a bit of that benefit.

The second significant factor is that the critical communications PTT standards are starting to become absorbed into key manufacturers' basic device builds as a matter of course. Previously, these standards had required specialised firmware, as well as specialised versions of the Android operating system. That's increasingly not the case.

#### **Why is that happening now?**

It's primarily a matter of increased volume. In previous procurements, the suppliers we were talking to had no choice but to build their business case according to the volumes that we could offer. By contrast, in a more recent scenario, a supplier came to us and said they had a new device, but also considerable commitment from many other customers around the world.

All of these signs are really encouraging for the sector. We've already seen that reflected – subject to contract – in some significantly lower price points for us.

#### **Returning to the timescale for roll-out, could you give some more detail around the Home Office's current contract with Airwave? Are you now able to simply renew it on a rolling basis?**

Yes. Fundamentally, the contract allows us to extend as required, and we're in constant discussion with Airwave regarding how much longer we're going to need it for.

This relationship with Airwave allows us to approach things differently than may have been the case earlier in the programme. For instance, there had previously been real fear on the part of the user community that



ESN wouldn't be functional by the time we needed to switch Airwave off. This was essentially because we'd said to them that the Airwave system was going away on a particular date.

What we're saying now is that Airwave is being replaced as fast as we can do it, but we'll only switch it off when users are happy with ESN. Driving ESN switch-on to a particular date was a route to introducing potential risk, particularly if the date wasn't realistic.

We've now turned the whole thing on its head. This is not a system that we're prepared to take risks with.

**Changing the subject slightly, how is ESN regarded by the international critical communications community? The UK was one of the first countries to embrace emergency services broadband, so to what degree are people looking to learn from the project?**

At this point, pretty much every major country has a plan to move away from TETRA or LMR and onto 4G LTE, and it would be fair to say that they're all looking at us.

In terms of our engagement with other countries, we have some pretty good forums now, looking in particular at PTT. We're in contact with a lot of other programmes who are also using Kodiak, and that's really helpful.

**What has been the key learning so far?**

It's actually quite difficult to talk about key learning from an organisational point of view, because the models of adoption are very different depending on where you are in the world.

For instance, FirstNet in the US has done some fantastic work, but they're essentially based around a 'pull' model, where users need to be encouraged onto the system. I'd say that a big focus of that project is actually sales and marketing, alongside a very heavy focus on data rather than voice.

Our world is almost diametrically opposed to that, in that we're not trying to attract people to a new solution so much as get people off the old one. We have to convince the whole community that ESN is safe to move to, all in one go.

**I recently asked [FirstNet CEO] Ed Parkinson what the advantages were of a 'competition-based' model. Given what you've just said, what would you say are the advantages of a more centralised structure?**

I'm not sure whether you'd call this an advantage or not, but I don't have to go out and convince the users to adopt my system. My target is very clear – provide Airwave equivalence, make it safe and get the users migrated.

**Coming back to potential learning, what would you say has been the most important thing from a technological point of view?**

Again, I don't think you can identify one specific thing on the technology side. There will undoubtedly be plenty of operational learning, for instance, rules around point-to-point communication, talk group management and so on.

We have certainly learnt an awful lot already, some of which was admittedly fairly obvious, but you only realise certain things with hindsight. At the moment we're grappling with questions around rates of user arrival at a major event or incident.

In terms of running the programme itself, for me the learning is all about making sure you stick to the basics of any big technology project.

When I came in last July, the key question I asked was, are people working together? Are we all pulling in the same direction? And if not, why not?

To be honest, the answer at the time was no, not really. Given what we've accomplished in the last 12 months, I'd say that the answer would be very different now. 🌀



# Professional Hybrid Networks ecosystems

## A winning choice for future effective communications



Professional users are facing new challenges: the growing importance of data communications now attaches to the functions ensured by current narrowband PMR networks that, even if still essential for supplying voice services, cannot deliver data services as real time video, real time tele-medicine and, in general, high data transfer applications.

Broadband networks, which are at the basis of communications at work and everyday life, are becoming a need even in public safety and mission critical sectors. In the past, the strong requirement for solutions ensuring service, even in critical conditions, determined a certain caution in adopting first broadband technologies for mission critical applications because they lacked critical features such as full reliability and priority control. The advent of fourth and fifth generation technology allowed to overcome these limits and, even if some limitations related for instance to direct mode still exist, is marking the way to build scalable communications systems able to dynamically adapt to the required performances. Nevertheless, implementing a mission critical broadband network, especially a large-scale one, is a complex process and goes far beyond the technological dimension. Mission critical activities are not led by technology as it happens in consumer or commercial sectors, but by operational requirements and services.

Despite the rising interest for broadband, Digital LMR technologies will continue to grow in the next future, according to main market analysts, given the fact that these are proven, tested and reliable technologies able to support business critical and Mission/Life/Safety Critical communication needs. Even if some narrowband technologies are considered mature and not evolving anymore in terms of standard functions, vendors still support them and design new optimized systems to take advantage of new hardware and software options. Leonardo is working on TETRA and DMR systems evolution for providing state of art networks and components and integrating them with broadband technology according to the hybrid network model. DTA is the new family of Leonardo convergent multi technology radio base stations, supporting Tetra, DMR and analogue communications, designed to ensure compatibility with existing Leonardo systems and features flexibility

and efficiency required by demanding PMR users.

In the majority of Countries, at worldwide level, mission critical services (mainly voice and messaging) are still delivered via narrowband infrastructures. With few exceptions, the transitioning model foresees narrowband and broadband infrastructures working side by side with progressive introduction of new services. Interoperability with existing narrowband networks is an important value for a smooth transition, allowing a phased approach and uniform management of technologically heterogeneous situations. International standards (3GPP TS 23.283) are defining interactions between current generation infrastructures and next generation networks even if some proprietary solutions are available on the market. When considering hybrid networks, it is important to design a well-balanced infrastructure where both components (narrowband and broadband) should have the same characteristics in terms of availability, reliability and resiliency.

In our view, hybrid networks will lead the professional scene in near and mid future scenarios. Leonardo RIM (Rete Ibrida Multivettore, Italian acronym for Multi vector hybrid communications network) provides native and standard based narrowband-broadband interoperability services enabling phased evolution and common multi technology control room and application services.

Built upon the proven CSP (Communications Service Platform) core network, RIM can support different deployment models whether in partnership with public Operators or in fully private infrastructures. RIM can accommodate current generation and future narrowband and broadband infrastructures, providing uniform management and unified control room services enhancing effectiveness of operations.

While relying on certified third party systems for network infrastructures, Leonardo is also focusing his broadband offer on services components. Our CSP-MCX (Mission Critical Services) solutions extends the wide portfolio of standard solutions for professional communications with next generation standard based Broadband capabilities: MC PTT, MC Data and MC Video. Leonardo CSP-MCX is a complete cloud native solution that can be deployed as an OTT (Over-The-Top)

application, or within 4G/5G network, supporting full quality of service control. LMR-IWF (LMR Interworking function) complements CSP MCX and provides 3GPP standard based interoperability with Leonardo TETRA and DMR according to 3GPP TS 23.283 and related 3GPP 24.xxx and 29.xxx specifications.

Hybrid networks are key components of a larger picture that includes all the elements needed to support professional communities. Operations effectiveness requires a complete ecosystem including field devices, related applications, and integration with control rooms (in turn evolving to take advantage of broadband capabilities). Leonardo MCCR (Mission Critical Control Room) solution provides a network independent view that allows mixed technology communications (group or individual), messaging, real time location and tracking together with traditional dispatching operations such as users and group management. For an extensive use of technology in control room, Leonardo designed X2030 to support the new model of applications based on C5I concept (Command, Control, Communications, Computers, Cyber & Intelligence). X2030 enabled control room integrates operational procedures, decision support processes and communications. X2030 can process heterogeneous information coming from several sources including traditional sensors, web and social media as well as documents and databases. In addition, leveraging technologies such as artificial intelligence and big data processing, it can provide superior situational awareness and decision support.

Security is a key element in all mission critical environments. Security has to address the whole ecosystem, starting from a process approach, extending to code verification and validation, network and applications management, and performed both in a proactive way employing threat intelligence and in a reactive way with automated response and decision support systems. Thanks to his expertise and the power of his SOC's, Leonardo can offer consulting for IT/OT Cyber Security Strategy & Governance, standards compliancy, policies & procedures assessment as well as Design, Build and implementation of IT/OT cyber protection solutions on premises and based on Leonardo Next Generation Security Operation Center.





# LTE's power play

Electricity transmission and distribution network operators are deploying private LTE networks to help them develop the smart grids required to manage distributed energy systems and meet strict zero carbon targets. **James Atkinson** reports

**E**lectricity generation has traditionally relied on a relatively few large fossil-fuel-burning power stations. Transmission service operators (TSOs) carry extra-high and high-voltage electricity to substations. Distribution service operations (DSOs) then convert the high-voltage current to medium and low voltages via many more substations and transformers to provide electricity to industry, buildings and domestic properties.

The industry has always deployed telecommunications to remotely monitor and manage assets on the grid using a mix of copper wire, fibre and mostly narrowband wireless technology. Operational telecoms are used to remotely monitor the live network, typically voltage and current for feeder circuits, and manage assets on the electricity grid, such as switching circuits on or off.

Without these operational telecoms, electricity control centres would be

blind to the state of the network and its equipment and would not be able to determine whether power is being supplied safely to customers. Nor would they be able to load balance, switch electricity around the network, or remotely isolate sections if there is a fault.

Operational telecoms are largely deployed only on the extra- and high-voltage parts of the grid, as Julian Stafford, general secretary, European Utilities Telecoms Council (EUTC), explains. "In the past, you didn't really need to know what was happening at the low-voltage level, or even the medium-voltage level. You only really needed to be able to control your extra-high- and high-voltage-level assets, because that is where all the action was happening, where the load balancing took place, and where any faults that were going to occur would really cause you some headaches."

Any activity that took place at the medium- and low-voltage level was

really very passive. "If there were any faults, you essentially relied on human intervention, in many cases to first identify there was a fault and then go and fix it," says Stafford. "Similarly, any automation schemes that might have existed to try and improve that restoration if there was a fault at medium- or low-voltage layer would be very 'dumb' [extremely low data] in terms of being a simple on/off circuit breaker."

The operational telecoms that exist at the very high level, on, for example, the UK's National Grid, have excellent communications between all the power stations and substations. Typically fibre is used, but as there are not actually that many high-voltage sites, deploying telecoms is proportionally not very expensive.

At the same time, however, there is very little connectivity at the medium-voltage layer, and none at all at the low voltage. A country like the UK has over 400,000 mostly unmanned substations



with either very basic or no wireless connectivity. This now has to change.

### Massive expansion of renewables

The industry is facing an almost perfect storm of circumstances, which require it to make major structural and technical changes in the way it operates. For instance, copper PSTN networks and some 2G and 3G networks are being switched off, so utilities that have relied on these technologies must find alternatives. Climate change objectives and the need to decarbonise energy generation to help cut greenhouse gas emissions is another major driver of change.

Pressure to close fossil-fuel power stations comes at a time when global demand for electricity is rising due to the increase in electrification of transportation systems, electric vehicle (EV) charging and, as the climate warms, more air conditioning. But this rising demand has to be largely met from 'green' energy sources, which are, of course, intermittent and often unpredictable.

At the same time, the massive expansion of small-scale renewable energy sources, including solar and wind-power sites, is creating its own set of challenges. Renewable energy, battery storage solutions and individual 'prosumers', who both consume and sell excess energy to the grid via wind, solar or heat pumps, are creating a two-way flow of electricity in a network designed for a one-way flow.

All of this is leading to a rapidly changing supply and demand landscape and the development of a very different, highly distributed energy grid that requires 'smart' connectivity technology to monitor and manage everything. But millions more sensors and connections will be needed.

"All of a sudden we need vastly more connections in the network from where we were before, potentially 100 times as many connections in terms of telecoms," observes Stafford. "And not only do we need 100 times more devices, we need something like 100 times more bandwidth at each of those locations."

"But the granularity of the data

we need here is such that we now need real-time measurements across a massive estate of current, phase angle, voltage, harmonics, power levels, power factors, and all these other issues which are required to make a grid truly smart." The challenge for the sector is to find a way to connect all these thousands of new sensors and devices in a reliable and secure way.

It has been apparent for some years that 3GPP cellular LTE technology is the best choice for mission-critical users such as utilities looking to transition from narrowband solutions. LTE allows these verticals to move away from expensive proprietary solutions and adopt an open global standard backed by a huge ecosystem, and one that offers a smooth evolution to 5G.

Koustuv Ghoshal, VP and head of utilities, energy, industrials at Ericsson, observes: "Utilities have waited to see if bi-directional cellular technologies proved themselves able to support mission-critical use-cases before adopting it and, at least for the foreseeable future, they are starting with LTE. But one of the strictures they are putting in front of technology suppliers like ourselves is to say: we cannot afford to rip and replace this in three years when 5G becomes viable for us."

