

# chapter 8

## Critical Communications



**Tony Gray,  
Chief executive,  
TCCA**

The critical communications landscape in Africa is one of contrasts and huge opportunity. The economic diversity of the continent together with an improving economic outlook have provided the foundations for increasing investment in critical communications infrastructure. This is opening the door to many PMR technologies for a range of users including government public safety and security agencies, utilities and industrial sectors.

Africa's growth outlook is positive. It is boosted by expected increases in commodity prices and domestic demand which continue to drive the region's growth. Better macroeconomic management, increased diversification and an improved business environment should maintain the region's growth resilience in 2018.<sup>1</sup>

This strengthening economy has created a good foundation for investment in PMR standards such as TETRA, which outstripped growth of any other technology in 2017 in Africa and saw a doubling of shipments bound for the continent.

Not only has TETRA been successful in the more developed economies of Africa such as Nigeria, South Africa and Angola, it has also made its mark elsewhere. In common with other countries in the region that have experienced war and the subsequent rebuilding of safety and security, states such as Libya, for example, have been recipients of strong investments in TETRA communications.

The cost sensitivity of this region coupled with a large number of legacy analogue users has also resulted in the success of DMR technology over the last few years. DMR solutions provide critical communications for police forces in Uganda, Ethiopia, and Tanzania, in addition to other public safety and security

organisations such as port authorities in Kenya and Tanzania. In other sectors, DMR has been installed in airports across the region, and was also used at the *Africa Cup* in Gabon in 2017.

China's inauguration of its first naval base in the region in Djibouti in 2017 is indicative of foreign direct investment in the region, and will create further demand for digital communications by government agencies and port authorities as security tightens there.

Africa has also been quick to adopt new technologies such as LTE, with countries such as Kenya using it for their public safety networks. In one of the notable successes for TETRA, Angola opted for a nationwide TETRA and LTE convergence solution in 2017 to service its public safety and security apparatus, ensuring the delivery of critical voice communications in conjunction with data rich features of LTE.<sup>2</sup>

However, LTE is not yet a mission-critical standard bearer. Narrowband mission critical technologies such as TETRA operate on dedicated networks with dedicated spectrum, and are built on standards designed specifically to support critical users. Yet as the Kenya and Angola examples illustrate, LTE is already being used to deliver broadband data services. It is therefore essential that the LTE standards are enhanced to ensure the bearers can meet the specific needs of critical users.

Together with other key stakeholders around the world, TCCA works closely with standards organisations ETSI and 3GPP to ensure the necessary features and capabilities are defined in the LTE standards. This will result in a common global LTE standard that will support mission-critical broadband communications, and that users can trust to support their needs.

The lack of dedicated spectrum for critical broadband is also an issue. TCCA lobbies governments and regulators to try to ensure there is sufficient spectrum for future critical LTE services. The World Radio Communications

Conference has revised Resolution 646 to address broadband spectrum needs and added 694-894MHz as the globally harmonised frequency range to be considered when individual countries undertake national planning for public protection and disaster relief (PPDR) applications.

In 2017, the South African Development Community (SADC) member states agreed a new framework for PPDR to include broadband in 700MHz in addition to the core bands in UHF 400MHz for narrowband. The African Telecommunications Union later adopted their proposal and agreed a common proposal to harmonise the spectrum for PPDR across African states.

The decision was further reflected in the latest revision of the International Telecommunication Union's ITU-R Rec. M. 2015 with harmonised bands for broadband PPDR in the lower part of the harmonised IMT band in the 700MHz band based on 3GPP LTE specifications. For narrowband, the decision includes 380-400MHz as the core band and 410-430MHz as the expansion band base for narrowband land mobile radio systems supporting frequency duplex spacing arrangements of 10MHz and bandwidth of 25kHz.

Such a decision enables public safety agencies that have not yet been allocated spectrum to seek frequencies nationally from within the ranges above and coordinate activities cross border accordingly. A number of administrations in Africa have announced national decisions to reserve a third of the 700MHz spectrum for broadband PPDR (2x10MHz) and will avail the remaining for the commercial deployment of broadband services as soon as digital TV is migrated to the lower band.

