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An eventful year

CCT editor **Philip Mason** looks back on 2025, and why it has been so significant for the critical communications sector

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 work to stimulate and focus debates on the topics that matter most and provide our readers with a means to raise their concerns.

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Welcome to the latest issue of *CCT*, the leading publication for those involved in critical communications across the world.

With time seeming to speed up with every passing year, it's difficult to believe that it's nearly November once more. And yet, here we are.

For those who have been following developments in the sector, it's been a truly interesting and significant year. This is probably most visible when it comes to the roll-out of broadband for public safety, with multiple nation states now well under way with – or even consolidating – projects across the world.

Something like the inclusion of the EUCCS Project in the European Commission's recent EU Security Strategy, meanwhile, indicates the degree to which governments are now viewing critical comms as integral to safety and security. With the world becoming an increasingly dangerous place, this is a welcome development.

Another area in which real progress is being made is the rail sector's ongoing move from legacy technology towards 5G. This is something that is explored in-depth in our cover story (page 12), which features interviews with stakeholders and experts from across the rail sector.

This is followed by another fascinating piece, exploring the roll-out of a new multi-agency control room, taking place on Anguilla in the Caribbean.

It is a notable story for any number of reasons, not least the sheer amount of hard work and dedication that went into completing the project. The real interest, however – as you will find out if you turn to page 18 – is how the facility has transformed emergency services culture on the island.

Finally, this issue features several 'question and answer' interviews from various luminaries from around the sector.

These begin on page 10, where Sepura's incoming and outgoing CEOs discuss the history of the company, as well as plans for its future. Skip to page 26, meanwhile, for an interview with Adam Howe (also from Sepura), this year's winner of the TCCA Young Engineer award. Finally, turn to page 34 for crucial insight from TCCA itself on the Interworking Function Interface.

Before signing off, I also want to draw your attention to this issue's lead news story, which reports on MA Exhibitions' recently signed multi-year extension to continue to provide events for TCCA, including Critical Communications World.

As you may or may not know, the magazine you hold in your hand is published by MA Exhibitions. I speak for the whole team in saying that we couldn't be prouder to continue our relationship with the association – and with a show as crucial to the sector as CCW.

Enjoy the issue.

Philip Mason, editor

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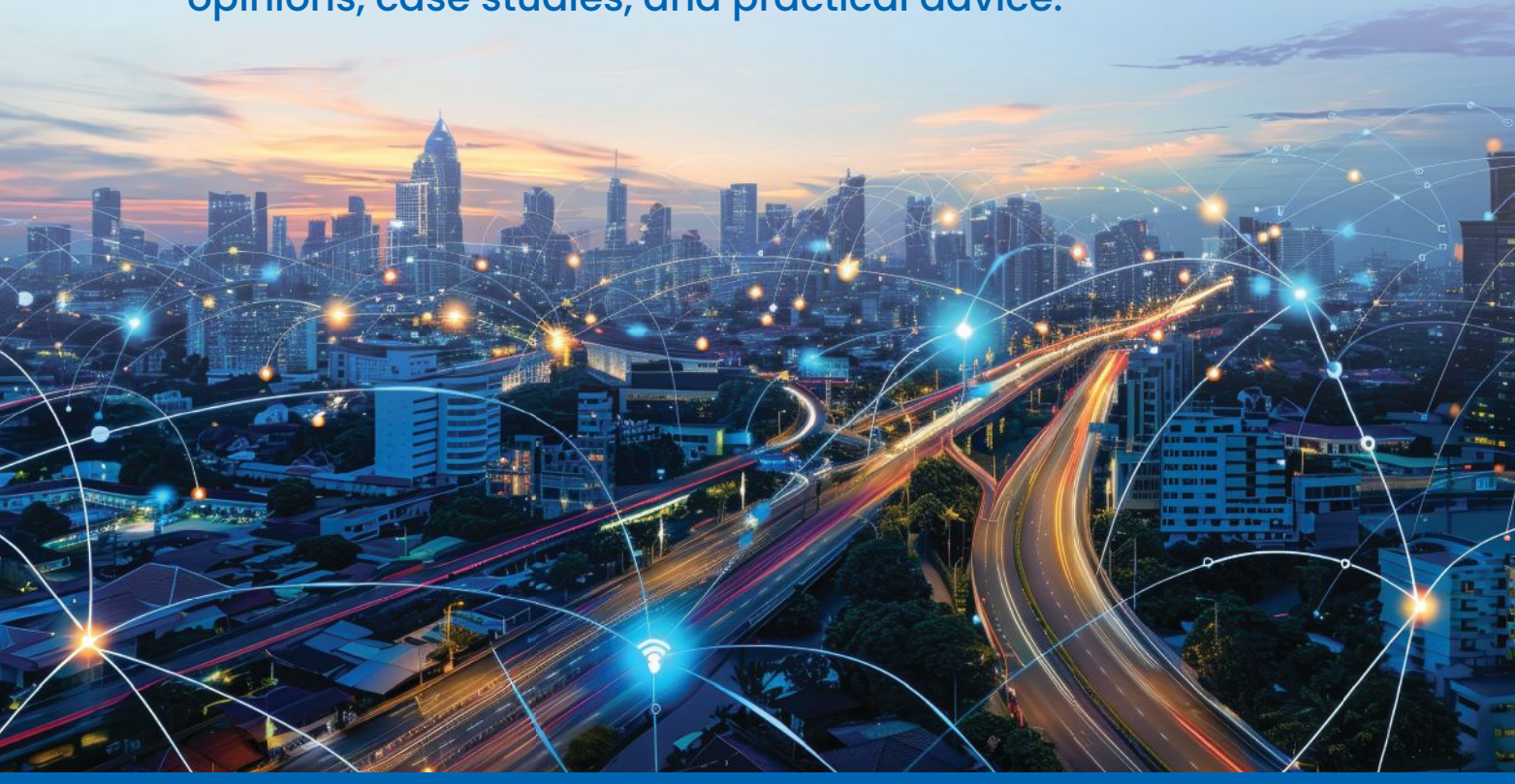

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Who, what, where

EUROPE

Change at the top at Sepura following planned succession

Sepura has appointed Chris Barnes as its new CEO, succeeding Steve Barber. According to the company, the change represents "a long-planned succession".

A statement released by Sepura said: "Chris brings a wealth of experience. Most recently [he] led the growth of Tracsis plc, a software and technology business specialising in the transport industry. He was Tracsis CEO for six years."

Barnes said: "Sepura has a fantastic reputation and market-leading technology used throughout the world.

"It has demonstrated great success in its core markets and, through its R&D hub in Cambridge, has successfully brought to market a range of products for the future needs of mission-critical services."

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Škoda leverages 'Vehicle-to-Everything' tech

Škoda has become the first vehicle manufacturer to introduce HAAS Safety Cloud-powered digital alerts in Europe. The roll-out leverages the latter's cloud-based Vehicle-to-Everything (V2X) digital alerting platform.

According to a statement from HAAS, the roll-out facilitates warnings to Škoda drivers in real time when ambulances are approaching. The alerts are delivered via Škoda's Traffication in-vehicle safety app.

Discussing the Safety Cloud platform, a spokesperson said: "[It] is the industry's most comprehensive V2X digital alerting platform. It is designed to connect emergency responders, municipal fleets, work zones, connected infrastructure, disabled vehicles and [other] vehicles."

Industry giants supply UK military communications

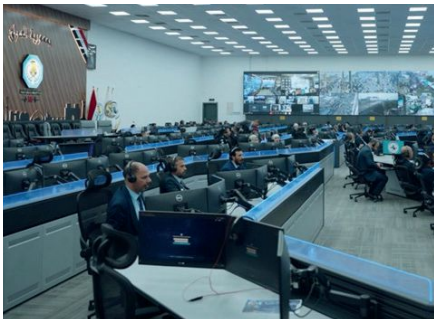
Motorola Solutions and Nokia are collaborating to provide a "next-generation, containerised, tactical communications network solution for UK defence agencies".

The modular system combines Motorola Solutions' TETRA infrastructure with Nokia's 5G AirScale portfolio.

The statement continued: "The solution is housed in rugged, deployable containers and can be operational in under 30 minutes. Motorola Solutions' Silvus MANET technology provides the resilient backhaul to extend connectivity across diverse operational environments and extensive geographical areas.

"The scalable, self-healing Silvus mesh network enables high-throughput communication links between forward-deployed units and command nodes."

MIDDLE EAST



New control room for Baghdad emergency services

The Iraq Ministry of Interior has deployed Hytera's SmartOne unified communication platform.

The project – which began last year – introduces a centralised call centre for Baghdad's emergency services.

Discussing the project, a spokesperson said: "Previously reliant on a fragmented network of 26 separate emergency numbers, the MOI sought to unify these under a single, cohesive emergency response system.

"Hytera's SmartOne solution integrates various communication technologies – ranging from DMR and TETRA to body camera feeds – into one platform.

"This enables seamless co-ordination between police, fire and medical services across Baghdad."

FAR EAST

TCCA launches new crit comms event in Hong Kong

TCCA has announced the launch of Critical Communications Asia, taking place in Hong Kong in April 2026.

Discussing the event, a spokesperson said: "Critical Communications Asia will bring international information to the North Asia community. It will showcase Asian Pacific voices and perspectives on the business requirements for critical communications across public safety, utilities, transportation, energy and ports.

"Hong Kong is the strategic gateway between China and the rest of Asia. It is uniquely positioned to host critical communications leaders at the intersection of innovation, policy and regional interoperability."

The title is 'Global standards, regional impact: advancing critical communications capabilities and resilience in Asia'.

NORTH AFRICA

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Hytera re-opens North African office in Morocco

Hytera has reopened its newly upgraded office in Rabat, Morocco. The company states that the facility "underscores the company's strengthened commitment to customers and partners across North and Francophone Africa".

According to Hytera, the Rabat office was originally opened in 2019 and has played a "central role in expanding [the company's] regional footprint and building a strong partner ecosystem in the region". Improvements to the office include "modern work spaces" and "enhanced collaboration areas."

Hytera Morocco general director Jayden Chen said: "Upgrading our Rabat office is a statement of Hytera's long-term commitment to North and Francophone Africa. By being closer to our customers and partners, we can truly grow together and foster innovation."