The question then arises as to whether smart grids could be adequately supported by commercial mobile network operators (MNOs). A 2014 study prepared by SCF Associates for the European Commission concluded that: "Commercial LTE networks could support mission critical needs but only if certain conditions are met. These conditions would fundamentally change the operating environment for the commercial mobile networks."

The conditions included the need to provide reliable services under fixed-priced contracts over long periods of time with the requisite levels of network availability, resilience, service quality (including priority access), security and coverage. Commercial networks would also need to be physically hardened from RAN to core.

Ghoshal thinks that the public versus private LTE network debate is now dying down and the utilities sector is firmly convinced that private LTE networks are the way forward. "Utilities want a private LTE network they have full control over and ownership of, while benefiting from using standards-based, future-proof technology," he observes.

### Ultra-low latency

Utilities do have one advantage here in that they can reuse their existing narrowband radio sites to support LTE networks, and Ghoshal believes that LTE will enable utilities to cover about 90 per cent of their use-cases. "It is either the ultra-low latency or the ultra-high bandwidth applications such as drones streaming video that LTE may not support."

A recent LTE trial conducted by Western Power Distribution (WPD) in the UK using band 87 (410-430MHz) bears this out. Using 2 x 3MHz of spectrum, WPD installed three eNodeBs to cover a 25km area centred on Taunton in Devon to connect 10 substations. At each one, a CPE unit was connected to an RTU, CCTV and a fixed VoIP handset. Low voltage (LV) monitoring and mobile voice and data were also tested.

The results proved that LTE could provide connectivity for SCADA; automation; LV monitoring; mobile voice, video and data; fixed voice; and fixed video (with limitations). However, the observed latency was deemed not suitable for supporting teleprotection or intertripping, essential safety applications for protecting the extra- and high-voltage parts of the grid.

The next problem is how to get dedicated spectrum and in what bands. Utilities can cover vast geographic distances, so low-band spectrum with excellent propagation and obstacle penetration properties is essential as it helps to minimise the number of base stations required and keeps infrastructure costs down.

Low band does have a limited data throughput compared with higher bands, but Ghoshal says: "Utilities don't care a lot about pumping much through that bandwidth. They care about resiliency and latency. Latency is more important to them than anything else."

Stafford says: "Bands like 700, 800 and 900MHz are all very attractive to utilities, but unfortunately they are also very attractive to the MNOs and they are already held by the MNOs in most cases. This drives utilities down the 400MHz frequency band route."

"It is a band already used by a lot of utilities for legacy narrowband systems," he points out, "and there is a degree of harmonisation, although not total harmonisation, that could happen reasonably easily between various European countries."

**“ All of a sudden, we need vastly more connections in the network ”**

The global utilities industry has had to push hard to get governments and regulators to listen to their spectrum argument, but there are clear signs that they are now listening, and in some cases acting.

In September 2019, Poland awarded 450-470MHz spectrum to PGE Systemy, the country's largest energy supplier, and the second-largest has now joined too. In November 2019, Irish regulator ComReg awarded 410-430MHz spectrum to ESB Networks DAC to build out a private national LTE utility network using spectrum originally earmarked for rural broadband.

In March 2021, Germany awarded 450-470MHz spectrum to 450connect to build a national LTE network. All the German utilities have agreed to buy services on this network for the next 15-20 years as a minimum. Saudi Arabia is expected to make an award shortly in the 400MHz band for mission-critical infrastructure, in particular utilities, while Brazil is also exploring the possibilities of using some 400MHz spectrum.

Of course, not every country has 400MHz band spectrum available, so other bands are being looked at. In July 2020, Spain earmarked 2.3GHz spectrum for private utility LTE use. In the UK, Ofcom is trying to identify possible spectrum, but the 400MHz band is heavily used and very fragmented, making refarming a challenging proposition.

In May 2020, meanwhile, the FCC in the USA allowed Anterix to transition its 900MHz narrowband LMR spectrum, formerly used by Nextel for its iDEN PTT network, to provide a 6MHz contiguous block of airwaves that can be used to deliver private LTE services.

However, utilities are also considering a multi-spectrum approach. "Is a hybrid strategy a better approach? Heck yes," says Ghoshal. "If you consider the morphologies of dense urban networks, sparser networks in suburbia, and then even sparser in rural areas, you could very easily use mid-band 2.5GHz or 3.5GHz in dense urban areas and then low-band spectrum out in rural areas."

### Knowledge of the ecosystem

Different models are likely to emerge as each utility adopts an approach best suited to its particular requirements. Anterix offers a good illustration of one approach. It is now the largest holder

of 900MHz spectrum across the USA, and although it was only able to go to market in October 2020, it has already signed contracts with three power companies: Ameren, San Diego Gas & Electric and Evergy.

Chief operating officer Ryan Gerbrandt explains that Anterix combines a deep understanding of telecom operations, thanks to its Nextel heritage and expertise, with a good knowledge of the utility landscape. "We know the ecosystem, we know the use-cases, we understand the behaviours and needs of the utilities.

"Our core business model is the spectrum which we are making available. Our standard package and model with utilities is to enable that through long-term leases. On average that is a 20-year lease to access our 6MHz of spectrum across their entire service territory," says Gerbrandt.

He expects to see a wide variety of models developing. "Some utilities will have the confidence to be their own prime contractor and will pull together the vendors, infrastructure providers, construction teams and so on in their own right. Others will look for more of a turnkey experience and hand over the prime contractor role to one of the big systems integrators.

"The sector is still figuring out the roles and responsibilities across a lot of these business models," he notes. The company has set up Anterix Active Ecosystem, which is designed to bring together the diverse range of suppliers to identify the best solution partnerships and commercial vehicles to help the utilities sector realise private LTE networks.

Anterix has also been active in forming partnerships, not just with infrastructure and device suppliers

such as Ericsson, Nokia and Motorola Solutions but also with other spectrum holders. For example, Anterix is collaborating with Federated Wireless, which won 3.5GHz spectrum in the CBRS auction last year so it can offer utilities a multi-band solution.

Gerbrandt adds that for the first time, 10 to 11 utilities participated directly in the CBRS spectrum auction. One winner was Anterix customer San Diego Gas & Electric, so in this model, the utility both has its own mid-band CBRS spectrum and it is licensing Anterix's 900MHz spectrum.

The utilities sector is only just beginning its transition to smart grids and 4G LTE operational telecoms. 5G holds out the promise of delivering additional functionality, including support for ultra-low-latency applications, massive IoT deployments and ultra-high-bandwidth applications. AI and edge computing will enable VR and AR applications and things like predictive maintenance.

However, Stafford warns that just like the PPDR and railway communities, utilities need to ensure that 3GPP includes the specific 5G enhancements the industry needs. "There is a lot of work that needs to be done in the background to ensure we get what we want in the standards," he says.

Every nation is dependent on a reliable supply of electricity for its economic and social well-being. From being a risk-averse and cautious adopter of new technology, the utilities sector is eager to modernise its electricity grids. It is up to governments and regulators to ensure that policy and legal frameworks keep pace with the rate of change and enable this vital sector to progress. 🌀

*The massive expansion of renewables is creating challenges*



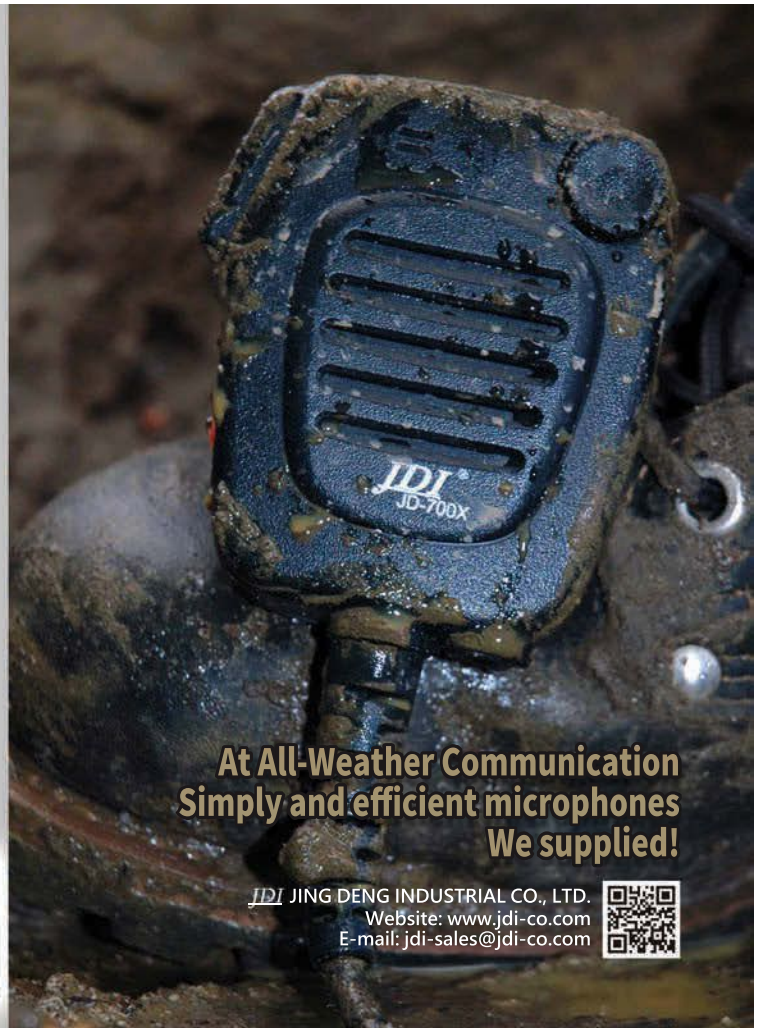
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# New ways, new vigilance

Following TCCA's recent cyber security co-ordination meeting, **Simon Creasey** talks to a variety of industry experts on the challenges presented by the ongoing transition from narrowband to broadband

**D**uring the pandemic, cyber criminals ramped up the number of attacks on companies and organisations. No-one was out of the firing line, not even public safety organisations, with nation-state attacks increasing as well. At the same time, the threat to public safety organisations has also come into focus due to the ongoing shift from TETRA to mission-critical broadband taking place in several countries.

One result of the increased threat is a stepping up of TCCA activity in this area. Earlier this year, for instance, it hosted a workshop to discuss these challenges. Last month, meanwhile, it held a co-ordination meeting attended by a range of stakeholders in order to discuss issues relating to cyber security for critical broadband networks.

So just how severe is the current cyber-security threat to critical communications? More to the point, what can be done to mitigate the risk?

## Security challenges

The original TETRA technology used for critical communications was very effective, reliable and safe. Broadband for mission-critical apparently creates a whole new set of challenges, however. "TETRA is a tightly controlled private infrastructure network, whereas mission-critical broadband can run on commercial cores and protocols," says Aaron Maben, corporate solutions engineer for security at Cradlepoint.

"Threat actors are much more versed in these protocols and standards and know more of their weak points, as they have been attacking them for decades."

As the threat environment continues to evolve and proliferate, this presents a major challenge for mission-critical broadband users, who could conceivably find themselves targeted by cyber criminals.

"While mobile operator networks are well protected today, they will inevitably become more attractive targets to attack," says Jason Johur, chair of TCCA's Broadband Industry Group. "Their services are [after all] becoming increasingly critical to consumers, industries and governments."

This is of course not to say that MNOs such as AT&T and EE – the latter of which is providing coverage to the UK Emergency Services Network – are unaware of the threat. Indeed, as *CCT* readers will remember, critical comms cyber-security expert Brian Murgatroyd expressed a high level of confidence in ESN security earlier this year. This is because ESN and other public safety networks, superimposed over public networks, will have additional security measures to ensure their protection.

Another factor in this evolving situation, meanwhile, is the increased complexity, comparatively speaking, of broadband technology. Discussing this, head of product security for Secure Land Communications at Airbus, Louis Granboulan, says: "When critical communications end-users use broadband, they use devices which are more complex





## Historically, threats facing each vertical were subtly different



implementing a network-of-networks. This naturally increases the complexity of any system. That said, security technology and expertise has also moved on to cope with these changing and more complex environments.”

While some of these challenges are common across all critical communication users, there are also different challenges for different mission-critical verticals, thereby complicating the situation further. Speaking of this, Granboulan says: “One big challenge depends on whether the network infrastructure is dedicated or shared. This choice of setting is very dependent on the verticals.

“There are different security threats on a network shared by multiple entities who use the system as a service, something which will often be the case for the transport, utility and industry verticals. One challenge here is to be able to trust the service provider to dedicate necessary resources when needed.”

Historically, the types of threats each vertical encountered were subtly different. Johur says that some sectors, such as public safety, would have implemented the full gamut of security features, whereas others might only be able to justify implementing a subset of features “commensurate with the perceived risks” to their business.

“But, as more and more industries converge on 4G LTE/5G ‘shared’ networks and future 3GPP technologies, the threats on different industries begin to overlap and coalesce,” he says. “Security solutions designed to protect the network will provide spillover benefits to protect a much wider range of industries than ever before, improving security for the many.”