The allocation of spectrum for critical broadband is crucial as mission and business critical communications evolve to leverage

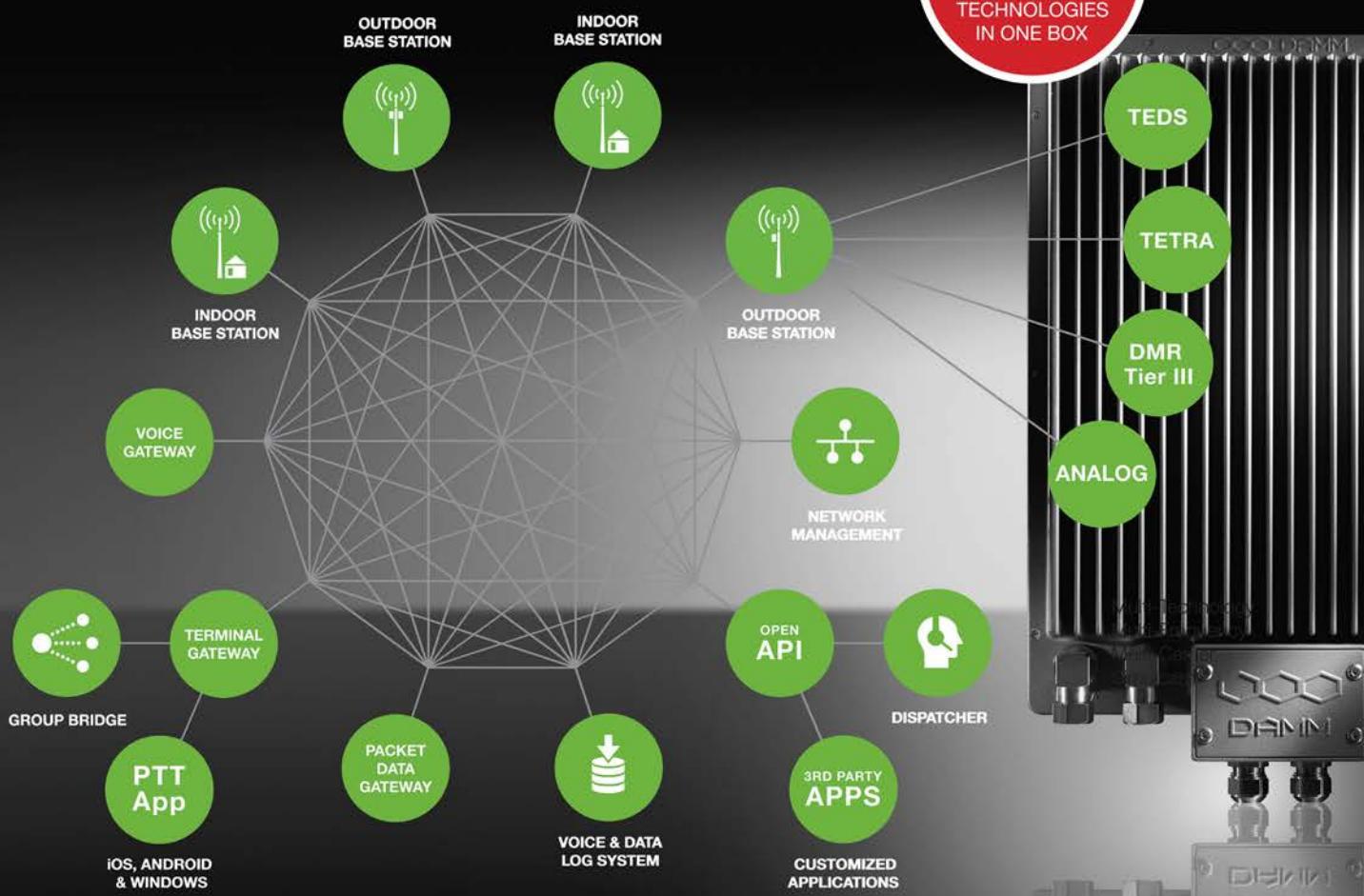
<sup>1</sup> <http://www.africaneconomicoutlook.org/en/outlook/africa-s-macroeconomic-prospect>.

<sup>2</sup> Also see section under *LTE and public safety* on p113.



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LTE to either supplement narrowband services or deliver critical communications over commercial mobile networks. ■

*Unless otherwise stated, all statistics are courtesy of TCCA member IHS Markit. Spectrum information is courtesy of TCCA member Motorola Solutions.*

*TCCA represents all standard mobile critical communications technologies and complementary applications. Members are drawn from end users, operators and industry across the globe.*

*The TCCA believes in and promotes the principle of open and competitive markets worldwide through the use of open standards and harmonised spectrum. It maintains and enhances the TETRA PMR standard, and drives the development of common global mobile standards for critical broadband.*

*TCCA is a 3GPP Market Representation Partner and a member of the Mission Critical Open Platform (MCOP) project. Members actively contribute in 3GPP working groups.*

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## Motorola Solutions vs. Hytera Communications

The critical comms market in 2017 was overshadowed by an ongoing dispute between **Motorola Solutions** and **Hytera Communications**.

