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PP100007393

5G NR test solution using R&S®ROMES to measure network quality

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Inside

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How good your coverage is, is the most important question to be answered with confidence for any mobile network technology, and this challenge imposes itself on all lifecycle phases of 5G NR networks.

Before network rollout (pre-installation phase): 5G NR network measurements are the only way to provide insights into the performance of the new technology and to overcome uncertainties before commercial launch.

At commercial network rollout (installation phase): 5G NR network measurements verify 5G NR network planning and site installation, for example to determine if the planned cluster and network coverage will be successful.

In network optimisation phase: 5G NR network measurements can verify the handover areas between sites, cells and beams and at the same time limit the interference between cells to increase the provided capacity.

Trouble shooting: 5G NR network measurements help find root causes of potential problems in networks, eg. coverage holes, high interference causing low capacity, etc.

Benchmarking: 5G NR network measurements will also support future Quality of Service and coverage comparisons between different network operators.

5G NR network measurement solutions from Rohde & Schwarz use R&S®ROMES test software to measure network performance using scanners and test smartphones, and to verify the impact of beamforming for synch signals and broadcast channels. R&S ROMES drive test software is designed to connect 5G NR USB dongles or other pre-commercial devices to monitor the 5G NR device/network interaction.

Rohde & Schwarz (Australia) Pty Ltd
www.rohde-schwarz.com.au

Transmit

When responding to a call for help, emergency services personnel need to know as accurately as possible the location of the person or persons in distress. At present there are various tools at their disposal to help them with this task. There's the national database of all residential and commercial buildings. There's the ability to triangulate or direction-find on mobile phone signals. But what Australia does not yet have is AML, or Advanced Mobile Location. When it is in use and a person makes an emergency call from a mobile phone, AML sends a small message to emergency control centres containing very accurate information about the caller's location… enabling much faster rescues and saving lives. As described in the article from EENA in this issue, AML services in Europe have resulted in pinpointing caller location to within just metres.

New Zealand has had AML for a couple of years, but Australia is not set to get it until 2020. That we don't have this capability yet seems a bit shameful, but hopefully it'll be better late than never.

And still on the topic of emergency communications, we're only a couple of months away from Comms Connect Melbourne, where hopefully we will be given a detailed update on progress on fielding a public safety mobile broadband capability for Australia's first responders. Despite official statements to the contrary, PSMB is another arena in which Australia is running behind some other parts of the world. So let's hope for some good news in November.

Jonathan Nally, Editor
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Calendar

October

IoT Impact 2019
15–16 October
iotimpact.com.au

World Radiocommunication Conference 2019
28 October–22 November
itu.int/en/ITU-R/conferences/wrc/Pages/default.aspx

November

Comms Connect Melbourne 2019
20–22 November
Melbourne Convention & Exhibition Centre
comms-connect.com.au

December

21st PSCE Conference in Paris
3–5 December
psc-europe.eu

March

BAPCO Annual Conference & Exhibition
10–11 March 2020
bapco.org.uk/events/

May

Comms Connect New Zealand
6–7 May 2020
comms-connect.com.au

June

Critical Communications World 2020
17–19 June 2020
tcca.info

For a full list of industry events,
see criticalcomms.com.au/events

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Beatriz Peon, PR & Communications Manager, EENA

Advanced Mobile Location technology is revolutionising emergency response and saving lives.

Every second counts in an emergency. As response time is key to determining a successful outcome, emergency services must act rapidly and make the most efficient use of their resources. And the work of these professionals relies on the primary information they can gather from the incident itself, location being key.

Oftentimes though, a person in need of assistance will not be aware of their whereabouts, being unfamiliar with their surroundings or simply distressed at the situation they find themselves in. How can emergency services know where and how to focus their efforts? That is when Advanced Mobile Location comes into play to provide a life-saving solution.

Your phone could save your life

Advanced Mobile Location enables a smartphone to identify when a call is placed to an emergency number. It then activates the phone's location and sends it as an encoded, free of charge, SMS to the emergency services before turning the location off again. This SMS includes information on the caller's latitude, longitude, time of positioning, level of confidence and positioning method (Global Navigation Satellite System, or Wi-Fi in certain cases). By being able to access the handset's location, the information shared with emergency services is up to 3000 times more accurate than traditional systems, such as network location.

How can this technology be integrated into our phones? It already is.

AML is not an application, but an element that is part of a smartphone's operating system, just like the code that runs the alarm clock, or the one that enables calls. It was first integrated into Android phones, as the Emergency Location Service (ELS) in July 2016, and was followed by phones running on Apple's iOS in 2018. The prevalence of both these operating systems for smartphones means that almost all devices worldwide are capable of sending accurate caller location in case of an emergency.

But even though the technology enabling this information to be shared is widespread and already available, emergency services need to be capable of receiving it. For AML to be operational in a country, operating system providers will activate the technology once the national authorities are technically and operationally ready.

In this process, corresponding authorities need to establish different configurations such as the emergency numbers for which AML will be activated, the transmission channel, the time delta to receive an SMS, whether it is available when roaming and whether it will also be activated for SMS-to-emergency number services (or equivalent accessibility services).

AML has not only proven to be easy to implement due to its low economic and resource-related costs, but also brings in a considerable turnover as it allows for more effective management of often costly emergency resources. A study conducted in 2016 by an independent consultancy estimated that if AML were to be fully implemented in all European Union member states, the results over a period of only 10 years would result in costs savings of €95 billion, with an estimated 7500-plus lives saved.

Deployments ongoing in Europe...

The United Kingdom became the first country in the world to implement AML, paving the way for other European countries: Austria, Belgium, Estonia, Finland, Ireland, Lithuania, Moldova, the Netherlands, Norway, Slovenia, United Kingdom and most recently, Denmark.

AML in New Zealand in numbers

- Average percentage of calls from a mobile phone where an AML position is received: 75% of all genuine emergency calls
- Percentage of AML messages received within 30 seconds: 96.85% (Android: 95.59%, iOS: 98.86%)
- Percentage of AML messages received within 15 seconds: 14.55% (Android: 1.05%. iOS: 36.23%), noting that the time delta is 25 seconds
- AML messages with an accuracy better than 100 metres: 84.15% (Android: 78.92%, iOS: 92.56%)
- AML messages with an accuracy better than 50 metres: 72.12% (Android: 73.93%, iOS: 69.23%)

> " THE EMERGENCY RESPONSE TEAM WAS ABLE TO LOCATE ANDREAS WITHIN A SIX-METRE RADIUS, IMMEDIATELY LAUNCHING A SUCCESSFUL RESCUE MISSION.

Success stories soon came to light in these countries, as emergency services became able to locate citizens in distress in remote areas, tourists unfamiliar with their surroundings, victims of accidents and vulnerable sectors of the population with learning difficulties, and bridging communication gaps in multilingual countries. AML even assists with regular issues related to emergency response, such as calls dropping. In Ireland, a fire was reported by a bystander, but the call dropped before they could specify the address. However, the call taker was able to register the exact house number and street thanks to AML — an address that did not even figure in fire-mapping records yet, as it was a new construction.

AML can also enable little heroes, as it is not uncommon that children would call for assistance but be unaware of their exact location. In Estonia, emergency services once received a call from children in a small town in Estonia alerting of a potential house fire. They were able to provide their street name and flat number, but not the house number — which the call-taker was able to gather thanks to AML, quickly dispatching emergency services.