News round-up

CCW partnership extended

MA Exhibitions has announced that its partnership with TCCA will be extended for six years from 2027. There will also be a further option to extend for up to an additional three years.

The agreement sees the continued annual delivery of TCCA's flagship event Critical Communications World, which next year is taking place in London in June. According to a statement, there will also be additional regional summits, beginning with the first Critical Communications Asia, taking place in Hong Kong in April 2026.

Discussing the development, a spokesperson said: "This renewed relationship demonstrates the two organisations' shared commitment to the promotion and development of standardised critical communication solutions for professional users across the globe. Under the stewardship of MA Exhibitions, CCW has enjoyed significant annual growth, with exhibition floorspace growing by 221 per cent between 2021 and 2025.

"New initiatives such as the Global Village for national critical communications network operators, and Tech Tours for focused topics around the exhibition, have ensured visitors continue to travel from around the world to attend CCW.

TCCA Board chair Mladen Vratonjić and Tero Pesonen, chair, TCCA Critical Communications Broadband Group

"Bringing together governments, regulators, manufacturers, operators and end-users, CCW provides a unique event where every stakeholder in the critical communications sector can connect, collaborate and shape the future of mission-critical technologies."

MA Exhibitions managing director Tim Willoughby said: "I am incredibly proud of our team and the close relationship we have built with TCCA. Together, we deliver a world-leading event that grows in scale and significance each year.

"With standardisation and international collaboration more important than ever, this extended partnership ensures we will be leading the way for years to come." TCCA Board chair Mladen Vratonjić said: "The critical communications sector becomes broader each year in our increasingly connected society. Our ongoing partnership with MA Exhibitions will ensure that this wider ecosystem is recognised, supported and promoted at TCCA's events, and we look forward to their support as we deliver regional summits in addition to the annual CCW.

"Our joint primary objective is to foster and facilitate innovation that continues to deliver critical and interoperable connectivity to professional and frontline users who keep society safe."

UK policing rolls out facial recognition

Bedfordshire Police in the UK has deployed live facial recognition (LFR) technology in the town of Bedford.

According to the force, LFR works by comparing a live camera feed with biometric 'templates' of images from a pre-established watchlist. It says the watchlists are unique to each deployment and feature 'police images' of those wanted by the police or courts, or individuals subject to bail conditions/specific court orders.

Discussing the history of the technology, a spokesperson said: "Pioneered by the Metropolitan Police and South Wales Police [in the UK], the expansion of LFR was [recently] announced by the Home Office, with Bedfordshire Police as one of seven forces to receive the innovative technology. If a match is found, officers are notified via secure devices to review [the match], ascertaining whether it is true. Officers will then engage with the individual to conduct further assessments to confirm their identification before taking appropriate action."

The force has said that it will also deploy LFR as part of operations to safeguard vulnerable individuals, for instance, locating high-risk missing people, victims of crime and those with "crucial information relating to a serious crime investigation".

LFR strategic lead, superintendent Ian Taylor, said: "We're proud to announce the launch of live facial recognition in Bedfordshire with our first deployment in Bedford.

"We know that the community still has a lot of questions about the use of the advanced technology within policing, and officers will be on hand to engage with [them] and answer any queries they may have.

"LFR [enables] policing to identify and detain wanted individuals, ensuring criminals are brought to justice swiftly, and that the communities of Bedfordshire are protected from crime and harm.

"While this capability is new to Bedfordshire, it has been used across policing and security services for a number of years. Adopting LFR at this stage provides an added layer of assurance as we have seen the technology improve greatly, even outperforming its anticipated accuracy and success rate."

Teltronic private-equity acquisition

Private-equity fund manager Nazca Capital has signed an agreement with Hytera Communications to acquire 100 per cent of the capital of Teltronic.

Describing Teltronic in a statement, a spokesperson said: "Founded in 1974 in Zaragoza, Teltronic is one of the world's leading companies in the design, manufacturing and deployment of mission-critical communication equipment and systems.

"It provides high-security, high-availability solutions for key market segments such as public safety, mass passenger transport and critical infrastructure. Teltronic has its own technological capabilities to develop customised products and solutions based on TETRA, LTE, 5G and 3GPP MCX applications."

The spokesperson continued: "The move will allow Teltronic to boost its current research and development lines. At a time of technological paradigm shift in the sector, these focus on integrating broadband solutions and applications such as artificial intelligence, IoT, big data and cybersecurity into mission-critical environments.

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"The company is also advancing its FRMCS [Future Railway Mobile Communication System] solution, which will further strengthen its leadership in the railway transport market."

According to the statement, Teltronic will maintain its organisational structure and management team, with the new owner expressing "strong confidence in the company's business model".

Teltronic's CEO, Juan Ferro, said: "The backing of Nazca Capital reinforces the validity of our strategic plan, supports our ongoing innovation strategy and will accelerate our growth. This is a continuity operation that strengthens our business project without altering our identity."

TCCA News

TCCA has published a white paper focusing on interworking between LMR networks and mission-critical broadband. The document is called 'Interworking Function (IWF). Interworking of LMR networks with 3GPP Mission Critical Services.'

According to a spokesperson, the white paper "explores the opportunities and challenges of interworking LMR networks with 4G/5G-based 3GPP Mission Critical Services [MCX] solutions by leveraging the standard-defined Interworking Function.

"The aim of this integration is to strengthen communication capabilities, achieve seamless interoperability and enable a gradual and successful adoption of broadband technologies."

The spokesperson continued: "Key opportunities discussed include seamless voice interoperability between LMR and MCX, data service integration, hybrid network support, multimedia feature enhancements for LMR users, standards-based interoperability and unified control room integration.

"The integration of LMR networks with broadband MCX services via the IWF standard marks a major advancement in mission-critical communications. This convergence harnesses the reliability of LMR with the expanded capabilities of 4G and 5G – enabling seamless voice, real-time data transfer, high-resolution video and enhanced coverage."

The white paper was authored by TCCA's IWF Working Group. It outlines the current status of the IWF standard, as well as "emerging feature capabilities, and the level of industry adoption, including support from organisations such as ETSI and 3GPP".

The document also provides a detailed assessment of interworking functionalities and technical requirements, "exploring both standardised and proprietary architectural models to connect LMR networks with MCX services.

"The paper concludes that the LMR–MCX hybrid model offers a practical, scalable and future-proof strategy for enhancing mission-critical communications. [The model ensures] operational resilience, user adoption and ongoing capability enrichment throughout the migration journey."

TCCA CEO Kevin Graham said: "Congratulations to all the industry experts from TCCA who contributed to the preparation of this important white paper. "End-users need hybrid co-existence or graceful transition of critical networks to ensure functional and operational interoperability. Standards-based IWF will be essential to delivering this enhanced capability. TCCA supports harmonising a multivendor approach."

TCCA also announced the appointment of DEKRA as new TETRA certification body, overseeing its interoperability (IOP) testing and certification process.

The organisation describes DEKRA as "the world's largest independent, non-listed expert organisation in the field of standards-based testing, inspection and certification".

Discussing the significance of the appointment, a spokesperson said: "TCCA's TETRA interoperability testing and certification process underpins the ongoing success of the TETRA standard. The independence of the process ensures the ongoing strength of the market.

"DEKRA was chosen from a number of bidding companies after evaluation by TCCA and its TETRA manufacturer members. Several DEKRA offices around the world will be involved in supporting the TETRA IOP process, including those in Germany, Chile, China and Spain."

A storied past, a bright future

Philip Mason talks to outgoing and incoming Sepura CEOs **Steve Barber** and **Chris Barnes** about the history of the business, and hopes going forward

Steve, if we can start with you. You've been with Sepura for over two decades – could you talk about your early experiences with the company?
Steve Barber: I think it was about 23 years ago that we morphed out of Simoco. We were very much there just as Airwave – or its predecessor at the time – was starting up.

Luckily for us, we got acquired by a venture capitalist, for £1. They then put a million into the business to support us through that first year, and I think we turned over around £12m in that time.

In 1998, when I started, we did a hell of a lot of requirements capture, which was a real benefit to the business. A few other members of the team and I did a massive roadshow around the UK and other European territories to understand what kind of problems police users were facing with respect to communication devices.

What kind of problems were they facing?
SB: The long and the short of it was that they were carrying too much weight on their belt. That resulted in a lot of lumbar problems and officers going off sick.

So, while they were traditionally used to a speaker microphone cable linked to a radio on the belt, we put a challenge into our design team. That was to produce a TETRA radio which was the same size as a speaker microphone, ultimately doing away with the cable.

The result of that was the SRP 2000, which was our second-generation product, and a game-changer. It came to market just as we did in the UK and gave us a real leg-up.

All that pre-homework we'd done with users about solving operational problems had really paid off. That said, there were complaints, don't get me wrong.

We had some officers saying: 'What if a car is speeding at me, and I want to throw my radio through the windscreen?' They were in the minority, though.

With that in mind, does Sepura still maintain a close relationship with different user groups? To what degree are they part of the product design process?
SB: To be honest, we've kept 'listen to the customer' as our mantra the whole way along.

That means not trying to dictate to them. Rather, solve their issues with whatever it is that you're bringing to market. It's all about fitting the market requirement and the market need.

What would you say your greatest achievement has been during your time with the company?
SB: From a work perspective, I think it was probably something which took place around 2007. I'd spent six months doing requirements capture around Europe for our next-generation handheld.

I'd done some designs for the team and went to the board at the time, saying that the new device was going to be double the size of the current radio. Nearly everyone told me that I didn't know what I was doing.

As it turned out, that was exactly the right design, and it was how we took two-thirds of Germany when the device went live.

Germany was already using products which were the size of a kitchen table and weighed about the same, so what we suggested was tiny compared to what they already had – even if it was twice the size of what we'd previously done.

The German market insisted the device had to have a rugged side connector which was screwed down. Plus, it had to be square and be able to stand. They'd always had square radios, and that's what they continued to want. Hence, we developed the STP8000.

Again, it's about research – going to see your customers and speaking to them. But more importantly, give them open-ended questions and just letting them talk.