### The role of the vendor

It is clear that vendors need to play a key role in locking down security in order to ensure that the transition from TETRA to broadband is as smooth as possible. This effort, of course, is something which is already taking place. One of the major challenges for vendors in relation to this, however, is understanding the fundamental differences between commercial and mission critical.

Manufacturers therefore need to ensure that they have the relevant in-house resources and experience to help them bridge any potential knowledge gap. Illustrating this point, Maben states that his own company hires and consults with public safety veterans on any key issues that need addressing.

Elaborating on this, he says: “Vendors should also consult with public safety organisations to ensure that the offering meets their stringent requirements. Vendor offerings should consider redundancy and assist public safety agencies on their PACE [primary, alternate, contingency, emergency] planning.

“For example, Cradlepoint produces products that allow for multiple communications options. This could either be through mobile communications – cellular, Wi-Fi, ethernet – or via ethernet/IP interface with an endpoint [satcom, LMR, MANET].”

At the same time, vendors also need to be fully aware of compliance and regulatory requirements within mission-critical communications, developing products that

than for legacy [systems]. Therefore, the security challenge [also] becomes more complex, but [the level of] complexity also depends on how the technology is organised and used.

“In particular, if the end-users have a [broadband] device which is not necessarily dedicated to critical communications, managing security risks becomes more complex. The more complex the end-user device is, the higher the security challenges are.”

Colin Tankard, managing director at cyber-security consultancy Digital Pathways, also says he is concerned about the potential issues presented by modern devices, which he views as potential weaknesses within the system. “Generally speaking, devices that are intended for a secure network, which could be TETRA or something for the military, are designed with security in mind. A commercial phone is generally not designed [with that level of high security].” Again, as with the MNOs mentioned earlier, this does not mean that broadband device manufacturers aren’t acting on the potential threats discussed in this article.

At the same time, there are also challenges on the server side. “Servers are less ‘monolithic’ than they were, and there are a wider variety of settings,” says Granboulan. “Cyber-security challenges can therefore depend on whether the server side is a dedicated system kept on-premises, or a shared one, which makes the security risk analysis more complex.”

Another issue, according to Maben, is that by introducing broadband for critical comms, users are “expanding the attack surface”. “This results,” he says, “in increased complexity in managing risk and security, as IT teams now have more to monitor. It can also create a supply chain risk if companies are relying on commercial providers instead of deploying private infrastructure.”

This is a view shared by Johur, who says: “Historically, many mission-critical narrowband networks were closed, often with no internet access. Going forwards, deployment of broadband technologies will inevitably result in

subsequently meet those requirements. Maben says they also need to put in place a robust cyber-security programme, while at the same time communicating how they manage their own risk. One vendor that is at the forefront of this particular push is Ericsson. Anders Ripa, who is principal security expert at the company, says that it “continues to be a recognised driving force in all aspects of security and privacy in our mobile networks”. He adds that “security is a fundamental building block” for making sure systems are stable and reliable.

To this end, he says: “Our product security incident response team is actively monitoring the international threat situation, feeding that [information] to our product development teams. The security team also supports our customers in incident handling and forensics.”

Other vendors have also put in place similarly robust protocols. Scott Kaine, vice-president and general manager, cyber-security services at Motorola Solutions, says safety is at the heart of everything his company does.

“Our philosophy is that security should be embedded in every phase in our product and software solutions, from the time before a developer even touches a keyboard all the way to the product being in the hands of our customers,” he says. “Our focus is on delivering secure solutions and educating our customers about areas of shared responsibility, including endpoint detection and identity and access management.

“They can [then] manage and maintain these solutions to a high standard of security to help ensure they are not compromised. We also offer a wide range of cyber-security services to help customers if they don’t have the expertise or resources to do this themselves.”

The support offered by the likes of Ericsson and Motorola will make it easier for critical communication users to safely make the switch from TETRA to mission-critical broadband. But, again, it is a move that is not without its challenges.

Digital Pathways’ Tankard says the ongoing evolution from narrowband to broadband is also going to require a significant mindset shift by some users themselves. Part of this issue, he says, is that many ‘mission critical’ organisations are more ‘information security’-orientated than ‘cyber security’ orientated. The reason for this, for him, is that a lot of the devices currently used in the mission-critical space are designed with security already in place.

According to Tankard, another problem is a relative slowness to embrace change on the part of some of these organisations when compared with other industry sectors.

That is not the attitude of TCCA, however, whose Security and Fraud Prevention Group has provided advice for years on how to secure communications over TETRA systems.

### Addressing the challenges

At TCCA’s recent cyber security co-ordination meeting, attendees discussed a wide range of issues, including how to share information around threats and protection in the most efficient and effective way. They also talked about industry best practice for critical communications broadband, and how to identify new system and network vulnerabilities and threats.

In addition, attendees also agreed what the first step might be when it comes to establishing a new task force. This would

*Broadband communications present an increased level of complexity*

focus on a specific cyber-security issue relating to mission-critical comms. What that topic might be is still under discussion and has not yet been agreed upon.

Speaking of TCCA’s involvement in this area of work, the chair of its Critical Communications Broadband Group, Tero Pesonen, says: “There is absolute consensus that we should do this, but the big question is what is the most important thing that we should tackle first. We are looking forward to getting the taskforce co-ordinated and getting it to work as soon as possible.”

Once the topic has been agreed, he anticipates the task force will spend three to six months exploring the issue in question. After this, it will report back, and a decision will be made as to whether to create another taskforce with a new topic, or to set up a working group.

Regardless of the path taken, says Pesonen, good progress has been made. He adds that TCCA is committed to working with critical communications operators and users to advise, enhance and add value to their cyber-security processes and procedures.

Discussing this further, he says he is confident that the challenges spoken about in this article can be addressed if everyone pulls together to meet them head on. He also cautions that – given the wider threat landscape associated with the move from narrowband to broadband – doing nothing is not an option.

“[Organisations need to] think to themselves, what do we know about cyber security? What is the environment?” he says. “They also need to understand what they can influence and whether their processes and knowledge base are in order.

“What things are going to change for you, when you move to broadband and when your organisation moves to broadband? And if you feel that something hasn’t been done yet in terms of cyber-security provision or operating procedure, then maybe it’s about time to start planning for it.

“We know that broadband is coming to every Western European country during this decade. The sooner user organisations manage to get their part done – as well as, of course, vendors, applications providers and operators – the smoother things will be, and the more benefits we will enjoy.”

The move to broadband will likely revolutionise mission-critical comms. With these new opportunities, however, also comes the need for increased vigilance. 🌀



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Rear camera: 13 MEGA PIXELS
- High performance speaker, supporting wind noise resistance
- DMO 2 slots
- IP67 waterproof and dustproof
- Platform dispatching visualization

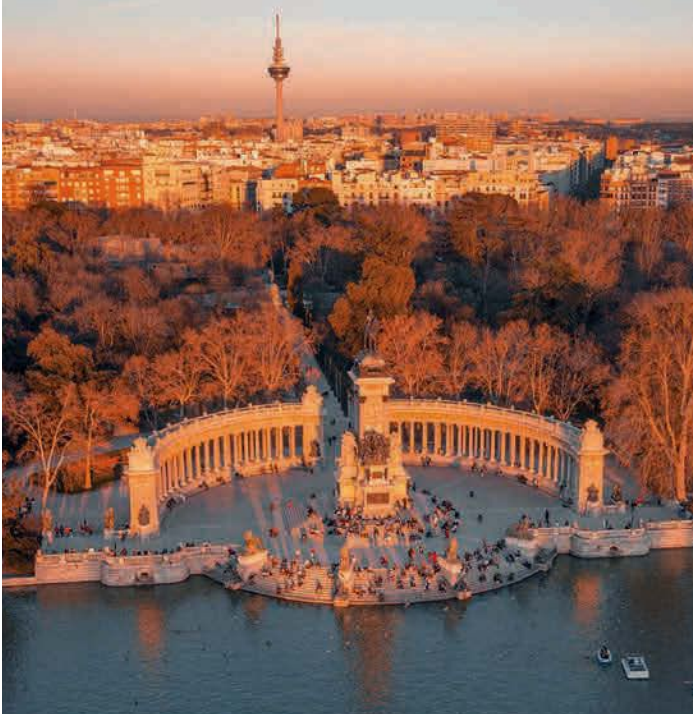


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# Operational excellence for emergency services

**W**e are entering a revolution in public safety, defined and driven by the adoption of mission-critical mobile broadband networks for first responders. The complex flow of information during an emergency often reveals gaps in the process – limited and semi-compatible warning systems, the lack of full situational awareness or real-time feedback from responders and citizens on the ground, along with impediments to precise tracking and coordination between command centres and emergency services on site – all of which could be improved for a faster, more precisely targeted response.

Fortunately, the next-generation networks now coming online offer advanced services designed to radically improve alert systems and enhance overall operational efficiency by incorporating voice, text, photos and even video input from citizens. This enables a new level of operational excellence driven by the ability to capture, analyse, and act on real-time data, resulting in faster, optimized public safety operations to save lives and property when every moment counts.

## From sirens to smartphones

We are all familiar with the wail of sirens alerting us to a nearby emergency. These traditional systems have saved many lives over the decades but are considered legacy technology today. Using digital Public Warning System (PWS) services, government agencies now can broadcast timely, authenticated emergency information to potentially millions of mobile phones, helping citizens take appropriate action to protect themselves and their property.

Most of us have experienced these mobile phone alerts, and you might assume they already are deployed in most developed countries, but that's not the case. In fact, many regions have not yet adopted SMS for public safety, spurring governments to enact new regulations to encourage and speed up its rollout. At political level, Article 110 of the European Electronic

Communications Code (EECC) makes it even mandatory for all member states of the EU to deploy public warning systems using telephone networks by June 2022.

Any agency looking to ramp up adoption should carefully compare and consider the key factors that can impact operational efficiency. The baseline for a fully optimized PWS alert system is one that responds to emergencies in near real-time with geo-targeting – providing essential information and instruction to the population at risk in a specific alert area, including non-residents.

## Assessing today's PWS

Effective PWS solutions can be best supported by utilizing one or more of three solutions that leverage the massive coverage and adoption of mobile phones: emergency call applications, location-based short message services (LB-SMS) and cellular broadcast (CB). Following is an overview of the strengths and drawbacks of each:

### Dedicated emergency call

**applications:** Dedicated applications allow delivery of rich multimedia content, but they have limited reach because users need to download the app on their smartphones to access the service. Additionally, not all people have a smartphone, or would have installed the appropriate app (particularly tourists). Dedicated apps also can take up to a day to disseminate critical information.

### Location-based Services

**(LBS):** These determine the precise geographical location of a user's device using network registration data, allowing applications to provide essential information to the target group of people who should be informed. Advantages include universal support among all devices independent of the model, native device capability that does not require installation or configuration, and the ability to provide information about the number of people and their movements during an emergency. However, there are drawbacks: These solutions, based on SMS, can deliver a few thousand messages per second,

but can't necessarily reach everyone instantaneously. LBS operations can slow down during heavy network activity common in emergencies, due to the additional network loads typical during those critical periods. Text size also is a limitation, leading to segmentation; and SMS could be spoofed, leading to integrity issues.

**Cell Broadcast (CB):** This standards-based technology enables government and public safety agencies to securely transmit an emergency alert of natural or man-made disasters to mobile handsets in a specified geographic area in near real time, regardless of the size of the area and the subscriber's carrier. Although country-level cell broadcast service (CBS) certification is required for mobile devices, and a few very old phone models may be non-compatible, CB can facilitate alerts in near real-time to all mobile devices within the targeted geographical area, even if the mobile network is congested, with these additional advantages:

- Immediate delivery (within a few seconds) of important alerts to everyone
- Not affected by network congestion
- Standards-driven
- Highly secure, ensuring the integrity of alerts
- A distinguished display of alerts on handsets
- High alert accuracy by mapping to targeted area
- Allows larger text sizes
- Ready for evolution to multimedia alerts

Given these attributes, it's clear that CB provides a superior approach for optimizing operational services and results — overall the best solution for PWS.

These solutions aren't mutually exclusive, and governments should consider supporting them with other technologies. Fortunately, Nokia, a top market leader in PWS with almost 30 references worldwide, provides a CB-based solution that can easily integrate other PWS components, such

as government alert gateway, to provide turnkey solutions for both authorities and mobile service providers.

## Better citizen input with NG 112/911

A related key area of improvement for public safety is the introduction of next-generation (NG) IP-based multi-media services to emergency call infrastructures, such as 112 in Europe and 911 in North America. Currently a vast majority of emergency call services only support voice, essentially squandering the rich incident assessment, response and situational awareness capabilities that could be provided through the huge number of citizens with smartphones that can send text, photos and video. These points of input will be augmented by the expected massive rollout of connected sensors from CCTV; environmental, smoke and audio monitors; and other “smart” devices that make up the expanding Internet of Things (IoT) landscape. All of these connected devices will further enrich the information delivered to Public Safety

## “ The next-generation networks now coming online offer advanced services designed to radically improve alert systems and enhance overall operational efficiency...”

answering points (PSAPs), helping them detect and respond to emergencies more quickly.