Last April, the Austrian Notruf Niederösterreich centre's remarkable rescue of a paraglider was awarded at the 112 Awards Ceremony held in Dubrovnik, Croatia. Paraglider Andreas Gremmel crashed in a remote, alpine area of Austria and found himself severely injured and unaware of his location. A weak mobile reception also made it impossible for emergency services to call him back to gather more information about the accident. Thanks to AML, the emergency response team was able to locate Andreas within a six-metre radius, immediately launching a successful rescue mission that lasted only 50 minutes.

...and beyond

AML is not exclusive to Europe. In July 2019, Mexico joined New Zealand, Iceland, the United Arab Emirates and the United States in embracing the technology.

While Australia is expecting to deploy AML by 2020, New Zealand has benefited from it since May 2017.

Shortly after deployment, we at the European Emergency Number Association (EENA) spoke with Ben Quay, Programme Director at New Zealand's Ministry of Business, Innovation and Employment (MBIE), who commented on the decision to move away from apps to AML: "The problems we were seeing with apps were that people weren't downloading them or they weren't using them in an emergency — apps added a lot of complexity for users."

The first country outside Europe to deploy AML, New Zealand provides this service all over its territory as a free message for the caller, with a time delta defined to receive AML positions of 25 seconds (which also applies to SMS-to-emergency number).

Examples of successful implementation include two remarkable dispatches by Wellington Free Ambulance, which once received a call from a man who had woken up on the side of the road, with no idea where he was or what had happened. The man had a history of seizures and had been driving from Bulls to Whanganui. The only details he could provide about his location were that he was in a farmland area and that there were no houses or road signs. Wellington Free Ambulance used the system to identify the man's location and provided him with the help he needed.

On another occasion, they received a call from a non-English speaker who hung up before an interpreter could be arranged. While the call-taker was attempting to call back, AML enabled identification of the location and help was immediately dispatched, as the person turned out to be in urgent need of medical treatment.

In another case, New Zealand police received a call from a person having suicidal thoughts. The only information that the call-taker could get while speaking with the person was that the caller was next to a train station without knowing which one exactly. Thanks to AML, emergency services obtained a very accurate location information (down to a four-metre radius) and found that the caller was on the rail tracks. Train control was immediately alerted, and police was dispatched on site to save the person.

What is next to come?

Currently, AML is fully deployed in 18 countries all over the world. And, as the new European Electronic Communications Code has made AML implementation mandatory in all Member States by December 2020 and for all smartphones sold in the EU as of February 2022 to enable AML, more and more countries are mobilising towards activating this life-saving feature.

AML has come a long way in five years, from conceptualisation to its increasing deployment all over the world, and we can only expect that more lives will continue to be saved as the technology further spreads. At EENA, we fully support and encourage national governments to take the necessary steps to assure a more efficient emergency response, with the potential to save not only resources but also countless lives.
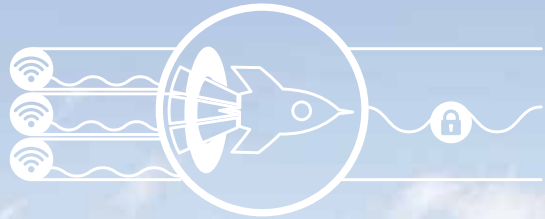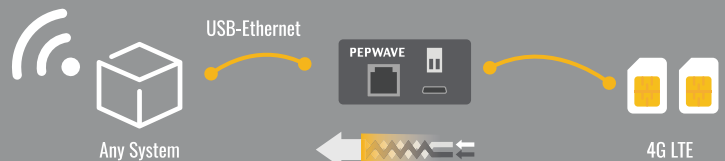
ACMA UPDATES CLASS LICENCES

The ACMA has updated class licensing arrangements to support new technology applications and bring Australia into line with international arrangements supporting standardised equipment supply arrangements. It follows the ACMA's call for consultation on proposed updates to Low Interference Potential Device class licensing arrangements last December, for which 18 submissions were received. The updates will support new technologies, wireless data communications systems (including those supporting 5G), radar systems used in road and rail safety applications, and internationally harmonised use of short-range devices.

More info: bit.ly/2PkMGcn

VODAFONE NZ TO LAUNCH 5G THIS YEAR

Vodafone has announced it will switch on a 5G network in New Zealand in December, beginning with Auckland, Wellington, Christchurch and Queenstown. The company has already begun rolling out 5G in the United Kingdom, Italy, Spain and Germany. "Vodafone is already working alongside a number of business partners to understand how the power of 5G can improve the lives of New Zealanders," said Vodafone New Zealand CEO Jason Paris. "I'm proud to announce our first four partners, NZ Police, BNZ, Auckland's Rescue Helicopter and Waste Management. They have agreed to work with us and our partners Nokia, Microsoft and IBM, to begin to scope their 5G future."

More info: https://bit.ly/2Ue5okJ

Fibre inspection kit

Fluke Networks' FI-1000 FiberInspector Kit allows users to quickly examine and certify fibre end-faces inside ports or patch cords. Its 2 s automated PASS/FAIL certification eliminates subjectivity and ensures accuracy of results. It is available for rent from TechRentals.

The kit features a USB fibre inspection video probe which requires a Versiv mainframe to operate, such as the DSX-5000 (with or without fibre modules) or the Optifiber Pro (also available from TechRentals). The 2 Mpx Fluke video probe is used for end-face inspection. It has a field view of 425 μm (horizontal) and 320 μm (vertical) to detect a minimum of 0.5 μm particles.

The kit includes a USB fibre inspection video probe for Versiv products and a tip set (LC, FC/SC bulkhead, 1.25 and 2.5 mm universal tips in a box).

TechRentals
www.techrentals.com.au

Multimode radio

The Hytera PTC680 is a TETRA/LTE-hybrid multimode radio that combines TETRA wireless functionality, LTE technology and the features of an Android-based smartphone with flexible data transfer in a single device, making it suitable for mission- and business-critical operations.

The PTC680's main features are: full TETRA functionality; TETRA-/LTE convergence; usable even with gloves; simple operation with just one hand; dual screens; MIL-STD 810 G and IP68 certified, voice and data encryption with AIE, Soft E2EE, SD card-based E2EE; positioning with GPS, Galileo and GLONASS; and two HD cameras with video recording in real time.

Hytera Communications Australia Pty Ltd

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VERTEL, PURPLE WI-FI JOIN FOR 'SMART PARKS'

Reflections Holiday Parks has rolled out $1 million worth of Wi-Fi infrastructure at its Forster Beach, Seal Rocks, Scotts Head and Hawks Nest holiday parks in NSW. Reflections called on Vertel to provide a connectivity solution. Vertel in turn worked with its analytics partner, Purple Wi-Fi, to present a comprehensive solution. "We delivered an adaptable Wi-Fi infrastructure with analytics that meets Reflections' requirements now and into the future," said Vertel's Commercial Director, Tony Hudson. Emergency management was part of the mix, with the Wi-Fi infrastructure providing communication to isolated locations such as the Reflections park at Seal Rocks.

More info: bit.ly/2ZxGNfL

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NZ NETWORK-ENABLED ARMY PROJECT

New Zealand's (NZ) army is set to gain new intelligence, surveillance and reconnaissance capabilities during phase two of the Network-Enabled Army project. The project, which started in 2015, aims to equip the army with new hardware and software, including radios, satellite terminals, command posts, power generators and modern secure digital services to help it respond quickly, effectively and safely in any situation, according to NZ Defence Minister Ron Mark. Phase two represents a capital investment of up to $106 million from within the NZ Defence Force's baseline funding and will be rolled out over the next four years.

