# CRITCALL COMMUNICATIONS TODAY

The global information resource for mission-critical communications





#### Faith in the future

How can emergency services convince the public of artificial intelligence's value when making life-critical decisions?



#### Turning the page

Charting the evolution of hybrid alerting solutions to bridge the gap between traditional paging and broadband-enabled apps



#### **Sketches of Spain**

Returning after a brief hiatus, Critical Communications World 2021 showed that the sector has been hard at work

#### February 2022

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# A sad loss for the sector

Critical Communications Today editor Philip Mason discusses the legacy of Phil Kidner

#### **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-theminute 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.

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

Before we get under way with the issue, I want to pay tribute to former TCCA CEO Phil Kidner, who sadly passed away at the beginning of the year. As anyone who worked with Phil will tell you, he was an influential presence in the sector, as well as a tireless ambassador for the development of critical comms across the world.

On a more personal note, the magazine you currently hold in your hands wouldn't necessarily exist if not for Phil. Working alongside our publisher at the time, he was integral to getting – what was then *TETRA Today* – off the ground over a decade ago. At the same time, his early influence went a long way to shaping the title and making it what it is today.

With that in mind, we hope that Phil would have approved of this issue of *CCT*, which features a number of articles focusing on the ongoing development of the sector, as well as users' relationship to it.



Turn to page 14, for instance, to read an interview with Motorola Solutions' senior vice-president of technology Paul Steinberg and Goldsmiths University's Dr Jennifer Barth, discussing public expectation when it comes to the use of 'cutting edge' technology by the emergency services.

Continuing to peer into the future, head to page 18 for an in-depth look at Swissphone's ongoing efforts to evolve the paging concept, heading into the era of mission-critical broadband. According to the piece's author, emergency organisations have started to leverage commercial broadband to contact volunteers, something which has obvious implications when it comes to network resilience. Can the company's recently developed hybrid solution move the situation to a better place?

Finally, turn to page 24 for a report on last year's Critical Communications World, which returned in Madrid following a brief, pandemic-induced, hiatus. It was a successful – and very welcome – event, proving that the sector has been working as hard as ever, despite the complications of COVID-19.

Enjoy the issue.

Philip Mason, editor

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# Who, what, where

#### **EUROPE**













# Airbus signs Virve 2.0 MC broadband agreement

Airbus has signed an agreement to supply its Tactilon Agnet 800 solution for mission-critical operations in Finland. The move coincides with the country's ongoing shift from the TETRA-based Virve network to mission-critical broadband in the form of 'Virve 2.0'.

Discussing the deal, Airbus account director for Finland, Jari Mäkinen, said: "Tactilon Agnet 800 MC-PTT is perfect for rapid acceleration into MC broadband. It seamlessly brings full interoperability between current and broadband Virve, enabling a rich ecosystem of mission-critical devices and accessories partnerships."

Operator Erillisverkot announced last year that Virve 2.0 will have its radio access network provided by Elisa, while at the same time its core will be delivered by Nokia.

# UK police forces' facial recognition solution

South Wales and Gwent police in the UK have announced the deployment to officers of a new mobile-phone-based facial recognition app.

According to a statement, the app will "enable officers to confirm the identity of a wanted suspect almost instantly, even if that suspect provides false or misleading details. Cases of mistaken identity will be easily resolved, without the need for a trip to a police station."

The forces have said that the solution will be made available to 70 officers during an initial testing phase, lasting three months. The app will be known as Operator Initiated Facial Recognition.

Assistant chief constable Mark Travis said: "The app means that officers can now easily answer the question 'Are you really the person we're looking for?'"

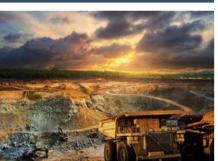
### Deal secures London Underground 4G coverage

Three UK and EE have agreed a deal with BAI Communications and Transport for London to provide high-speed mobile connectivity across the whole of the London Underground network for the first time.

According to a statement released on behalf of the companies, all ticket halls, platforms and tunnels across the current Tube network will have 4G- and 5G-ready mobile coverage as a result of the deal. Coverage on platforms and in tunnels on the new Elizabeth Line is also planned to go live. BAI has said that all mobile operators will be able to access the London Underground Wi-Fi as well as the company's neutral host mobile network.

London mayor Sadiq Khan said: "This will make a huge difference to passengers, allowing them to make calls and read emails."

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## Nokia consolidates European 5G presence

Nokia has announced deals with Elisa Estonia and Tele2, expanding its 5G footprint across Northern Europe.

The five-year Elisa Estonia deal will see the company replacing the country's existing 4G infrastructure, deploying nationwide 5G RAN. As part of the separate Tele2 partnership, meanwhile, Nokia will modernise the former's radio network through the deployment of its AirScale and ReefShark solutions.

Discussing the deal, CEO at Elisa Estonia, Andrus Hiiepuu, said: "We have huge ambitions in relation to providing state-of-the-art entertainment and communications services to our customers, underpinned by a 5G network.

"Nokia is our trusted partner and will help us to deliver a sustainable 5G business."

#### **NORTH AMERICA**





be Stock/Mario Ha

# PowerTrunk updates airport TETRA across the US

PowerTrunk has provided software upgrades to Collins Aerospace TETRA networks at several airports in the USA.

According to a statement, company personnel updated each site's PowerTrunk-T system, including for the main and redundant central control nodes and network management servers. The airports included Los Angeles International, New York JFK, San Francisco International and Newark Liberty.

A spokesperson for PowerTrunk said: "As a result [of the software upgrades], the TETRA networks now include the latest software versions, device drivers and features.

"This, in turn, improves the internal operational performance of the system and assures that the networks are not affected by obsolescence."

# Europe's biggest goldmine plans to leverage 5G

Nokia has announced the deployment of a standalone 5G network at the Kittilä mine in Finland, in collaboration with Telia.

According to a statement from the company, Kittilä – which is operated by Agnico Eagle Finland – is Europe's biggest goldmining facility. It is situated around 900km north of Helsinki.

Nokia has said that the network is planned to be deployed in phases, with the expectation that the project will be complete as of October this year.

Speaking of the roll-out, general manager of the Kittilä mine, Tommi Kankkunen, said: "We want to innovate by using the latest technologies. We will leverage 5G to enhance operational efficiency and support the highest level of safety."

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#### **NORTH AMERICA**





#### US Navy extends Motorola Solutions contract

The American Department of Defense has exercised a \$29m contract option to extend Motorola's "operations and maintenance" of land mobile technology for the US Navy.

According to the company, the deal ensures the provision of "essential radio communications to co-ordinate deployments and response actions at bases worldwide". The LMR network also facilitates secure collaboration between Navy emergency services and other federal, state and local agencies.

Motorola Solutions vice-president and general manager, federal government markets, Joe Balchune, said: "The Navy depends on reliable and interoperable communications every day to support their mission-critical operations."

#### MIDDLE EAST





# Critical comms contribute to F1 season finale

The organisers of the recent Abu Dhabi Grand Prix have thanked Airbus for providing secure communications at the title-deciding final Formula One race of the season.

According to a statement, the company supplied its TH9 TETRA radio solution, alongside the TH1n radio console system. Race organisers also leveraged Airbus's Push-to-talk over Cellular application, Tactilon Agnet.

Discussing deployment of the Airbus technology at the event, the company's head of Middle East, Africa and Asia Pacific, Selim Bouri, said: "Our technologies are specifically designed to support the communication needs of various events and sectors.

"We are honoured that our solutions have played an important part in the successful hosting of Abu Dhabi Grand Prix 2021."

#### ASIA





# Winter Olympics security forces roll out PoC

The General Armed Police Corps of Hebei Province leveraged POCSTARS' PTT over Cellular technology during this year's Beijing Winter Olympic Games. According to a statement, the police were tasked with "safeguarding venues, such as Chongli Stadium and Guyangshu Ski Resort".

Discussing the roll-out in a statement, POCSTARS said: "The [PoC] system supports a long list of features, including private call, group call, temporary call, priority call, and interrupt or forced call. It also includes positioning, track playback, temporary enable and disable, SOS alert, text and multimedia messages, video streaming, private and conference video call, and video recording."

The Beijing Winter Olympic Games took place from 4-20 February.





# **ETSI** finishes **ENI** Release 2 specs

TSI has completed Release 2 of its Experiential Networked Intelligence (ENI) specifications, concerning self-adapting autonomous networks with the ETSI GS ENI 005 system architecture. The announcement follows on from meetings of the organisation's ENI industry specification group, taking place in late 2021.

According to a spokesperson for ETSI, GS ENI 005 will provide improved insight into network operations, thereby "allowing more effective closed-loop decision making plus better lifecycle management".

The spokesperson continued: "Through its use, operators will be able to leverage acquired data and apply artificial intelligence algorithms. This will mean that they can respond much quicker to changing situations and gain far greater agility."

The release defines a variety of key architectural use requirements, as well as outlining a range of potential use-cases. It has been supported with a variety of reports focusing on data characterisation, fault identification, AI mechanisms and more.

Chair of the ENI ISG, Dr Raymond Forbes, said: "ENI will have an important part to play in how next-generation networks are managed, making them contextually aware and giving them greater inherent flexibility. Use-cases and PoCs are already enabling its validity to be demonstrated, and with ENI Release 2 we are providing a framework upon which operators and their technology partners can implement it into their infrastructure."

In other ETSI-related news, the organisation has also released what it calls a "global standard for securing smart phones", the Consumer Mobile Device Protection Profile.

According to ETSI, the specification – otherwise known as ETSI TS 103 732 – identifies "key security and privacy risks for user data [while providing] appropriate protection". This data includes photos, videos, location services, passwords and 'fitness-related' information.

Discussing the standard, a spokesperson said: "Smartphones and tablets hold a wide range of user data and apps. At the same time, security attacks have increased, with malicious applications and network eavesdropping.

"The ETSI specification contains a broad coverage of security features including cryptographic support, user data protection, identification and authentication, security management, privacy protection, resistance to physical attack, secure boot, and trusted

communication channels." Alex Leadbeater, ETSI cybersecurity chair, said: "Following the excellent improvement in security achieved with ETSI EN 303 645 for consumer IoT devices, [we have] been working on securing other consumer devices. ETSITS 103 732 provides a complete solution to secure smartphones and tablets."

Finally, wrapping up a busy period for the standardisation body, its Network
Functions Virtualisation industry group has started working on its next specification release, officially known as Release 5. The Release 5 work programme is intended to drive the group in two main directions, firstly

consolidating the NFV framework and expanding its "applicability and functionality set".

Discussing the release, ETSI ISG NFV technical manager, Joan Triay, said: "With Release 5, ETSI NFV is advancing the state of the art of NFV and cloudification. [It is] increasing their support of telecom use-cases by taking into consideration the advancements and trends coming from upstream technologies.

"This release also applies the experience accumulated by network operators and vendors in developing and commercialising systems based on the NFV framework."

## Australian company deploys space-age comms



DN2 has provided radio communications to Southern Launch, a 'rocket launch service' company based in Australia.