In a complaint filed with the US International Trade Commission (ITC) in late March, Motorola claimed its Chinese rival was "unlawfully" importing and selling two-way radio equipment and systems and related software and components that infringe its patents. It called for an immediate investigation by the ITC, an exclusion order to halt the importation of what it said were "infringing products", and a cease-and-desist order to stop their marketing and sale of in the US.

In a statement issued during the International Wireless Communications Expo (IWCE) held in Las Vegas at the end of March, Hytera said it "embraces competition" and respects the intellectual property rights of others. "Motorola Solutions' new action continues its pattern of legal manoeuvring instead of competing with Hytera in the marketplace," alleged the

firm in its statement. "By waiting to file its ITC complaint on the first day of [IWCE] – the largest US trade show for PMR providers – Motorola Solutions is transparently using its legal filings to generate publicity."

Hytera added that it would defend itself against the allegations and remained "fully confident" of prevailing. But Mark Hacker, general counsel and chief administrative officer of Motorola Solutions, fired back with: "Hytera asserts that it embraces legitimate competition, but there is nothing legitimate about the illegal copying and misappropriation in which it has engaged. We are committed to vigorously defending our valuable intellectual property as we continue to drive innovation for our customers across the globe."

In July, Motorola filed new complaints that targeted Mobilfunk, Hytera's German operation. In documents filed with the regional court of Mannheim, Germany, it alleged that Hytera's two-way wireless communication devices with improved squelch functionality were infringing its European patent number EP1139562 B1.

**Airbus'** IP-based *Taira Tetra Server* for PMR networks is said to be smaller than a typical switch, and claimed to work more efficiently and economically while still providing high service availability. The *Taira* consists of standard solutions with virtualisation layers. Airbus said this ensures true hot standby redundancy even in extreme situations. It has also been designed to be easily managed as it fits into existing IT environments. The firm believes using modern IT server technology in the framework of a TETRA network enables operators to integrate a TETRA system into their existing data centres. It said the network can then be operated with the same processes and personnel used for other IT services.



According to **Codan Radio Communications**, the *Sentry-HTM* is based on its "proven" Envoy HF SDR platform to deliver an "advanced radio solution at an affordable price point". Featuring high-power voice and data in a single RF unit, the radio is



equipped with second-generation digital voice, frequency hopping, embedded GPS, 3G ALE, and IP/USB connectivity. It is custom-built for mobile and base configurations, thus eliminating the need for an external amp and allowing for quick solutions during emergency situations. The system also features a smart handset and a menu system with multiple language options.



**DAMM's** *TetraFlex* client app offers TETRA over LTE and provides coverage extension as well as data capacity for videos and pictures. It supports full integration with the Danish company's *TetraFlex* radio systems, and enables PTT in TETRA groups, individual calls, messaging, video streaming and GPR tracking. According to the firm, no radio gateways are required. The app supports *Android*, *iOS* and *Windows* operating systems, and offers a vendor-independent soft terminal for non-critical voice and data communications through Wi-Fi, UMTS and LTE networks.

**ETELM** claimed its *e-LBS eNodeB* LTE base station has the longest reach ever developed for PMR 4G technology and will help operators

boost their coverage areas from existing locations. It uses LTE's multi-broadcast features to ensure the widest coverage area, including group calls.

The *e-LBS* implements the LTE protocol stack in every base station, thereby allowing radio sites to directly and seamlessly connect to the LTE backhaul. According to ETEL, in the future all operators will use the LTE core network, so having the ability and flexibility to connect onto this industry standard network is important for inter-technology communications.

**Hytera** expanded its DMR product range with the *PD485* handheld radio. Thanks to what's described as its "robust housing and versatile functionality", it's claimed the *PD485* is the optimal radio for a very wide range of application areas. It features a Bluetooth interface which means it can be used with audio accessories while kept hidden from view, said Hytera. It added that data exchange and convenient programming is also supported via Bluetooth. The *PD485* also has an integrated GPS module and GPS antenna which enables real-time positioning of



Motorola sought an injunction preventing the company from offering and delivering products with this squelch feature in Germany, as well as the recall and destruction of what it described as "infringing" products and various damages.

With these additional actions in Germany, Motorola now had five pending IP litigations against Hytera. As well as the patent infringement and trade secret misappropriation complaints filed with the US authorities as described above, the company also filed a separate complaint with the regional court of Düsseldorf in April.