More info: bit.ly/2Uey2Cq

Optical fibre multimeter

The EXFO Optical Xplorer from Comms-Force is an optical fibre multimeter suitable for use by frontline technicians. The device verifies optical links and if faults are suspected it finds and identifies them automatically.

Features include: Click-Out optical connector; lifetime calibration and field-replaceable connectors; Fault Xplorer; time saved by exploring only faulty links, EXFO Advisor; and validation of link quality in seconds (assigning a 1- to 5-star rating).

CommsForce Pty Ltd
www.commsforce.com.au

IoT wireless sensor devices

Advantech's WISE-4210 series of IoT wireless sensor devices includes a wireless LPWAN-to-Ethernet AP and three wireless sensor nodes. The device-to-cloud total solution provided by this series allows IT, OT and cloud platform system developers to easily implement a private LPWAN, acquire field site data and achieve seamless integration with both public cloud, such as Microsoft Azure, and private enterprise clouds.

Based on proprietary LPWAN technology, the WISE-4210 series minimise frequency band interference, support a wider data transmission range, are compatible with lithium batteries and enable cloud platform integration. By locking the sub-GHz frequency band, the series significantly reduces susceptibility to interference for 2.4 GHz wireless communication technologies such as Wi-Fi, Bluetooth and Zigbee. By supporting a network transmission distance of up to 5 km, the series meets the requirements of large-scale interior environments such as data centres, factories and warehouses for collecting and applying a wide range of interior data.

With LPWAN technology, only three 3.6 V lithium batteries are required to operate the nodes for up to five years, eliminating the need for additional wiring and frequent recharging. Additionally, the WISE-4210 series supports multiple transfer protocols, including MQTT, RESTful, Modbus/TCP and Modbus/RTU, for simple device-to-cloud connections.

The WISE-4210 series of LPWAN IoT wireless AP and sensor nodes provides the necessary device-to-cloud integration functions for conventional automation and emerging IoT applications. The series allows users to easily deploy private networks and quickly develop systems.

Advantech Australia Pty Ltd
www.advantech.net.au

AUSSIE TECH AT THE HEART OF ASTRID

Belgium's emergency services organisation's paging system, ASTRID, has received a major upgrade, with Sydney-based company Infostream's simulcast technology at its heart. Several years ago, Thales Belgium won the contract to provide ASTRID with a modern paging system infrastructure and chose Infostream as one of its key suppliers. The upgrade has moved into its through-life support phase, with Infostream to continue to support Thales Belgium with a seven-year support contract. "Infostream is proud to supply core infrastructure to this project and assist Thales to provide a critical service to Belgium and its volunteer firefighters," said Infostream CTO and Executive Chairman Paul Schlusser.

More info: bit.ly/2Zll5wg

MOTOROLA SOLUTIONS' NEW MD A/NZ

Con Balaskas has replaced Steve Crutchfield as Motorola Solutions' Managing Director for Australia and New Zealand. Balaskas — who has held multiple senior positions in his 20 years with Motorola Solutions — has "played a pivotal role in the growth and expansion of the company's managed services business", according to the company. "His strong relationships with Motorola Solutions' customers and team members throughout Australia and New Zealand will serve him well in his new role." Balaskas also chairs the company's Inclusion and Diversity Council and helped it achieve its first certification as an Employer of Choice from Australia's Workplace Gender Equality Agency.

More info: bit.ly/2PhEd9P

Handheld spectrum analyser

Anritsu has introduced the Field Master Pro MS2090A RF handheld spectrum analyser. With high continuous frequency coverage up to 54 GHz, real-time spectrum analysis bandwidth up to 100 MHz and a ruggedised design to withstand the demands of field test, the product is suitable for a range of current and emerging field applications, including 5G, broadcast, regulatory compliance, aerospace/defence, satellite systems and radar.

A good test tool for the rollout of 5G New Radio (5G NR), the Field Master Pro MS2090A supports 5G NR demodulation, including cell ID, beam ID, RSRP/RSRQ, SINR and EVM in all 5G bands (sub-6 GHz and millimetre-wave).

3D indoor and outdoor coverage mapping for 5G NR allows wireless professionals deploying 5G NR to conduct more accurate measurements than conventional instruments using 2D data. This ensures 5G NR networks meet performance specifications both indoors and outside.

Real-time spectrum analysis spans up to 100 MHz are possible for interference monitoring in the cellular bands or full ISM band. A spectrogram display and low noise floor make it easy for field technicians and engineers to conduct RF spectrum monitoring and locate intermittent or interfering signals.

The high performance of the Field Master Pro MS2090A makes it suitable for general spectrum analysis applications. Integrated channel power and occupied bandwidth (OBW) measurements simplify the characterisation of common radio transmissions.

The large 10″ colour touchscreen allows users to swipe and scan across the frequency range, or pinch and zoom to quickly view signals of interest.

Anritsu Pty Ltd
www.anritsu.com

Cavity/bore hole pan tilt camera

Camtek's Cavity/Bore Hole Pan Tilt Camera is an underwater vertical camera for fast and clear visual inspections. It is designed to enable the quick discovery of suspect objects, defects, cracks and blockages in pipes, walls, drain, cavities, water tanks, reticulation, bore holes, pylons, air ducts and ventilation systems. It is available to rent from TechRentals.

The camera has a Sony HD image sensor housed in a waterproof casing (8 bar, 80 m) with 360/180° pan tilt capability and 120° FOV with LED lighting. The camera head has a diameter of 50 mm and length of 150 mm, and is attached to 100 m soft cable specifically designed for vertical deployment.

Further features include a 20 cm colour LCD monitor with video output, file playback and video capture (MEG4). It can be powered via mains or onboard battery, and the unit features a text overlay function with built-in keyboard.

TechRentals
www.techrentals.com.au

KEEPING PEOPLE AND PLACES SAFE

Jonathan Nally

We spoke with the NSW Telco Authority's new Managing Director to get a progress report on the state's communications programs.

The NSW Telco Authority is a statutory agency within the newly created Department of Customer Service, with a remit to connect emergency service personnel across the state so that they can work together to keep people and places safe.

It does this by designing, commissioning and managing operational telecommunications services which support NSW Government agencies and communities, especially the Government Radio Network (GRN).

The Authority is currently involved in four major efforts: the Mobile Black Spot Program, the Regional Digital Connectivity project (RDC), the Critical Communications Enhancement Program (CCEP) and Public Safety Mobile Broadband (PSMB).

Under the Mobile Black Spot Program, the NSW Government has committed more than $39 million to build at least 183 new or improved mobile base stations throughout the state. The NSW Telco Authority works in partnership with the Department of Premier

and Cabinet on the program, which is being delivered in partnership with the Australian Government and mobile network operators. In NSW, 159 new sites have been built to date.

The RDC project is part of the state government's $50 million Connecting Country Communities Fund, which is investing in infrastructure to provide fast and reliable broadband internet access to regional communities in NSW. Delivered in partnership with the Department of Premier and Cabinet, it aims to enable the same level of digital

A GRN site at Campbelltown in south-western Sydney.

connectivity in the regions as is available in metropolitan areas.

Of most interest to readers of *Critical Comms* are the GRN and the CCEP and PSMB projects. To find out more about them and to get a progress report, we spoke with the new Managing Director of the NSW Telco Authority, Kylie De Courteney.