According to a statement, the roll-out included a two-way radio network provided by Hytera, alongside Kiloview IP video encoders. Key requirements for the overall system included full encryption, blue force GPS and the ability to record on-site conversations.

The company also wanted 4K video streaming transmitted in real time, leveraging drone-mounted cameras deployed across the site to capture "the testing and launch of space vehicles in real time, and at superslow-motion speeds".

Speaking of the roll-out, Southern Launch mission control manager, Shane Bennett, said: "The ability to communicate clearly across the very rugged terrain – and utilise the GPS tracking capabilities – provides the Southern Launch senior operational team

with real-time situational awareness of all staff locations and status.

"The radio solution was designed to deliver ultra-reliable communications across the entire site. This system provides the backbone for our security, range management and mission control, and is a critical enabler for us to undertake safe and secure launch operations."

Southern Launch's facilities include the Whalers Way orbital launch complex and the Koonibba suborbital testing facility, both of which are located in South Australia.

These are described in the release mentioned above as being situated within "a large, undulating and geographically challenging landscape". Describing what the company actually does, the statement says that Southern Launch's engineers develop a "full-service continuum catering to the key needs of rocket manufacturers and their payload customers".

## **Sector mourns Phil Kidner**

ormer TCCA chief executive officer Phil Kidner has died, following a short illness. He passed away on 7 January.

Following the announcement of his death, the organisation released a statement outlining the key role Phil played in the development of both TCCA and the critical communications sector as a whole. The statement read: "Phil managed TCCA through a decade of significant change as critical broadband appeared on the horizon, while still maintaining a high profile for TETRA.

"He had many, many career highlights, among which was the signing of the 3GPP Partnership Agreement in 2013, the formal document that made TCCA the Market Representation Partner for critical communications in 3GPP. He worked closely with ETSI to help deliver the first Mission Critical Push-to-Talk Plugtests in 2017. These have now evolved into the MCX Plugtests."

Speaking of his memories of Phil, chair of the TCCA Board, Mladen Vratonjić, said: "Phil was unique in his knowledge, expertise, passion and commitment. He had time for everyone and was a highly valued mentor to many.

"His contribution to the critical

communications sector is unmatched. I was proud to work with him and proud to call him a friend. On behalf of TCCA, I extend sincere condolences to Phil's family – such an immeasurable loss."

In 2017, TCCA awarded the contract to stage Critical Communications World to CCT publisher MA Exhibitions, part of Mark Allen Group. Phil was part of the decision-making committee, subsequently working closely with Mark Allen Group chief operating officer Jon Benson. He was also integral to the launch of Critical Communications Today (originally TETRA Today) in 2010.

Discussing this, Benson said: "It was both a pleasure and a privilege to work alongside Phil. We would not have launched TETRA Today were it not for Phil's vision to promote the unique



benefits of TETRA to a global audience. I could not have respected PK more."

Phil retired from TCCA in 2017.

#### **TCCA** news

TCCA has welcomed location navigation systems provider Syntony GNSS as its latest member.

Based in France, the USA and Canada, the company designs and manufactures global navigation satellite system (GNSS) products, including receivers and simulators. In the words of a statement released to accompany the news, these products are "dedicated to mission-critical applications, transportation and aerospace, and defence."

One example of a key Syntony product is SubWAVE, which enables global positioning systems (otherwise known as GPS) to work underground, facilitating subterranean emergency call location.

Speaking of the decision to join TCCA, Syntony president and founder Joel Korsakissok said: "We are very proud to become a member of TCCA, whose DNA is focused on life saving through critical communications. "We invented SubWAVE with the aim of saving lives. To be able to precisely locate a firefighter inside a tunnel, for example, is critical to his or her safety, and this is what our system does. Also, being able to pinpoint the location of emergency calls being made from road or rail tunnels will enhance first-responders' ability to provide assistance and rescue."

TCCA CEO Kevin Graham said: "We welcome the expertise of Syntony GNSS to enhance knowledge within TCCA of this critical area and look forward to working with Joel and his team.

"Reliable GPS/GNSS coverage in underground and denied locations like subways, rail and road tunnels and mining is now an essential requirement for emergency services and asset operator personnel navigation and response, as well as citizen safety."

In other TCCA-related news, the

organisation has recently run a number of online events following on from the Critical Communications World, which took place in November in Madrid. (Turn to our report elsewhere in this issue on the CCW 2021 conference).

The first of these took place in December, titled 'TETRA: the optimal critical communications solutions, now and into the future'. The session was chaired by Francesco Pasquali, representing TCCA's TETRA Industry Group, with a panel consisting of Sepura CTO Peter Hudson, Motorola Solutions' industry relations director Tim Clark and DAMM senior solutions manager Simon Riesen.

This was followed by a United Statesfocused virtual TETRA update in January. Future, pre-CCW, webinars include 'Critical broadband – what the user needs to know' and 'New solutions to optimise critical operations.'

# Around from the beginning

Going into Panorama Antennas' 75th anniversary year, sales director Robert Jesman discusses the history of the company, the future of TETRA and his views on the Emergency Services Network

## Could you tell me a little about the origins of the company as well as your background?

My grandfather started the company back in 1947, having been a chief engineer in the merchant navy during the Second World War. He eventually docked in Southampton and decided to settle in the UK – he was originally from Poland – and started a manufacturing business in Putney making a variety of consumer products.

Following the television broadcast of the Queen's coronation in 1953, he saw that there was an opportunity to be had with making TV antennas.

Moving into the late 1950s, early 1960s, he started doing work for the Metropolitan Police. With the arrival of the transistor and smaller transceivers, the Met decided to install two-way radio into every police vehicle in London. Up until that time there were only two 'wireless cars', both of which were Wolsey 6/80s.

In the 1960s and 1970s, Panorama worked closely with many radio equipment suppliers, both for PMR – as critical communications was called at the time – and the military. Famous names such as Pye, Racal, Plessy, Marconi and Storno were all customers. I suppose this was the entry point to the OEM [original equipment manufacturer] business.

My dad and my uncle took over the company together in the late 1970s, at which time CB radio had become a new craze. In the mid-1980s, meanwhile, cellular car phones were launched into the market, with Panorama winning 90 per cent of the Vodafone business, and about half of the business for BT. Around the time that GSM was introduced to replace cellular, the company disposed of the consumer products [that is, TV and CB antennas] and started to concentrate on two-way communications in PMR, cellular and for the military.

I came into the business in 2006, basically because I didn't really know what I wanted to do after I left university. Initially, I just wanted a summer job, and I've been here ever since. There's eight of us in the family that work for the company.

# You mentioned working with the police in London. At what point did the company start to focus in earnest on mission-critical comms?

Pretty much with the arrival of TETRA in the mid-1990s. We already had analogue products following on from our

previous experience with public safety and MOD, so we ultimately became the default company for TETRA. Back then procurement was different. Most police departments had a radio shop, and they'd basically just ring up to ask for a TETRA UHF antenna to replace a VHF one.

When TETRA came along, we aligned ourselves with all the major TETRA OEMs, and that's how we secured the market. This followed on from the Vodafone partnering strategy during the GSM days, and it's served us really well ever since. Having now gone into 4G, we're now replicating the model with new relationships with router manufacturers.

# What does your offer currently look like? I assume you have to be reasonably reactive to account for changes in the wider technology environment.

We are now incredibly diverse in terms of what we produce. We have products for TETRA as well as LTE, of course, but we've also developed a number of antennas that combine both. That's currently very attractive to customers, for obvious reasons.

For those who don't know, antennas need to be designed to account for particular frequencies, which are different according to whether it's TETRA or LTE. The other important factor is the build quality in the context of the application. We do a huge amount of testing once the product is built – tuning, drop tests and so on. Many of the products need specialist certification.

We'll generally do about three to six months development work with each product, going back and forth with the client until it is right.

## What are the different types of antennas being deployed in the mission-critical space?

There are many different types of mobile antennas being manufactured at this point. We have standard quarter wave antennas, high gain antennas [for use in rural and remote locations], low-profile antennas, as well as combination antennas for migration across different technologies.

Some sectors will have their own specifications. A typical roll-out of a low-profile antenna, for example, might be on a fire appliance, where it needs to be as unobtrusive as possible.

We're about to launch a new product which has around 15 features contained within one housing. Antenna innovation



Panorama Antennas sales director Robert Jesman

needs to evolve in parallel with the different standards and demands of communications technology.

## Are there any markets which are particularly difficult to enter?

DMR is difficult because it tends to be very price-driven, which doesn't leave a great deal of margin. P25 is difficult too, but the problem there revolves around power handling, which is often significantly higher than TETRA.

Often – but not always – P25 is deployed where the landscape is more open, and coverage needs to be greater. The solution is to increase power, and not all TETRA antennas are suited to that.

## What is your key focus currently? Why have you chosen to go in that particular direction?

Our business now is primarily in 4G/5G LTE, simply because of the opportunities which are available and the different sectors which are adopting this technology. We still support TETRA and will do so for many years to come, but that's a mature market and not where our business sees significant growth. A huge part of our business also now comes from data communications ranging from metering to machine-to-machine and IoT.

The final sector that we work in is in-building/DAS, which is comparatively small in relation to the other areas. We've been supplying antennas for various underground railway projects for a number of years. These need to meet high performance standards in challenging environments. Transportation in general is an exciting sector.

## Going back to your comments about TETRA, what do you predict the future will be for the standard?

TETRA is going to be around for many years to come. If you look at somewhere like Germany, for instance, the BDBOS contract is going to continue for a very long time. TETRA is incredibly reliable and continues to have a solid place in the market – it's just that our opportunities within the technology are limited.

My personal view is that the sensible thing for critical communications going forward is for TETRA and LTE to continue to work in parallel. There's certainly a role for both.

#### As a British company, what are your views on the Emergency Services Network?

Honestly, as a manufacturer, it's become a real bugbear for us. We introduced our original, ESN-ready, shark fin antenna to the emergency services about 10 years ago, having been engaged with that sector for so many years.

Over the same period, many other parts of the world have managed to implement their projects and are now onto their next generation of technology. I understand that reaching decisions in the public sector is not always easy, but I think both the public and the emergency services would benefit from greater agility in this area.

# With that in mind, what are the major challenges you're likely to be facing going into the future? What will be the biggest issues for antenna manufacturers, and the industry as a whole?

A key challenge will be the increased sophistication of the devices as we get nearer to 5G. 5G requires more antennas within a single housing, with 4x4 MIMO generally being the standard.

This has the potential of becoming a real problem since the housing itself often can't be allowed to increase in size. So, you've got to somehow find a product which is small enough for the application, but also, crucially, actually works. At a certain point, you're going to come up against the laws of physics.