Hytera went on the counter attack. On 28 August, the firm announced it had filed a lawsuit in a federal district court in Ohio stating that Motorola was infringing its US patent number 9,183,846. This asserted that Motorola "unlawfully misappropriates" Hytera's patented technology for sound adjustment, incorporating it into its *MOTOTRBO* portable radios.

Hytera also alleged that by actively inducing direct infringement by other persons who use products that embody one or more of the claims of the patent, Motorola should have

known "that its actions would induce direct infringement by others, and intended that its actions would induce such direct infringement".

Hytera said it sought damages and that its aim was to pursue further relief "as appropriate". The company added that it currently holds 480 issued patents, including 269 for DMR, TETRA and PDT digital products. Speaking at the time, Andrew Yuan, the company's president of North and South America, said: "Hytera is an adamant advocate of intellectual property rights. We will look to enforce our patents in court in the US and worldwide."

As the year drew to a close, Hytera went on the offensive again, this time with a complaint submitted to a US federal district court in New Jersey on 4 December. The firm alleged that Motorola was preventing it from competing in the US marketplace with its critical communications products. Hytera said: "Motorola Solutions is engaging in anti-competitive practices that are unlawful under the Sherman and Clayton Acts by deliberately and actively foreclosing competition in LMR communications systems, in order to reap billions of dollars on sales at inflated prices to US customers."

Together with its subsidiaries that include US-based PowerTrunk and UK firm **Sepura**,<sup>1</sup> Hytera alleged that by "foreclosing" competition from its DMR and TETRA solutions, Motorola is able to maintain "inflated" pricing in the US on its products that use P25, the standard for public safety communications that is widely used in the country. According to Hytera, TETRA offers similar functionality and features to P25 equipment, and can be "significantly less expensive". It claimed this makes TETRA a "compelling option" for commercial users in the US.

The company further claimed that Motorola was leveraging its dominance of the US public safety market to "impede adoption of newer, less expensive technologies", and forcing LMR dealers to drop its products. "Motorola Solutions is forcing US customers to pay artificially high prices for critical communications," said Tom Wineland, director of sales for Hytera Communications America (West). "It can do this because of its long-standing monopoly. "Customers want a choice, as reflected by the demand by public safety customers and other US customers for DMR, a robust LMR alternative at a fraction of the cost of P25."

Hytera went on to accuse Motorola of engaging in a series of "sham" litigation and regulatory actions. It said this includes suing Hytera for patent infringement on a set of standard essential technologies that industry users have agreed to license on fair,



**According to Vodacom, its service supports applications such as real-time video on existing consumer smartphones as well as more rugged LTE devices.**

reasonable, and non-discriminatory terms, and for which Hytera has already been paying Motorola Solutions to license.

In response to this latest action, Motorola Solutions issued the following statement: "We believe Hytera's complaint is without merit and a clear attempt to shift attention away from the heart of the dispute – Hytera's brazen theft of our trade secrets and wilful infringement of our patents. We will continue to vigorously pursue our ongoing global efforts to stop Hytera's egregious behaviour and protect our intellectual property."

The dispute between the two companies continued into 2018, and at the time of writing in late February, there seemed to be no resolution in sight.

## LTE and public safety

In April 2017, South African mobile operator **Vodacom** claimed it had successfully demonstrated the first broadband multimedia trunking solution for critical comms users on a commercial LTE network in Africa. It used **Huawei's LTE Integrated Trunked Radio Application (LiTRA)** to demonstrate the solution which ran on its nationwide, commercial 4G network.

According to the operator, traditional private mobile radio network technologies (such as TETRA) mainly provide basic voice trunking services such as PTT and cannot support new, innovative, high-speed data services such as video and multimedia services. "These traditional PMR networks are expensive to construct and maintain, the user terminals are expensive and have limited variety, and the network technology is often proprietary and inflexible," stated Vodacom.

The firm believes these issues can be overcome by using a broadband public trunking communications system such as the one it demonstrated. It said LiTRA overcomes the challenges of using a public LTE network for critical communication by prioritising emergency comms with a higher QoS and also ensures encryption and security of these messages. The company claimed that the platform enables its entire LTE network to be leveraged to provide high bandwidth and low latency trunking capabilities to improve the performance of existing mission and business critical services such as PTT.

Vodacom added that, more importantly, LiTRA can support new broadband multimedia trunking services such as push to video, real-time video

subscribers using various AVL applications. The radio also offers a full-sized keypad for simplified programming. For instance, settings such as current frequency, time slot or colour code can be quickly and easily changed via the keypad without needing to connect the unit to CPS.