Prior to being appointed Managing Director, De Courteney was the Chief Customer Officer at Service NSW with responsibility for organisational strategy, data analytics and customer experience. Before that, she was the Chief Digital and Product Officer.

De Courteney has expertise in complex program delivery and organisational transformation as well as experience in mergers and acquisitions and operational performance improvement in the private and professional services sectors, and federal and state government. She has previously held senior management roles at Telstra and Ausgrid, and was previously an independent member of the NSW Telco Authority Board for three years.

"I am passionate about the digital transformation of government and customer-centric service design," she said. "I want to harness that commitment to customer-centric service to ensure the Authority is delivering to its most important customers — emergency services organisations (ESOs) including NSW Police, NSW Ambulance, Fire and Rescue NSW, NSW SES and the NSW Rural Fire Service."

Spectrum and the GRN

"The main activity that we undertake is managing the public safety network… keeping people and places safe. That's the core of what we do," De Courteney said. "Part of that requires having spectrum, so therefore there's a role for the Telco Authority in liaising with the Commonwealth Government since telecommunications and spectrum is their responsibility.

"In terms of spectrum, it's clear that demand outstrips supply across commercial, government and not-for-profit sectors," she added.

Part of that spectrum is used by the GRN, the main communications backbone that, historically, has been used by almost all NSW emergency services agencies. But in order to rationalise assets, increase interoperability and reduce costs, the NSW Government has taken the decision to move essentially all government bodies that use radiocommunications onto the GRN. Could this include NSW Police, which has its own (yet compatible) network?

"It is very clear now that from the Premier to Macquarie Street, to all of the Commissioners leading all of the emergency services and public safety agencies, that there is support to move to one network that covers the state," De Courteney said.

So does this mean that absolutely every single NSW Government body, no matter how big or small, will eventually make its way onto the GRN?

"The working hypothesis is that it is everyone, because it's about both efficient use of taxpayers' money on infrastructure as well as the efficient usage of spectrum," De Courteney said. "I can't imagine the taxpayer being particularly happy if we've got a Government Radio Network… which covers most of the state, and then someone else builds something else that sits beside it. It's just not a great use of taxpayers' money."

The NSW Government has a very successful data centre network called GovDC, which provides complete data centre services to government departments and agencies. So successful has it been that even local councils are signing up to use it. Does De Courteney see the potential for something similar happening with the GRN?

"The core of what we're doing here is about public safety agencies, but there's certainly capacity for others to use the network," she said.

Critical Communications Enhancement Program

The GRN provides secure radiocommunications to more than 40 ESOs and state agencies, encompassing a total of approximately 55,000 radio users.

The CCEP will extend the GRN's geographic coverage from less than 35% to more than 80% of NSW, and represents the largest investment ($320 million) in critical communications by the NSW Government in two decades.

There are currently more than 230 sites in the network — this will increase to about 700 sites when the project is complete.

A CCEP pilot project has been successfully completed in north-western NSW covering the area around Lightning Ridge, Collarenebri, Walgett, Carinda, Coonamble, Nyngan and Warren. Seventeen new sites were added to the GRN during the pilot, resulting in radio coverage increasing from approximately 57% to over 90% in the area.

In the greater metropolitan area (GMA), the Authority is enhancing the existing network by almost tripling its 46 current sites.

The GRN site at Mt Canobolas in central New South Wales.

In June 2019, construction of the first 12 new sites within the GMA commenced with the first site at Hill Top completed and operational.

Increasing the density of radio sites and the addition of dedicated in-building systems across the GMA will result in significant improvements in handheld radio coverage and in-building coverage, De Courteney said.

"The greater metropolitan area has its own set of challenges," she said. "The roof of a Westfield is not quite the same as the top of a hill on the Queensland/NSW border, in terms of design challenges and construction challenges."

Improving communications coverage on the NSW North Coast is a high priority, given its flood-prone areas and high rate of natural disasters. Eighty-seven radio sites have been identified in a region that runs from Port Stephens to the Queensland border.

"We're gaining a lot of momentum in the North Coast area, so you can start to expect to see more of the announcements about the North Coast," De Courteney said.

Detailed design has been completed for more than 40 North Coast sites. Construction of approximately 50% of the sites is expected to be complete by 31 October 2019.

In addition to all of the above, there is a Priority Works program, being a collaborative initiative involving the Authority and the five public safety agencies, which prioritises construction and upgrades to 53 sites deemed critical.

Construction of nine of the first 10 Priority Works sites has been completed, with six sites operational: Griffith, Castle Hill, Campbelltown, Mungindi, Mt Darling in the Hilltops local government area (LGA) and Martins Lookout in the Glen Innes Severn LGA.

An additional four key Priority Works sites were completed and operationally accepted in 2018: Parramatta, Royal North Shore Hospital, Westfield Sydney and Chatswood.

Public Safety Mobile Broadband

Emergency services organisations have an increased need for mobile data to support day-to-day and mission-critical activities, which

is why many nations, including Australia, are working hard to provide first responders with mobile broadband capabilities.

These capabilities will add broadband data and video to the first responder toolkit, enabling much greater two-way transmission of critical information.

Australia's PSMB effort is being led by the Department of Home Affairs in Canberra, with all of the states and territories involved in negotiations and discussion about the final form of the network.

To date, the program has seen stakeholder and customer engagement, technology and innovation planning, and a Request for Proposal procurement process for a PSMB proof-of-concept trial.

Some details of PSMB and the RFP for the proof-of-concept trial have been presented and discussed at the Comms Connect conferences over the past two years. But it's fair to say that not a lot of information has been forthcoming, as government deliberations slowly progress.

The NSW Telco Authority hosts the PSMB National Program Management Office (PMO), which is charged with developing the national roadmap.

"It's not that NSW is doing it on behalf of [the states and territories], we just happen to be hosting the national PMO," De Courteney said. "But it is a great example of the states and territories all working together with the Commonwealth to drive to the right outcome in this Public Safety Mobile Broadband space.

"It can be quite challenging to work across state boundaries and certainly for something like this we're all trying to get ahead… you know, we don't want the rail gauge issues of the past. But everyone's working really collaboratively together to progress this," she added. "We're hoping that there's more we can say by the end of the year."

Public service

"Having an organisation in NSW that's able to focus on PSMB, the GRN and RDC… it's a great opportunity for government to leverage what's here in the form of the Telco Authority," De Courteney said. "It's great for the Telco Authority to… have that expertise in the intersection of infrastructure and communications."

De Courteney said she's inspired in her work by "the opportunity to make a difference to almost everyone in the state".

"Bringing all of the emergency services organisations onto one network will make life better for the people of NSW and all of those people at the frontline of emergency service provision," she said. "It's fantastic to be working in that kind of purpose-driven organisation."

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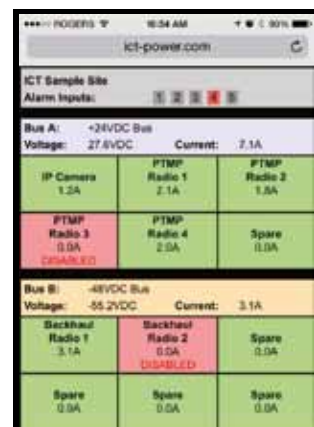
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Industry Talking

It has been another busy year for the Association; it certainly feels like it has gone by in a blur. ARCIA continues to represent the industry across many areas. Spectrum remains a key focus for the industry, ensuring both existing and future arrangements take into account what our industry does for Australia. Members of the Association's committee attended the annual ACMA RadComms conference in Sydney, have met with ACMA officials and responded to consultation papers.