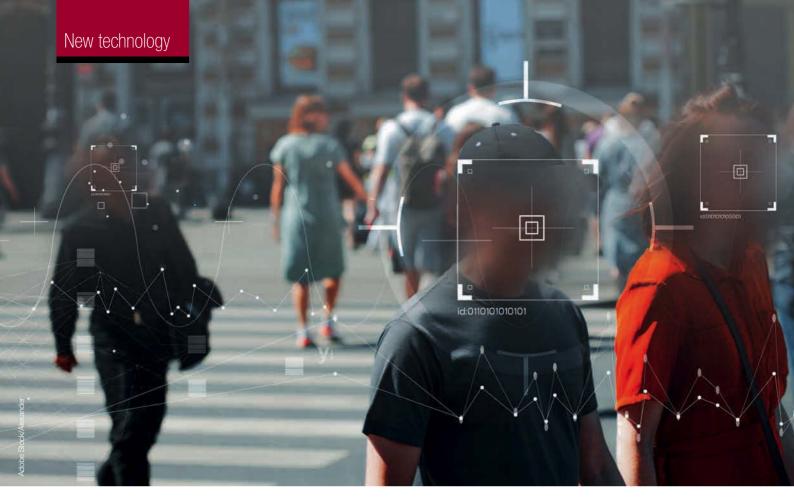
That in turn ties in with space on the vehicles themselves starting to be at a real premium, precisely because of the increased amount of technology which they're being required to carry. It's sometimes a real challenge to find extra room on police cars and ambulances.

# Finally, what are your thoughts on Panorama's 75th anniversary? You must be incredibly pleased with the company's longevity within the sector.

It's a real honour, I have to say. I think my grandfather would be very proud of the family, particularly with the business starting off as it did.

I'm also proud of the fact that we are a family business, which in itself is unusual. That brings a level of commitment that you wouldn't necessarily get if you just worked in a company. Panorama is more than a job – it is part of my DNA.

February 2022 @CritCommsToday



# Faith in the future

Following a recent report on the use of 'cutting edge' technology by emergency services, **Philip Mason** talks to Goldsmiths University's **Dr Jennifer Barth** and Motorola Solutions senior vice-president of technology **Paul Steinberg** about ways to increase public trust in the likes of Al and facial recognition

he past decade has seen a wholesale societal transformation when it comes to the ways in which we incorporate technology into our lives.

This is obviously true in the 'personal' realm, with the availability of high-bandwidth solutions revolutionising how we communicate, shop, entertain ourselves and so on. It is also the case in the mission/business-critical sector, with the increasing viability of 4G-based solutions opening hitherto unforeseen avenues in terms of increasing safety and the creation of efficiencies.

At the same time, meanwhile, the past two years have also seen this process speeding up even further, thanks to the circumstances created by the ongoing COVID-19 pandemic.

To take an obvious example, the increasing willingness on the part of businesses to roll out 'remote working' solutions has led to a step-change in terms of how we conceive of the workplace itself. We have also witnessed the development of any number of solutions to help detect and track the virus, as well as technology to help maintain social distancing within a variety of professional environments.

With that in mind – and with the pandemic now potentially moving to its latter stages – it seems like an opportune moment to examine what our prevailing attitudes might be towards this likely proliferation of ever-more elaborate technology going into the future.

As indicated above, we are becoming increasingly reliant

on the likes of AI (whether we know it or not), but to what degree do we *trust* it, particularly when it comes to sifting sensitive information or helping to make lifecritical decisions?

Just as interesting, meanwhile, is the potential complacency which could conceivably arise from having every problem 'solved' the comparative moment it arises. Could this in turn lead to increased passivity or even entitlement on the part of society at large?

#### The reality of the pandemic

One convenient way to get a handle on some of these questions – at least within the public safety context – is via research carried out last year by Motorola Solutions in collaboration with Dr Chris Brauer at Goldsmiths, University of London. Entitled 'Consensus for Change', the study suggests that not only do the public accept the use of cutting-edge technology by emergency services organisations but they also have an overwhelming expectation that this is exactly what should happen.

Findings illustrating this include 71 per cent of respondents saying that 'advanced technologies' are needed to "address challenges of the modern world", with a similar figure suggesting that emergency services should be able to "predict risk", again via the use of the technology in question. Three-quarters of respondents, meanwhile, said

they are "willing to trust the organisations that hold their information, so long as they use it appropriately".

Giving an introduction to the findings, lead researcher for the project, Dr Jennifer Barth, says: "During the pandemic we saw accelerated technological innovation, but it's also key to recognise that this wasn't always specifically around the development of new products. Rather, people were moving towards more creative thinking, leveraging solutions that answered very new problems quickly. We needed to assess risk, and then we needed to move forward at speed."

She continues: "At the same time, the research also indicated a doubling down on trust and transparency. The public said, 'Yes we will listen to you, but we also want to know what you're doing, and we want you to communicate with us.'

"This was certainly the case when it came to public safety, with the public understanding that technology was being developed to keep them safe, but also wanting a stake in how it was being used. They wanted to be consulted and talked to."

According to press information issued at the time of its initial publication, the report was written following consultation with a stated 12,000 citizens, as well as "50 public safety agencies, commercial organisations and industry experts across 10 global geographic markets". That being the case – and taking the figures at face value – this indicates something approaching a global consensus on the use of new technology within the emergency services context.

While this is encouraging for the mission-critical communications sector as a whole, and certainly for Motorola Solutions, it also begs the question as to why the global public are content to put so much faith in what could conceivably be referred to as the 'non-human element'. Why has arguably the most cynical society in human history chosen to put such enormous faith in something which is so new and ultimately so unfamiliar?

One very simple answer to this could be, as indicated above, the degree to which technology has become a key enabler across pretty much every aspect of everyday life. For Motorola Solutions' senior vice-president of technology, Paul Steinberg, meanwhile, much of the answer can also be found in the reality of the pandemic itself.

Discussing this, he says: "I would say that there are a few things going on here. As Dr Barth said, the pandemic created a situation in which innovation needed to be accelerated out of necessity. Across a broad range of industries, we saw less focus on brand new inventions – no lightspeed travel leap, more the realisation of what could be accomplished with that which already existed.

"A good example is decentralised public safety call-taking centres, which saw staff taking emergency calls from home. That was made possible through a combination of cloud technology, distributed access to relevant software platforms, as well as the availability of push-to-talk in addition to traditional two-way radio."

He continues: "At the same time, society as a whole has also started to realise the degree to which technology plays an ever-increasing role, not just in relation to people's ability to function but also their overall wellbeing. Over the course of the pandemic, we all became very dependent on technology in this regard, and by and large it worked.

## "

## One pain point in the report coalesces around the use of Al



"The logical conclusion in relation to this is why wouldn't I as a citizen want to know that public safety is using the same things to keep me safe that I can access at home. Of course, the technology designed for mission-critical situations must adhere to much higher standards, particularly in terms of reliability."

#### **Trust issues**

As readers will remember, one particularly striking finding of the recent report was that 75 per cent of respondents are willing to trust organisations that hold their information on condition that it is used appropriately. Again, this is good news for both manufacturers and public safety agencies, signalling as it does an implicit level of trust in both.

Where the figures get potentially more interesting, however, are around issues where definitions of 'appropriate' use itself come into question. One specific pain point in relation to this coalesces on the use of artificial intelligence, with a much lower 52 per cent of respondents saying they would trust AI to "analyse situations of threat".

For both Barth and Steinberg, this clearly indicates that there is more to do in terms of building consensus around use of this technology in particular, something which is in itself no surprise given how AI has traditionally been portrayed across the wider culture.

One only has to think of fictional AI network 'Skynet' becoming self-aware prior to engineering global nuclear catastrophe in the Terminator films. It is also difficult to forget the open letter on AI signed by the likes of Stephen Hawking and Elon Musk in 2015. This called for research into the wider potential impact of the technology, while also warning that for it to be beneficial, human beings must continue to be in control of it rather than vice versa.

Discussing this apparent lack of trust in AI while also linking it with wider concerns around privacy, Steinberg says: "I don't think that it's very surprising that 52 per cent said that they would trust AI to analyse a situation of threat. This highlights the need for more public education around how AI is actually used in this context, and the role it can play in supporting public safety."

Illustrating this notion further, he continues: "In our day-to-day lives, AI is increasingly infused throughout our experience, generally as a way of making surrounding technology better, more efficient and more personalised. That's different from [as in dystopian science fiction] humans being somehow displaced by it.

"We see time and again that people are willing to give something – for instance, information about themselves – if they trust the provider and understand what they get in return is to their benefit. Safety and security are clearly very important benefits to individuals."

Steinberg illustrates his previous characterisation of AI as a kind of 'enabler' for human decision-making by describing Motorola's general philosophy when it comes to this area of manufacture and deployment.

His comments are all the more compelling given the company's ongoing development of the technology, which

– in its words – is "designed to support humans with the analysis of increasingly complex data to improve efficiency and accuracy". In other words, what the company calls the "human-in-the-loop" principle, where the person, not the AI, makes the decision on any critical action.

"Our thinking on this is that AI is human augmentation, not human displacement. It's not going to take any action of significance on its own. [The job of AI] is information synthesis and data reduction, not drawing a conclusion, with human beings still having the ultimate responsibility. AI has an important role to play, but it should never replace the role of human judgement in critical areas such as public safety.

"For instance, a lot has been spoken about using AI to analyse radiological medical scans, which it does very well. At the same time, while it produces accurate results, it's not preferable to radiologists in all cases.

"So, would the recipient of the diagnosis want the radiologist's point of view, or the machine learning? Or both? I'll take the latter every time."

#### **Two-way conversation**

The figures presented in the study indicate that the public possesses an increasing expectation that emergency services will use cutting-edge technology to help keep society safe. Thankfully, this is something we are already seeing, as hastened - at least in large part - by the COVID-19 pandemic.

One example of this is the 'decentralised' control room technology referenced by Steinberg earlier in the interview (as demonstrated, for instance, by West Yorkshire Police in the UK enabling its control room operatives to remotely access its HQ-based server via the use of a VPN).

Another UK-based example, meanwhile, is the speed with which the whole of British policing rolled out Microsoft Teams at the beginning of the pandemic, something which has likewise transformed the culture of the organisation going forward.

Going back to potentially more contentious technology such as AI (not to mention the likes of facial recognition), in what ways does the conversation need to evolve? How can greater trust be established in these new technologies, both on the part of the organisations adopting them and the citizens they are designed to protect?

"Regarding the organisations themselves, what we found through the research is that they have to get comfortable with the technology," says Steinberg. "They have to know that it's going to behave predictably, and that it's going to make their job easier, not harder. At the same time, society requires the use of it to be fair and accurate — ultimately that it makes life better. We always advocate transparency."

Picking up on this idea of 'transaction' between public safety agencies and the people they protect, Dr Barth continues: "In terms of the research, we essentially split the respondents between 'catalysts', 'advocates' and those who were falling behind. The catalysts understood that you have to give something to get something.

"It's the same thing that people understand about using their mobile phone. Even if they don't fully understand why, they know that the information they give is being used to spit back out something that they need or want."

She continues: "Regarding something like artificial intelligence, communication around what it is tends to be like something out of science fiction. It's become on one hand hope, on one hand fear, and on one hand everything.

"It isn't reasonable to have a technologist go out and explain these things, particularly on behalf of those providing public safety. At no point do we want that gap, so it's a challenge."