Then, if you visit different customers, you'll end up with common threads going across each conversation. It's not rocket science. It's about listening.

What was the rationale for hiring Chris? What did the recruitment process look like?
SB: Our owners Epiris and I took about two years looking for my replacement, and in the end, we were lucky enough to find Chris. Given his background, it seemed like the perfect match. But also his attitude, and his infectious enthusiasm for driving the business forward.

There's a lot of opportunity for us from a worldwide

> **I think Chris is exactly the right person for the job. I've been here a long time and I don't easily hand over the keys**

perspective, and because of his engineering and commercial background, he understands the process of developing a product that meets end-user requirements in different markets.

I think he's exactly the right person for the job. I've been here a long time, and I don't easily hand over the keys.

Chris, could you talk a little bit about your background, and why you wanted to work for the company? Why was it the right fit from your perspective?

Chris Barnes: I'm an engineer by background and have experience throughout my career in all parts of the product lifecycle. All the way from design, engineering, testing and validation, procurement, manufacturing and sales, across multiple different technology sectors.

So, you could say that I'm fascinated by all things 'product'. What's great about Sepura is that it's a rare example of a UK-based business which is still involved in the entire product lifecycle. It's fascinating to join the team in Cambridge and see everything taking place under one roof.

That aspect of the business gives us an exciting challenge, because we should be faster to market than our competitors, and really bringing those strengths to the fore. It's a great privilege to be taking on the leadership of the company, building on what Steve and the team have already achieved.

How do you plan to increase Sepura's market share in the sector going forward?

CB: The real skill which is required is the ability to strategically assess the market and ask why people would want to work with us.

Some markets are all about price, while others are about the full end-to-end service that you provide. How good is your customer support? How quickly can you turn a customer conversation into a proof of concept and demonstrate what the next generation of product might look like?

What we've really got to make sure is that we have a clear understanding of the future opportunities and requirements in public safety and other verticals – transportation, mining and so on – and then decide which of those we direct sell into. In other words, where should we directly own the relationships and where should we work with existing or new partners.

> "We have to be responsive to customer requirements"

What are the factors involved in the decision?

CB: If you look at some of our markets, we've got partners who are brilliant at TETRA. But they might not be the right partner when it comes to the future growth of broadband. It's a different market with different use-cases, you will have different buyers and end-users, and the procurement process might look very different.

It's very much case by case, but as Steve said, the heart of what we do has to be that close relationship with the customer. We have to be responsive to customer requirements, ultimately delivering the highest-quality product.

Finally, are you optimistic for the future? Not just in terms of the company, but also the mission-critical sector itself?

CB: Very much so. I've just spent the last six years on a very exciting journey in the rail sector [with Tracsis], and this is the start of another exciting journey in the mission-critical communications sector.

This business has got a fabulous reputation and a great team of people who are really passionate about what they do. They've got each other's backs, which is something that you can't necessarily always take as a given. We've also got an owner which backs us and is prepared to finance that growth and the journey ahead of us. Sometimes you come into a business and everything needs to be restructured and costs need to come down. This is completely the opposite.

In terms of the market, it's a really interesting time to look at everything Steve and the team have built and say, right, where can we take this? It's going to be fascinating to see what we learn when we launch the [TETRA/broadband hybrid] SCL3 product later this year. The feedback that we get from customers, and the new opportunities which might come.

SB: It's very much a niche industry, but it's also very interesting, very exciting – and very difficult. But, if you look at the geopolitical environment, I feel that the market will continue to grow.

There will be more and more opportunities for us. We just need to remember to keep doing what we're good at.

5G for railways: gathering speed

The European railway sector is working hard to develop and test the specifications for moving communication and train safety systems to 5G, ahead of the looming obsolescence of its current 2G GSM-R technology. **James Atkinson** reports on progress so far

The European railway sector is slowly gearing up to replace its more than 20-year-old GSM-R technology. GSM-R provides voice and data services between train drivers and signallers and acts as the data bearer for the European Train Control System (ETCS).

GSM-R and ETCS are the key components of the European Railway Traffic Management System (ERTMS). This 2G technology will be replaced by the 5G-based Future Railway Mobile Communication System (FRMCS).

FRMCS promises to aid global interoperability by providing a harmonised rail system facilitating seamless cross-border operations. The enhanced data capacity provided by 5G will enable predictive maintenance, real-time monitoring and advanced passenger services.

5G's ultra-low-latency capability will support safety-critical applications such as train driver to controller communication, railways emergency calls, ETCS, automatic train control and advanced warning systems.

But the task ahead should not be underestimated. GSM-R is deployed on more than 130,000 kilometres of track in Europe (with 90,000 activated on-board cab radios), and some 210,000km worldwide, according to the International Union of Railways. But GSM-R is rapidly approaching obsolescence, and supplier support for the technology is expected to cease around 2035.

Final and fully tested

A final, fully tested version of the FRMCS specifications is therefore needed urgently, so that rail infrastructure managers (IMs) and train operating companies can invite tenders for works packages. However, those final specifications for FRMCS are still a work in progress.

> **"A final and fully tested version of the FRMCS specifications is therefore urgently needed"**

"The process has been much more complex than anticipated," says Oana Gherghinescu, executive director, European Union Agency for Railways (ERA), "and efforts are ongoing to-date. The successful deployment of FRMCS depends on completing its technical specifications, including thorough testing to ensure readiness for production and deployment."

The development of the specifications is being undertaken by the relevant European rail stakeholders, including UIC, ERA, ETSI, EIM, CER, UNISIG and UNITEL, which are defining the necessary functionalities and underlying system requirements.

"The work on specifications is driven by UIC, while the agency co-operates closely with the sector to make sure that the technical specifications are

Adobe Stock/Tomasz Warszewski

sufficiently mature, lean and that the subsequent authorisation processes are cost-efficient," explains Gherghinescu.

"As the ERTMS system authority, our responsibility is to facilitate collaboration among stakeholders to agree on technical requirements and navigate the question marks and challenges before the specifications are turned into legal requirements as part of the TSI [Technical Specifications for Interoperability].

"The progress of the technical specifications developed in the UIC Programme is under assessment by all stakeholders, especially on whether they will be complete and ready in time for massive roll-out as GSM-R is approaching its end of life. The major challenges are to agree on the scope and timing of FRMCS 1st edition and to ensure that all stakeholders are involved in the development of that system," Gherghinescu adds.

A key part of the process is live testing and validation of the current FRMCSv2 specifications, which is now under way in the shape of the €13.5m FP2-MORANE-2 Project.

Funded by Europe's Rail Joint Undertaking, the 34-month project began on 1 December 2024 and is due to end on 30 September 2027. The commercially implementable FRMCS 1st edition (FRMCSv3) is then expected to be finalised and integrated into the TSI, allowing rail IMs to begin migration in 2028.

MORANE-2 is being co-ordinated by UIC with contributions from UNIFE, the European Rail Supply Industry and the participation of 13 European railways, 13 product manufacturers and two mobile network operators (MNOs). The first step involves testing activities in three laboratories run by Ericsson, Nokia and Kontron.

This will be followed by five different live field tests operated on two railway tracks from Spain's ADIF, one from Germany's Deutsche Bahn (DB), one from Sweden's Trafikverket in collaboration with mobile network operator Telia, and one from ProRail in the Netherlands in conjunction with mobile operator KPN. Four of these lines are conventional, while the fifth is a high-speed line operated by ADIF.

Tested on live trains

In September 2025, DB announced that it had deployed Nokia's new 1900MHz (n101) 5G radio network solution with its 5G standalone cloud-native Core Enterprise Solution for railways. These are products that were only officially launched in August 2025. The technology will be tested by DB on live trains and will also be used for MORANE-2.

"We are preparing the MORANE-2 ▸

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test cases," says Emanuele Di Liberto, head of global railway sales at Nokia. "We are going to deploy a lab system and then we're going to do field tests in 2027. That learning will be captured and then become part of FRMCSv3. That will be the basis under which ERA will issue the TSI."

Railway infrastructure managers and operators have a lot of decisions to make as to how best to implement FRMCS. For a start, what spectrum should be used? FRMCS in Europe will use spectrum in the 1900MHz band, as well as reusing the existing 900MHz GSM-R bands. UIC has outlined five main migration options based on what spectrum is used and when.

The first option is to deploy a simultaneous operation of both GSM-R and FRMCS in the 900MHz band. This would involve either implementing FRMCS within the GSM-R band where free GSM-R channels are available, or overlaying 5G on the GSM-R spectrum using advanced scheduling techniques.

A second approach is to migrate to FRMCS in the 1900MHz band, while GSM-R continues operation in the 900MHz band until the latter is switched off. Another option involves simultaneous operation of both GSM-R and FRMCS in the 900MHz band plus FRMCS in the 1900MHz band.

The remaining two options involve migration using MNO services. The first involves simultaneous operation of FRMCS based on MNO services, using one or more MNO frequency bands, in parallel with GSM-R during the migration period. After GSM-R switch-off, the FRMCS system will continue operation using the MNO services.

The other option comprises migration using a hybrid configuration of both GSM-R in the 900MHz band and FRMCS in the 1900MHz band, together with MNO-based services.

Di Liberto reckons the most likely option is that IMs will deploy FRMCS in the 1900MHz band and run it in parallel with GSM-R until the last line and train have migrated to FRMCS.

Rail operators will then need to decide whether to implement FRMCS trackside first, or on-board systems first, or both at the same time. They will also need to decide which lines or regions and types of train to upgrade first and which applications to introduce first.

For example, the migration of cab radio voice applications and ETCS data applications from GSM-R to FRMCS will start with a dual-mode phase. But decisions have to be made as to whether to first migrate the voice cab radio, then ETCS at a later stage, or vice versa, or migrate them simultaneously.

Ease of implementation might influence this decision. As Di Liberto observes: "ETCS is a relatively easy system to support, but voice is more complex."

> The railway is critical national, and international, infrastructure

At the ERTMS 2024 Conference, Deutsche Bahn InfraGo outlined its strategic plan. More than 90 per cent of its 30,000km of lines are currently using GSM-R with 4,000 GSM-R base stations in use, 3,300 controller workplaces equipped with wireline dispatcher terminals, 30,000 cab radios/EDOR (ETCS Data only Radio) and approximately 77,000 handheld radios.