To support this evolution, Nokia offers IP Multimedia Services (IMS) to route any kind of information to the most relevant PSAP. Callers can transmit voice, pictures, video, enhanced messaging and other rich multimedia data from fixed or mobile networks, routing each one to the nearest PSAP with precise location information. This technology already is largely deployed among communication service providers, where it simplifies the interconnection in between their networks and emergency call routing infrastructure. It also supports features defined by emergency services organizations such as the North American Emergency Number

Association (NENA) and the European Emergency Number Association (EENA) to guarantee proper interworking with all PSAP equipment.

## While settle for less than excellence?

The bottom line is that emergency services now can benefit from powerful next-generation communication architectures and tools on par with capabilities of the commercial world. This will guarantee that rich, critical communications can flow quickly among citizens and first responders, assuring a new era in operational excellence for protecting life and property. When every moment counts, why settle for anything less?

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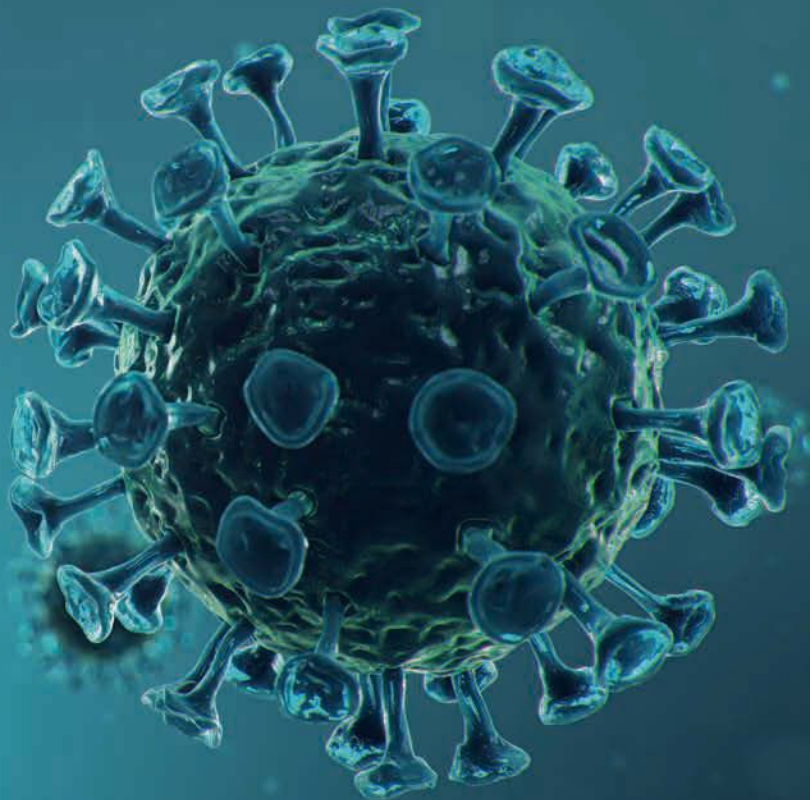


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# North-western heroes

**Philip Mason** talks to the University of Louvain about their ICCA-winning satellite comms roll-out at a COVID-19 testing centre in Piedmont, Italy

**A**cross the course of this year, one of the main things which *CCT* has set out to do as a magazine is spend time talking to the winners of the 2020 International Critical Communications Awards. The awards are a crucial event for the sector after all, showcasing global best practice across a broad range of verticals.

With that in mind, in this issue we are publishing the final ICCAs focus of 2021, this time looking at the award for best use of critical communications in public safety. The winning roll-out in this category was the B-LiFE (Biological Light Field Laboratory for Emergencies) COVID-19 testing facility, set up last year in Piedmont, Italy. The project was led by the Centre for Applied Molecular Technologies of UCLouvain, with ETELM integrating satellite and terrestrial (LTE, TETRA, Wi-Fi) networks through a 4G-linked platform.

This is obviously an apt topic on which to end the year, given the shadow that COVID-19 has cast over the past 19 months. It will also hopefully serve as a small acknowledgement both of the first-responders and health professionals who have worked so hard during the pandemic, as well as the continued ingenuity of the critical

communications sector itself, under often incredibly difficult conditions.

## **Social distancing without chaos**

Established in the late spring of 2020, the mobile field laboratory deployed in the Piedmont region enabled the Italian authorities – in the words of host organisation the European Space Agency (ESA) – “to test thousands of key workers for COVID-19”.

“Staff used the lab to perform and analyse nasopharyngeal swabs, to identify whether or not a person had the coronavirus,” continued the ESA statement. “[Staff also] conducted antibody tests to demonstrate whether a person had been recently infected by the SARS-CoV-2 virus with evidence of an immune response after the viral infection.”

While use of the ESA Piedmont facility was obviously valuable, the location also possessed the key drawback of having no communications infrastructure whatsoever. This, according to one of the interviewees for this article, was due to the all-metal structure of the building, creating in essence an enormous Faraday cage.

Giving more detail about the site, B-LiFE principal medical expert,

*The Piedmont field lab tested hundreds of essential workers for COVID-19*

Professor Jean-Luc Gala, says: “The location in Piedmont was chosen by the Italian authorities, essentially for its size and easy accessibility for the individuals to be tested. At the time, we were at the height of COVID-19, and there was a need to test thousands of key workers. “Obviously, the authorities wanted to know who had the virus, but also whether the biosafety procedures and personal protective equipment that they’d issued were working.

“The Piedmont location made it easy to maintain social distancing on the site without creating chaos, because it was such a wide-open space. The facility was also guarded, which ensured that it wouldn’t be broken into, and the equipment stolen or damaged. It was perfect for this type of testing set up.”

He continues: “The lab was situated in the large hall of the facility, within which we also had a container to take blood samples and nasopharyngeal swabs. On arrival, we took the personal details of everyone being tested, after which they received an anonymised lab identification number in order to respect GDPR.

“In terms of the testing itself, we checked for anti-SARS-CoV-2 antibodies using a prick test on the patient’s finger. If that was positive, they would undergo more testing; if it



was negative, we would allow them to go home.”

As mentioned, as welcome as use of the facility was, one key problem that needed to be solved was the provision of communications infrastructure, the details of which we shall discuss later in the article. This was necessary to enable what is known as the on-site laboratory information management system (or LIMS for short), which is a software-based solution enabling the management and sharing of patient data, and the protection of data in compliance with GDPR.

Describing the operation of the LIMS, Gala says: “It essentially enables the protected collection of personal data, and data from all the different lab devices, which can then be stored, formatted, sent to stakeholders and so on. At the same time – and this was particularly useful with COVID-19 – it also enables the user organisation to draw an accurate map of the cases and suspected cases.”

According to Gala, the Piedmont LIMS was continually operating, in real time, throughout the six-week operation period. The data collection process began with the aforementioned patient registration, followed by the various different rounds of testing. Results were then processed, both manually and automatically, with the system linking anonymous personal data and laboratory data.

“It was crucial to have the capacity to do this,” says Gala. “In this kind of scenario, there’s a huge amount of data to deal with, incorporated into a complicated information flow. That relates not only to the samples, but the type of analysis and technology that you’re intending to use, as well as the need to protect sensitive medical and personal data use by anonymising them.”

### Complicated process

For the University of Louvain, there were two key requirements when it came to the Piedmont COVID-19 testing centre communications infrastructure. The first of these, fairly obviously, was that it worked as it should, providing a reliable network for as long as the project required.

At the same time, the system also needed to be easy to set up and install, due to the lack of specialised communications engineers onsite. This requirement was simultaneously informed by previous – not necessarily

always positive – experiences of deploying the B-LiFE in even more remote locations than the testing centre.

The solution ultimately provided by ETELM was its 4G-linked platform, which enables a multi-technology standalone ‘telecom emergency node’, integrating both satellite and terrestrial assets into a unified mission-critical network. Standards available via the use of the system included TETRA and private LTE.

Discussing the solution, B-LiFE Consortium’s technical director, Alexander Vyborno, says: “The idea behind the technology is to provide a bubble, providing different types of terrestrial communications, via a reliable and secure sat com link.

“In certain locations – such as the COVID-19 testing facility – Wi-Fi is obviously the preferred form of communication. However, in more remote areas of the world, it is also necessary to have voice communication between the end-users. For instance, as in 2014 when the B-LiFE laboratory was set up at an Ebola treatment centre in Guinea, West Africa.”

He continues: “When you’re talking about a mobile lab, everything needs to be quickly deployable. This is because the lab team doesn’t always know where it will deploy, or what the conditions will be like when they get there. Is the existing telecommunications infrastructure reliable and efficient?

“The idea in that case is to have a platform which is fully independent, and not dependent on whatever conditions may be prevalent. That way, you’re never relying on a third party and you can communicate straight away.”

The importance of this is illustrated in reverse by the communications link employed during the 2014 Guinean roll-out. While it ultimately was very effective, according to Gala the system was by no means easy to set up and use.

“The set-up in Guinea was really not user-friendly at all,” he says. “We had a big issue with the antenna, for instance, which was inflatable. It was very difficult to align on the satellite, and if there was any kind of leakage of air, you lost the connection altogether.

“It was impressive to look at, but awful to work with, thereby requiring the presence of an engineer pretty much the whole time. That kind of person is difficult to recruit, and once the technology is in place, they’re just sitting around waiting for a technical failure which may not happen.”

Talking more generally about the mission to West Africa – and its attendant communications requirements – he continues: “Because of the remoteness of the location, there was no commercial coverage whatsoever. The mobile network which Orange had set up across the country was just not accessible in that region.


“That obviously had major medical consequences, not least that the lack of communication could make it incredibly difficult to contact specialists who were not already onsite. We didn’t have paediatricians, for example.

“At the same time, there was also the psychological aspect for the team of not being able to communicate with their families for months on end. The inflatable antenna was difficult to work with, but it worked and did enable us to make the necessary professional and family contacts. For instance, it enabled me to reassure my eight-year-old daughter, who was very scared due to me being in a location with Ebola.”

Six years later in Piedmont, meanwhile, the brief for ETELM was to provide something which was highly improved and much more adapted to the field conditions. In real terms, this meant a comparatively low-weight solution, the installation of which was so straightforward Gala could do it himself. The previously mentioned ‘Faraday cage’ issue, meanwhile, was solved by placing the antennas outside.

Going into detail in regard to the set-up, Vyborno says: “In Piedmont, the B-LiFE telecommunication team used different types of internet service provider integrated in the telecommunication emergency node. Used as backhaul for the terrestrial telecommunication subsystem, the TEN architecture consisted of the GovSat-1 satellite operating in X band, Eutelsat Ka-band HTS services, and Vodafone IT infrastructure.”

“These three types of ISP channels were combined to create a robust unified backbone for the private telecommunication bubble. The Wi-Fi, TETRA and LTE were combined, which provided sufficient bandwidth and delay to the end-users.”

The COVID-19 pandemic has had a huge, often overwhelmingly negative, impact on how we live our lives. As the B-LiFE Piedmont roll-out demonstrates, however, it has also given the chance for the sector to showcase its seemingly inexhaustible levels of ingenuity. 



# The camera eye

Motorola Solutions' head of mobile video, **Richie McBride**, talks to **Philip Mason** about a recent, major, BWV roll-out to ambulance crews in the UK

**O**f all the 'new' technology that has been rolled out by first-responder organisations in recent years, perhaps the most impactful in terms of frontline use has been body-worn video.

This has been most obviously demonstrated by the avenues opened up by the solution – at least in a police context – when it comes to providing new forms of visual evidence. In cases where BWV footage is presented, the jury is now able to not just hear about what went on but also see it, from the privileged point of view of the officer on scene.

Perhaps even more profound, however, is the impact that BWV has had on behaviour, something else that is a key, but often forgotten, part of the business case. Clearly, this means the public themselves, who are anticipated to act much differently than they normally would once they know they are being recorded on camera. At the same time, emergency services staff themselves are now also being held to a higher standard, by virtue of exactly the same principle.

This is something that has been recognised by NHS England in the UK, which has recently made the decision to roll out BWV to all ambulances across the country. The equipment in question – both front and back end – is being provided by Motorola Solutions, which announced the deal towards the start of the summer.

## Stressful profession

According to a press release issued by Motorola at the time, the roll-out consists of its VB400 cameras, features of which include "full HD recording in 1080p", as well as "long battery life" for use across a full shift. These in turn have been

coupled with the company's Video Manager software which, in Motorola's words, offers "a seamless, intuitive and highly configurable software experience".