**Motorola Solutions** has designed the *SLR 1000* repeater to enable service providers to easily extend their network through dead zones and across remote locations so that everyone is within reach. It can work with both conventional and trunking systems that support voice and data, and has a frequency range of 400-527MHz. Unlike traditional repeaters, the company says its radio can be deployed outdoors or indoors and offers the flexibility to be used in places such as parking garages, subway tunnels, and other potentially damp and wet locations. The *SLR 1000* is IP65 rated for dust and water protection, and its operating temperature is specified at -30° to 60°C. Wherever the device is deployed, Motorola reckons users can put their "maintenance and repair worries aside", as a fanless design means less noise, less particulate intrusion, fewer components and all while delivering more coverage.



<sup>1</sup> Hytera announced its acquisition of Sepura earlier in 2017. See Chapter 1, State of the Markets, Investments mergers and acquisitions table, p10.

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surveillance, high resolution photos and location based services. Furthermore, it said the solution demonstrated was fully compliant with 3GPP standards, is compatible with existing consumer LTE smartphones and new rugged LTE devices, and does not restrict the user terminals to exclusive providers as is the case with traditional PMR network technologies.

Staying in Southern Africa, in June we reported that **Hytera** will deliver a nationwide critical communications system to the Ministry of Interior of Angola under a deal worth around USD31m. The PMR specialist said the turnkey project included TETRA infrastructure, TETRA radios as well as LTE-TETRA multi-mode advanced radios, and convergent dispatching systems.

As part of the government's initiative of modernising public security and safety in Angola, the new mission critical communications system was planned to be used by departments such as police, firefighting, customs, etc. Hytera claimed its platform incorporates feature-rich broadband technologies while ensuring that critically important voice services remain reliably accessible using narrowband technologies such as TETRA, DMR, and PDT.

Despite the move towards using LTE for critical comms, the TCCA (**TETRA and Critical Communications Association**) issued a warning that the security mechanisms being designed into future LTE standards were not currently at a level to match purpose-designed professional mobile radio standards.

In a white paper published earlier in the year,<sup>3</sup> the TCCA identified four key focus points for governments to consider if they are looking to implement LTE-based public safety networks.

Among them, it said suitably qualified staff should carry out a review of the security

arrangements available in LTE systems and any commercial network that is used.

The TCCA said that while mobile operators already have the ability to deliver mobile broadband to public safety services which many organisations are taking advantage of, this is only for non mission-critical applications and with the traffic carried by a 'best efforts' commercial service. For safety critical applications – such as dispatching ambulances, passing on details of terrorist suspects, dealing with major incidents, etc. – the association said it is essential to use networks that are suited to mission-critical communication.

The TCCA also pointed out that as with any commercial organisation, mobile networks are subject to being bought and sold. As a result, critical national infrastructure could end up being owned by foreign firms. It advised those responsible for public safety communications to therefore consider national government policy with regard to foreign ownership and operation of telecoms infrastructure.

Spectrum and funding were also highlighted as focus areas in the white paper. The TCCA said the availability of spectrum is essential to enabling choice in the provision of broadband data services. But even if spectrum is secured for public safety agencies, building nationwide infrastructure will be relatively costly in many countries. The TCCA therefore believes that an optimal balance between dedicated and commercial networks will be needed.

In a separate development reported in September, the TCCA formed a new working group to encourage broadband vendor cooperation in the development of common global critical communications solutions. The **Broadband Industry Group (BIG)** planned to drive market adoption of standardised critical communications LTE and subsequent 5G technologies for the benefit of critical communications users and organisations. It also aimed to promote an evolutionary approach towards future solutions.

The TCCA said this work will build on its achievements of driving and supporting open standards and interoperability, and ongoing research into professional users' requirements to protect customer investments for the long term.

"With the formation of the BIG, TCCA has provided industry a home to advance critical service based on broadband, including migration to 3GPP LTE and 5G standard technologies," said TCCA chief executive Tony Gray. "In parallel, we will continue to recognise the importance of narrowband PMR, and model our broadband activities on the success of those technologies in supporting professional users worldwide. This success will be further strengthened by the evolution of interworking between critical narrowband and broadband technologies."

Philippe Agard, Nokia's global public safety and defence segment leader, is chairing the new group. He is supported by Jason Johur, Ericsson's market development director for mission-critical communications, as vice-chair.

According to Nokia, organisations across key vertical markets have been expressing the need for an evolution from narrowband PMR towards broadband. It said that as the first networks are rolled out, BIG will help open up a broader worldwide ecosystem." ■



**Ericsson's Jason Johur (left) said BIG will focus on ensuring 3GPP-compliant products and services meet the evolving needs of all critical comms users. Also pictured is the group's chair, Philippe Agard.** PHOTO: ERILLISVERKOT

– or to deliver critical services solely over a suitably enhanced LTE network.