Many areas of spectrum management are changing, with 5G, spectrum sharing and legislation issues prominent. ARCIA has invited ACMA staff to attend our events around the country, as we find this is very useful for both the ACMA and members of the industry. Once again our Executive Officer, Ian Miller, has spent a huge amount of time responding to consultation papers on which the ACMA often provides very little. However, the input from the Association is valued and, regardless of future technology options, the Association believes it is important to highlight the value that all users of spectrum represent.

Events are the primary way that members of ARCIA get together, and over the past 12 months there have been excellent events all around the country. Those events have been well attended with more than 1000 people coming together to network and celebrate the industry. Each state selects and awards a member who exemplifies best practice; the list of very worthy winners continues to grow. It never ceases to amaze me how many dedicated and knowledgeable people are in our industry.

For this year, ARCIA ran daytime training sessions followed by networking events in Perth and Brisbane, rather than the traditional Comms Connect during-the-day approach. Once again we must thank Ian Miller for stepping into the breach and making this happen. Despite my personal concerns, members and guests did respond well and the events worked well. In Perth, Chris Fosten from the ACMA provided a presentation on focus areas for the ACMA, with the subsequent question and answer session proving very useful.

Of course, the headline act is the Annual Gala Dinner, and in November 2018 around 500 attendees celebrated at the Melbourne Convention & Exhibition Centre. Held alongside Comms Connect, both events were a terrific success and we expect that 2019 will be even better.

The Association continues to work with international partners to share information and bring information back to Australia. Over the last 12 months we attended the annual meeting of the Government Wireless Technology & Communications Association (GWTCA) in the US and, of course, the annual meeting of our close neighbours from New Zealand, RFUNZA. Committee members from RFUNZA attended our annual planning day in Brisbane and excellent discussions were held on many subjects. ARCIA also attended the PSCE conference in Lancaster in the UK in June — this event encompasses most of the European critical communications community, and we were pleased to be both able to represent our region as well as bring information back to our members. Everyone has similar issues with spectrum, training and technology; by working together we are able to learn the lessons from other countries.

For 2019, the Association's planning event was held in Brisbane so that local members could attend. We enjoyed two excellent days that were very well attended by committee members, partners and associates. There is a growing recognition that our Association is not really a 'radio' association anymore; the needs of our industry are far broader. We have many members now providing private LTE networks in the mining industry (amongst many other services), and this supports our belief that the wireless future goes beyond traditional LMR. This year the association met with the TCCA and the ATF to discuss how we can work on our common interests in critical communications, and we intend to further those relationships.

I am delighted to report that over 2018–19 we finally got started on ARCIA-led, industry-based training, with more than 150 members attending sessions in Melbourne, Perth, Sydney and Brisbane. ARCIA is very grateful to RF Industries for providing content and the assistance of key staff. We intend to expand the program and provide membership value through training.

Finally, I would like to thank our committee members for their dedication and commitment, our commercial partners for their support of the Association and our media partner WF Media (publisher of *Critical Comms*) for their efforts across the country over the last 12 months. Our industry has a lot to be proud of, and with everyone's continued support, we can continue doing what we do.

You can read greater detail about the topics I've discussed here, in the annual report available on ARCIA's website, arcia.org.au.

Hamish Duff, President
Australian Radio Communications
Industry Association

Energy storage solution

The REACT 2 energy storage solution from ABB includes a high-voltage Li-ion battery with a long life and a storage capacity of up to 12 kWh. The modular solution can grow with the needs of any household from 4 to 12 kWh and reduce electricity charges thanks to an achievable energy self-reliance of up to 90%, according to the company.

The line, available in power ratings of 3.6 and 5.0 kW, is claimed to have one of the industry's highest energy efficiency rates, providing up to 10% more energy than lower voltage battery systems.

Thanks to the possibility of both AC and DC side connection, REACT 2 is a solution for new systems or the retrofitting of existing ones, allowing home owners to improve their energy self-consumption and save on their energy bills.

The units have a flexible and modular design, with plug-and-play connection and system monitoring through a dedicated mobile app. REACT 2 is Modbus TCP/RTU Sunspec compliant and compatible with ABB free@home for a full ABB smart home experience.

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ECONOMICS

IPART PROPOSES RENT CHANGES
FOR CROWN LAND TOWERS

NSW's Independent Pricing and Regulatory Tribunal (IPART) has released proposals that would bring rents for communication towers located on Crown land more closely into line with market rents.

IPART is seeking feedback on the proposed rent changes, which it says would "reflect recent market changes, improve simplicity and transparency and help facilitate the rollout of emerging technologies".

Currently there are approximately 800 communication tower sites owned by around 200 different users located on Crown land administered by NSW Department of Planning, Industry and Environment, the NSW Office of Environment and Heritage and the Forestry Corporation of NSW.

IPART has recommended that rents continue to be set via a schedule that would result in:

- lower rents for towers located in Sydney and high and medium-density areas across NSW, with rents falling by between 10% and 46%. Rent in Sydney would be $33,700 per site per year, down from $37,304 (in 2020–21 dollars);

- rent increases of 19% for towers in low-density areas to bring them more closely in line with rents for towers on private property;

- a reduction in government revenues (around $2.7 million in 2020–21 dollars) from communication towers.

Under the proposals, for primary users on new sites and Small Country Automated Exchange (SCAX) sites, annual rents would vary according to the size of the site in square metres as well as the location.

For co-users of new and existing sites and small cell technology, annual rents would be charged only for additional land.

Where there is no additional land footprint only the minimum annual rent to occupy Crown land should be charged.

The recommendations would also remove scope for site-by-site negotiation and discounts for infrastructure providers. IPART has recommended replacing rental rebates to community groups, local services providers and other users with transitional financial assistance or subsidies "that more transparently address their needs".

IPART Tribunal Member Ed Willett said the recommendations would ensure that rents reflect "fair market-based returns", improve simplicity and transparency, and respond to technological developments in the telecommunications industry.

"We have recommended a rent schedule that better aligns with recent market rents for communication towers on private land. Because these rentals are agreed in a workably competitive market, we consider they are likely to reflect efficient prices for communication tower sites removing the risk of monopoly rent being charged," he said.

IPART has also recommended new arrangements for sites used by emerging communication technologies, such as 5G mobile.

"This technology requires many small cells to be deployed in high-density locations. Therefore, it needs many more sites than traditional communication technologies, and uses less land area per site," Willett said.

The draft report (PDF) and recommendations are available at ipart.nsw.gov.au.

A final report will be provided to the Premier and Ministers in September.

Introducing the CM60 Series

Designed, engineered and manufactured in Australia for the toughest conditions, the CM60 Series provides a robust solution ideal for both the large systems integrator with an extensive network of mobiles, portables and repeaters, or the small operator with a single site.

The CM60 Series provides an analogue solution with optional licensing upgrades for P25 in Conventional, Trunk and AES 256-bit Encryption.

The advanced User Interface Control (UIC 600 Series) features an OLED screen for high-visibility characters, back-lit keypad, powerful front facing speaker and a secure in-vehicle interactive bracket.

All CM60 variants are compliant with AS/NZS 4295 (LMR). UHF variants are compliant with AS/NZS 4365 (CB) and all P25 variants are CAP (Compliance Assessment Program) compliant, conforms to TIA-102 Standards.