Going into greater detail about the NHS England roll-out, head of mobile video at Motorola Solutions, Richie McBride, says: "The initial stage took place via a proof of concept and trial, initially involving London and North East ambulance services. That was basically to prove that the cameras were going to be useful to the paramedics in the course of carrying out what can be an extremely stressful job.

"In the first instance, the footage stored on the camera enables an independent, objective witness of any escalating situation. At a time when attacks on ambulance crews are increasing, it gives those on the frontline a feeling that someone is on their side, watching out for them."

He continues: "For a lot of people who do jobs on the frontline, it's simply a matter of finding a way to say 'Look, you're dealing with a real person here and I do feel threatened by how you're behaving'. Having the cameras makes them realise that they are not alone."

While the use-case is broadly similar to other parallel emergency services roll-outs, the details of the deployment in question are very much specific to NHS England. Describing a typical NHS England set-up, McBride continues: "They'll generally have a pool of cameras in a muster room, in the same location where the paramedics pick up their radio at the beginning of the day.

"They'll sign them out by beeping their ID card onto the tray of cameras. The cameras generally aren't individually assigned, so at that point the system will select the camera





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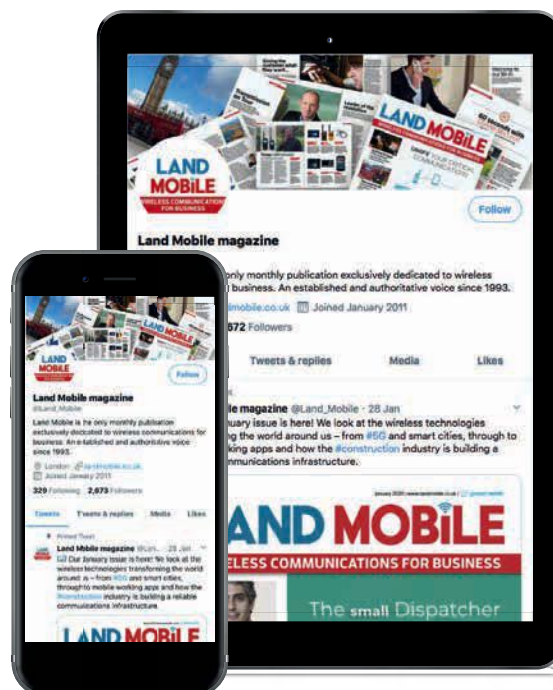
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which the paramedic in question is going to use that day. They then clip it onto their uniform, which tells the system who has the device and what time it was assigned. From that moment on, the body-worn camera is active and video can be recorded. As the camera and back-end system are encrypted, footage is securely captured.”

According to McBride, once the shift begins, crews have the ability to manually switch the camera on if they feel threatened, rather than simply keeping it on all the time. The subsequent recording is stored on the unit itself, which is then docked and the footage uploaded once they get back to base at the end of the day.

Another element of the functionality described by McBride, meanwhile, is what he refers to as “peer assist recording”, the use of which automatically turns on the cameras of every other responder on-scene or on their way to the scene.

“Imagine you’re a police officer that’s been called to an incident. Once you arrive, you might start recording, as well as putting in a call for assistance on your radio, at which point everyone else’s camera will switch on when they arrive, giving multiple views of the scene. That can be invaluable.

“In times of extreme stress, it’s important that emergency services personnel can focus on the situation in front of them, instead of having to think about how to use various pieces of technology.

“First-responders’ jobs are demanding enough as it is. Therefore, their technology should work seamlessly, and intuitively support them, without distracting them from the situation at hand, and the people they need to take care of.”

### Increasing use-cases

Since it started developing the technology, Motorola Solutions has been involved in body-worn video camera roll-outs across a variety of different sectors. This includes not only in the emergency services realm but also parking enforcement, as well as retail, for instance via a recent contract with supermarket chain the Coop.

With that in mind, how does McBride anticipate the technology evolving in parallel with the seemingly ever-expanding number of environments into which it is being rolled out? Would there ever, for instance, be a business case for streaming live footage, something which you imagine would become increasingly an option for the emergency services when using broadband?

“The question which always needs to be addressed when developing any kind of new technology is who is going to be using it, and what are they going to be using it for,” he says. “That’s certainly the case if you look at streaming, which is more suitable for some environments than others.

“Thinking specifically of emergency services organisations, I’m not entirely convinced of the need for real-time streaming back to the control room, given that personnel on the ground already possess a TETRA radio with an emergency button. The other side of that is do we really want the person in the control room taking time to watch footage being streamed live across a whole incident?

“Having said that, there are specialist cases where I think live streaming from the scene could be a really good idea, for instance during a hostage situation. If I’m a hostage negotiator, it could potentially be incredibly useful to stream

back to the Gold commander, in order to give them as much situational information as possible.”

One environment where McBride does see live streaming being of use is in retail. He illustrates this through the use of another hypothetical scenario.

“Imagine that it’s late at night and you’re a shop assistant, and you decide to decline to serve a customer because they are misbehaving,” he says. “In those circumstances, video streaming could be initiated via the in-shop Wi-Fi, through to the business’s alarm receiving centre, who could then keep an eye on what is happening.

“Obviously, there’s already CCTV in retail outlets across the country, all of which is being monitored centrally. The difference with body-worn video is that the person in the control centre will be alerted of the incident as soon as the camera is switched on. The technology can actually make them look and dispatch support if needed, which makes the cameras a real guardian angel on the shoulder of the people on the frontline.”

Going back to the emergency services piece, one area of deployment which McBride is excited about is the potential for body-worn video technology to fit in as part of the IoT ecosystem. This could include the aforementioned ability to turn on multiple cameras at once during a shout, or leveraging sensors as part of a wider ‘safe city’ effort.

Discussing this, he says: “We’re already seeing that now with IoT holster wear, the use of which automatically turns on an officer’s body-worn video once they pull their gun or Tazer. That’s proving exceedingly useful.

“What we’re basically trying to do the whole time is provide relevant, useful contextual information from an increasing number of sources and integrate it into one ecosystem. Anywhere you’ve got someone providing frontline services, talking to the general public, you’ve got a potential user of body-worn video.”

NHS England’s decision to leverage BWV is an important moment for an increasingly relevant technology. 📡

*Attacks on ambulance crews are increasing*







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# Exploring new horizons

In his first interview since being awarded the position, incoming TCCA chief executive **Kevin Graham** outlines his plans for the organisation



Kevin Graham

## What excites you most about the prospect of becoming TCCA CEO? Why did you want the role?

I am very humbled to be the first non-European appointee to this position in the 26-year history of TCCA. My appointment is another indication that TCCA is an internationally recognised association, bringing together the end-user community and the diverse ecosystem of supplier organisations and other stakeholders.

What excites me most is the broad spectrum of TCCA stakeholders and global affiliates, including vendors and users, who are actively collaborating. The member participation in a variety of global initiatives is amazing.

These include TCCA Working Groups, contributions to open standards evolution, and support for standards-based broadband solutions, including development of an associated device certification regime. It also includes continued enhancement of the TETRA standard, as well as collective desire for regulatory support, including equitable spectrum access and harmonisation.

## What do you hope to accomplish, both in terms of the critical comms sector and the organisation?

I will aim to expand our existing global membership and alliance collaborations, to enhance the excellent traditional support within Europe, and further strengthen our collective voice and advocacy. By 2026 – with the collective involvement of TCCA's community and others – I would hope we can ensure that 3GPP-compliant MCX solutions and certifications are well established, and that interworking functions between LMR and broadband are extensively deployed.

Of equal importance, we also need to ensure that spectrum availability has been committed to. This is to support both private and telco carrier services so they can meet global critical industry grade of service requirements. We must also ensure that 5G+ mission-critical standards are confirmed.

## What does TCCA need to do to remain integral to the industry and keep driving it forward?

User demand drives industry investment, innovations and standardisation priorities, all of which are essential to meet user future functional requirements. TCCA needs to continue to drive ongoing TETRA standardisation enhancements in

conjunction with ETSI. This will maintain the momentum already created regarding MCX broadband standardisation, through TCCA's market representation partner status in 3GPP.

Future success depends on industry investments and planning now. We all need to take our individual and organisational responsibility in this journey. TCCA and I welcome *CCT* readers' feedback and participation.

## What can TCCA do to help meet key issues?

The key priorities are to provide ongoing support of critical communications LMR open standards and products, such as TETRA, P25 and DMR. It is also necessary to advise and support end-users in confirming/re-affirming their desire for solutions that ultimately support open-standards-based MCX.

The commercialisation of standardised interworking functions between LMR and mission-critical broadband is crucial. Also crucial is the commercialisation of MCX standards-based solutions that are fit for purpose for government, public safety, PPDR and critical industry. The availability of multi-vendor standards-based MCX interoperability and certification regimes is very important.


TCCA is already deeply involved in all these areas but requires further global industry and end-user participation to add to the effort and expedite the outcomes.

## How do you see the TETRA standard evolving, taking into account mission-critical broadband?

There are significant investments globally in TETRA. Irrespective of the emergence of critical broadband, there is acceptance that the practical timelines to achieve organisation-wide change are measured in years – possibly a decade or more.

TETRA also continues to expand with new deployments in vertical markets. The TETRA community therefore must collaborate with end-users to ensure that network and device support, as well as refresh cycles, meet requirements.

Group packet data transfer optimisation, enhanced futureproof security options and the interworking function with MCX broadband remain high on the agenda of ETSI TC-TCCE.

Any advancements of the standards need to also be supported through TCCA's interoperability testing (IOP) processes that underpin the global success of TETRA. 





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**A**fter more than two years, CCW in Madrid will be an opportunity for colleagues and friends to see each other, face to face at the world's most important event in the field of critical telecommunications. This is significant because the best ideas and solutions are born when people are together.

That being said, despite these difficult times, our sector has been very active. Intensive work has continued in terms of defining the future development of critical telecommunications, in the field of standardisation as well as in the implementation of new solutions.

Many countries have begun the process of transitioning their national systems to broadband and are in various stages, from planning to equipment procurement. The pandemic itself has also contributed to a better understanding of certain needs and has shown where urgent solutions are needed.

We are very fortunate in having representatives from many of these operators participating in Critical Communications World. Our new Government Authorities Global Village will provide a forum where government operators can share their progress, challenges and concerns, learning from each other's experiences and benefiting from combined expertise.

Leading companies from across the critical communications ecosystem will also be present, creating an excellent exhibition. They are waiting to finally showcase their developments and achievements of the past two years. We also know that they will listen closely to the needs and requirements of critical communications users, and work together to ensure that planned solutions and services are designed to meet market expectations.

This year's conference programme is particularly powerful, featuring a range of sessions under the theme of 'Protect, Enhance, Envision, Advance.' This reflects both the continued requirement for maintaining and enhancing existing systems, while at the same time anticipating future needs.

Conference attendees will be able to learn from government officials, industry leaders, and other experts working to create the technology of the future. They will also learn from end users who rely on the products and services of today. Questions that will be answered during the conference include: how challenging will quantum computers be for telecommunications security; what does the future look like for rail communications, and many more.

As well as a comprehensive exhibition and in-depth conference presentations, we also have our ever-popular Masterclasses, and of course the International Critical Communications Awards event. There is much going on - we can't wait to see you in Madrid.

**MLADEN VRATONJIĆ,**  
**BOARD CHAIR, TCCA**





# VISITOR INFORMATION

## WHY ATTEND?

After two years without being able to meet physically, connecting with critical communications professionals face-to-face is more important than ever. Critical Communications World 2021 therefore represents an invaluable forum for knowledge exchange, networking and collaboration.

In a rapidly changing sector, CCW 2021 is the ideal setting to discuss challenges, solutions and to expand your knowledge. It is vital to stay on top of the latest technological developments that affect you and your organisation. Attending CCW 2021 will give you the inside track on all the latest cutting-edge communications solutions and best practice.

**TURN TO PAGE 38 TO SEE THE FULL CONFERENCE PROGRAMME.**

## COVID-19 SAFETY

As organisers of CCW 2021, we regard the health and safety of everyone participating in the show as of paramount importance. Any measures put in place at the event will ensure the safety and comfort of all those on-site.

We are implementing COVID-19 status checks, and all CCW 2021 attendees must be able to provide proof of COVID-19 status for entry to the event. We are continuously updating our guidelines based on Spanish government recommendations, and working alongside the IFEMA Madrid with their venue protocols. Keep up to date with the latest guidelines here:

**[CRITICAL-COMMUNICATIONS-WORLD.COM/MADRID/SAFETY-MEASURES](https://critical-communications-world.com/madrid/safety-measures).**

## WHERE?

CCW will take place at IFEMA Madrid in Spain from 3-5 November this year. The venue is one of the five most important trade fair institutions in Europe and the leading one in Spain. IFEMA attracts over four million visitors through its doors each year.



## FULLY SUPPORTED ONLINE

As well as taking place in the physical realm, 2021 will be the first year that the CCW is fully supported online. The show will connect operators, end-users and manufacturers worldwide to ensure access to the right people, information and products.