It is clear that what we somewhat erroneously regard as 'future' technologies are going to play an increasing role as we move forward. If emergency services are going to leverage these to their fullest extent, it is also clear that the public needs to be onboard and understand its uses as well as its limitations.

A key proposed use for AI is in the diagnostic environment





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# **Turning the page**

Emergency services are beginning to use both paging and broadband technology to contact staff, albeit with the use of the latter proving problematic. Swissphone has developed a hybrid solution which it believes can bridge the gap using commercial and mission-critical LTE, as **James Atkinson** reports

he number of pagers in use may be far fewer than the 60 million operating in their 1990s heyday, but despite the advent of broadband technologies and personal smartphones, pagers continue to thrive in niche areas. The reasons for this are not hard to identify.

One-way pagers are small, simple to use and have a battery life of up to three months. Pagers use VHF spectrum, so the signal propagates much further and is better at penetrating buildings than mobile phone or Wi-Fi signals.

Pagers operate over independent, self-reliant infrastructure, so they are highly available and highly reliable. Unlike mobile phone or fixed telephony networks, they can still operate in the event of regional or national power outages.

Pagers remain popular in the

healthcare sector, particularly in the UK, and are still widely used by emergency services, especially those organisations that rely on volunteer or retained staff. These personnel are not equipped with specialist radios at home, and getting hold of them quickly via mobile or home phones is highly impracticable.

This makes personnel hard to find. But a fire chief, for example, needs to have a highly reliable and efficient way of alerting retained firefighters. Speaking of this, Philipp Zimmermann, head of marketing at alerting solutions provider Swissphone, says: "You cannot allow yourself to call double the amount of firefighters. You need just to be sure you have enough.

"So, there is a need to call only the people you really need with the right specialist skills, when you need them. For that kind of targeted alerting, the fire chief needs to know who is available before the event. Then when they call, they need confirmation that staff are coming, so if they can't make it, the next person can be called."

#### **Technologies in tandem**

Naturally, this means that retained firefighters have to carry a pager. But the ubiquity of mobile phones has led some organisations to switch to using mobile apps as an alerting mechanism, which does have the obvious benefit of enabling the firefighter to respond to the alert via the same device.

However, the advantage of investing in a regional or nationwide pager network is that it is fully independent and self-reliant. Zimmermann points out that during the 2016 terrorist bombings in Brussels, both the emergency services' TETRA network and mobile networks were down, whereas the pager network still worked.



More recently, mobile networks were out during the storm Arwen in December 2021.

"If you have a mobile app and there is a crisis where the mobile networks do not work, then you cannot call your first-responders," says Zimmermann. The trade-off here is that the high reliability of pagers is sacrificed for the convenience of mobile phones. Emergency service organisations are therefore having to think about how they can reliably alert people, while giving them the convenience of a mobile phone app.

Pagers generally provide one-way messaging alerts based on the POCSAG protocol. Of course, one-way pagers have their limitations, but two-way pagers also exist and have done since the mid-1990s, based on the FLEX protocol. Swissphone introduced POCSAG two-way pagers 10 years ago by integrating relevant mobile standards from GSM over 3G and LTE-M, nowadays. "This allows the first-responder to reply and say, 'Yes, I am available'," says Zimmermann.

The company has proposed a fire station alerting evolution

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Two-way paging saves time as it enables more targeted alerting. Rather than having to wait vital tens of minutes for first-responders to turn up at the station, dispatchers using two-way paging systems will be updated much more quickly as to who is available. They can then send out rapid second and third dispatch messages if not enough first-responders say they are on their way after the first message has gone out.

Two-way paging also saves money, as retained firefighters have to be paid if they turn up, even if they are then not required. Two-way paging ensures this does not happen. Discussing this, Zimmermann says: "You save money as you only call as many first-responders as you need, rather than having to call more than you require to provide a safety margin in case not enough people show up."

The drawback of two-way pagers, however, is that battery consumption increases considerably with the mobile connectivity. A POCSAG one-way pager battery charge can last for up to three months, but a two-way pager is out of charge in two or three days.

According to Zimmermann, Swissphone has overcome this issue by introducing what it calls its s.QUAD pager, which works in conjunction with a mobile phone, integrated with Swissphone's own s.ONE mobile app. The s.QUAD becomes a two-way pager via the mobile app with the two devices connected by Bluetooth Low Energy (BLE). The pager is thus able to retain its long battery charge, as the mobile handles the energy-consuming radio transmission side.

A number of configurations can then be deployed, making the best use of both POCSAG and the smartphone's connectivity. "You can configure the app so that it only works fully if it is connected to the pager. But you can also configure it so that it works fully independently on the smartphone too. At the same time, the app can be integrated with the organisation's message encryption without having to import the keys in first-responders' private smartphones. This is quite a unique concept from Swissphone," Zimmermann points out.

## Towards mission-critical broadband

According to Zimmermann, Swissphone has been refining these concepts over the past five years. However, it now

believes there is an opportunity to adapt its solutions to meet the alerting needs of first-responders planning to migrate to the UK's Emergency Service Network (ESN) and France's Réseau Radio du Futur (RRF) nationwide public safety LTE networks.

Conversations with stakeholders of the UK Home Office and France's Ministry of the Interior reveal that fire brigades in particular are concerned that there is a gap between their legacy alerting systems and what ESN and RRF will deliver, and when it will be delivered.

Graeme Hull, head of international sales and managing director, Swissphone North America, says: "We have this idea of a hybrid network to fill that gap and maybe show them a sensible migration route to whatever ESN develops into."

Taking the UK as an example, Hull explains that there are 14-15,000 retained firefighters in England and Wales. Currently, the station alerting systems are local and independent of each other. There is no synchronised region-wide or countrywide alerting system.

Swissphone specialises in paging networks that cover wide areas where the base stations send out alerts in a synchronised way. "This is important," explains Zimmermann, "because if you do not synchronise the transmissions in separate locations, they can erase each other."

The company has proposed an evolution of fire station alerting in conjunction with ESN to ensure retained firefighters can be alerted simultaneously across multiple brigades in the event of a major incident.

As a precursor to this, the company has developed a public emergency alert button in response to a number of power outages that hit mobile and fixed telephony networks in Switzerland two years ago, leaving the public unable to call the emergency services.

In those cases, Swissphone deployed buttons on the outside of fire stations in Switzerland for public use. "If nothing else works, you can go to the fire station and push this button and alert the fire services. The fire brigades have TETRA or Tetrapol radios, so they can call the ambulance service or police. They act like a triage service," says Zimmermann.

"Our networks have the ability to communicate over the air," he continues. "At one base station anywhere in the network you can send a message that will hop over the air to



the control room. So, all our customers with our region-wide networks can add buttons at the base station and it will link back to the control room even if everything else is out."

Swissphone customers with existing networks already have the core regional, fully synchronised and self-reliant infrastructure in place. The button is designed to be a simple addition, providing the public with an emergency calling fallback solution in the event of a power blackout.

#### True hybrid network

Swissphone's proposals to ESN and RRF involved putting these two concepts together so that POCSAG paging is added as a complement to the mission-critical LTE network. This provides fire chiefs with a highly reliable way to alert volunteer and retained firefighters who do not have an ESN device at home. And they can also integrate the concept of the emergency call button for the general population as well.

This arrangement would retain a similar architecture to that which is currently in use with the vast majority of UK fire brigades. "The key points here are: the input from the control room from the dispatch centre; a transport layer; the station alerting layer; and then another transport layer out to the devices," says Hull.

"It is a true hybrid network. The main differences here being that we are proposing using the ESN network as the transport layer. But there are a whole range of ways you can get the message from the control room to the individual station. In most instances, we'd use the ESN network as a back-up to the fire brigade's own IP network," he observes.

Standard one-way POCSAG pagers could also be used, so volunteers would just receive a message and go into the station. Or POCSAG base stations can be combined with the s.ONE server, which would be used in conjunction with a standard POCSAG pager and the s.ONE app on a mobile phone to provide the feedback channel.

"The other hybrid option is to bring in our new mioty low-power wide-area network (LPWAN) IoT technology," says Hull. "It is a different type of hybrid whereby we are effectively using an IoT technology to give them the option for feedback. That could even be presented as an emergency button that the public could access in the event the complete network was down."

Swissphone tested a number of LPWAN IoT technologies including LoRa, but decided mioty was the best for a number of reasons. For a start, it is an ETSI standard, unlike the proprietary LoRa approach. A key reservation with most LPWAN protocols is that data is transmitted in

Emergency organisations are increasingly leveraging broadband technology one go, so if there is any interference, the data can be lost.

Mioty, on the other hand, splits the information into several packages. "You can lose up to 50 per cent of the packages and still reassemble the information afterwards. That is the reason why mioty is extremely robust," says Zimmermann.

"The power and range of mioty is comparable to LoRa due to regulations within the 868MHz band, but scalability and robustness is special, as you can connect a lot of sensors to one base station with a lot of messages sent per day and it will all come through. The quality of service is excellent. LoRa is not always as reliable."

Zimmermann says another advantage of mioty in mobile use-cases is that it will successfully transmit to vehicles speeding at 120km/h and even above, while LoRa with high spreading factors shows increased losses, starting at 40km/h.

Hull adds: "We are really trying to present fire brigades with a number of options that are robust but still cost-effective. We are dealing with public money here and the budget issue is a real one.

"By using technologies which are typically cheaper to deploy, like mioty and POCSAG, and blending that with the public layer, like the ESN network, there is a lot of inbuilt resilience and robustness. It also provides options in terms of the types of devices that are used to receive, acknowledge and make sure firefighters are fully in the picture as to what is happening."

According to Swissphone, it is nearing completion on the development of a mioty base station with an LTE option inside. This unit can be slotted on to its existing POCSAG base stations, so they double up as an regional or national IoT network as well. What this also means is that wireless mioty-enabled public emergency buttons can be deployed anywhere, along with other mission-critical IoT applications. They just need to be within range of a combined POCSAG/mioty base station.

It may ultimately prove that mission-critical LTE networks will develop a network-based way to get in touch with the likes of retained firefighters who may not have an ESN or RRF radio device at home. But Swissphone's proposed concept offers an economic way of getting round the problem, which ensures reliability and additional resilience.



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# Engineering a safer future

With shockwaves from the UK Grenfell Tower disaster still being felt, Tait Communications talks to *CCT* about a new solution it believes can provide complete comms continuity across the fireground

s has been widely reported, one of the key pieces of emergency services learning to come out of the UK Grenfell Tower disaster centred around the use of communications on the incident ground.

One apparent issue in this regard revolved around firefighters' difficulty in talking to commanders on the ground. While this is clearly not the place to explore this topic as fully as it deserves, suffice to say that evidence given at the subsequent incident inquiry will likely have given first-responder organisations across the world food for thought.

With that in mind – with the shockwaves from Grenfell still reverberating – we are reporting in this article on a new radio solution which, according to its manufacturer, might have gone some way to negating the issues that hampered firefighters during that awful day in London in 2017.