Africa has a thriving critical communications market. The migration from analogue to digital PMR is gaining pace; IHS Markit projects that the region will be the most digitised in the world by 2021, with more than 90 per cent of users having converted to digital PMR technology.

Combined with the potential offered by critical broadband, Africa promises much for the future of critical communications.

<sup>3</sup> <http://www.africaneconomicoutlook.org/en/outlook/africa-s-macroeconomic-prospect>



**Tony Gray,**  
Chief executive,  
TCCA

**The year ahead:** Africa is increasingly becoming well served by mobile broadband – according to the GSMA,<sup>3</sup> 3G will remain the dominant mobile broadband technology for the foreseeable future, but 4G adoption is rising rapidly as a result of increasing network rollout. There were 97 live 4G networks in 39 countries across sub-Saharan Africa, covering 28 per cent of the region's population, as of March 2017. By 2020, it is predicted around 35 per cent of the population will be covered by 4G networks.

As long as spectrum can be secured, there are significant new business opportunities for mobile network operators to support critical communications. Historically, critical communications services have been based on dedicated narrowband technologies, including TETRA, Tetrapol, P25 and DMR. The service operators for these systems have typically been government organisations.

With the forthcoming generation of critical communications solutions based on LTE technologies and open standards defined by 3GPP, MNOs can leverage their commercial infrastructure to complement existing narrowband services – as in the Angola example mentioned above



**Mark Zheng**  
Director of  
Southern Africa  
region,  
Hytera

**A**ccording to Mark Zheng, 2017 proved to be one of the most significant years for Hytera in Africa. He believes the general political situation across the continent, as well as its economy, public safety environment and international relations are more stable and better than before. Furthermore, Zheng said oil prices are increasing which is a benefit for the region's oil-producing countries.

Looking back over the year, Zheng pointed out that Hytera's channel partners have increased dramatically. "We now have more than 400 partners in Africa, and also established two subsidiaries on the continent, one in Johannesburg and another in Abuja.

"Hytera's business witnessed big growth in Africa in different industries, especially in public safety. For example, Angola's national LTE-TETRA network is the company's first overseas LTE-PMR convergence network; while SAPS (South Africa Police Services) awarded a two year analogue buying contract.

"Other customers are also taking our solutions as well. The international SKA (Square Kilometre Array) project has adopted Hytera's DMR trunking system for communications, and Sappi [South African Pulp and Paper Industries] is using our DMR conventional for a migration from analogue mid-band radio to digital."

When asked how Hytera saw Africa's critical comms market adapt and evolve over 2017, Zheng said the company still regards narrowband voice as the key to wireless communications.

"Narrowband solutions like analogue, DMR and TETRA are still currently the main technologies and offer high security, wide coverage, great performance and at a moderate price.

"But we cannot deny the fact that the market is on the verge of experiencing the change from narrowband to broadband which could offer even more service with strong promotion by a number of manufacturers like Huawei, ZTE, Nokia, etc., especially in public safety sectors. Customers need big data applications, such as video transmission."

Zheng continued by saying while LTE is the future trend, not all sectors need such services. "Hytera released the *LTE-PMR Convergence Solution* to protect existing investment on a DMR/TETRA network, and deliver data services with LTE technology where needed."

He added that it still takes a long time to widely deploy a private broadband network, especially in Africa. There are a number of hurdles that need to be overcome here.

"The application of frequency is a challenge, and in some countries it takes about a year to get the license. For public safety customers, the demand for building digital critical communication networks

is strong, but due to budget or financial issues, funding is still the biggest challenge."

According to Zheng, while the convergence of broadband narrowband has given customers more choices, the industry is becoming more complex and the migration from analogue to digital is slower than expected. "There is still strong demand for analogue products, while the proof of concept [LTE] radios are gaining some attraction in South Africa's commercial market because of their low cost and relatively wider coverage by telecom operators."

Despite his upbeat introduction, Zheng said Hytera is still facing issues of politics, economy, exchange rates, taxation, etc., in some countries. Having said that, the company remains optimistic about the Africa market.

"We will continue to support our partners and customers with our technology and our expert local teams now that we have two subsidiaries on the continent. We aim to establish more offices with local teams in Africa in order to provide better services, and also hope to expand our brand influence to more industries and customers with the Chinese Government's *One Belt And One Road* policy."