**YOU CAN FIND OUT MORE ABOUT THIS ON PAGE 34.**

## WHEN?

### MASTERCLASS OPENING TIMES:

3rd November 2021, 09:00-17:30

### CONFERENCE OPENING TIMES:

4th November 2021, 09:15-17:30

5th November 2021, 09:30-16:00

### EXHIBITION OPENING TIMES:

3rd November 2021, 13:00 - 18:00

4th November 2021, 10:00 - 18:00

5th November 2021, 10:00 - 16:30

### REGISTRATION TIMES:

All days: from 08:30

## GETTING THERE

### CAR

IFEMA has road connections to Madrid's main access and ring roads, including the M11, M40 and A2.

### PUBLIC TRANSPORT

The nearest Metro station to IFEMA is Feria de Madrid, which is very close to the venue. The station is well connected to Madrid-Barajas Adolfo Suárez airport, with other Metro routes also offering excellent connectivity to and from anywhere in Madrid. The airport is also just a short taxi ride from the IFEMA.

### BUS

Madrid's extensive bus network allows you to get to IFEMA from anywhere in the city.

### TAXI

There are three taxi ranks inside the IFEMA enclosure: South, North and East Entrance.

**SCAN THE  
QR CODE TO  
REGISTER**



# WHAT'S ON?

## A BREAKDOWN OF WHAT TO EXPECT OVER THE COURSE OF THE EVENT

### EXHIBITION

Stay at the forefront of critical communications by browsing products and services from a broad range of international exhibitors. Speak to established market leaders and suppliers to find a solution to your operational challenges. Don't miss the chance to transform your organisation via products that improve efficiency and ensure faster, more effective communication.

During the CCW 2021 exhibition, visitors will have the chance to connect with Platinum Sponsors Leonardo, Motorola Solutions and Hytera, as well as Gold Sponsor Ericsson.

### CONFERENCE AND MASTERCLASSES

Taking place across the course of the event's three days, the CCW conference sessions offer a huge range of cutting-edge presentations, delivered by some of the most respected thought leaders in the critical communications industry. The conference is free to all attendees.

Conference highlights include the Spanish government discussing its future telecommunications strategies, and ETSI's Adrian Scrase looking at how to preserve and enhance the solutions which are currently working well for the sector and its users. There will also be a keynote address from BBC journalist and technology expert Rory Cellan-Jones, discussing the challenges and opportunities presented by new technology.

Visitors to CCW will also benefit from its masterclass sessions, which for a small fee, offer half-day deep dives into some of the most pressing topics currently facing the critical communications sector. These are specifically designed to be diverse, engaging, informative and above all, helpful.

All conference sessions will be held live in Madrid and livestreamed on the online platform. All physical attendees and paid online attendees will be given access to all conference session recordings on-demand.

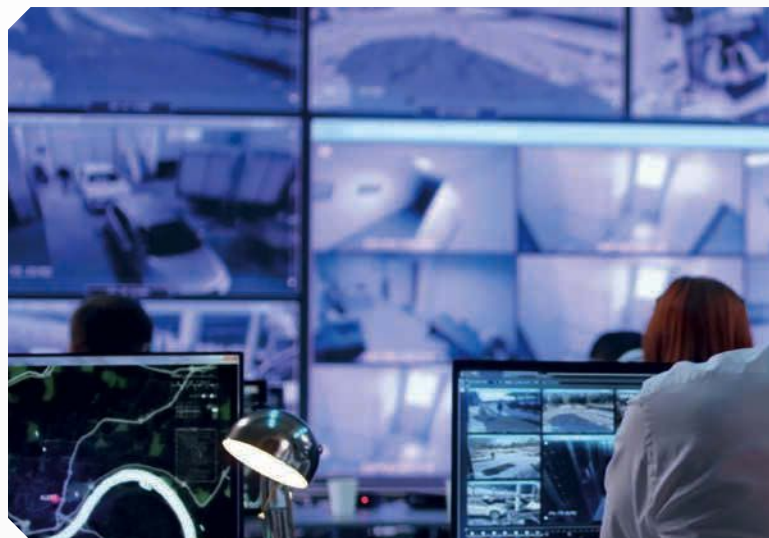
### NEW FOR 2021: FULLY SUPPORTED ONLINE

2021 marks the first year that CCW will be fully supported online, meaning that those with restricted travel don't have to miss out.

Visitors who cannot attend the physical show for free will have the opportunity to buy a €199 online ticket to access an interactive online platform.

#### ONLINE VISITORS WILL BE ABLE TO:

- Livestream seminar talks and take part in interactive chats and Q&As
- Gain on-demand access to seminar recordings
- Browse online exhibitor booths containing product information, and take advantage of a direct line to knowledgeable reps
- Directly message exhibitors, chat with peers and host video calls with experts around the globe.





# WHAT'S ON?

## A BREAKDOWN OF WHAT TO EXPECT OVER THE COURSE OF THE EVENT



**2,500+**

**CRIT COMMS  
PROFESSIONALS**



**80+**

**LEADING  
SUPPLIERS**



**90+**

**EXPERT  
SPEAKERS**



**31%**

**C-LEVEL AND  
DIRECTORS**

### **GOVERNMENT AUTHORITIES GLOBAL VILLAGE**

The Government Authorities Global Village at Critical Communications World 2021 provides an exclusive forum for national critical communications operators from around the world to come together to discuss ideas and best practice.

With more than 20 authorities in attendance at CCW, the Global Village will bring organisations and operators together to foster a spirit of collaboration across international borders.

With each international authority at a different phase in terms of strategy, this new initiative is the perfect platform for global stakeholders to combine and move forward together.

### **EXCEPTIONAL NETWORKING**

After two years without a physical show, networking is more important than ever, both face-to-face and online. While at the show, visitors can make use of the Networking Lounge and TCCA Members' Lounge, both of which are purpose-built spaces enabling attendees to develop business relationships and leverage high-level networking opportunities. Additionally, the virtual platform will allow attendees to book meetings online and face-to-face, as well as chat with exhibitors and plan their time at the show.

### **THE INTERNATIONAL CRITICAL COMMUNICATIONS AWARDS**

The ICCAs, presented by TCCA, are the most prestigious awards in critical communications.

Celebrating excellence in the sector, they recognise the success of products, organisations and individuals which have pushed boundaries and capabilities within the field.

Attendees to this gala night will network with the best and brightest in the sector, while also enjoying fantastic food and drink, as well as top-class entertainment. The ICCAs 2021 take place at the Casino de Madrid, following the conclusion of the event's first day. We look forward to raising a glass with you!

# SPEAKER PROFILES



**RORY CELLAN-JONES**  
*JOURNALIST AND BBC NEWS TECHNOLOGY CORRESPONDENT*

Rory has been a reporter for the BBC for a quarter of a century, covering business and technology for much of that time.

He now covers technology for BBC television, radio and online, as well as blogging regularly at 'dot rory.' In 2014, he began presenting a new weekly programme called 'Tech Tent' on the BBC World Service.

He is also the author of 'Dot.Bomb', a critically acclaimed account of Britain's dot com bubble.

**OPPORTUNITIES AND CHALLENGES OF NEW TECHNOLOGIES**  
**NOVEMBER 4TH, 9:30-10:00**



**ADRIAN SCRASE**  
*CTO, ETSI*

Adrian played a central role in the creation of the 3rd Generation Partnership Project, otherwise known as 3GPP.

He is currently responsible for the operations of 3GPP's Project Coordination Group, as well heading its Mobile Competence Centre.

As well as 3GPP, Adrian was also principally involved in the formation of the oneM2M Partnership Project.

He is CTO within ETSI, with operational responsibility for all of the organisation's standards production activities.

**PRESERVING AND ENHANCING WHAT WORKS WELL TODAY**  
**NOVEMBER 4TH, 10:30-11:00**



**EDWARD PARKINSON**  
*CEO, FIRSTNET AUTHORITY*

Ed is responsible for overall management of all FirstNet Authority operations and the agency's strategic direction. He previously served as Acting CEO from October 2018 to May 2019.

Before joining the organisation, he served for five years as a Professional Staff Member for the House Homeland Security Committee.

During this period, his primary responsibility was in the field of first responder telecommunications, as well as working on issues including national security, emergency preparedness, and cybersecurity.

**HOW ARE WE MAKING THE MOST OF CUTTING-EDGE TECHNOLOGIES?**  
**NOVEMBER 4TH, 12:30-13:15**



**CLARA BODIN**  
*GLOBAL LEAD FOR DIVERSITY & INCLUSION, TELIA COMPANY*

Clara leads a team of diversity and inclusion managers in countries across the Nordics, including Sweden, Norway, Denmark, and

Finland. Her mission and passion is to make Telia Company an even more effective equal opportunity employer.

She previously worked in Russia, Ukraine and Eurasia in various HR and business roles for Swedish companies. Clara was awarded 'Top Swede Abroad' in 2011 by Sweden's leading business journal, during which time she ran her own HR consultancy company in Ukraine.

**WHY DIVERSITY IS IMPORTANT AND HOW TO ACHIEVE IT**  
**NOVEMBER 4TH, 13:45-14:30**



**MARK PECEN**  
*PRINCIPAL ADVISOR, QUANTUM VALLEY IDEAS LAB*

Mark Pecen serves as Principal Advisor at Quantum Valley Ideas Lab, a world leader in quantum-safe cryptographic solutions

for governments and original equipment manufacturers.

He is also Chairman and founding member of the European Telecommunication Standards Institute (ETSI) Working Group for Quantum Safe Cryptography (Cyber QSC) in Sophia Antipolis, France. Mark is advisor to the European Commission on ICT R&D and technology standardisation and various agencies of the Canadian government.

**KEYNOTE ADDRESS: COMMUNICATION SECURITY CHALLENGES IN THE POST-QUANTUM WORLD**  
**NOVEMBER 5TH, 10:00-10:30**



**KAORU INOUE**  
*DIRECTOR, GLOBAL ENABLING SUSTAINABILITY INITIATIVE*

Kaoru is a Director at GeSI, which is a globally recognised thought leading organisation and a proactive driver of the

ICT sustainability agenda. She manages the overall operations of the GeSI secretariat, as well as programme coordination across various workstreams, including circular economy, climate change, and digital trust and responsibility. Prior to GeSI, Kaoru worked on stakeholder engagement and project management at the International Telecommunication Union situated in Geneva, Switzerland.

**DIGITAL WITH PURPOSE: HOW TECHNOLOGY CAN ACCELERATE SUSTAINABILITY**  
**NOVEMBER 5TH, 12:15-12:45**

**SCAN THE QR CODE TO JOIN US IN PERSON OR ONLINE**





# MASTERCLASSES

3RD NOVEMBER 2021

## Room 1

09:00-12:30

### A: CONTROL ROOMS: MANAGING THE TRANSITION TO BROADBAND

**CHAIR: IAIN IVORY**, Founding Partner, Hermitage Comms

**HARALD LUDWIG, CHAIR**, Technical Forum, TCCA

As mission critical users look to adopt new mission critical broadband services, the control room is one of the key elements organisations must consider. It is critical to understand the standards and interfaces needed within the control room, and the implications for control room staff and users.

This masterclass will review the 3GPP standards from the perspective of the control room. It will also cover the challenges of migration including interoperability during migration, and look at how this is being addressed in countries implementing broadband services.

14:00-17:30

### D: FUTURE TECHNOLOGIES

**CHAIRS: ROBIN DAVIS**, Chair, Future Technologies Group, TCCA

**IAIN IVORY, CHAIR**, Future Technologies Group, TCCA

This masterclass will be presented by members of the TCCA Future Technologies Group and will cover the up and coming developments in adjacent technologies that the Group feels will likely have relevance or impact on the work of TCCA.

This includes technologies that are connected to and relevant for mission critical users and that may utilise mission critical communications as a bearer. For example, new or novel uses of 5G, trends in the transportation market such as vehicle connectivity, PPDR device innovations, developments in the IOT and SCADA world that may have impact or relevance on connectivity or data provision to critical communications users.

The Future Technologies Group aims to provide a platform for everyone interested in future technologies that are connected to and relevant with mission critical users and that may utilise mission critical communications as a bearer. The group produces a quarterly 'horizon scanning' newsletter that highlights the most interesting developments.

So please take the opportunity to come and join this Masterclass and listen to our group of visionaries to learn about future developments.

## Room 2

09:00-12:30

### B: APPLICATIONS OF BROADBAND IN FRONTLINE CRITICAL COMMUNICATIONS PART 1

**CHAIR: TERO PESONEN**, Chair, Critical Communications Broadband Group, TCCA

The use of broadband for frontline critical communications is currently a key topic for the sector.

With the likes of FirstNet and the Emergency Services Network beginning to come to fruition, this masterclass will look at core issues around the technology as well as its implications for life on the frontline.

14:00-17:30

### B: APPLICATIONS OF BROADBAND IN FRONTLINE CRITICAL COMMUNICATIONS PART 2

**CHAIR: TERO PESONEN**, Chair, Critical Communications Broadband Group, TCCA

Part 2 will take a more in-depth look into the challenges of deployment of broadband technology in mission-critical and business-critical environments.