Developed by Tait Communications, the suite of products in question

includes a vehicle device and a wearable, offering the potential to act as a personal area network gateway, in order to leverage multiple bearers. These include LTE broadband, analogue and DMR (P25) to improve communications in almost any environment, mission critical or otherwise.

#### Use of multiple bearers

Discussing the product and where it fits in with the rest of the company's communications ecosystem, Tait's senior business development manager, Richard Russell, says: "The TWX550 wearable device is part of our new TAIT AXIOM broadband solutions platform, which we launched at IWCE in Las Vegas. It is a suite of cloud-based software services, applications and devices, designed for use in the business and mission-critical environment.

"In terms of hardware – alongside wearables – it includes a vehicle-based solution, the TMX450. The software piece includes workflow applications integrated into the TMX450 to enhance productivity."

A decent summary of Tait AXIOM's raison d'être can be found on the Tait website. According to the online description, the system exists to "enable workers with applications that help them collaborate, co-ordinate resources and stay informed. [Using the technology, organisations can] invite everyone into the conversation to talk, message, share location information and exchange data regardless of network or device type."

As mentioned, the focus of interest in this article is a specific part of the platform designed, in essence, to provide mission-/business-critical users with a broadband-enabled personal area network. Going into greater detail about this aspect, Russell says: "The concept revolves around the ability to connect groups of users using multiple bearers at the same time.

"We have an application – Tait PTToX [Push To Talk over X] – designed to be installed on a smart device. During a demonstration I gave in autumn of last year, I used PTToX to communicate from a ruggedised smartphone device over Wi-Fi and via an internet connection to our UK-hosted Tait AXIOM PTToX server. Cellular could also have been an alternative. The signal was then pushed out over LTE to one of our TMX450 unified vehicle devices, with minimal latency."

Going into greater detail about the part which the TMX450 has to play in this, he continues: "The device contains a Linux operating system, which has a number of applications. For instance, its modular form includes long-range Bluetooth, dual SIM LTE modem as well as Ethernet and Wi-Fi connectivity. Traditional radio technology includes analogue, and DMR Tier 2 and Tier 3.

"With the signal sent, it's then a matter of choosing the appropriate channel or talk group, depending on the user. Additional connectivity via the 'PTToX Bridge Mode' application links the TMX450 to traditional handheld radios on the ground, via the LMR [VHF or UHF] bearer."

According to Russell, Tait anticipates that the solution will be rolled out in a variety of business contexts. One of the most obvious use-cases, however, is to help improve site-specific emergency services communications.

## From control room to fireground

Going back to the subject of the Grenfell Tower disaster, it is clearly something which is very much on Russell's mind, particularly when it comes to development of the technology described above. Indeed, he believes that if the solution had been available at the time, some of the issues around communications may have been lessened.

Having asked him to outline why this is the case, he begins by providing a general refresher on current fire and rescue service procedure, entirely outside of the context of the response to Grenfell. "UK fire and rescue services use a variety of different communications solutions during an incident," he says.

"They currently leverage TETRA in the first instance, thereby allowing the control room to talk to the fire appliance on scene and vice versa. At the same time, a separate radio solution will likely be used on the fireground itself.

"The upshot of this is that the firefighters on the ground can't easily communicate directly with the control room. There's a fundamental disconnect, in other words."

He continues: "In operational terms, this means that someone has to spend time monitoring the TETRA radio in the cab, writing down the information as it comes in. It then needs to be transferred to a third party, who will in turn deliver it to the appropriate person on the bridgehead.

"That information obviously must be understood in the first instance, transposed correctly and finally delivered accurately. At the same time, the recipient of the information must be accessible, which is not always necessarily the case on the fireground. This all takes valuable time."

In contrast to this, the Tait solution's 'multiple bearer' approach is designed to ensure a consistent communication chain at all points during an incident. At the same time, again according to Russell, deployment of the technology might also open up new opportunities for situational awareness while

Discussing this, he says:
"Fundamentally, this part of the
AXIOM concept enables those working
in the control room to convey voice
information via an LTE connection to
the incident itself.

"This information is then rebroadcast from the command vehicle in real time, with – again – very little latency. In terms of the fireground, it would then be re-broadcast over the UHF bearer to both the firefighters on the ground and at the bridgehead.

"That being the case, it could also conceivably enable firefighters to receive information from the person actually reporting the incident. The member of the public in question could give incident information via the controller, as well as details about the location."

As well as showcasing Tait AXIOM out and about at trade shows, Russell has also given presentations looking at the adoption of both new technology and attendant new ways of working on the part of emergency services.

Part of this presentation – titled The Shock of the New – examined organisational culture itself across public safety organisations in the UK, something which he believes will likely evolve and change.

He says: "What I've gathered from emergency services is that there's always a weighing up of risk. At the same time, there is also an element of balancing that risk with generational changes of attitude towards the adoption of new technology. A deep, natural energy [within organisations] to say 'Yes, we need to do this'.

"This [change in attitude] has to go hand in hand with fire and rescue services having a willingness to take on board the opportunity to drive the technology themselves. That often requires someone – an internal sponsor – to drive that area of work within particular organisations."

In order to illustrate this, Russell uses the example of a UK fire and rescue service – East Sussex – which has worked closely with Tait to roll out new critical communications products within the operational environment. Rewinding back to February 2020, he discusses the role that "key sponsors" within that organisation played during the initial discussion and implementation of the company's technology.

"One key part of the discussion was looking at the potential scope for how they might actually use the tech," says Russell. "As in – "We've bought into this new digital technology. What else can we do with it apart from deployment purely on the fireground?"

"In response to that, we suggested a scenario where the control room guys could potentially talk to the incident command unit/breathing apparatus-wearer over LTE, as per what we've been discussing. They thought that it was a good idea, which in turn enabled us to have the 'art of the possible' conversation."

Following on from this exchange, Russell was able to go back to the engineers at Tait and feed the idea back to them as a "potentially interesting evolution of our portfolio". This elegantly demonstrates not only the power of engagement at the user end, but also how that engagement might contribute to the overall development of the technology itself.

As well as being an appalling human tragedy, the Grenfell Tower fire will also likely stand as a key moment in the history of fire and rescue services worldwide, containing as it does important learning around both the use of technology and general operational procedure.

That being the case, manufacturers such as Tait have a crucial role to play in ushering in a safer tomorrow.



# Getting back to business

CCT reports from Critical Communications World 2021 in Madrid, finding that the sector has been hard at work during the show's short hiatus

aking place at the beginning of November (rather than May or June, as has recently been the case), Critical Communications World 2021 featured a wide-ranging conference programme, reflecting the seemingly endless issues and opportunities with which the sector is currently engaged.

The first day kicked off with a keynote from the BBC's technology correspondent Rory Cellan-Jones discussing the 'opportunities and challenges of new technologies'.

While not necessarily as critical-comms-specific as the rest of the conference programme, Cellan-Jones delivered an entertaining overview of what may or may not be the direction of travel across the next 15 years. As he said – not unreasonably, given the current rate of ongoing technological and societal change: "Prediction is a mug's

game. I know nothing, you know nothing. We're all wandering around in a haze."

The next keynote of the day was delivered by ETSI CTO Adrian Scrase, who spoke about these ongoing changes as they directly relate to the critical communications community. His session was entitled 'Preserving and enhancing what works well today'.

Focusing heavily on the standardisation piece, Scrase began by identifying Critical Communications World 2014 in Singapore as the start of the sector's engagement with mobile/broadband technology.

Discussing this, he said: "At that point, we decided as an industry – through TCCA – that we would go to the mobile community and make an impossible challenge. Can you adapt your mobile phone systems so that they do all the things we need for our blue-

light services? We then started work on this project called 3GPP."

Jumping forwards seven years, he then suggested that the world has "overtaken us", both in terms of the potential capabilities of broadband technology itself, as well as mission-critical verticals' increasing interest in rolling it out. "We're not just talking about mission-critical voice, video and data any more," he said.

"Rather, we're talking about a whole suite of capabilities and a much broader industry profile. It's not just about blue-light services any more. It's entire industries coming to us and saying, we want our smart grid to work using 5G."

From here, Scrase moved on to discuss progress on 3GPP Release 17 alongside Release 18, stating that the package of work for the former will be complete as of March this year. Regarding Release 18, meanwhile – which will



ultimately be known as 5G-Advanced – he anticipated that its package of work would be decided before the end of 2021. Numerous ideas and requirements had already been gathered from across the sector, he said.

Staying on the subject of Release 18, he listed proposed mission-critical "candidate work items" including 'application layer support for factories of the future', 'mission-critical services over 5MBS' and 'gateway UE function for mission-critical communication'.

There has been huge interest in Release 18 from a variety of industry groups, said Scrase. This has been evidenced by representatives from many industries (for instance, automotive manufacture) approaching standardisation bodies and putting forward specific requests on behalf of their members.

Scrase finished by discussing a variety of different 'hot topics' for the sector, including 'smart energy' technology, factory automation, increasing adoption of virtual/augmented reality, and more. One particular area of interest, meanwhile, was sustainability, which he anticipated was going to become of increasing concern going forward.

# The issue of sustainability is going to keep the clever engineers busy for quite a while

"

This, he said, presented "a bit of a conundrum. We're trying to deliver increasingly compelling services – faster, more reliable – all of which are going to consume energy. This is going to keep the clever engineers busy for quite a while."

#### Integrated working capacity

Critical Communications World 2021 took place at the IFEMA in Madrid. It was therefore entirely fitting that a portion of the show's 'international' content focused heavily on Spain. This included host organisation Telefónica discussing the future of mission-critical comms on day two, as well as a day-one presentation looking at 'the Spanish path towards a mission-critical broadband network. The latter was delivered by Enrique Belda, representing the Spanish Ministry of Interior.

Belda began his presentation by discussing Sirdee, the incumbent, Tetrapol-based, mission-critical network currently operating in the country. Giving a general overview of the requirements for such a network, he said: "The main role of a critical communication system is to have the capacity to work together. To work together, you need to be connected.

"This is the 20th anniversary of Sirdee, during which time we have been working with different evolutions of the Tetrapol technology. It is a solid technology, which is absolutely crucial."

Illustrating the above, Belda showed the audience a number of slides outlining the scope of the network in terms of users and coverage. According to his figures, it offers just over 99 per cent availability to public safety users, alongside 95 per cent field coverage across the country. Other figures included 71,000 terminals currently in use, 1,530 base stations, and 114 "administrative and technical centres".

The last portion of Belda's presentation was concerned with the Spanish government's interest in evolving the service towards the use of broadband, in collaboration with Telefónica. The reason for this, he said, is that "new emergency use-cases need a broadband bearer".

Continuing his discussion of this -

and in particular the aforementioned use-cases – he said: "We need information in real time from drones. We need to connect body-worn video, and establish the ability to send fingerprints between devices. We need to be able to share data."

The requirements for the network were elaborated on a subsequent slide, detailing, not entirely unsurprisingly, that "critical voice must be guaranteed at all times" and that "broadband must meet or exceed current OoS levels provided by the narrowband Sirdee service".