First unveiled in 2013, the *One Belt And One Road* initiative is said to be the largest infrastructure project the world has seen. It aims to connect and cover more than 68 countries with roads, pipelines, railways, etc., and is due for completion in 2049. The Chinese Government is reportedly investing USD150bn into projects each year.

Back in Africa, Zheng said key points for Hytera in 2018 are transferring skills and knowledge. He believes cultivating partners and customers with the company's technologies and industry insights is important for growing the market.

"The more familiar they are with all this, the more willing they are to recognise our brand and products. We will introduce more Hytera college training programmes to Africa for our partners and customers, and enable them to better use mission critical communications to cope with their daily challenges."



**Tunde Williams,**  
Head of field  
& solutions  
marketing for  
Europe & Africa,  
Motorola Solutions

**T**unde Williams began his career with Motorola 18 years ago, starting as a system engineer working in what used to be the company's cellular division. One of his main roles at the time was being part of the team that helped operators optimise their networks using Motorola's *Intelligent Optimisation System (IOS)*.

Williams then changed roles in the company, joining the global marketing team and focusing on TETRA before moving into his current position in November 2014.

So isn't there a huge difference between optimising GSM networks to marketing TETRA/PMR in Africa?

"They're not that different. They both have the challenges of maximising capacity with limited spectrum. What we were doing with the *IOS* was helping operators get the most out of the spectrum they had. There is a similar problem in TETRA where you want to maximise capacity with limited spectrum.

"The customers are obviously a bit different. Cellular is very profit driven so that changes how you design the network. In the cellular world, operators would want to design a network to provide the minimum that they can get away with. That may sound negative, but an operator would not put a base station in the middle of nowhere if it only attracts a man and his dog once a year. There is no business case in such a situation. But in public safety, you almost have a duty to do that. You have to say wherever there could potentially be a problem, my guys need to have coverage because that could be a matter of life or death. That is the key difference."

In recent years, talk in the critical comms industry has focused on broadband networks for the public safety sector and the use of LTE. There is also DMR as an alternative critical comms standard. Where does all that leave TETRA?

"From an African point of view, DMR and TETRA will be the primary digital technologies, as well as P25 (Project 25). There are some technical attributes of P25 that make it suited to Africa. Take Sudan, for example. It is a massive country but its population is quite light in density, so if you are going to cover the country nationwide you really want to think about doing that in the cheapest way possible. A technology like P25 has advantages over other technologies like TETRA because it basically offers higher power to cost-effectively cover fewer sites."

"We are seeing P25 getting some traction in Africa. We have deployed P25 in Africa as we have done with TETRA as well as MOTOTRBO. Within sub-Saharan Africa, we are seeing a lot of potential for all three technologies. So we have a TETRA network in Cape Town and also work with the South African Police Service. There are other countries as well but unfortunately I cannot give you the actual country names, it is too sensitive."

Williams said that there is also a significant installed base of analogue equipment throughout the region and so Africa remains a strategic business for Motorola Solutions in terms of driving growth. "Digitisation is the key thing at the moment and we are seeing growth in terms of analogue systems being replaced."

Motorola Solutions is currently embroiled in legal disputes with Hytera (see *Year in Review*, p112) and while Williams cannot comment about this, he says the company does not feel threatened by relatively new players coming into the market.



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"Obviously we want to be in a competitive market because that helps everybody grow. The challenge is that we need to win every battle, and we think we have the technology and track record to do that. One thing you have to appreciate (and I can say this as I am from the continent) is that doing business in Africa is quite different from elsewhere. The way you form relationships and build networks requires experience in this environment – you can't just take a European model and transpose it onto Africa. It does not work. What you need is patience, and we have been in Africa for over 50 years so we are very well-established and that gives us a unique position. We are now starting to see the benefit of that, and have formed long-standing relationships with people within governments and commercial organisations. That is how we're seeing growth."

Williams continued by saying that the company is now trying to grow its partner network in Africa. "So that tells you we see a lot of potential in the market. We are actively driving our *Partner in Power* programme in Africa and that is very important in order to get the penetration. The brutal truth is that we want to be growing the market, selling more digital systems (most likely). That is the end game. We want to establish Africa as a region where we are dominant and that is going to take a lot of investment.

"We are establishing a local presence in a number of countries within the continent (countries which I cannot name). That is an important message because unlike other companies who completely rely on partners we have our own branded presence on the continent. That's an advantage because it brings us closer to the local market; we can adapt a lot faster and our offering can be differentiated because we are more local."