## Room 3

09:00-12:30

### C: TETRA: THE OPTIMAL MISSION-CRITICAL VOICE SOLUTION. TRUSTED, ALWAYS EVERYWHERE

**CHAIR: FRANCESCO PASQUALI**, Chair, TETRA Industry Group, TCCA

TETRA networks are specialist networks delivering mission critical communications services, a specific feature set and a high grade of reliability and availability. These networks are designed to provide a high level of inherent resilience and redundancy in their architectures. Dimensioned to provide a specific grade of service at peak load to the user groups they serve, the services on a TETRA network are intended for command and control operation, focusing on group-oriented services to enable fast and efficient communication and dissemination of information.

TETRA has matured over the past 25 years to become the technology of choice for millions of PPDR users who demand true mission-critical communications.

In this session we will discuss how TETRA continues to deliver mission-critical coverage, security, availability and resiliency. Also, an update will be provided on ongoing enhancements.

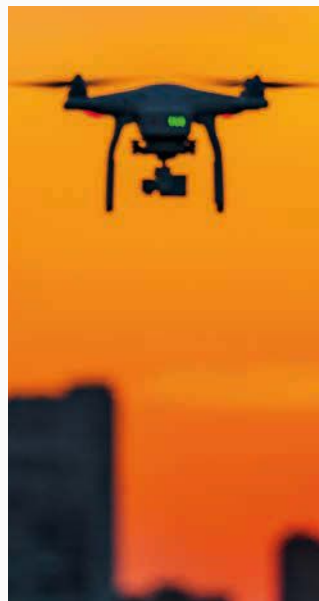
14:00-17:30

### F: BROADBAND INDUSTRY MASTERCLASS

**CHAIR: JASON JOHUR**, TCCA Broadband Industry Group Chairman, Board Member

This masterclass will cover key topics relating to 3GPP mission-critical broadband technology, including aspects to aid the planning, design, implementation and enhancement of networks built on this cutting-edge technology.

The target audience for these presentations includes government agencies, end user organisations, communication service providers and professional consultants.



## Room 4

09:00-12:30

### E: SECURITY AND CYBERSECURITY

**CHAIR: TREVOR EVANS**, Chair, Security and Fraud Prevention Group, TCCA

This masterclass will consist of high-level discussion around the latest developments in security in both TETRA and 3GPP technologies.

As communications technology evolves, so does the urgent need to protect the information being transmitted.

14:00-17:30

### G: INTERWORKING

**CHAIR: HARALD LUDWIG**, Chair, Technical Forum, TCCA

Today, most existing regional and nationwide (narrowband) mission critical mobile radio networks are not connected with their neighbouring systems. Only a few years ago the first TETRA networks in Norway, Sweden and Finland were connected via the ISI (intersystem interface).

With the start of the rollout of broadband systems the interconnection between these systems and the interworking with existing mobile radio technologies like TETRA, P25 or GSM-R is becoming an important topic.

This masterclass will present the technical, organisational and operational challenges with connecting networks, with a focus on interworking with currently used networks.

Attendees will learn about the current status of the various standardisation activities to connect 3GPP and non-3GPP systems and how these standards will be put into reality.



# CONFERENCE TIMETABLE

4TH NOVEMBER 2021

## STREAM 1 PROTECT AND ENHANCE

09:15-09:30

CONFERENCE OPENING & INTRO

**MLADEN VRATONJIC**, Chair, TCCA

09:30-10:00

KEYNOTE ADDRESS: OPPORTUNITIES AND CHALLENGES OF NEW TECHNOLOGIES

**RORY CELLAN-JONES**, Journalist & BBC News Technology Correspondent

10:00-10:30

KEYNOTE ADDRESS: ASSESSING TELECOMMUNICATIONS STRATEGIES FOR THE FUTURE

**PROFESSOR ARTURO AZCORRA**, Telecommunications General Director, Ministry of Economic Affairs and Digital Transformation, Spain

10:45-11:15

THE SPANISH PATH TOWARDS A MISSION CRITICAL BROADBAND NETWORK

**ENRIQUE BELDA**, Deputy Director General of Communication and Information Systems for Security, Spanish Ministry of Interior

11:30-12:00

SHARED SITUATIONAL AWARENESS: LESSONS FROM THE LANDSLIDE DISASTER IN NORWAY IN DECEMBER 2020

**SIGURD HEIER**, Head of Department, The Norwegian Directorate for Civil Protection (DSB)  
**ANDERS LØBERG**, Fire and Rescue Chief, Øvre Romerike Fire and Rescue  
**LARS MAGNE HOVTUN**, Emergency Management Advisor, The Norwegian Business and Industry Security Council

12:15-13:00

PANEL DISCUSSION: INTERNATIONAL CO-OPERATION IN THE NORDICS TODAY AND IN THE FUTURE

**CHAIR, JARMO VINKVIST**, COO, Virve, Erillisverket  
**RONNY HARPE**, Head of Rakel and Command Operating Systems, Swedish Civil Contingencies Agency (MSB)  
**SIGURD HEIER**, Head of Department, The Norwegian Directorate for Civil Protection (DSB)  
**LENE GISSELØ MAALØE**, Head, Danish Centre of Emergency Communication (CFB)

13:45-14:15

CHALLENGES IN THE TRANSFORMATION OF THE COMMAND AND CONTROL LANDSCAPE OF THE AUSTRIAN FEDERAL MINISTRY OF THE INTERIOR

**WOLFGANG MÜLLER**, Ministry of the Interior, Republic of Austria  
**IVAN GOJMERAC**, Regional Sales Manager for Central Europe, Public Safety, Frequentis

14:30-15:00

HYBRID NETWORK INFRASTRUCTURES UNDER TEST: BDBOS BROADBAND TASK FORCE'S FINDINGS

**GERALD BEDÜFTIG**, Head of the Network Design Division, German Federal Agency for Public Safety Digital Radio (BDBOS)

15:15-15:45

ACHIEVING MAXIMUM ADVANTAGE FROM EXISTING CRITICAL COMMUNICATIONS NETWORKS

**PETER HUDSON**, Chief Technology Officer, Sepura

16:00-16:30

LEONARDO SPONSORED SESSION

FUTURE PROOF PROFESSIONAL COMMUNICATIONS ECOSYSTEM: LEONARDO VIEW AND SOLUTIONS

**ANGELO BENVENUTO**, Head of Solution and Product Marketing, Cyber Security Division, Leonardo

16:45-17:00

WHY A PROFESSIONAL APPS ECOSYSTEM IS ESSENTIAL

**NIKLAS LAGERBLUM**, Solution Business Manager, Airbus

## STREAM 2 ENVISION AND ADVANCE

10:30-11:00

KEYNOTE ADDRESS: PRESERVING AND ENHANCING WHAT WORKS WELL TODAY

**ADRIAN SCRASE**, CTO, ETSI

11:15-11:45

CRITICAL COMMUNICATIONS OF HYBRID DRONE NETWORKS

**DR ANDRE SAMBURG**, Expert and Project Evaluator for the European Commission on Public Safety and Security, Uusimaa Regional Rescue Association

12:00-12:30

FUTURE TECHNOLOGIES

**ROBIN DAVIS**, Co-Chair, Future Technologies Group, TCCA  
**IAIN IVORY**, Co-Chair, Future Technologies Group, TCCA

12:30-13:15

PANEL DISCUSSION  
HOW ARE WE MAKING THE MOST OF CUTTING EDGE TECHNOLOGIES?

**CHAIR: ROBIN DAVIS**, Co-Chair, Future Technologies Group, TCCA  
**ED PARKINSON**, CEO, FirstNet Authority  
**JOHN ANTHONY**, President, British APCO  
**IAIN IVORY**, Co-Chair, Future Technologies Group, TCCA

14:15-14:45

PRESERVING THE BENEFITS – AND GAINING NEW ONES

**SIGURD HEIER**, Head of Department, The Norwegian Directorate for Civil Protection (DSB)

15:00-15:30

USING AI, VIDEO ANALYTICS, MISSION-CRITICAL BROADBAND AND LAND MOBILE RADIO TOGETHER AS A RESOURCE MULTIPLIER TO TACKLE PUBLIC SAFETY CHALLENGES

**PAUL STEINBERG**, Senior Vice President of Technology, Motorola Solutions

15:45-17:00

PANEL DISCUSSION  
5G: SUPPLY-CHAIN RISK MANAGEMENT AND ENABLING USE CASES

**CHAIR: TERO PESONEN**, Vice-Chair, TCCA, Finland

**RYAN POLTERMANN**, Wireless Communications Research Engineer, Pacific Northwest National Laboratory

**AUDUN JØSANG**, Professor and Head of the Research Group on Digital Security, University of Oslo

## STREAM 3 PROTECT AND ENHANCE

10:30-11:00

CRITICAL COMMUNICATIONS FOR RAILWAYS

**DAVID ROTHBAUM**, Director, Business Development, Ericsson

11:15-11:45

SAVE MINUTES, SAVE LIVES

**DAVE HANNAN**, Chief Inspector, Lancashire Constabulary  
**IAN DRUMMOND-SMITH**, Chief Superintendent, Devon and Cornwall Constabulary  
**IAN WILLIAMS**, Software Consultant for Europe, Motorola Solutions

12:00-12:45

PANEL DISCUSSION  
BEYOND STANDARDISATION: HOW DO WE GET THIS TO BE A REALITY FOR ADOPTION?

**CHAIR: TONY GRAY**, Chief Executive, TCCA  
**NINA MYREN**, Director and Board Member, TCCA  
**ADRIAN SCRASE**, CTO, ETSI  
**PAUL STEINBERG**, Senior Vice President of Technology, Motorola Solutions  
**GIANCARLO SANTINI**, Operations and IT Director, Airbus Mexico and LATAM

13:00-13:30

MOTOROLA SOLUTIONS SPONSORED SESSION  
THE LIFECYCLE OF AN INCIDENT FROM A USER'S PERSPECTIVE

**IAN WILLIAMS**, Software Consultant for Europe, Motorola Solutions  
**DAVE HANNAN**, Chief Inspector, Lancashire Constabulary

13:45-14:30

PANEL DISCUSSION  
WHY DIVERSITY IS IMPORTANT AND HOW TO ACHIEVE IT

**ANNELI KARLSTEDT**, Head of Inclusion and Diversity, Nokia  
**TINISHA AGRAMONTE**, Chief Diversity Officer, Motorola Solutions  
**CLARA BODIN**, Global Lead, Diversity and Inclusion, Telia

15:00-16:30

GAGV: CRITICAL COMMUNICATION PROJECTS FROM AROUND THE WORLD

**SPEAKERS TO BE CONFIRMED**

17:00-17:30

TETRA: AN ADVANCED UNIFIED MISSION-CRITICAL BEARER FOR LIGHT RAILS

**PRAVIN MAGAR**, Technical Architect, Consort Digital, Mauritius

## STREAM 4 ENVISION AND ADVANCE

10:45-11:15

EMOTIONAL AI: A NEW TOOL IN TRACKING CRIMINAL INTENTION: RISKS AND REWARDS

**DIANA MIRANDA**, Lecturer in Criminology, University of Stirling

11:30-12:00

INTEGRATED COMMUNICATIONS AND SECURITY FOR CORTINA 2021 ALPINE SKI WORLD CHAMPIONSHIPS  
**NICOLA MORET**, TLC Director, Cortina 2021 Alpine Ski World Championships

12:15-12:45

KRIVAT CONCEPT: THE COLLABORATION PLATFORM FOR COMPANIES AND AUTHORITIES  
**JOUNI HONKANEN**, Product Manager, Erillisverket

13:00-14:30

PANEL DISCUSSION  
THE SKY IS THE LIMIT – HIGH-SPEED INTERNET FROM SPACE IS GOING INTO OPERATION. WHAT IS IN IT FOR CRITICAL COMMUNICATIONS?