Other requirements include comparable levels of security, full 3GPP standard support, narrowband/broadband interoperability and private spectrum usage, leveraging public networks only as a backup. Bearing the latter in particular in mind, the development of 'broadband Sirdee' should clearly be a compelling watch going forward.

The emphasis on the user experience continued with two further presentations on day one, one of which focused on a large-scale sporting event, with the other examining a serious public safety incident.

The first of these focused on 'integrated communications and security' for the Cortina 2021 alpine ski world championships, as provided by Leonardo. The presentation was delivered by Cortina TLC director Nicola Moret.

Moret began by giving an overview of the championships themselves, which he said needed to be considered the first big sporting event taking place during the COVID-19 pandemic (in February of last year). Pertinent statistics illustrating the scale of the event included the participation of 600 athletes from 70 countries, who competed across five courses over a period of two weeks.

According to Moret, the conversation around critical communications for the event began three years prior, with the organisers – following consultation with police – deciding on the need to implement a video surveillance system across the competition site. It was also decided that the event radio system itself needed to be updated, with local police



at that point using analogue. Picking up the story, Moret said that for the 2021 event, Leonardo put in place a solution leveraging the TETRA standard as "primary vector", complemented by broadband LTE. As mentioned, an advanced video surveillance system was also adopted, customised in particular to suit the often harsh weather in the mountains. This was augmented by two multi-agency control rooms, with the main control hub located in the city centre.

Discussing the composition of the network in more detail, he said: "The multi-vector hybrid network, based on the Leonardo core and CSP [common service platform], was able to guarantee interoperability between TETRA and LTE. [It also guaranteed] integrated management of the network, and safety and security due to authentication of [each piece of equipment] on the network."

The system was implemented through the use of a "TETRA network backbone with redundant ring", covering the north side of the Italian Veneto region, alongside dedicated LTE via a private core network.

The second 'user-focused' presentation mentioned above was delivered by chief of the Ovre Romerike fire and rescue department, Anders Leberg, discussing lessons from a catastrophic landslide taking place in

Norway in December 2020. Giving an outline of the quick clay slide, Leberg – who was the strategic lead of the rescue effort – said: "The disaster was very challenging to handle in scope and complexity. We'd never had to deal with that kind of incident and had to work with many specialist [public safety] groups."

According to him, the operation saw emergency services personnel operating in the dark and the snow in order to evacuate over 1,000 people from the area. Public safety efforts were co-ordinated across six control rooms, including those at national tactical and government level. Personnel leveraged Norway's country-wide, TETRA-based critical communications system, Nodnett.

Discussing use of the aforementioned radio technology, Leberg said: "Well-functioning radio communication saved lives, [with] all the first-responders able to communicate in the same channel. This saved time. We also sent out a safety report, which contributed to fire crews not putting themselves in any unnecessary danger."

As effective as Nodnett clearly was, Leberg finished his presentation by outlining useful functionalities which would have been available on the day via the ability to leverage mission-critical broadband.

He illustrated this through the

Keynote speaker, Rory Cellan-Jones example of electronic incident mapping systems currently used by emergency services organisations in Norway, and through which each organisation is only able to view its own resources. "We are talking about 2021. It shouldn't be like this," he said.

Finishing his presentation, he continued: "Common situational awareness is more than voice [communication]. In the future, we have to share more information, particularly with the people who make the decisions.

"There is nothing to suggest those who lost their lives could have been rescued if other decisions had been made during the rescue operation.

But – lessons learned – we can always be better, and I think we have to find new solutions together. As users of the system, we have to tell you what we need for the future."

#### **Quantum mechanics**

Moving on to day two of the conference, one of the most interesting – as well as most unusual – sessions was delivered early on, with Quantum Valley Ideas Lab's Mark Pecen discussing potential threats posed by quantum computing technology. His presentation was called 'Communication security challenges in the post-quantum world'.

Pecen began by giving a – frankly, much needed – breakdown of quantum computing as a concept. He did this by characterising it as a "blend of information theory and quantum mechanics", combining a high degree of certainty with a high degree of uncertainty.

Explaining further, he said: "A 'classical' bit is either 1 or 0 [which he explained in terms of a light bulb either being on or off]. In a quantum computer, meanwhile, you have qubits [quantum bits], which can exist in multiple states simultaneously, like a light bulb that's on and off at the same time."

The upshot of this, he said, is that quantum computing lends itself particularly well to solving certain classes of problems, not least those relating to the breaking of encryption. Or to put it in his words, "it is going to break today's public key encryption standards".

Pecen illustrated this in real terms by talking about the potential impact this could have in relation to over-theair software updates, via the breaking of what he called the embedded route of trust.

"Shor's algorithm can break this digital signature," he said. "And you really don't know if you're connected to the real factory or an attacker who's going to disable your car, airliner or whatever you're trying to update."

Having alerted the audience to the cybersecurity implications of quantum computing, Pecen finished his presentation by discussing strategies to help systems remain secure.

Central to this was what he referred to as 'cryptoagility', which he defined as the ability to deploy different cryptographic techniques depending on the security requirements of the individual subsystem.

Finishing his presentation, he said: "Quantum computing is absolutely going to have an impact on communications security. The question is when will quantum computers be developed in terms of large-scale devices? We don't know for sure, but there's a lot of investment and we can't ignore this."

Returning to the subject of national roll-outs, another important presentation on the second day focused on New Zealand and Australia, with much of the discussion focusing on the journey towards mission-critical broadband. The session was delivered by director of engineering and spectrum at the New South Wales Government Telco Authority, Alison Port, and

strategy manager at New Zealand's 'nextgeneration critical communications lead entity', Neal Richardson.

The presentation – which was titled 'Government critical communications moving ahead in ANZ' – began with Port setting the scene via a description of the previous year's Australian bushfires, which were the biggest in the history of the country.

These were followed by flooding caused by torrential rain, which in turn led to an "abundant harvest" occasioning a plague of mice. "Never has there been a greater need for our frontline responders to have critical communications," she said.

Port continued by outlining New South Wales' current mission-critical communications network, leveraging P25. As well as narrowband, she said first-responders also have access to Pushto-talk over Cellular and business-critical broadband running on commercial LTE.

Improvements to NSW's communications effort are continually taking place, she said, in relation to resilience and redundancy, as well as leveraging "non terrestrial technology" to provide coverage for rural areas. Port also announced that the Telco Authority has "successfully delivered the first P25 [interoperability] project across Australian jurisdictions, in collaboration with our counterparts in Queensland".

She finished her presentation with a discussion of the aforementioned planned move to mission-critical broadband, cross-state support for which was decided in 2018.

Discussing her state's involvement in the project, she said: "New South Wales leads three work streams, including a proof of concept for PSNB. In 2021, NSW signed a contract with Nokia on behalf of all jurisdictions to deliver the proof of concept."

With the conference drawing to a close in the afternoon of the second day, the conversation shifted back to the testing/certification piece, with an important presentation from MCS TaaSting co-ordinator Fidel Liberal. He discussed 'MCS conformance testing becoming a reality', considerable progress in relation to which has been achieved over the past two years.

Liberal began his presentation by saying: "My purpose today is to talk to you about why conformance testing is relevant now, and if you're a user, a vendor or an MNO, how it can fit into your road map for mission-critical service deployment."

He went on to provide a definition of conformance testing in relation to the 3GPP MCS standard, after which he outlined recent progress which has taken place, leading to the development of a 'testing as a service' mechanism.

"MCS conformance certification is a must for building true, multi-vendor, open eco-systems", he stated. "[It] is already mature, with certification programmes coming in 2022."

As is always the case with this event, Critical Communications World 2021 provided far too much content to properly cover over the course of a few pages.

As the above demonstrates, however, the range and quality of what was being presented augers well for the future of both the sector and the show.





# Ready for a big year

Tero Pesonen – chair of TCCA's Critical Communications Broadband Group (CCBG) and TCCA Board vice-chair – discusses his hopes for mission-critical 4G and 5G



TCCA Board vice-chair Tero Pesonen

#### What was achieved by the CCBG in 2021?

In particular, I would like to highlight two published white papers – one for mission-critical 5G, and another one for broadband device procurement. Both are great examples of the quality and commitment of TCCA members' volunteer contribution to the worldwide critical communications community. We all should recognise the amount of work required to produce these, and the value of the content.

Beyond those, several other task forces have been and are working on common themes. One already concluded looked at broadband capabilities and operation in the 400MHz area. Task forces on Mission Critical Application Programming Interface (API) and Mission Critical Broadband Applications are just finalising their work. Plenty of work for future task forces has taken place, including workshops on cybersecurity, satellite communication and spectrum topics.

Probably the single biggest topic was the work for 3GPP Release 18 content. Overall, however, the most impactful area of work has been the information sharing and open discussion we have conducted globally, building common understanding among the stakeholders.

#### Are you satisfied with Release 18?

Standardisation is about finding a common path for common good. 3GPP is a place where the needs and expectations of consumers, mobile operators, device vendors and a multitude of different verticals come together. Representatives from all stakeholders had brought forward about 150 per cent worth of valid, well-thought-out, proposals, so content reductions were required to achieve consensus. If we in critical communications were 100 per cent happy with the outcome, we would not have been pushing our future very strongly forward.

Having said this, we can be quite content, as the majority of work items forming 3GPP Release 18 – 5G Advanced – bring benefits for our sector and society as a whole. Our key requirement pillars are coverage, capacity and fit for purpose. All of these will be further enhanced in Release 18.

## You've previously talked of promoting the sector's understanding of 5G. What does that mean?

The white paper mentioned earlier – 'What role will 5G play for Critical Communications users?' – is an important step on

this path. The last couple of 3GPP releases have been about 5G. Commercial networks are being rolled out, devices are coming to market, and also private 5G networks, such as for Industry 4.0, are being taken into use.

5G including NR [New Radio] is part of the 3GPP continuum we are committed to. It has to be taken into account in all broadband-related planning, decisions and procurement. Its potential shall not be overlooked, while recognising that it is not a one-size-fits-all solution.

Co-operation is essential to share issues and ensure feedback is taken into consideration so standards enhance appropriately.

#### What do you think the group will achieve in 2022?

Plenty. It has been an active start to the year. The spectrum-related task force has submitted TCCA's response to an open consultation of the European Commission Radio Spectrum Policy Group (RSPG). The workshop on TETRA/Broadband Interworking Function (IWF) took place in January, and several new task forces are being started.

The Mission Critical Broadband Callout task force has already had its first session. A task force focusing on critical communications requirements for non-terrestrial networks kicked off at the beginning of February, and Mission Critical Video as well as Cybersecurity will follow shortly. There is a great commitment in the membership to work on these important topics, but also a lot of work to be done.

We need support from everyone, whether for a longer or shorter duration, smaller or larger task; a senior to share experience, or a junior bringing new out-of-the-box insight.

#### What are your hopes for the sector this year?

In the community, the forerunners are entering the transition to critical broadband. Therefore, in the roadmap, we need to begin to properly look beyond that. At the same time, new issues are and will be identified throughout – in the technology, in the environment, as well as in the user domain.