So what are the obstacles that could prevent the company from achieving its ambitions on the continent? Here, Williams said finance could be a challenge, but reckons being flexible in this regard could help overcome this particular issue. What is more important is to offer solutions that can adapt to the local environment. "One area that distinguishes Africa from the developed world like Europe is access to power which you cannot take for granted. In a lot of cases, you are relying on creating your own power, whether from a generator or alternative energy source like solar. So we need to have a solution that will adapt to that environment.

"There are also things like vandalism and theft that you might not experience in a developed market because they are at a different stage from an economic development point of view.

"So to be successful you need to be prepared to address these challenges. And this is another area where we have an advantage because we have been here for over 50 years and have been able to adapt over that period of time. We are therefore better prepared than some of our competitors."



Nicolas Hauswald,  
Sales & marketing  
director,  
ETELM

France-based critical comms specialist ETELM made its debut at AfricaCom in 2016. So in the year or so that has elapsed since then, what progress has the company made across the region?

"ETELM has worked on several projects in Africa in the past year in sectors such as oil and gas, transport and security," said Nicolas Hauswald. "For example, we supported the deployment of a private radio network in Kenya to cover all its national parks. This project, which was part financed by the French government, welcomed Nicolas Hulot, French minister for ecological and inclusive transition, who visited the radio network deployed for Kenya Wildlife Service."

According to Hauswald, the mobile comms sector is witnessing rapid and unprecedented developments. He said technological advancements have never been as important as they are today. "The ability to communicate quickly over a reliable network at any location in the world has become a priority for consumers and users of mission critical communications alike. As a result, providers are facing pressure to keep up with developments like never before.

"ETELM focuses mainly on private networks. We can see increasing demands for private networks, particularly for security and critical national infrastructure (airports, power plants, etc.) The users in these sectors cannot always afford to depend on a third party to manage/operate their network. They have critical needs and missions that can only be successfully achieved when they are in full control of the infrastructure.

"TETRA has been the narrowband technology of choice for mission critical users over the past 15 years. This dominance has come because of its architecture that was built around broadcasting answering the customer needs. On top of that, the radio part was standardised and all vendors went through heavy interoperability test sessions to satisfy the demand of the customers.

"TETRA is still a proven, reliable, and robust solution around the world. But the pressures from technological advancements and the ever-growing needs of mission critical users for data mean that LTE has a place to take. Without a doubt, mission critical LTE will become the preferred solution, but it still has a lot to prove in the field and requires important investment for users.

"We believe that a hybrid approach that includes both TETRA and LTE for mission critical solutions is the best alternative as it allows users to grow step-by-step in terms of coverage, services and investments.

"Arguably, a convergence of TETRA and LTE within the industry should be considered instead of taking the approach that one should replace

the other. A combination of the two technologies could be used as part of a transitional period, over many years. This kind of phased update would allow for complete testing to be carried out, allowing for any issues to be fixed, therefore preventing interruptions to coverage.

"An approach combining the best of both technologies will ensure the robustness and reliability of TETRA works with the additional broadband services and capabilities of LTE, including new streaming and advanced data applications. This can increase situational awareness and further build relationships between users, such as those working within blue light services. The ideal situation would be for a limited number of applications to be released and tested, ensuring applications that are in demand get preference over those that are potentially not relevant or useful."

When it comes to the challenges in Africa, Hauswald said that there are a lot of major infrastructure projects currently running in the transport sector that require secure radio networks but some are being hampered by funding.

"When a company doesn't bring a financing possibility, there can be years and years before effective deployments can be made. Given the nature of the mission critical industry, this process is not something that can be rushed – safety and reliability may be compromised and this is something that is simply unacceptable to those relying on it.

"However, there has been a large increase in major infrastructure developments in the region, and we are very hopeful that this will continue, and that the demand for advanced, secure telecoms in the commercial and private sectors will expand.

"Emergency services are a cornerstone for all developing countries, and with the latest mission critical LTE and TETRA solutions being available from commercial network operators (in addition to private systems) we expect to see a major improvement in public safety and security. This in turn will result in more inward investment and an improved economy."

ETELM is currently actively looking for partners and integrators to enhance its footprint in Africa. Hauswald pointed out that the company has more than 35 years' experience in supplying secure communications around the world, and claimed that it also has a "very good" knowledge of the users as well as "enhanced" field experience in Africa.

"ETELM has developed a range of 4G linked technologies including LTE, TETRA, DMR and analogue base stations which connect directly to any standard LTE core network without any gateways or specific interfaces. The company has the right profile for African companies looking for reliable and experienced partners.

"As the mission critical landscape becomes increasingly complex and challenging ... organisations are increasingly working together, sharing knowledge and specialisms. This kind of collaboration is likely to continue as large-scale issues continue to shape the world in which we live." ■