DB intends to migrate to FRMCS line by line and application by application. For this, parallel operation of GSM-R and FRMCS is required, along with dual-mode functionality of the two on board trains.

The aim is to test operations in isolation, then gradually add more lines and functions. This includes interworking functions and international roaming with other European rail operators; and then later adding the first automatic train operation (ATO) applications, along with interworking and national roaming with public MNOs.

At the same conference, the Norwegian Railway Directorate presented its analysis of six possible migration options, each of which was given a socio-economic ranking. It identified the use of rail mobile radio (RMR) frequencies plus frequencies from one MNO as the fastest and easiest way to implement FRMCS.

Every European country is going to ▸

> **"The migration of cab radio voice applications and ETCS data applications from GSM-R to FRMCS will start with a dual-mode phase"**

have to make this kind of analysis and detailed strategic planning. Di Liberto believes the trackside implementation will not be a major problem in terms of equipment supply and installation.

The on-board equipment implementation will be much more challenging. Rail operators will need to carefully assess workshop, engineering and authorisation capacity, along with financing and precise fit-out scheduling to minimise the impact on services.

Approximately seven years

Following the introduction of FRMCS Edition 1, rail operators will have approximately seven years to migrate to FRMCS by 2035. At the ERTMS 2024 Conference, a presentation by SNCF and DB estimated they would need to migrate approximately 10,000 vehicles a year.

Di Liberto says he has heard it takes about three weeks to fit out a vehicle with all the radios, cables, antenna and modems required, but this will depend on the age and type of train.

All this lies in the near future, but there is plenty that rail IMs can do in the meantime to prepare for FRMCS. "You need to have a network backbone able to support 5G with IP/MPLS and modern time synchronisation techniques," says Di Liberto. He points out that some IMs have remained on circuit-switched SDH technology, but it has been possible to implement MPLS on GSM-R technology for over 10 years, and some IMs have done so.

"You also need to increase network capacity, so additional sites will need to be built," says Di Liberto. This is largely because the propagation characteristics of 1900MHz spectrum are less than GSM-R's 900MHz, so more wayside infrastructure is required, particularly outside dense urban areas.

In June of this year, the UK's Network Rail announced the award of its Project Reach, which will deliver a new fibre-optic network backbone. Neos Networks will initially deploy 1,000km of ultra-fast, high-count fibre-optic cable (up from the current 48-count cable to 432 count).

Some 5,000km of cable will be installed. Freshwave will work with MNOs to deploy 4G (with a 5G upgrade path) base stations in 57 tunnels and deep cuttings, plus 4G/5G infrastructure in 12 main stations.

Rail IMs will also need to overhaul their data centre fabric to make it more robust, secure and reliable by engineering a high degree of resilience and redundancy. "They also need to prepare to introduce the cloud, because 5G will fundamentally be a cloud-based technology," says Di Liberto.

IMs can introduce cloud technology now. In August, ProRail, the organisation responsible for the Netherlands' national railway network infrastructure, announced a deal with Nokia to deploy a cloud-native GSM-R core network.

While this will both extend the life, and improve the efficiency, of the existing 2G infrastructure, it will also enable ProRail to gain valuable insights into cloud-native technology and prepare the way for FRMCS.

Di Liberto notes that dealing with cloud-native tech requires "a mindset shift that we believe the industry needs to embrace". He adds: "Let's not forget cybersecurity. 5G comes with a huge amount of cybersecurity inherent in the technology itself, but clearly rail infrastructure managers will also put more security on top."

Meanwhile, the focus is on getting the FRMCS specifications finalised and planning the transition to FRMCS across Europe. "The transition must be strategically planned to avoid delays in investment and ensure technological clarity, while protecting rolling stock investments to ensure financial predictability and operational stability," says ERA's Gherghinescu.

"As we prepare for the implementation of FRMCS, DAC [Digital Automated Coupling] and ATO, our goal is to establish a fully harmonised and standardised set of specifications and a streamlined model for authorisation," she says.

"We anticipate that no national rules will remain in play, allowing us to implement an innovative solution that has been thoroughly agreed upon by all stakeholders."

However, the timing of the mass roll-out of FRMCS and GSM-R obsolescence continues to evolve. "Recent contract extensions in France and the Netherlands and continued GSM-R deployments in Eastern Europe signal that the GSM-R lifetime might be extended beyond 2035," notes Gherghinescu.

"Consequently, the need for FRMCS deployment will need to be considered from a different perspective, also because its deployment will not necessarily be synchronised in every EU member state."

Migrating live railways to new systems is a highly complex and demanding process. But the benefits in terms of increased functionality, safety, sustainability and lower infrastructure costs should make it all worthwhile.

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Winds of change in the Caribbean

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Two British police officers discuss building a new multi-agency control room on Anguilla, including the ways in which it will help emergency services respond to extreme weather

For the past few years, UK public safety comms technology association BAPCO has been sponsoring its own category at that nation's Annual Control Room Awards, recognising technical innovation in the field.

The winners of this year's Control Room Innovation Award were Dale Morgan and Ken Townsend, who together have led on the setting up of a state-of-the-art facility in the British Overseas Territory of Anguilla.

A statement released following the awards ceremony described the initiative in this way: "The Joint Emergency Services Control Room is a part-funded Government of Anguilla and part-funded UK Foreign, Commonwealth and Development Office collaboration with shared goals and clear vision.

"The team in Anguilla achieved this award for their ground-breaking work in launching the island's first, fully interoperable Joint Emergency Services Control Room (JESCR).

"This was a pioneering initiative that has revolutionised tri-service collaboration. It has embedded a bespoke technical architecture full of operational efficiencies and capabilities that has been specifically designed for the business, by the business, a project that many people believed to be unachievable."

The Caribbean island of Anguilla sits in the Lesser Antilles, roughly 500 miles to the east of the Dominican Republic. According to a well-known online encyclopaedia, it comprises a total area of around 35 square miles, with a population – as of 2021 – just shy of 16,000.

Offering more detail on the roll-out, the statement continued: "Previously, the only emergency response service on the island was a single phone, answered by a police officer at the front desk of a very busy police station.

"The JESCR project proactively drove the complex process of merging three distinct emergency services into a single, cohesive operational unit. Answering calls 24/7 on average within one to two seconds."

CCT caught up with Morgan and Townsend in order to dive deeper into the deployment, its logistics and the ways in which the new control room is already changing the culture of Anguillan emergency services.

Island-wide network

Describing how he got involved with the project, Townsend says: "I recently retired as a superintendent from Hertfordshire Constabulary [in the UK]. For a three-year period, I was the head of its force control room, which subsequently afforded me the unique opportunity to work in Anguilla on this project.

"A white paper had already been

written, which provided me with an excellent framework. I then spent 14 weeks in Anguilla launching the entire project, developing a multi-agency delivery plan.

"This not only focused on the creation of the control room itself but also set the foundations for the implementation of a command, control and dispatch system."

When he returned to the UK, Townsend subsequently carried out a remote recruitment process in order to identify the supervisors and call-handlers who would be required to staff the JESCR. The national interest in this opportunity was immense. There were over 160 applicants for the initial 12 positions.

He continues: "Dale then joined the team and we returned to Anguilla for a further eight-week period, in order to fully train the JESCR team, none of whom had previous control room experience. We had to overcome significant challenges to enable both the 911 telephony and emergency services radio communications."

Morgan's background is also in policing, where he had 17 years of experience. He began his career as an emergency call-handler. According to him, during this time, he identified opportunities for improvements and innovation within the service.

Morgan then advanced through leadership roles, ultimately achieving what he calls "a senior and influential position where [he] could lead meaningful change on a much larger, national – and now international – scale". He has subsequently had an influential role in the shaping of UK public contact strategies, "driving national and international digital transformation programmes".

Going into greater detail about his motivation, he says: "My strong sense of passion and drive hasn't changed in 17 years. I always think that if a friend or member of my family needed to contact the emergency services, I would want them to receive the highest level of professional service and care possible. That's my passion and what drives me – compassion for others."

He continues: "I've always been able to see beyond what others see. I see opportunities, efficiencies, new capabilities, all kinds of creative solutions.

"I enjoy the challenge of shaping and delivering meaningful solutions that achieve large-scale transformational change and innovation. Designing and successfully delivering a complex five-year public contact programme in the UK has gifted me so much experience."

The new control room has revolutionised emergency services operations on the island

Moving onto the challenges presented by Anguilla itself, Morgan and Townsend provide some background, both from a societal and emergency services perspective

Townsend says: "It's a British Overseas Territory, and absolutely crucial in the Caribbean. The country is heavily reliant on its appeal as a stunning tourist destination, hence the absolute importance and crucial requirement for an effective and efficient 911 service.

"Before the new JESCR was implemented, there was a single incoming 911 telephone and line, located in the main police enquiry office, known as the Guard Room. The officer stationed within the Guard Room had a whole host of competing responsibilities, and as such, incoming emergency calls were not always prioritised.

"Right from the outset, we designed a joint emergency services control room that would have the ability to take on additional work streams. This will include a national CCTV system, coastal surveillance system, as well as electronic monitoring of those on probation."

> **"Before the JESCR, there was a single incoming 911 telephone"**

Discussing the necessary infrastructure outside of the control room, meanwhile, he continues: "Not only did we develop the control room but also the phone network, as well as a full, interoperable, radio network in collaboration with a local partner.

"Prior to that, dispatch by a single officer in the Guard Room mainly took place via mobile phones, with them attempting to ring police officers or paramedics for critical support."

Going back to the topic of the island-wide radio network, Morgan says: "In order to achieve maximum coverage around the island, we had to upgrade, re-programme and re-network the entire infrastructure, creating resilient connections with host infrastructure providing the JESCR full resilience in service delivery.

"There's no point in delivering a national emergency service contact centre if it can't withstand something as severe and regular as hurricane conditions here in Anguilla.

"With our combined experience in leading complex contact centres, Ken and I understand the critical importance of building a centre that is fully resilient.

"[That is] capable of supporting technology and service delivery in any situation, while safeguarding the dedicated staff of the JESCR. The foundations of such a contact centre must be strong – exceptionally strong."