Preparations for the World Radio Conference in 2023 need to take place this year, to support the spectrum needs of the critical communications sector. Further, 2022 would be rather successful if the first MCX-related official certification can take place. MCS-TaaSting and work in the GCF mission-critical stream have progressed well, but there is much to be done.



# SHOW PREVIEW

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## John Anthony introduces this year's show

It gives me great pleasure to welcome you to this BAPCO 2022 Conference & Exhibition show preview. We are once again holding the event at the Coventry Building Society Arena, which has welcomed us so warmly for the past few years.

As ever, BAPCO continues to be the premier event in the public safety technology sector, providing the forum for professionals in the field to exchange ideas and experiences, and to keep up to date with the latest developments. With that in mind we hope that you use this preview to plan your visit, getting the most from the show's two days.

My particular thanks, as always, must go to our sponsors and exhibitors, without whom we would not be able to deliver such successful events. In addition, massive thanks also has to go to the many contributors to our conference sessions.

Coming back to our exhibition, I am pleased to say that we are continuing to grow from our successful

As I write this, it looks like the majority of

"BAPCO continues to be the premier event in the public safety technology sector"

event last October. The exhibition floor this year is larger, with many returning exhibitors, as well as a number who are exhibiting for the first time.

Regarding the conference, this year's sessions will once again feature a diverse range of speakers, enabling visitors to hear first-hand about the global trends in public safety technology and collaboration. Be sure to use this guide to schedule the sessions that you wish to attend. Although, if you do miss a session, we will be making a number of the key presentations available after the show.

COVID-19 restrictions may have been lifted by the time of the event (although we will, of course, continue to put whatever sensible precautions are required in place). With that in mind, I am particularly pleased to see that the easing of travel restrictions will allow an increasing number of overseas visitors to join us this year. These visitors will also be participating in a number of our conference sessions.

Another key feature of BAPCO 2022 will, as ever, be our networking dinner, which was such a success last year. This will allow those in the sector to continue to renew acquaintances in a relaxed and informal atmosphere. There will also be plenty of opportunity to hear from, and support, our charity partner, the British Heart Foundation.

Our mission, as always, is to continue to meet the requirements of visitors, providing benefit to the public safety communications sector at no cost to end users. I look forward to meeting you in Coventry.

John Anthony, MBE
President, British APCO

## Join us for free at BAPCO 2022!

### Why Attend?

Over the years, British APCO as an organisation has steadily grown in size and influence. This was demonstrated at its 2021 annual Conference & Exhibition, which saw a 10 per cent visitor increase, despite the difficulties of the previous 18 months.

The UK public safety communications community chose BAPCO as the place to reunite after that long absence, coming together to share insights, knowledge, and view the latest products. It is clearly the key show for the sector.

With that in mind, we're expecting BAPCO 2022 to be even bigger and better. As ever, the show will help visitors stay on top of the latest developments and strategy, with a conference programme delivered by some of the biggest names in the sector. It will also feature a world-class exhibition, enabling visitors to network and view the latest products.

Attending BAPCO 2022 will give you and your organisation the inside track on the latest cutting-edge communications solutions and best practice.

#### **Safety Measures**

As organisers, we regard the health and safety of everyone participating in BAPCO 2022 to be of paramount importance. We are therefore operating in line with UK government COVID-19 guidance and will also incorporate appropriate measures from the venue.

To ensure BAPCO is as safe and accessible as possible, we will be implementing random COVID-19 status checks. On arrival at the event, all attendees - including visitors, exhibitors, contractors, venue and staff - must be able to demonstrate COVID-19 status.

This includes either proof of a full course of vaccination two weeks prior to arrival, a negative lateral flow test result taken within 48 hours of arrival, or proof of natural immunity.

Full details can be found on our website: www.bapco-show.co.uk/event-safety-measures. If you have any questions regarding COVID-19 safety, please head to www.bapco-show.co.uk/contact-us and get in contact with a member of the team.

#### Where?

We are pleased to be returning to the Coventry Building Society Arena, previously known as the Ricoh Arena. The venue is a major UK location for business and entertainment, and is also home to Wasps Rugby, Wasps Netball and Coventry City Football Club.

The venue attracts over one-and-a-half million visitors each year. Situated in the heart of the UK, the Arena is within a two-hour drive of 75 per cent of the UK population. It is easily accessible by train and situated close to Birmingham Airport.

#### When?

Tuesday 8th March, 09:00-16:30 Wednesday 9th March, 09:00-16:00

#### How much does it cost to attend?

The exhibition and conference are completely free to attend. You can buy tickets to the BAPCO Annual Dinner, taking place on Tuesday 8th March. Find out more on the BAPCO website.

#### **By Road**

The Coventry Building Society Arena is just metres from **Junction 3 of the M6** and is also close to Coventry Arena and Coventry main stations. **Sat nav postcode: CV6 6GE.** 

#### **By Rail**

Coventry Arena Station is next to the Coventry Building Society Arena and is now open. Coventry Railway Station is in the city centre and approximately six miles away. There are always black cabs immediately outside the station and it is roughly a 10 to 15-minute journey.

For more information on train stations and timetables, please visit: www.nationalrail.co.uk

#### By Air

The Coventry Building Society Arena is around 20 minutes by road from Birmingham International Airport (BHX). Please visit <a href="https://www.birminghamairport.co.uk">www.birminghamairport.co.uk</a> for more information.

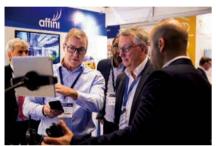
#### Visitors to BAPCO 2022 will have access to FREE PARKING and FREE WIFI.

















#### **Exhibition**

BAPCO 2022 will bring together the entire UK public safety communications sector to source the latest equipment and systems, develop important business relationships and generate new opportunities.

As ever, the biggest critical communications companies in the world will be in attendance, congregating on the exhibition floor, which this year we have extended due to high exhibitor demand. Use the exhibition to get hands-on with new equipment, and speak to experts on how to transform your organisation and reach your goals.

The exhibition will also give visitors the opportunity to network with our sponsors. These include Platinum sponsor, Motorola Solutions; Gold and Networking sponsor Hytera; Gold sponsors, BlackBerry, Saab and Sopra Steria; as well as Silver sponsors Absolute, Content Guru and Cradlepoint. You will also be able to meet our charity partner, the British Heart Foundation.

#### Conference

Taking place across the course of the event's two days, the BAPCO 2022 conference sessions offer a huge range of cuttingedge presentations, delivered by some of the most respected thought leaders in UK public safety comms. The programme will consist of three streams across two days, packed with keynote addresses, best practice discussions, technology updates, panels and debates. The conference will cover key topics including ESN delivery and operational assurance, as well as the status of critical broadband adoption around the world.

It will also look at delivery of technology to the NHS during the COVID-19 pandemic, and much more. Attending the BAPCO 2022 conference will enable visitors to learn about the most important developments in public safety communications, all for free.

What's more, we will be supporting and celebrating International Women's Day on 8th March, including a panel, kindly supported by Motorola Solutions, on how we can achieve more diversity in the emergency services, and why this is important.

#### **Networking Lounge**

2022 will see the return of the Networking Lounge – a purpose-built space enabling attendees to take time out to catch up with valued colleagues and contacts. Come and take in a great atmosphere and experience the more social side of BAPCO 2022.

#### The BAPCO Annual Dinner

The BAPCO Annual Dinner is the must-attend event for all those working within UK public safety communications, providing a unique opportunity for the sector to come together. Attendees will be able to enjoy fantastic food and drink as well as top-class entertainment as they relax in an informal setting, following the conclusion of the conference and exhibition's first day. We look forward to seeing you there!



Dr Nicola Millard, Principal Innovation Partner, BT

#### From automation to zedonks: Trends shaping the future world of work

Once described as "human caffeine" on Twitter, Nicola injects a people-centred 'expresso shot' to innovation. Half social scientist, half technologist, all academic, she uses techniques from disciplines such as design thinking, psychology, anthropology, computing, and business consulting. She generates data, provocations and stories with the aim of engaging and creating conversations, from the board room to the frontline. She has worked in a variety of areas, including futurology, research, marketing, and more.

March 8th, 09:45 - 10:15 **Conference room A** 



**Teressa Latimer, Motorola Solutions Head of Business Relationship Management** 

Panel discussion: Post-pandemic, how can we ensure diversity across the UK's emergency services and why does it matter?

Teressa leads the Business Relationship Management team across all of the emergency and public safety lines of business within Airwave. She has over 30 years of experience within the telecommunications industry, having started her career as a BT Operator, managing 999 calls from members of the public, and onward liaison with the emergency services. Teressa feels strongly about supporting female leadership and encouraging diversity across all organisations.

March 8th, 13:45-14:45 **Conference room A** 



Lisa Casias, Deputy CEO, US Government **First Responder Network Authority** 

#### FirstNet's process for investment in the network

Lisa joined the FirstNet Authority as Deputy Chief Executive Officer in November 2019. In this role, she is responsible for providing executive leadership and overall direction to key FirstNet offices and functions. She is also responsible for assisting in the development and implementation of policies and strategies, as well as assisting in the oversight of FirstNet Authority day-to-day operations. Prior to joining the organisation, she worked at the Department of Commerce..

March 8th, 10:15-10:45 **Conference room A** 



Tony Porter, Chief Privacy Officer, **Corsight AI** 

Panel discussion: Benefits, uses and ethical considerations of facial recognition technology

Tony Porter is a retired senior police officer and more recently was the Government's Surveillance Camera Commissioner between March 2014 and December 2020

Tony is now the Chief Privacy Officer for facial recognition software company Corsight Al and a passionate advocate for facial recognition technology.

March 9th, 14:15 - 15:00 **Conference room B** 



lain Ivory, Founder, Partner and Managing **Consultant, Hermitage Comms LLP** 

#### **Future technologies**

lain founded Hermitage Comms in 2016. It is a specialist telecoms and IT consultancy, primarily working with government and public safety organisations to help assess the benefits and impact of the rapidly changing telecoms industry. His work covers evaluation of emerging telecoms standards, assessment of existing IT and telecoms systems, as well as future strategies. He has supported many clients in developing strategies for migration of systems to the cloud.

March 8th, 12:45-13:15 **Conference room A** 



Richard Morris, Operational Evaluation **Lead, Emergency Services Mobile Communications Programme** 

#### Working with users to assure ESN

Richard is an experienced leader and practitioner in the field of operational strategic leadership, command and control, and communications.

After a 30-year policing career - the last ten of which at chief officer level - he continues to work in the policing and security sector. Prior to his current role, his consultancy operations included a placement in Guyana, advising on its new national command and control centre and associated protocols.