Zero tolerance

Improving communications in Melbourne with Hytera XPT

A cost-effective, simple solution for events, festivals and large organisations, enhancing the safety and well-being of staff and patrons.

Hytera's XPT (Extended Pseudo Trunking) system is a cost-effective multi-site digital trunking solution that allows you to increase the capacity of your DMR radio network, by simply upgrading the RD985S repeater. This is becoming increasingly popular with large organisations in ensuring patrons and staff are safe, through clear and effective communication systems. Hytera's XPT uses the latest digital technology which complements the Hytera two-way radios, to meet the ever-growing communication demands.

Wireless Technology Group, a supplier of two-way radio equipment, was founded in 1980 and operates in different areas of communication. Their enthusiasm for Hytera products has led them to become a direct seller, and Hytera have been working in partnership with them for six years. During this time, radio communications has stimulated their business opportunities and they now supply Hytera radios to multiple large arenas in Melbourne.

These popular and iconic Australian venues needed their technology and communication systems to be seamless.

perfect solution when faced with the safety of thousands of people. With Hytera's XPT, you can send one common message at a time and even private call when needed, so the need for individual channels is eliminated. Irrespective of which channel the radios are on, the broadcast capability is extremely high and the smart XPT has the ability to track the location of the radios. It reduces the amount of panic from a variety of individuals, from voluntary first aiders to paid staff, providing a simple solution for all the necessary people to communicate with one another.

Hytera's XPT systems have provided Melbourne with a cost-effective, simple solution for events, festivals and large organisations, enhancing the safety and well-being of staff and patrons. Using XPT for such events has provided greater flexibility to those working with it; they are now able to build a trunking system in a shared channel environment. The strong anti-interference capability, superior audio quality and long communication distance has helped these organisations carry out their work quickly and efficiently, eradicating all issues experienced with the previous conventional communication system and generating confidence in the staff that their business-critical messages are always delivered, instantly.

The improved, and now safer, communication system has received an overwhelming amount of incredible feedback, particularly reducing the amount of panic amongst workers with its trouble-free and simple-to-use functionalities.

The requirement for safety in large arenas has accelerated in recent years, placing extra pressure on facilities management teams. An increasing issue within large establishments is bomb threats. In this instance, large arenas in Melbourne were finding it ever more difficult to find the correct communication systems with the broadcast capabilities that are necessary to resolve the problems efficiently; the conventional communication systems could no longer meet the communication demands of day-to-day work. Working with an individual channel system caused important tasks to be more difficult than necessary, whereby having emergency services on different channels became a complicated disaster.

These popular and iconic Australian venues needed their technology and communication systems to be seamless. With a full understanding of what was required, Wireless Technology Group proposed an XPT communications system, which uses the latest digital technology, enabling users to connect to a larger number of users. This system is the

Hytera

RED ALERT
FOR EMERGENCY SERVICES NETWORK
Jonathan Nally

The Home Office is "not on top of" the UK's long-awaited Emergency Services Network, according to an official investigation.

The UK's long-awaited Emergency Services Network (ESN) is now three years late and expected to cost the taxpayer at least £3.1 billion more than planned, according to a just-released report from the Committee of Public Accounts (PAC).

The Committee said in a statement on 17 July that "despite repeated warnings from this Committee and others, the Home Office's programme to create the new Emergency Services Network (ESN) has been beset by problems. Delays to the delivery of the programme have continued and costs have escalated.

"The Department's original approach was far too optimistic given the level of risk, and its governance arrangements were insufficient to deal with problems that emerged."

The aim of the ESN is to replace the extant narrowband voice communications system used by public safety agencies — the Airwave network — with a mobile broadband service utilising commercial carrier networks.

Although the Home Office announced in 2018 that it was to 'reset' the programme, "we are not yet convinced that it has done enough to turn the programme around" the Committee said.

"The plan for delivering ESN is still not sufficiently robust and the Department does not yet have the skills to make it work. The programme faces substantial levels of technical and commercial risk, and failures to date have undermined the confidence of users that the programme will deliver a system that is fit for purpose and meets their needs.

"On current evidence it seems inevitable that there will be further delays and cost increases."

The statement goes on to say that the Department has "put itself in a position where the status quo is costly and leaves

little option but to progress with ESN. One company, Motorola, is involved in both the new and the old contract leading to perverse incentives and putting the Department in a weak negotiating position.

"The Committee has examined this programme on eight occasions and we remain concerned about its progress and the Home Office's ability to meet the challenges ahead."

Chair of the Committee, Meg Hillier MP, said that "The endless delay in delivering a new system for our emergency services to communicate and share data is creating a crisis of confidence as police, fire and ambulance no longer have trust in the new system being delivered. Neither the emergency services, nor the PAC, are convinced that the Home office has a credible plan to deliver a reliable and effective service anytime soon. In the meantime services are having to find work arounds and buy new equipment," Hillier added. "The financial benefits originally predicted for this programme are rapidly evaporating and it will not now realise cost savings, on the most optimistic forecasts, for at least a decade."

"The key technology behind the ESN is not yet fully proven and we were not convinced that the Home Office has the capability and plans to deliver a coherent single system that provides the functionality and dependability the emergency services demand."

Recommendations

The following are the official conclusions and recommendations from the Committee's report.

Conclusion 1: Despite extending the Emergency Services Network by 3 years and increasing its budget by £3.1 billion, the Department has still not got a grip on whether it can deliver the programme. The ❯

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> **THE KEY TECHNOLOGY BEHIND THE ESN IS NOT YET FULLY PROVEN AND WE WERE NOT CONVINCED THAT THE HOME OFFICE HAS THE CAPABILITY AND PLANS TO DELIVER A COHERENT SINGLE SYSTEM.**

Department announced it had 'reset' ESN in September 2018, but there are significant issues to resolve if it is to meet its extended deadline. Emergency services were meant to have started transitioning to ESN in September 2017, but nearly two years later the Department still does not yet have an integrated plan for how and when each emergency service will deploy ESN.

Technology for some parts of ESN is still not yet ready, for example work to build a network to enable emergency service aircraft to use ESN has not yet started and coverage is not available everywhere it is needed, including on underground railways. The Department has extended the Airwave contract to December 2022 but is already describing this as a 'not

before' date rather than a realistic target for when ESN will be ready.

Recommendation: The Department should set out, by October 2019 a detailed, achievable, integrated programme plan including a realistic date for turning off Airwave and the cost of any extension of Airwave that may be needed and update the Committee when this plan is ready.

Conclusion 2: An unhealthy, 'good news' culture in the Department meant it failed to heed warning signs that the programme was undeliverable. Many of the issues with the Department's original approach were foreseeable and should have been challenged earlier. For example, the Department could have taken a more incremental approach from the start and should have allowed more time to get

planning permission for sites on which to build masts. We have been warning that ESN is a high-risk programme since 2016, but only now does the Department accept that it was too optimistic about how long it would take to build ESN.

The Department admits that where problems had been identified, they were not escalated properly, which meant the Department missed opportunities to correct its approach earlier. For example, the Senior Responsible Owner for the programme was not made aware of an early report which had identified some of the issues and risks with the Department's approach. It is positive that the current Accounting Officer quickly commissioned an independent review of the programme when he took up post in 2017, and that, as a result, action was taken to reset ESN, but it is concerning that such a report was necessary.

Recommendation: The Department should write to the Committee by October 2019 setting out the steps that it has taken to: improve senior oversight of the programme; ensure assumptions are subject to appropriate challenge; and to make sure the findings of independent assurance reviews are widely shared and taken seriously.