**CHAIR: BARBARA HELD**, Journalist, Behörden Spiegel  
**JONATHAN HOFELLER**, Vice-President of Starlink Commercial Sales, SpaceX  
**NICK SHAVE**, Vice-President, Strategic Programmes, Inmarsat  
**DYLAN BROWNE**, President, OneWeb  
**CHRISTOPHE ALLEMAND**, European Space Agency (ESA)  
**ANTTI KAUPINEN**, Head of Department, Erillisverket

14:45-15:30

PANEL DISCUSSION  
STANDARDS, TESTING AND CERTIFICATION

**HARALD LUDWIG**, Chair, Technical Forum, TCCA  
**CHRIS HOGG**, Programme Manager and Mission Critical Services Co-Convenor, Global Certification Forum  
**SAURAV ARORA**, Technical Project Manager, ETSI  
**MAGNUS TRANKE**, Product Manager, Mission Critical Applications, Ericsson

15:30-16:00

HYTERA SPONSORED SESSION  
WHAT IS THE FUTURE OF NARROWBAND COMMUNICATION?  
**MARTIN EDWARDS**, Head of Engineering, Hytera Communications Europe

16:15-16:45

BUILDING NEXT GENERATION SITUATIONAL AWARENESS: HARNESSING THE LATEST TECHNOLOGIES AND THE WORLD OF DATA  
**SAMI HONKANENIEMI**, Co-Founder & Managing Director, Mentura, Finland



# CONFERENCE TIMETABLE

5TH NOVEMBER 2021

## STREAM 1 PROTECT AND ENHANCE

**09:30-10:00**

**KEYNOTE ADDRESS: MAKING THE RIGHT DECISIONS FOR A NATIONWIDE MISSION CRITICAL BROADBAND SERVICE: LESSONS LEARNED FROM THE SPANISH CASE**  
**FRANCISCO JAVIER TORIBIO TORREJON**, Technical Director, Telefonica

**10:00-10:30**

**KEYNOTE ADDRESS: COMMUNICATION SECURITY CHALLENGES IN THE POST-QUANTUM WORLD**  
**MARK PECEN**, Principal Advisor, Quantum Valley Ideas Lab

**10:45-11:15**

**GOVERNMENT CRITICAL COMMUNICATIONS MOVING AHEAD IN ANZ**  
**KEVIN GRAHAM**, Director, Australasian Critical Communications Forum

**11:30-12:00**

**AN AGE OF TRANSITION: ENSURING ONGOING OPERATION IN CHALLENGING SITUATIONS**  
**RICARDO GONZALEZ**, Vice President for Strategy in International Markets, Motorola Solutions

**12:15-12:45**

**DIGITAL WITH PURPOSE: HOW TECHNOLOGY CAN ACCELERATE SUSTAINABILITY**  
**KAROU INOUE**, Director, Global Enabling Sustainability Initiative (GeSi)

**13:00-13:00**

**MCS CONFORMANCE TESTING BECOMING A REALITY**  
**FIDEL LIBERAL**, Coordinator, MCS TaaSting

**13:45-14:15**

**FINDING THE OPTIMAL TIMING FOR MOVING TO MISSION-CRITICAL BROADBAND**  
**HANS PETTER NAPER**, Chief Engineer, The Norwegian Directorate for Civil Protection (DSB)  
**KNUT BALTERZEN**, Specialist Director, The Norwegian Directorate for Civil Protection (DSB)

**14:30-15:00**

**2020 CYBERSECURITY THREATS TO PUBLIC SAFETY COMMUNICATIONS**  
**TYLER BRODBECK**, Senior Threat Intelligence Team Lead, Motorola Solutions

**15:15-15:45**

**WHAT CAN TACTICAL LTE BRING TO WORKERS IN THE FIELD?**  
**MARC SOULACROUP**, Sales Director, ETELM

## STREAM 2 ENVISION AND ADVANCE

**10:00-10:30**

**A PROCESS TO CHANGE LAWS TO ENABLE CRITICAL BROADBAND**  
**JARMO VINKVIST**, COO, Virve, Erillisverkot

**11:15-11:45**

**AUGMENTED REALITY IN THE CONTROL ROOM**  
**RYAN POLTERMANN**, Wireless Communications Research Engineer, Pacific Northwest National Laboratory  
**DAVID VAN BALLEGOIJEN**, General Manager, Western Fire Chiefs Association  
**KISHAN SHETTY**, Principal Software Engineer, JANUS Research Group

**12:15-12:45**

**PANEL DISCUSSION INTERNATIONAL PERSPECTIVES ON THE MINING, OIL, UTILITIES AND TRANSPORTATION INDUSTRY APPROACH - FROM SCADA TO IOT**  
**CHAIR: NICK SMYE**, Principal Consultant, Mason Advisory  
**JULIAN STAFFORD**, Technical Director, European Utilities Telecom Council  
**ROBIN DAVIS**, Co-Chair, Future Technologies Group, TCCA  
**FIONA WILLIAMS**, Research Director, Ericsson

**13:15-13:45**

**KEYNOTE ADDRESS: CYBERSECURITY IS CRITICAL: HOW DO WE ACHIEVE IT?**  
**CHARL VAN DER WALT**, Head of Cybersecurity Research, Orange Cyberdefense

**14:00-14:30**

**CONNECTING AIRCRAFT TO FIELD OPERATIONS: AIR-TO-GROUND BROADBAND COMMUNICATIONS**  
**LEE NIGHTINGALE**, Senior Manager ESN, EE  
**IMRAN DURRANI**, Senior Account Manager, Nokia

**15:15-15:45**

**ERICSSON SPONSORED SESSION PROPER PLANNING IS KEY: FROM LMR TO MISSION CRITICAL 4G AND 5G**  
**ANTONIO FERNANDEZ MERINO**, Global Business Development Director, Ericsson  
**MANUEL RUIZ**, Global Head of Mission Critical Networks, Ericsson

**15:30-16:00**

**NEXT GENERATION EMERGENCY SERVICES: ACHIEVING THE VISION**  
**FABRICIO VELEZ**, Pre-Sales Solutions Consultant, Nokia

## STREAM 3 PROTECT AND ENHANCE

**10:00-10:30**

**HYTERA SPONSORED SESSION NEXT-GEN MISSION CRITICAL COMMUNICATIONS TRENDS**  
**SIMON YIN**, Vice President, Hytera Latin America & the Caribbean

**11:15-12:45**

**GAGV: CRITICAL COMMUNICATION PROJECTS FROM AROUND THE WORLD**  
**SPEAKERS TO BE CONFIRMED**

**13:00-14:30**

**CCF SPONSORED SESSIONS**  
**DETAILS TO BE CONFIRMED**

**14:45-15:00**

**PANEL DISCUSSION SPECTRUM, THE POWER OF THE FUTURE?**  
**CHAIR: LUZ FERNANDES DEL ROSAL**, International Cooperation, Federal Agency for Public Safety Digital Radio (BDBOS)  
**RENAUD MELLIES**, Standardisation and Innovation Leader, International Cooperation, French Ministry of Interior  
**ANESTIS GIGAPOLOUS**, Spectrum Policy Unit at DG CNECT, European Commission



## STREAM 4 PROTECT AND ENHANCE

**11:00-11:30**

**THE CHALLENGE OF IMPLEMENTING A MULTI-OPERATOR CORE NETWORK IN BELGIUM**  
**CHRISTOPH GREGOIRE**, Technical Director, ASTRID

**12:30-13:15**

**PANEL DISCUSSION: HOT OR NOT? TRENDS IN COMMERCIAL NETWORK SUPPORT FOR CRITICAL COMMUNICATIONS**  
**KEN REHBEHN**, Principal Analyst, CritComms Insights  
**VILLE SYRJÄNEN**, Go to Market Manager, Enterprise Mobile Solutions, ELISA

**13:30-14:00**

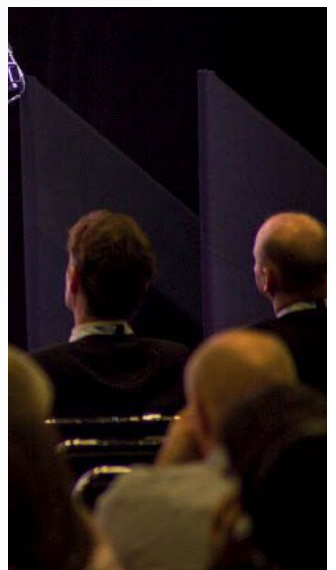
**KIMA: A 4G BASED MISSION CRITICAL SYSTEM**  
**HEINI ØSTERØ**, Fire Chief, Torshavn Fire Department  
**PAETUR MAGNUSSON**, KIMA Project Manager, Faroese Telecom  
**NICKLAS SPANGBERG**, Development Director, Ericsson

**14:15-14:45**

**TRYING TO CONNECT TETRA TO THE FUTURE: WHAT WE HAVE LEARNED (SO FAR) FROM PILOTING A PTT APP**  
**MATILDE BROWN MEGÅRD**, Senior Advisor, The Norwegian Directorate for Civil Protection (DSB)

**15:00-15:45**

**PANEL DISCUSSION PLANNING AI FUTURES: HOW TO MAKE THE RIGHT DECISION - PROGRESSING TO 5G/6G**  
**CHAIR: ROBIN DAVIS**, Co-Chair, Future Technologies Group, TCCA  
**NICK COPPENDALE**, Principal Consultant, Actica Consulting  
**ANTTI KAUPPINEN**, Head of Department, Erillisverkot  
**ASLE SVANOE**, Head of Wholesale Division, Telenor Norway



# SPEAKER INTERVIEWS



## PAUL STEINBERG

SENIOR VICE PRESIDENT OF TECHNOLOGY, MOTOROLA SOLUTIONS

**AT CCW, YOU WILL BE DISCUSSING 'FUTURE TECHNOLOGIES' SUCH AS AI AND VIDEO ANALYTICS. WHAT KEY TAKE-HOME POINTS WOULD YOU LIKE PEOPLE TO GET FROM YOUR SESSION?**

The public safety community is facing multiple challenges, all of which put strain on limited resources. That said, I truly believe that we are on the precipice of a renaissance in mission-critical communications and operations. With the emerging technical capabilities at our disposal, we can use AI, video analytics, mission-critical broadband and LMR together as a resource multiplier for many public safety challenges. To get this right, we need to apply solution thinking, integrating these technologies in a purpose-built manner so that the whole is greater than the sum of the parts. This will enable better societal outcomes.

**WHICH CCW CONFERENCE SESSIONS OR MASTERCLASSES ARE YOU MOST LOOKING FORWARD TO ATTENDING?**

There are a number of sessions where users of mission-critical technology are providing case studies, and/or offering their experiences and insights. This is always insightful, instructive and inspiring.

I'm also looking forward to Ricardo Gonzalez's presentation on 'An age of transition: ensuring ongoing operation in challenging situations'. I expect that his session will highlight some of the key challenges public safety network operators face as they deploy mission-critical broadband technology.



## NINA MYREN

DEPUTY HEAD OF EMERGENCY COMMUNICATIONS, NORWEGIAN DIRECTORATE FOR CIVIL PROTECTION

**WHAT WILL BE THE MOST TRANSFORMATIVE CRITICAL COMMUNICATIONS TECHNOLOGY IN THE COMING YEARS, IN YOUR OPINION? HOW IS THE MARKET LIKELY TO DEVELOP BECAUSE OF THAT TECHNOLOGY?**

Users depend on the availability of standardised, secure and reliable products for mission critical use. In the coming years we will see more remote controlled - or autonomous - mission critical vehicles, drones and robots used on sites during incidents, disasters and crises.

We will also see more data driven decision processes and algorithms, and more cross-organisation and cross-border collaborations. The roll out of 5G could become the enabler of this development, and cyber security and information security will be focus areas.

**WHAT BIG CHANGES WOULD YOU LIKE TO SEE IN THE WORLD OF CRITICAL COMMUNICATIONS? WHAT WOULD MAKE THE SECTOR MORE EFFICIENT AND EFFECTIVE?**

You could say that, overall, our sector is in a period of transition from dedicated, voice-centric systems and services, to data rich services and commercial technology. It will be a culture change for everyone coming from the narrowband world, as well as the broadband market players.

What I would like to see is the major commercial network operators driving mission critical requirements in the 3GPP standardisation process and beyond. A good start for them would be to join TCCA. Common standards are crucial to 'increase the cake', rather than fight for a larger piece of the same, small cake.



## BARBARA HELD

INDUSTRY EXPERT AND FORMER TCCA BOARD MEMBER

**CCW 2021 WILL FOCUS ON HOW CURRENT CRITICAL COMMUNICATIONS SOLUTIONS CAN BE MAINTAINED AND ENHANCED, WHILE AT THE SAME TIME EXPLORING WHAT'S NEXT. WHAT NEEDS TO BE 'PROTECTED', AND WHAT ADVANCES WOULD YOU LIKE TO SEE IN THE FIELD?**

Critical communications technologies are 'only' a means of facilitating efficient cooperation across PPDR forces. Therefore, technologies by themselves do not need to be 'protected and enhanced', but functionalities and services do. First responders need the most modern, state-of-the-art, technological support that society is able and willing to provide them.

**WHAT WILL BE THE BIG OPPORTUNITIES AND CHALLENGES FOR THE SECTOR OVER THE NEXT FIVE YEARS?**

Taking in account recent German experience, I believe that relief of natural - and human made - disasters and diseases will be the main challenge for PPDR. Furthermore, the proportion of cybercrime is rapidly increasing.

Critical communications can play a decisive role in the effort to face these problems, providing reliable, innovative and highly available technologies.

**WHICH CCW CONFERENCE SESSIONS OR MASTERCLASSES ARE YOU MOST LOOKING FORWARD TO ATTENDING?**

To be honest, the thing I am really looking forward to is meeting my former and current colleagues in person again. But I will certainly attend masterclasses and sessions on future technologies.



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