March 9th, 15:00-15:30 **Conference room A** 

#### **Conference Theatre A**

#### 09:30-09:45

**Welcome to the BAPCO annual Conference** & Exhibition

John Anthony, President, British APCO

#### 09:45-10:15

**KEYNOTE ADDRESS: From automation to** zedonks: Trends shaping the future world of work

Nicola Millard, Principal Innovation Partner, BT

#### 10:15-10:45

FirstNet's process for investment in the network

Lisa Casias, Deputy CEO, US Government First Responder Network Authority

#### 11:00-11:45

Panel discussion: CC:IPS - Inspiring global interoperability for next generation emergency communications

Chair: Chris Lucas, Vice President British **APCO** 

#### 12:00-12:30

Updates on critical broadband projects around the world

Tero Pesonen, Chair, Critical Broadband Group, TCCA

#### 12:45-13:15

#### **Future technologies**

**Robin Davis**, Chair, Future Technologies Group, TCCA

lain Ivory, Founder and Managing Consultant, Hermitage Comms LLP

#### 13:45-14:30

Panel discussion: Post-pandemic, how can we ensure diversity across the UK's emergency services and why does it matter?

Teressa Latimer, Head of Business Relationship Management, Airwave, **Motorola Solutions** 

Sarah Roberts, Director of Programmes and Core Operations, Motorola Solutions

#### 14:45-15:45

Focus on AI: Short presentations and panel discussion

Robert Hogg, Founder & CEO, Black Marble Paul Kennedy, Strategy Advisor, Police Security and Technology, Black Marble Ismail Syed, Senior Cloud Specialist - Data Science and Analytics, Oracle

Nick Chorley, Director of Public Safety, Hexagon

Phil Lawrence, Principal Cloud Architect,

Jan Thompson, Senior Director EMEA: Defence, Justice and Public Safety, Oracle

#### **Conference Theatre B**

#### 10:30-11:00

Innovation, accelerated! Introducing DASA, the Defence and Security **Accelerator** 

Ellie Rice, DASA Security Lead, Defence and **Security Accelerator** 

#### 11:15-11:45

**Content Guru Sponsored Session** The case for cloud-first policing: Lessons from leaders in digital policing

Colum Gorman, Business Development **Director. Content Guru** Shub Naha, Business Development Director, Content Guru

#### 12:00-12:45

**Panel discussion: Technical** interoperability

Neil Beet, Business Development Manager, National Security and Public Safety, Amazon Web Services

Dr Fatema Zaghloul, Lecturer in Information Systems and Systems Thinking. Southampton Business School William Moore, CEO, Airbox Systems **Christine Cant**, Head of Product Management, Europe, Hytera **Communications Europe** 

#### 13:00-13:30

**Updates from Virve 2.0** Jarmo Vinkvist, CEO, Erillisverkot

#### 13:30-14:00

**SAAB Sponsored Session** The evolution to information led policing

Tim Willoughby, Head of Digital and Innovation, An Garda Síochána Martin Walsh, Operations Manager, An Garda Síochána Fintan Brady, Head of ICT Infrastructure, An

Garda Síochána

#### 14:15-14:45

Changing emergency services forever: Using technology to support first responders and enhance pre-hospital care anywhere

Alan Lowe, CEO, Visionable

#### 15:00-15:30

**Cradlepoint Sponsored Session** 

#### 15-45-16-15

Helping to make control room call handling more efficient Speaker to be confirmed

#### **Conference Theatre C**

How to attract the next generation of technology professionals: The role of apprenticeships

**Dr Fatema Zaghloul**, Lecturer in Information Systems and Systems Thinking, **Southampton Business School** 

#### 11.30-12.00

Delivering value through automated fleet

Gary Maughan, Regional Director, UK & Ireland, Sepura

#### 12:15-12:45

**Hytera Sponsored Session** Deploying reliable communications for emergency operations with Tactical **Broadband Networks** 

Mark Brandstatter, Broadband Manger, **Hytera Communications Europe** 

#### 13:00-13:30

**PCTEL Sponsored Session** In-building communication is critical: Efficient ways to ensure public safety radio, ESN and commercial coverage **David Adams**, Director, Business Development, PCTEL

#### 13:45-14:15

**Interoperability: Crossing borders and** working together William Moore, CEO, Airbox Systems

#### 14:30-15:00

Sopra Steria Sponsored Session

#### 15:15-15:45

The benefits of collaborative joint service building and risk information sharing across UK fire and rescue services Speaker to be confirmed



#### **Conference Theatre A**

#### 09:30-09:45

**Chair's introduction** 

Chris Lucas, Vice-President, British APCO

#### 09:45-10:15

**KEYNOTE ADDRESS: Technical delivery update** 

**John Black**, ESN Programme Director, Emergency Services Mobile Communications Programme, Home Office

#### 10:15-10:45

#### **Cloud-based solutions**

**Steven Richardson**, Account Manager, Justice and Public Safety, Amazon Web Services

#### 11:00-11:30

Delivery of technology to the NHS during the Covid-19 pandemic

**Lucy Baker**, Healthcare Innovation Director, Enterprise BT

#### 11:45-12:30

Panel discussion: Machine originated calls Darryl Keen, BAPCO Representative on 999/112 Liaison Committee

#### 12:45-13:15

Deployment of technology during an aviation incident

**David Bartlett**, Assistant Chief Fire Officer, Heathrow Airport Fire and Rescue Service

#### 13:30-14:00

Network resilience: Keeping connected during major weather incidents James Hattam, Service Management & Customer Experience Director, Emergency

Services Network, EE

#### 14:15-14:45

Hybrid Connex: Digital ambulance of the future project

Adrian Smith, NHS Arden & GEM CSU Simon Hill, Chief Technical Officer, Excelerate

**Tristan Wood**, Chief Technical Officer,

**John Vesey**, Head of Health, Wellbeing and Emergency Service, Catapult

#### 15:00-15:30

**KEYNOTE ADDRESS: Working with users to assure ESN** 

**Richard Morris**, Operational Evaluation Lead, Emergency Services Mobile Communications Programme, Home Office

#### **Conference Theatre B**

#### 10:30-11:00

**Updates from the TCCA** 

**Tero Pesonen**, Board Member and Director, TCCA

#### 11:15-12:15

Focus on mental health: Short presentations and panel discussion

**Mike Isherwood**, Founder, Softable Ltd **John Stone**, Engineer, Public Safety Solutions, Avaya

**Perpetual Addo**, Emergency Medical Call Taker & Dispatcher

#### 12:15-12:45

Motorola Solutions Sponsored Session How to Improve security in the digital world against cyber threats

**Marcus Wale**, Senior Account Manager - Cybersecurity, Motorola Solutions

#### 13:30-14:00

New and emerging technologies and their impact on critical communication networks of the future

**Gerard Donohue**, Chief Technology Officer, Telent

#### 14:15-15:00

Panel discussion: Benefits, uses and ethical considerations of facial recognition technology Robert Watts, CEO, Corsight

#### Conference Theatre C

#### 10:15-10:45

REACT – automated redaction of body worn video for legitimacy, transparency and safeguarding across public sector agencies

**Simon Clifford**, Managing Director, Cliff42 **Geoff Robinson**, Superintendent, Thames Valley Police

**Kyle Massingham**, Chief Technology Officer, Cliff42

#### 11:00-11:30

Absolute Sponsored Session
Combining 1,000 years of policing with
powerful tech to bring criminals to justice
Derek Skinner, International Director of
Investigations, Absolute Software

#### 11:45-12:15

Blackberry Sponsored Session
The Critical Importance of Effective
Communication in Coordinating a MultiAgency Major Incident Response
Chris Ullah, Business Relations and Solutions
Manager, BlackBerry

#### 12:30-12:45

The rapid digital transformation of UK emergency services: Why DEMS is making it happen

**Richard Perkins**, Director of Public Safety, EMEA, NICE

#### 13:15-13:45

**Sponsored Session** 

#### 14:00-14:30

Sponsored Session

#### 14:30-15:00

What does it mean to be mission critical? Peter Hudson, Chief Technology Officer, Sepura



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Motorola Solutions is a global leader in public safety and enterprise security. Its solutions in LMR mission critical communications, video security and access control and command centre software create a truly integrated technology ecosystem, to help make communities safer and ensure that businesses stay productive and secure. This technology is bolstered by managed and support services. Motorola Solutions says that it is ushering in a new era in public safety and security



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BlackBerry provides intelligent security software and services to enterprises and governments around the world. The company secures more than 500M endpoints including 175M cars on the road. Based in Waterloo, Ontario, the company leverages AI and machine learning to deliver innovative solutions in the areas of cybersecurity, safety and data privacy and is a leader in endpoint security management, encryption, and embedded systems. BlackBerry's vision is clear—to secure a connected future you can trust.



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Saab UK serves the global market with world-leading products, services and solutions within military/defence, civil security and the emergency services. Through innovative, collaborative and pragmatic thinking, the company develops, adopts and improves new technology to meet customers' changing needs. Saab's SAFE public safety unified control room solution is created in partnership with the blue light market, enabling streamlined workflow and business process management. SAFE is already in operation in over 35 mission critical control rooms across Europe and the US



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STAND H<sub>10</sub>

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Sopra Steria is a European leader in consulting, digital services and software development. It helps its clients drive their digital transformation. With 46,000 employees in 30 countries, the group places people at the heart of everything it does to build a positive future. The company has a long history of providing major operational systems to the public safety market. It deeply understands user requirements, providing solutions that use the best combination of technologies to meet the needs of its customers. It's STORM command and control solution supports the majority of UK police forces.



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Absolute accelerates customers' shift to work-from-anywhere, through the industry's first self-healing Zero Trust platform, ensuring maximum security and uncompromised productivity. Only Absolute is embedded in more than half a billion devices. It offers a permanent digital connection that intelligently and dynamically applies visibility, control, and self-healing capabilities to endpoints, applications, and network access, ensuring cyber resilience, tailored for distributed workforces. The company is trusted by nearly 16,000 customers, including over two thirds of UK police agencies and 85 per cent of US forces.



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A global leader in cloud communications solutions, Content Guru delivers off-the-shelf and bespoke cloud contact centre services through its multi-awardwinning storm solution. The first cloud contact centre solution to be selected for blue light 999 services, storm brings together intelligent automation, third-party systems integration, and on-demand scalability to enhance all communication functions. With true omni-channel interaction and recording capabilities, storm gives organisations the power to document mission-critical communications, store interaction recordings securely in the cloud, and use data to drive service-improving insights.



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www.cradlepoint.com

Cradlepoint's network management software and wireless cellular routers utilise the power of 4G LTE and 5G — including public safety networks such as ESN—for secure connections to MDTs, surveillance, body cameras, sensors, on-board diagnostics, and beyond. More than 3,000 public safety agencies worldwide trust Cradlepoint and its cloud-delivered 46 LTE and 56 wireless network edge solutions to maintain communications during the most critical situations. At BAPCO 2022, Cradlepoint will be demonstrating management solution NetCloud, and showing the latest in its range of wireless routers, which are purpose-built and engineered for size, ruggedness, connectivity options, and expandability.

#### **EXHIBITORS**













































































































































#### MEDIA PARTNERS









































7 - 8 MARCH 2023

COVENTRY BUILDING SOCIETY ARENA

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