Conclusion 3: The Department's mismanagement of the programme means the emergency services do not yet have confidence that ESN will provide a service that will meet their needs. Our previous examinations of the Department's e-borders programme and the modernisation of the Disclosure and Barring Service have shown that a lack of understanding of user needs can lead to programme failure. The intended users of ESN have not yet seen enough evidence that it would be ready to replace Airwave by December 2022. The new incremental approach adopted by the Department could improve users' confidence in the programme. But the initial test, the first version of 'ESN Direct', will only be used by about 120 users in immigration enforcement, a tiny fraction of the 300,000 potential ESN users.

The Department continues to say that it will not force users to accept ESN until they all agree it is 'as good' as Airwave, but it has not defined what this means with sufficient clarity. It has also yet to confirm what happens if some users require expensive changes before they will accept ESN.

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MOBILE BROADBAND

Recommendation: The Department should, without delay, agree with users a set of specific and detailed criteria that will be used to determine when ESN is ready to replace Airwave, and who will ultimately decide when those criteria are met.

Conclusion 4: We are not convinced that the Department has the plans or the skills needed to integrate the different elements of ESN into a coherent service. The Department's first attempt at integrating ESN was unsuccessful, with the 'delivery partner' KBR failing to provide planning and collaboration between the other contractors after its role was downgraded by the Department.

The critical role of making all the different elements of ESN work seamlessly together has now passed to the Department, but it does not yet have sufficient skills to undertake this role. Its plans for testing ESN are not well developed and its track record of coordinating this programme so far is poor. It failed to realise the implications of EE and Motorola making plans based on different versions of telecommunications standards. It similarly failed to ensure suppliers worked together in the same location at the start of the programme, which could have improved collaboration. The Department intends to contract a new delivery partner, but this has not yet happened.

Recommendation: Before contracting with a new delivery partner, the Department should analyse the skills and tasks needed to integrate ESN, how any skills gaps will be filled, and how lessons from the failure of the KBR contract will be applied to the new delivery partner contract.

Conclusion 5: Based on past failures to manage its contractors, we are concerned about the Department's ability to manage the significant commercial risks facing the programme, including those presented by Motorola's position as supplier to ESN and

> **WE ARE NOT CONVINCED THAT THE DEPARTMENT HAS THE PLANS OR THE SKILLS NEEDED TO INTEGRATE THE DIFFERENT ELEMENTS OF THE ESN INTO A COHERENT SERVICE.**

owner of Airwave. The Department failed to ensure contractors delivered ESN to the timetable in the original contracts. It admits that the commercial structure for ESN is highly disaggregated and adds complexity to an already difficult task, and is trying to improve the contracts by changing them. But it signed the new Motorola contract 5 months late and the new EE contract was still not signed when we took evidence.

The Airwave contract has been extended to end in December 2022, but a further negotiation will be needed to cover the additional delays which now seem inevitable given the Department's admission that it could take longer to build and deploy ESN. It is vital that Airwave does not cease working before ESN is fully ready but extending Airwave again is likely to further increase the costs of the programme.

Given its previous negotiation to extend Airwave achieved only a 5% discount, and given Motorola, which is a key supplier to ESN, has a monopoly position as Airwave's owner, we are concerned that the Department has limited leverage to secure value for money in any future extension of Airwave contract.

Recommendation: The Department should write to the Committee by October 2019 setting out how it will manage the risks presented by Motorola's position and the possible need to extend Airwave until it can be replaced by ESN.

Conclusion 6: Delays to the Department's revised business case for ESN and the prospect of further increases in cost raises doubts over the value for money case for ESN. Although the forecast cost of ESN has increased by £3.1 billion, the Department still asserts that ESN will eventually be cheaper than Airwave. But it no longer expects this to happen until 2029, a delay of 7 years compared to the 2015 business case. Delivering ESN later than planned is also likely to create cost pressures for emergency services who may need to buy new Airwave devices while they wait for ESN to be ready.

The Department's forecast costs for the programme are not finalised as they are part of a business case which is not approved. The business case is now expected to be approved in early 2020, over a year late. Given it is likely that Airwave will need to be extended further than December 2022 it seems inevitable that the £9.3 billion cost of ESN will increase again. This will further delay the point at which ESN is cheaper than Airwave, weakening the argument for continuing with ESN.

Recommendation: The Department should ensure it delivers a revised and approved business case, which both the emergency services and the other funders of ESN support, by the end of 2019 at the latest. The business case should include an appraisal of when continuing to spend money on ESN ceases to be value for money and should set out a 'plan B' for what would happen if that point was reached.

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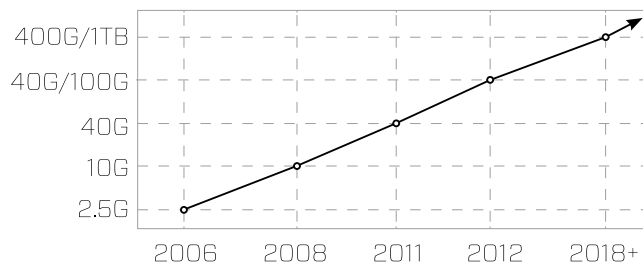
COMMS CONNECT MELBOURNE 2019

Jonathan Nally

The future of communications will be on show at Australia's premier communications event.

Next-generation communications technologies and systems will be at the forefront of the presentations and discussions at Comms Connect Melbourne again this year, 26–28 November at the Melbourne Convention & Exhibition Centre.

Now in its 13th year, Comms Connect is expected to draw more than 1500 attendees from a broad range of industry sectors, including utilities, public safety, government (local, state and federal), transport, mining, oil and gas, security, defence, IT, backhaul and telemetry and the wider commercial environment.

The conference will feature individual presentations, panel sessions, keynotes and workshops covering a myriad of topics of interest to everyone in the critical communications field: latest technologies; regulation and government policy; case studies; cybersecurity; public safety; the Internet of Things, and many more.

Of particular interest will be (hopefully) an update on Australia's forthcoming PSMB solution, to be presented by Luke Brown from the Department of Home Affairs. Brown presented an update at Comms Connect Sydney in June, and said that by November he hoped there would be a lot more he could say about the status of the project.

Industry workshops

This year's event will kick off with a series of workshops on Tuesday, 26 November. These workshops are always very popular, and this year will include not only discussion but also hands-on training in some cases. The topics to be covered are:

- Microwave radio masterclass — presented by Trevor Manning, Managing Director, TMC Global
- Lightning protection and earthing systems — facilitated by ARCIA and presented by Kaine Mulder, RFI Wireless
- Sensors, smart cities and the implications for critical control rooms — presented by Vi Lee, Standards Australia
- Cutting through the hype: current progress of digital land mobile radio and mission-critical broadband open standards
- Mapping and GIS fundamentals — facilitated by ARCIA and presented by Chris Stevens, SLSA Lifesaving Communications Advisor

Special registration rates are available, taking into account whether you also want