A recent result of severe weather is the impact made by Hurricane Irma in 2017. This was a Category 5 storm that caused huge disruption and devastation ▸

across the island.

According to Townsend and Morgan, another challenge faced by the team is what the latter refers to as "managed shutdown of technology and power services", which is apparently quite common in overseas territories such as Anguilla.

He says: "You'll receive a WhatsApp saying that the electricity or the water is being taken offline for four hours. That's four hours of disruption we cannot afford, hence the detailed resilience plans to ensure continuity of contact centre services."

Emergency services culture

As mentioned, prior to the deployment of the new control room, the Anguillan emergency services had a very specific, arguably quite limited, way of responding to emergency calls. While by no means ineffective, this was fundamentally different from what might be found in a UK-based control room.

That being the case, you have to wonder how Anguillan emergency services personnel responded to such wholesale change taking place, not only on a technological but also on an operational level.

Addressing this, Townsend says one of the key things that needed to be addressed is what he refers to as "cultural change". This started right at the very beginning of the project, during which every partner was engaged and consulted over the course of the initial 14 weeks.

This engagement included "three significant multi-agency planning sessions" involving not only police, fire and emergency medical services but also the Department of Disaster Management. Other stakeholders present included procurement, finance and other government officials.

Moving on to how that translated to life in the control room itself, meanwhile, Townsend continues: "The first thing we said to the newly recruited supervisors and call-handlers was that this is your control room. We're here to deliver it together, as one team, with one dream.

"The entire team were engaged from the outset. They set their own training rules, designed the national JESCR logo and branding for the control room, along with their own uniforms."

Morgan continues: "The control room needed to have its own identity – something the people of Anguilla could truly embrace.

"For me, cultural change comes in two parts. First are the new processes, how both emergency responders and callers interact to get things done. But more importantly, it's about people. Why this innovation matters, how it improves lives and how everyone plays a part in its success. Ultimately, it's about winning hearts and minds.

"We've now put the core processes in place for running the control room. It's effective, efficient and something I'm exceptionally proud of. But the real work was on the people side.

"From the start, those in public safety and across the public sector were fully behind the idea of a joint emergency services control room. They have been incredibly supportive through some challenging times.

"At the same time, when we engaged with communities, we were often met with confusion and the question: 'What for?' Up until then, many people bypassed the old 911 service altogether because the Guard Room was so busy.

"Instead, members of the public would just ring someone they personally knew in the police or emergency medical service.

"The people-culture challenge is still ongoing and will likely go on for years. But the fact is, we're now answering every call with the same consistent and reliable methodology.

"Everybody loves the control room, and after the recognition, everybody's talking about it. Trust and confidence are rapidly increasing. People report feeling safer and confident that emergency responders will get to them as quickly as possible."

According to Morgan, beyond the core 911 control room functions, additional 'peripheral' solutions are also being introduced to meet specific community needs. One key example is the geo-location tool What3Words, which helps pinpoint people, homes and locations across Anguilla, where – Morgan says – road names and house numbers are extremely limited.

He continues: "For JESCR call-handlers, it was often nearly impossible to locate a caller when the description was something like 'white house in the bush, west'.

"For emergency responders, that lack of detail made reaching people in need even more challenging. What3Words bridges that gap and has already been instrumental in saving lives in Anguilla."

Another important innovation is a 'confidential reporting channel' called Secure AXA. According to Townsend and Morgan, this is necessary to encourage communities and individuals to share important information with the Royal Anguilla Police Force while remaining anonymous. On a small island with close-knit communities, they believe that this service is essential and plays a vital role in supporting intelligence-led policing.

Moving back to the culture of the control room itself, Morgan believes the training received by operators is "significantly more advanced than anywhere in the UK".

Describing JESCR call-handlers,

"The people-culture challenge is ongoing. But the fact is, we're now answering every call with the same consistent and reliable methodology"


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The island of Anguilla sits in the Lesser Antilles, 500 miles east of the Dominican Republic

he says: "They are highly skilled professionals who undergo a comprehensive, ongoing training programme, equipping them to manage calls for police, fire and emergency medical services. They provide reporting, tailored advice and life-saving guidance.

"Their truly omni-competent capabilities allow them to access all emergency service responders via radio channels on a fully integrated technology platform. Trained in JESIP principles and connected through multi-agency co-ordination channels, the JESCR is exceptional in its design.

"Not only have we delivered a control room, but we've also stepped outside the box to test a fully interoperable telephony and radio communications platform.

"JESCR staff can answer emergency calls for all three services on a single screen and, with a simple tab selection, access an entire suite of radio communication channels across Anguilla for emergency responders and other agencies.

"They can transfer or join channels, dispatch single or multiple agencies with a single button press. This is a true game-changer. The JESCR monitors the safety of all agencies and can adapt operations to meet the needs of services with just one click."

The first phase of the project has now been embedded, with the new control room well on the way to revolutionising emergency services response on the island of Anguilla.

That is far from the end of the story, however, with the intention now being to increase the capabilities of the JESCR and further enhance Anguilla's national security capabilities. The most pressing needs in relation to this are the policing of the island's surrounding waters, as well as, of course, extreme weather response.

Morgan says: "The collaboration between the Government of Anguilla, the Governor's Office and the Foreign Commonwealth and Development Office is truly remarkable. These three instrumental bodies have come together to achieve a shared vision for the island.

"They are strongly committed to enhancing Anguilla's capabilities in public safety and national security, investing in new technologies, resources, 24/7 monitoring stations and a pioneering multi-agency communication network.

"I am extremely grateful to continue delivering this incredibly innovative programme that will include further expansion of the JESCR facility, adding new skills and capabilities, new technologies and strengthening its world-class status as a centre of excellence.

"We have recently welcomed a new coastal surveillance system to monitor Anguilla's shores, ensuring vessels requiring assistance can be helped quickly and efficiently. This 24/7 monitoring service also provides a comprehensive picture of activity at sea around Anguilla, deterring unlawful activity and informing intelligence-led policing operations.

"Then there's the National CCTV Monitoring System that is about to be installed, also a 24/7 monitored service incredibly beneficial to public safety and security throughout Anguilla. I am currently drafting what the expansion of JESCR services looks like, but I'm confident it will be a national centre of great benefit to Anguilla.

"The JESCR isn't just a milestone in a project, it's a legacy. A lasting commitment to Anguilla's communities, its visitors and future generations. Stable, reliable access to public safety emergency services at their greatest time of need is now firmly in place."

Townsend concludes: "We've gone from a phone on a desk in the Guard Room, transforming into a state-of-the-art national command and monitoring centre. It has some of the best technology available, capable of supporting the growth of the nation and protecting its security, while safeguarding the incredible communities, visitors and businesses that thrive here."

The story of Anguilla's new Joint Emergency Services Control Room is inspirational for any number of reasons, not least the obvious impact the technology has had on the island's emergency services culture. It is also a triumph of planning, hard work and dedication, as well as a testament to the willingness to work with all stakeholders, including the community itself.

This article first appeared in the BAPCO Journal.

Innovation for the real world

The organisers of this year's PMRExpo discuss why the show is the meeting point for secure communications in Cologne

PMRExpo is an annual event, taking place in Germany

PMRExpo 2025 will open its doors in Cologne from 25 to 27 November. With the exhibition, the PMRExpo Summit, the Connecting Area – and the new accompanying symposium, 'PMRExpo meets Wehrtechnik' on the topic of drone and cyber technology – it offers a unique forum and networking in the field of secure mission- and business-critical mobile communications.

A visit to the trade fair is especially recommended for public safety organisations, operators of critical infrastructures, as well as companies from all economic sectors. The thematic areas include, among others, digital radio BOS, 5G and 5G campus networks, control centres, cybersecurity and the critical IoT.

Innovation and industry dialogue

Exhibitors from around the world will present innovations, products, solutions and applications on the three days of the trade fair. This includes areas such as application solutions, control centre and security technology, infrastructure components and accessories.

Especially topical is the interconnectivity of narrow and broadband networks, as well as the setting up of private broadband networks, which are mostly operated independently by users. These have increased considerably in importance, with LTE and particularly 5G standards.

The changed threat situation in Europe calls for the increased integration of civil and military protection tasks, and thus for co-ordinated security solutions. Communication plays an important role in civil-military co-operation.

The need for interoperable systems becomes especially clear in the field of communications infrastructure. The co-ordination of joint digital communication solutions is thus increasingly becoming the focus of the trade fair.

Platform for learning

The three-day PMRExpo summit is the ideal platform for learning about the latest trends and developments in secure mission- and business-critical communications.

The first day will focus on communications and solutions for critical infrastructures. On 26 November, the summit then concentrates specifically on public safety organisations. On the final day, 27 November, the programme is dedicated to control centres.

Renowned managers and experts will shed light on current challenges, present practice-compatible solutions and provide insights into proven best practices.

The summit offers space for an exchange on innovative technologies, security aspects and business chances, specifically promoting knowledge transfer and the formation of valuable networks in the industry.

Users, experts and specialists from industry, authorities and research organisations that use or provide security-critical communications systems will meet here.

5G Hub for Private Networks

Following the successful start last year, there will once again be a special area in 2025 dedicated to the theme of 5G. In the '5G Innovation Hub for Private Networks', exhibitors will demonstrate live how private 5G networks are setting new standards for networked applications in industry, logistics, security and critical infrastructures.

Visitors will experience real-world scenarios and technological innovations that boost efficiency, flexibility and security while ensuring data sovereignty.

Connecting Area

The Connecting Area will once again provide the opportunity for an exchange of knowledge, and networking. The programme is diverse and offers exciting insights into the industry, from expert lectures through product presentations to start-up pitches and the awards ceremony for the Hackathon@PMRExpo.

On day one, the featured topic is 'Private 5G live – solutions for connected security and digital sovereignty'. Experts and users will provide insights into application examples, challenges and approaches to solutions.

Innovative tech meets crisis

The Hackathon@PMRExpo has established itself as a successful format at PMRExpo and is entering the next round this year. Under the banner of 'Technology meets crisis – shaping the communication of tomorrow', leading innovative minds will meet to jointly rethink communication in crisis situations. In a 48-hour design and coding marathon, interdisciplinary teams develop AI-supported, practical and socially relevant solutions.

In 2024, more than 40 hackers, 120 community members and 12 exhibitors took part in the Hackathon. The winning team's project is currently taking off in the context of an EXIST start-up grant.

'PMRExpo meets Wehrtechnik'

The first 'PMRExpo meets Wehrtechnik' symposium will take place during PMRExpo in 2025. It aims to foster the exchange between the German armed forces, public safety organisations and industry.

PMRExpo thus introduces a format that addresses current challenges with practical solutions. This year, the symposium will concentrate on both the technical and regulatory aspects of military drone operations and aspects of cybersecurity.

Product news

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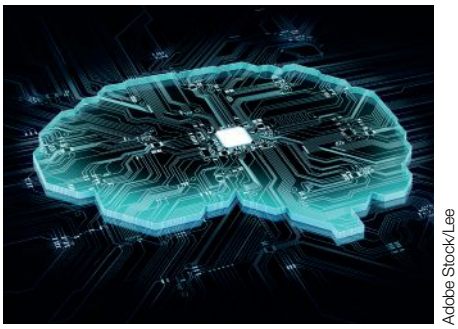

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Ignion's artificial-intelligence-driven antenna integration

Ignion has launched Oxion 2.0, which it describes as an "AI-driven RF and antenna design tool".

According to the company, the solution is designed to "simplify integration and remove the usual roadblocks".

Discussing the product, a spokesperson said: "Now featuring automatic PCB Gerber review, Oxion 2.0 processes and analyses PCB Gerber files in detail and quickly reports back on integration readiness and optimisation opportunities.

"Also new, the embedded AI assistant provides expert-level guidance on antenna theory and helps users interpret reports and optimise their designs. Fully integrated in the desktop environment, the assistant is available in real time to provide instant, actionable insights."

Additional features include what the company calls an AI design explorer, intended to "adjust antenna placement, dimensions and clearance".

Ignion cloud product manager Aitor Moreno said: "Building on powerful performance prediction and interactive design capabilities, new features of Oxion 2.0 deliver tremendous time savings.

"Automatic PCB Gerber review relieves hours of manual design validation, while the AI assistant gives instant access to expertise that would take many years for an engineer to accumulate.

"Oxion now accompanies users even further along their journey to achieving perfect antenna-PCB integration."

Motorola Solutions' public safety AI innovation

Motorola Solutions has launched SVX, which it describes as "a first-of-its-kind video remote speaker microphone that converges secure voice, video and AI". The new solution is designed for the company's flagship radio, APX NEXT.

The company is also launching its AI-based Assist solution, which is designed to provide "contextual and actionable information that's personalised for the time, person and place where decisions need to be made".

Discussing the technology, a spokesperson said: "As a converged and wireless device, SVX effectively halves the number of devices and reduces maintenance.

"Everyday shifts are covered with the swappable battery.

"Critically, the convergence of radio, video and AI serves as a force multiplier, capturing and synthesising a greater diversity of data throughout an incident for more accurate police reporting and verified evidence."

The SVX solution also features ambient noise reduction, while its HD video "retains all ambient sound to protect the objective integrity of everything an officer sees and hears through the camera".

Assist, meanwhile, "redefines SVX from being hardware to actively supporting an officer in real time". It enables – among other things – the ability to query a licence plate and "automatically search for associated records or warnings".

It can also "turn SVX into a live language translator between an officer and a community member".

Nokia brings AI-driven network tools to market

Nokia has launched new software tools as well as AI models, intended to "significantly improve operational efficiencies and enhance network reliability". The products are part of the company's Altiplano platform.

According to a spokesperson, the new solutions will enable operators to "create a comprehensive digital twin of their FTTH network and establish a single unified view of active and passive components". This will in turn help to reduce operational cost, as well as providing the ability to detect disruptions earlier.

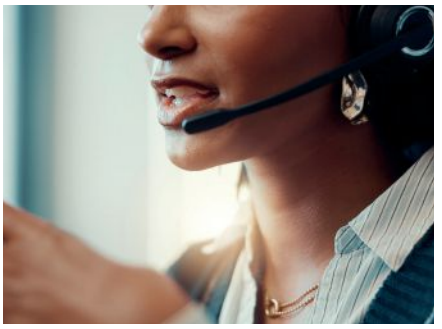
The spokesperson continued: "Nokia Altiplano gives operators a unified, real-time view of their FTTH networks, using automation tools to continuously validate inventory, topology and resource data.

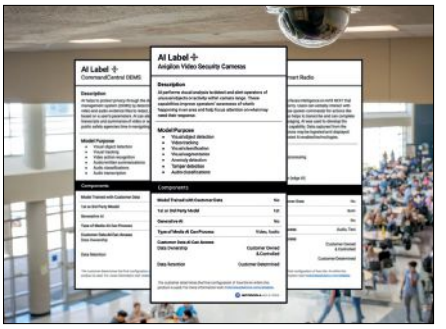
"The new AI-powered Fiber Health Analyzer application allows operators to monitor the health of fibre links, audit the imported topology, isolate fibre faults, proactively detect issues and perform root cause analysis.

"The Altiplano digital twin capabilities, meanwhile, are compatible with diverse inventory and geospatial software solutions."

Nokia broadband networks general manager Geert Heyninck said: "We can help operators eliminate the blind spots associated with FTTH deployments by removing the need to look at the active and passive network independently.

"Our software tools and digital platforms provide a unified view of the network, allowing operators to detect issues faster and resolve them before they escalate."





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Company pitches AI translation to public safety

Vasco has launched its Translator Q1 in Europe, a device which the company believes is ideally suited for use by the emergency services.

Combining "cutting-edge technology with a user-friendly design", Q1 offers an array of functionalities. These include 'Call Translator', which according to the company translates calls in real time in 53 languages. Complementary functionality 'My Voice', meanwhile, produces a digital version of the call-taker's voice, enabling them to 'answer' in multiple languages.

Users also have the opportunity to choose whether they want to answer in a female or male voice.

Going into greater detail about the voice translation functionality, a spokesperson for the company said: "The feature allows [users] to communicate with 90 per cent of the world's population. [It possesses] 96 per cent accuracy, which captures every nuance.

"Whether exploring new cities, sealing business deals or making life-long friendships around the world, this multi-lingual translator allows users to speak freely and confidently. And with automatic mode, they don't have to worry about buttons."

Moving onto the specific public safety use-case, the spokesperson continued that features include long-lasting battery life, unlimited connectivity, "strong data security" and "exceptional audio clarity".

"[The solution] instantly dissolves linguistic obstacles, delivering responsive precise assistance to citizens from diverse linguistic backgrounds," they said.

Industry giant introduces 'AI nutrition labels'

Motorola Solutions has announced that it is introducing what it calls 'AI nutrition labels' to "provide clear, concise information about how artificial intelligence is used across its safety and security technologies".

According to Motorola Solutions, each label will explain the type of artificial intelligence used, as well as who owns the data, human controls and the purpose behind "the product's specific application of AI".

The initiative is aimed at helping users understand core artificial intelligence "ingredients".

Discussing the company's use of AI, a spokesperson said: "[Artificial intelligence] is fundamental across Motorola Solutions' ecosystem of safety and security technology [products].

"It is designed to proactively assist people with accurate, actionable and reliable information that gives them not just context but clarity.

"The company's AI strategy is centred on enabling an assisted experience that helps people prioritise their actions and make sense of holistic and dynamic information that surfaces from a wide array of people, roles and technologies during an incident."

Motorola Solutions executive vice-president and CTO, Mahesh Saptharishi, said: "It is our unwavering conviction that technology – including artificial intelligence – is the bedrock for safety and security.

"It must be deployed with purpose and transparency to fulfil its promise as a force for good."

AI-based networking tool launched by Ribbon

Ribbon has announced the launch of its new Acumen product.

Discussing the solution in a statement, a spokesperson for the company described it as "a powerful new AIOps and automation platform, designed to help service providers and enterprises navigate the complexities of today's challenging operational environment and accelerate their transition to autonomous networks.

"Ribbon is dedicated to helping service providers, enterprises and critical infrastructure operators worldwide modernise and secure their networks and services."

According to the company, the product includes 'out-of-the-box' applications built on its Analytics and Muse solutions. Acumen Builder, meanwhile, enables the "creation of custom apps tailored to the needs of telecom and critical infrastructure.

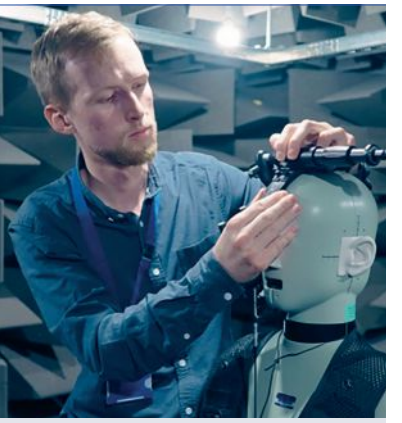
"It introduces a low-code/no-code workflow builder that easily instantiates AI agents into any business process. It includes an AI services layer allowing for flexible integration of models, data stores and related services."

Discussing the product, industry analyst Roy Chua said: "Acumen's AIOps and automation are a compelling extension to Ribbon's portfolio. Acumen draws on the company's experience in delivering proven solutions across Layers 0/1 to 7, leveraging cloud-native software architecture.

"With its track record across Tier 1 providers and other mission-critical networks, Ribbon is well-positioned to distinguish itself in a new generation of AI-powered platforms."

A bright future ahead

TCCA Young Engineer of the Year, Sepura's **Adam Howe**, discusses his career so far and what the award means to him



Adam Howe

Can you tell us about your current position and what a typical day looks like for you in your role?

My current day-to-day activities mostly consist of ensuring the audio for our newest radio, the SCL3, will perform the best it can for our customers. This involves adjusting the audio parameters for hundreds of different use-case possibilities, such as different accessories and different call types, so that it can be reliable and flexible for the user. This includes things such as noise suppression, howl suppression, automatic input gain and equalisation, to shape how the radio sounds.

Other activities might include assisting the customer support team with any audio-related queries. Or, assisting the electronics team with testing and assessing any new components on our existing products, which might be required due to obsolescence. This ensures that our current products continue to perform.

All of this work takes place in our own anechoic chamber at our headquarters in Cambridge, allowing us to conduct tests and make adjustments very quickly and reliably.

What specific projects or achievements are you most proud of in your current role?

My favourite project was creating my mobile acoustic testing box. The aim was to create a mini version of our anechoic chamber, providing us with another reliable and repeatable testing enclosure that could work alongside the main chamber.

This has greatly aided our productivity as a team, and also allowed us to test elsewhere in the building if required.

Can you walk us through your career path from graduation to where you are today? Were there any pivotal moments?

I got into music and playing guitar at the age of 11, and from there decided to take music at GCSE. I then took a music course at Cambridge Regional College, where I became interested in how stringed musical instruments function. This was my first interest in acoustics.

I then went on to study audio and music technology at Anglia Ruskin University, which provided a taster into a wide variety of audio-related career areas. One of the areas that I immediately gravitated towards was acoustics and psychoacoustics. I developed a desire to learn how sound was created. My interest in stringed instruments was enhanced as it provided me with more scientific explanations for how they sound the way they do.

The course also included other areas such as engineering mathematics, electronics, digital signal processing and sound engineering.

With a clearer view of what I wanted to pursue, I went on to do the Institute of Acoustics post-graduate diploma in acoustics and noise control at London Southbank University. The course provided me with the practical skills and knowledge required for conducting acoustic measurements, both in an anechoic chamber and in the field, as well as analysing and processing the data. These skills have been really valuable for my current role.

While finishing the course, I worked as a production technician at Prism Sound, a company that designs and builds audio interfaces for music studios. This involved assembling, testing, repairing and servicing the products. I was then hired as a graduate acoustic engineer at Sepura.

Who have been your most influential mentors or role models throughout your career so far, and what did you learn from them?

My most influential mentors in my short career have been the two main engineers in my first job at Prism Sound. They taught me the basics of fault-finding and the importance of putting an extra bit of effort in to make sure the product is right for the customers.

What does receiving the TCCA Young Engineer of the Year award mean to you?

Being nominated, shortlisted and then chosen as the winner for this award all came as a big surprise to me.

Winning the award reflects my passion for trying to provide the best possible performance for critical communication solutions used by the emergency services. It has strengthened my commitment towards this.

Looking back, what advice would you give to engineering students or recent graduates?

I think it's good to have an idea in your head of what area of study you want to pursue and what you want to achieve. However, it's also great to try lots of other things and gain experience in different areas, because you never know what opportunities might come your way, or what secondary skills might be useful in securing your future job.

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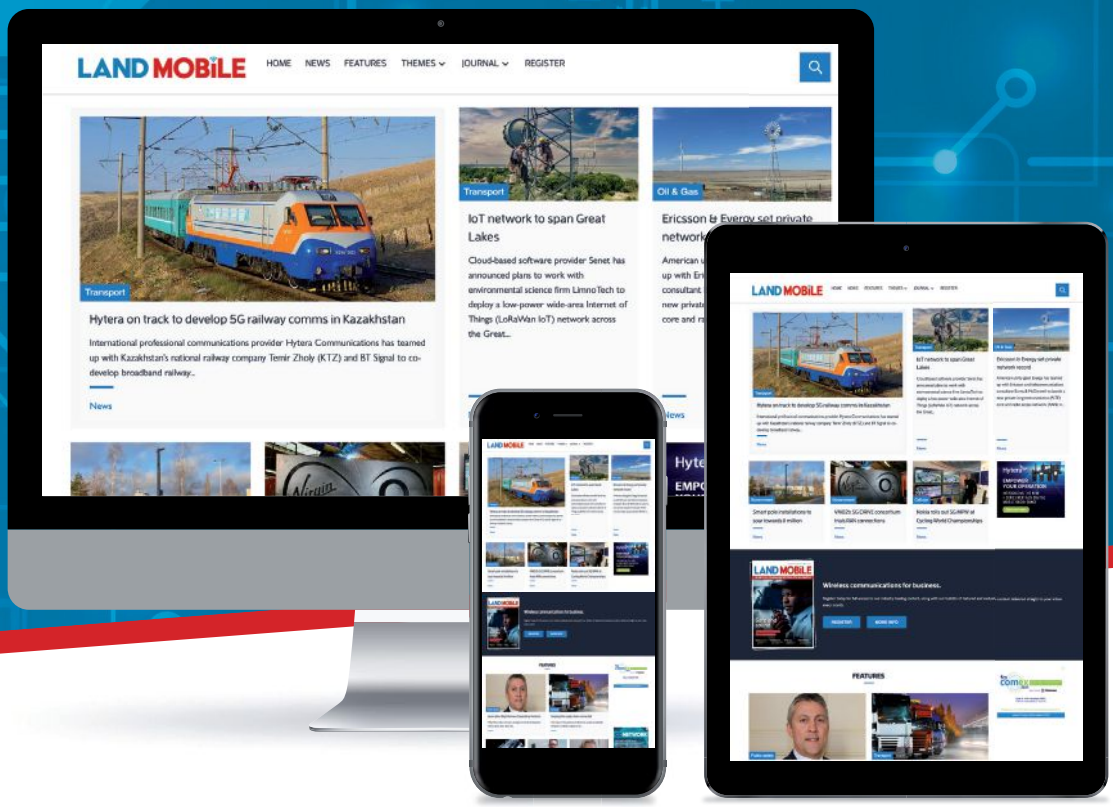

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Crit comms community converges in Belgium

CCT reports on some of the major themes from this year's Critical Communications World and its conference, taking place in Brussels

This year's Critical Communications World conference provided an enormous amount of content, covering every part of the global sector.

Clearly, these few pages are not nearly enough to do justice to even a small percentage of the presentations that took place. With that in mind, in this review we are going to focus primarily on some of the most pressing issues for the international critical communications sector.

This includes the impact of artificial intelligence, as well as other 'emerging' technologies, the continuing evolution of TETRA, and so on.

But we will begin with arguably the most pressing issue of them all. That is, the ongoing move from narrowband to broadband critical comms, as well as the development of interworking functionality to see organisations through in the interim.

National roll-outs

One presentation that encompassed all of the latter came from Lene Gisselø Maaløe, who is the head of the Centre of Emergency Communication at the Danish Emergency Management Agency. The presentation – which was called 'Critical communications status in Denmark' – gave an update on just that.

Maaløe began the presentation with an overview of her organisation's structure, as overseen by the Danish Ministry of Resilience and Preparedness. The latter was established in August of last year in order to "put a larger focus on all the different challenges meeting us from [around] the world".

One part of the new ministry, she said, is the Danish Emergency Management Agency. Embedded within that, meanwhile, is the Centre for Emergency Communications, having been transferred from the National Police.

CCW 2025 provided an enormous amount of content

Maaløe continued by describing the country's current TETRA network, SINE, as provided by Motorola Solutions. She then discussed the planned next phase of the country's emergency services comms, going back to an initial contract signing in October 2023.

Discussing this, she said: "The pilot test has been completed in March of this year. We've been [looking at] the hardware and software up to December

Adobe Stock/ Lena Wurm

The event took place in Brussels, not far from the landmark Atomium

2024. So, we're on track, and the contract will be in operation by April of next year, or at least that's the plan. It will be an eight-year contract, but with the possibility to terminate three years early – and also with the opportunity to extend for five years.

"Any insecurity we might have had about being ready for the next generation, I think we've got something like a five- to 13-year contract right now. It's a nice position to be in."

Moving onto the contents of the contract itself, Maaløe continued: "We included a new feature in the contract, called Dimetra Connect. That's a feature – still to be proven, but we're very confident – to maintain TETRA features over broadband when outside of TETRA coverage.

"So, the switch between TETRA and broadband is automatic and requires no user interaction. This is not a broadband solution, however – it is a carrier for TETRA. It's a way to solve some of the coverage issues, for instance, when users go into shopping malls or underground parking lots."

Discussing devices, she said that users would require something that had either Wi-Fi or an embedded SIM card for LTE access. "You need to have the possibility to access both kinds of networks."

Following this phase, meanwhile, the 'next generation' of critical comms in Denmark (that is, broadband) will be known as FREBI. This stands for 'critical communications infrastructure' in Danish. FREBI is currently in the funding stage, with the programme in the process of conducting small-scale pilot tests.

Other national updates included the RRF in France, SafeNet in South Korea, critical communications in India, and many more.

The use of mission-critical broadband in a different operational context was explored by Leonardo Cyber and Security's Massimo Lenzi, and HPE's Stefano Cocco. The title of their presentation was 'Italian defence private mobile broadband network: challenges and opportunities'.

The session began with some context, the presenters stating that their companies had been awarded a contract from the Italian Ministry of Defence. This is to provide the first 5G infrastructure for the country's military.

Lenzi outlined the parameters of the project, as well as the problems that needed to be solved. "The customer had [several] requests, and main challenges," he said.

"The first one was to rely on a complete, dedicated 5G infrastructure, potentially connecting all Italian sites belonging to the Ministry of Defence. They decided to start with the first milestone, mainly based on the core network and some tactical bubbles.

"The second point was to implement a system that from the very beginning was taking care of connectivity and interoperability with pre-existing systems, like command and control.

"And then, of course, the possibility to deploy part of the system, whenever ▸

needed for tactical operations. This is not a tactical infrastructure, but this requirement was quite clear at the time."

Lenzi then went on to describe the "comprehensive solution" comprising the system architecture. This included a redundant 5G core network, installed across two main sites.

He continued: "On top of this, the Ministry of Defence intends to build the national infrastructure. But in order to test the capability of the core network, two server farms were also provided, redundant between the two sites. [This is] where the third-party applications are installed.

"At the moment, the main application testing the solution is the Leonardo MC Links. Then, we [installed] one transportable 5G system, which is providing coverage to the local site."

The important thing, he said, is that everything is based on the Italian Integrated Defence Network. This is a transport network, "partly optical, partly radio relay", which is completely owned by the defence administration.

He continued: "At the end of the day, this is a network which is 100 per cent based on facilities belonging to the defence administration. The Ministry of Defence own the frequencies, own the backbone, and now is owning the core network, all the applications and the access radio."

He said the system was almost completed, anticipating that it would go operational in the month following the presentation currently being reported on (July of this year, in other words). It would provide connectivity to 1,200 users, with the ultimate aim being for the MoD to operate the system independently of its providers. "Extensive training" is currently being provided in order to achieve that goal.

The certification piece

A key aspect of the move to mission-critical broadband is the certification process. This was covered in-depth during a presentation from TCCA Technical Forum chair Harald Ludwig, and the Global Certification Forum's Asif Hamidullah. The session was called 'The MXC Certification Programme – a key step in the migration to broadband MCX'.

Ludwig began by providing some context and history of the certification piece. This included the TCCA TETRA certification programme, which leveraged the ETSI TETRA standards while laying interoperability and conformance over the top.

Discussing this, he said: "I believe that this was one of the real success factors of TETRA, because everyone was asking for the certificates. So, every vendor needed to participate and test, and this really created a very interoperable, multi-vendor market."

He continued: "In parallel, GCF did something similar for the commercial market. It was founded 25 years ago, taking the 3GPP standards for mobile network technologies, and creating a certification programme.

"This consists of assessment-capable entities of recognised test-organisations, with the framework allowing testing and certification of devices. [It] also enables an interoperable multi-vendor market. If you buy a smartphone today, you expect that it will work on every network in the world."

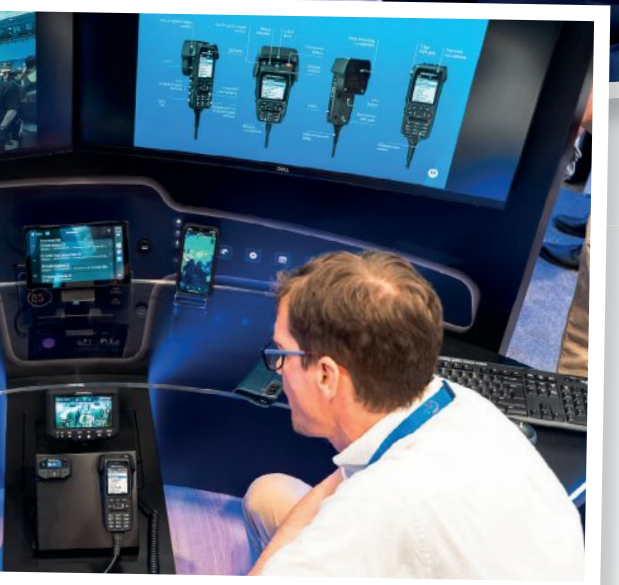
Bringing the story up to date, Ludwig said that the two organisations decided that they wanted to join forces and embark on a similar programme for broadband mission-critical products.

The CCW exhibition floor featured a broad range of companies and tech

According to him, this involves taking the 3GPP MCX standards, with the ETSI Plugtests providing the opportunity to "test with each other and verify the standards".

This in turn led to the establishment of the conformance and certification programme, which was launched in June of last year. In parallel with this, the organisations are also embarking on interoperability certification.

He said: "A third thing we're working on, together with GCF, is the so-called



performance testing, which ensures that implementation complies with indicators such as voice quality, call set-up times, and things like that. We are also working on establishing a programme to do performance testing with GCF."

Hamidullah continued the presentation by discussing GCF's role in more detail. He said: "When we look at the testing, what services are we covering? Today in the GCF, our three main areas for phase one have been mission-critical Push-to-Talk, mission-critical video and mission-critical data.

> **"We're putting a lot of thought into how to create those curated datasets, used to train AI models"**

"We started off with Release 14, supporting these over LTE. But now we're progressing towards execution over 5G. The current scope is the client and UE side of certification, but we are working in the near future to establish the scope of certification for server-side.

"This includes all the interfaces which are on our road map, such as the control room, server-to-server, as well as the IWF."

Cameras and sensors

As anyone with an interest in the sector will know, the use of artificial intelligence by mission-critical organisations is becoming increasingly integral to the conversation.

A key CCW 2025 session looking at this was delivered by Brianna Huettel, Kerianne Gibney and Dereck Orr from NIST (the National Institute of Standards and Technology).

The topic of conversation was the Public Safety Communications Research Division's use of AI for its own work.

The title of the session, meanwhile, was 'Artificial Intelligence, but real-world applications: leveraging machine learning for advanced public safety communication'.

A key area when it comes to AI in public safety is the importance of data. Discussing this in particular, Orr said: "There is [currently] not a scenario – there isn't a use-case – where somebody doesn't talk about where AI can be applied.

"It is definitely exciting technology, with all kinds of applications to really improve response. However, it comes with a lot of risks as well. So, as much as we're excited by the capabilities, we at NIST want to go into this new age with an understanding of those risks."

He continued: "In the public safety field, we're not just looking at AI to draft a resumé or find out what books to read. We would be using it to make life and death decisions for first-responders, and that comes with a lot of risk."

Orr followed this up by stating his belief that the "outcome" from AI is only as good as the input that trains it in the first place. Or as he put it: "Garbage in, garbage out."

Discussing this, he said: "If you train it on bad data, you're going to get bad outcomes from the AI system. It might seem like a great feature to have AI in systems across public safety. But if you aren't sure that it was built and trained off of curated, purpose-built datasets, you really have to ask yourself what the outcome is.

"We're putting a lot of thought into how to create those curated datasets, which will be used to train AI models in specific use-cases."

One example of that, he said, is the use of cameras and sensors in the environment in order to detect 'public safety movement' and then make assumptions about what the user is doing. Plus, make assumptions about whether they're injured, in a dangerous situation, and so on.

With that in mind, Orr said NIST is using one of its facilities in Boulder, Colorado to bring in public safety personnel to "execute various tasks as per their training". The aim of this is to create a curated dataset based on first-responder movement, which in turn can be used to inform industry and academia.

"That's just one example," he said. "That's a dataset that does not [currently] exist. You can't just go and scrub movies and YouTube videos to determine how public safety operates and moves.

"You have to base it on reality. You have to base it on their training."

Other sessions focusing on artificial intelligence included Airbus's Serge Delmas discussing 'How can AI and data spaces be used effectively in critical communications'. President of the SafeNet Forum, Seong Ju Kang, meanwhile, discussed the establishment and operation of a 'citizen safety' AI centre.

As mentioned, this article has barely even scratched the surface of Critical Communications World 2025.

Luckily, many of the conference sessions are available in full via our new Media Library, on the *CCT* website. Visitors will also find interviews with exhibitors from across the show floor, including Motorola Solutions, Nokia, and more.

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Understanding the IWF interface

TCCA's Interworking Function Working Group discusses its new white paper. The group is chaired by Harald Ludwig and Michel Duits

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What was the background of the white paper?

The Interworking Function [IWF] white paper was written to inform mission-critical users – like public safety authorities and vendors of TETRA systems and MCX servers – about the IWF interface.

The interface was specified in 3GPP to enable connectivity between MCX servers and narrowband technologies such as TETRA, P25 and GSM-R.

The paper outlines the capabilities of the IWF, and which features can be brought across the different technologies. While TETRA is used as the primary example, the principles apply equally to technologies like APCO P25.

Why is the white paper necessary?

The paper should help to facilitate the adoption of the IWF as a standards-based solution for connecting different technologies. It is especially necessary for TETRA because the TETRA IWF does not specify an internal interface to the TETRA system. This requires the vendor of the TETRA system to implement the IWF.

If a TETRA system vendor does not want to implement this IWF interface, the paper also outlines other possible options to connect TETRA systems with MCX systems. The alternatives all use the standardised IWF interface and other available interfaces on the TETRA side.

Ultimately, the white paper serves as both a technical guide and a strategic roadmap. It helps stakeholders navigate the evolving landscape of mission-critical communications and prepare for future developments, including 5G compatibility.

The main key finding – particularly for the TETRA case – is that alternative solutions exist to implement the IWF on the TETRA side, significantly reducing the need to rely entirely on the TETRA system vendor for IWF integration.

This insight is crucial as TETRA systems do not natively define an internal interface for the IWF. As a result, the implementation of the IWF has traditionally depended on the vendor's willingness and capability to adapt their systems.

The white paper highlights that this dependency can be bypassed by leveraging standardised reference points defined by 3GPP, and by deploying the IWF as a standalone entity or embedded component within the MCX architecture.

What is the current status of the IWF standard?

The IWF is fully standardised by 3GPP for the MCX server side. For narrowband technologies, ETSI has published standards for interworking with TETRA and GSM-R, and ATIS/TIA has published standards for interworking with P25 and land mobile radio systems.

Both 3GPP and ETSI are working on adding functionality to the standards, but the important features and functions are available today. Implementations of the native IWF are demonstrated in the ETSI MCX and FRMCS Plugtests. And the other implementation options were shown during Critical Communications World in June 2025 in Brussels.

Thinking about public safety in particular, what is going to be the most popular model?

Public safety in particular benefits very much from the information-centric opportunities that broadband services provide. Many European countries are in the process of moving from their nationwide public safety TETRA and Tetrapol services to 3GPP-based 4G/5G.

This transition will require a significant amount of time, including to ensure broadband coverage in currently under-served areas. Elsewhere, there are nations aiming to do the same and others that are, at least for now, targeting running narrowband and broadband in parallel.

Looking at the societal level beyond just public safety, there are other critical communications stakeholders. Most probably some of them will continue to use narrowband technologies, so on a national level there are likely to be both broadband and narrowband systems in use that will benefit from being interconnected.

What are the factors informing those decisions?

The key drivers to use exclusively broadband or exclusively narrowband service are to have uniform capability across users and to save on operational cost when only one system needs to be maintained.

A hybrid model may in turn be a cost-optimal solution when metropolitan and urban areas require capacity and various services to cope with daily usage levels, while at the same time remote areas are above all coverage-driven.

Clearly, a hybrid model with overlapping coverage provides an additional layer of redundancy and resilience, which in many disaster-prone [areas] is the decisive factor.

The lead author for the white paper was Sylvain Allard from Capgemini. The document can be found here: https://tcca.info/about-tcca/tcca-resources/whitepapers/

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