COMMS 2019 CONNECT

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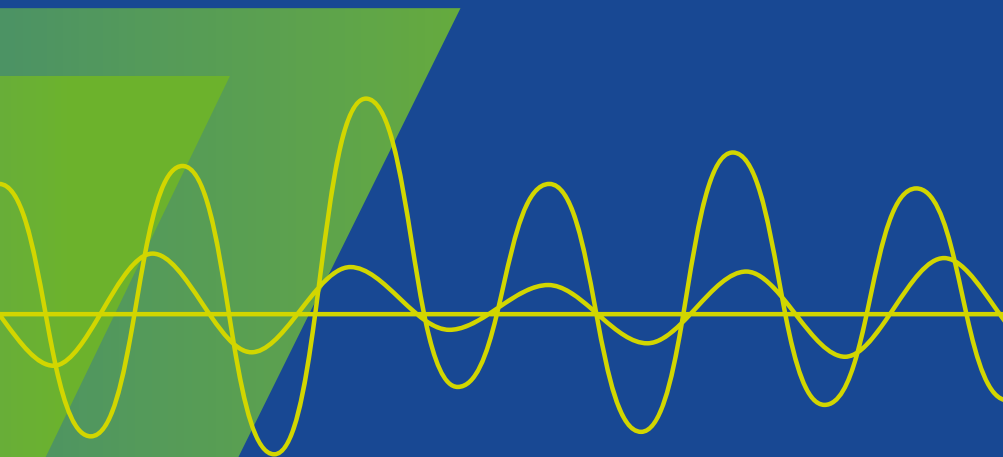
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The full range of communications technologies will be put under the microscope, from TETRA to DMR, LTE to 5G, satellite to Wi-Fi and more. Here are just some of the confirmed speakers:

- Victoria Lee — Vice President, The Public Safety Network
- Ranjan Bhagat — Vice President & General Manager, Zetron
- David Rylance — RPAS Chief Remote Pilot, Metropolitan Fire and Emergency Services Board
- Sohan Domingo — Head of Product Management — Unified Solutions, Tait
- Sam Fasullo — Business Development Manager, Norsat
- Hamish Duff — Honorary Director, DMR Association
- Simon Lardner — CTO, Challenge Networks
- David Cooke — Regional VP, Pacific, Parallel Wireless
- Rodney Nebe — Mine Superintendent — IT Senior Network Engineer, Gold Fields
- Johan Strydom — Product/ Solution Manager, RFI
- Jamie Bishop — General Manager — Transport, Tait Communications
- Andy Bull — Senior Satcom Specialist, Nova Systems
- Noel Kirkaldy — Business Development, Public Sector, Nokia
- Stuart German — Business Development, Digital Matter
- Niiaz Shakirov — Telecom Project Manager, TISSCOM Ltd
- Mark McKenzie — Head of Innovation (Operations), Transdev
- Rob Bellian — Sales Director, Simoco Wireless Solutions
- Terence Ledger — Regional Director Asia Pacific, Sepura
- Graham Manson — Director & Founder, International Resilience Group Pty Ltd (IRG)
  Plenary addresses will be given by:
- Peter Clemons — Chief Designer, Quixoticity Index/Global Advisor, Genaker
- Alex Stefan — National General Manager, Government and Public Safety & Security, Telstra Global Enterprise and Services
  These are just some of the people you'll hear from at Comms Connect. For the full list

to attend speaker sessions and the exhibition — see the Comms Connect website for full details. Please note that the Microwave radio masterclass is a two-day event, spanning the Tuesday and the Wednesday.

Speaker sessions
On the Wednesday and Thursday of the conference, an array of local and international experts will gather to speak on a wide range of topics, covering the gamut of 21st-century communications.

As with previous years, the sessions will be broken into three streams: public safety and emergency management, technology and industry.

There will be a large contingent of international speakers in the public safety space, including representatives from FirstNet, the Public Safety Technology Alliance, Safe-Net

Forum, BroadWay, TCCA and more. And, of course, Australia's public safety mobile broadband efforts will be front and centre too. The speakers will include:

- Jeanette Kennedy — Government Affairs, First Responder Network Authority, USA
- Luke Brown — Assistant Secretary, Department of Home Affairs, Australia
- Steve Hwang — Committee member, Safe-Net Forum/Business Development, Public Sector APAC, Nokia
- Dr David Lund —Vice President, Public Safety Communications Europe Forum and Coordinator for BroadMap
- Dereck Orr — Division Chief, Public Safety Communications Division, NIST Communications Technology Laboratory, USA
- Tony Gray — Chief Executive, TCCA
- Chris Beatson — Director, NSW Police Force, PoliceLink Command

COMMS CONNECT
MELBOURNE 2019

Workshops: Tuesday, 26 November (9.30 am–5.00pm)
Conference: Wednesday, 27 November (9.00 am–5.00 pm) and
Thursday, 28 November (9.00 am–4.30 pm)
Exhibition: Wednesday, 27 November (9.00 am–5.30 pm) and
Thursday, 28 November (9.00 am–3.30 pm)

of speakers and their bios, plus the topics on which they will be speaking, refer to the Comms Connect website, https://melbourne.comms-connect.com.au.

Panel sessions

There will be three panel sessions. The first, to be moderated by Chris Stevens (Managing Director, CartGIS), will tackle the topic of 'Next-generation Triple 000: The road ahead'. The second panel, 'Data sharing and security in an IoT world', will be led by Ghislaine Entwisle (Director, Protiviti) and moderated by Geof Heydon (Principal Consultant, IoT Alliance Australia).

The third panel discussion will be the final item on the Comms Connect Melbourne 2019 agenda. Panellists and the audience will be asked to contemplate and discuss 'Critical communications for all, not just public safety'.

Exhibition and sponsors

The exhibition hall will have more than 90 exhibitors all eager to show off their latest and greatest solutions, and keen to speak with the expected 1500 delegates who will attend across the two days of the event.

No event of this size could function without the support of leading sponsors. At the time of writing, this year's sponsors are as follows:

- Platinum Sponsor: Hytera Communications
- Gold Sponsors: Codan Communications, L3Harris, GME, Motorola Solutions Australia, Simoco Wireless, Zetron and BT
- Silver Sponsors: Icom Australia, M2M One, Socius Technology and Challenge Networks
- Networking Drinks Sponsor: Wireless Innovation
- Lanyard Sponsor: Parallel Wireless

Some sponsorship places were still available at the time of writing. If you're interested, visit https://melbourne.comms-connect.com.au/sponsor/ for details.

ARCIA Gala Dinner

Don't forget that the annual ARCIA Gala Industry Dinner and Industry Awards presentation will be held on the evening of Wednesday, 27 November, preceded by networking drinks.

The Dinner is always a fantastic opportunity to celebrate what makes the radiocommunications industry great, and to mix with partners, clients, employees and colleagues. And, based on recent years' experience, we can expect some very interesting entertainment during the dinner.

You can book your tickets through ARCIA's website, http://www.arcia.org.au.

BICSI conference and exhibition

This year for the first time, Comms Connect will be co-located with the annual conference and exhibition of BICSI South Pacific, the peak industry body representing designers and installers of information and communications technology systems.

BICSI South Pacific's membership encompasses ICT professionals in the commercial and government sectors, with interests spanning not just voice and data but also audio, video, life safety and automation systems.

This year's BICSI South Pacific conference and exhibition will enable delegates to experience presentations from local and international thought leaders on numerous important topical issues, such as:

- Standards and regulations
- IoT, smart buildings and smart cities
- Data centres
- 5G infrastructure

In addition, there will be content on infrastructure for intelligent transport and autonomous vehicles; Power over Ethernet and digital power; wireless technologies such as Wi-Fi, Li-Fi and free-space optics; and intellectual property.

The Comms Connect and BICSI events will be located immediately adjacent to each other, with easy access between the two. This will be a great opportunity for delegates to widen their horizons, meet new people, experience different vendors and see how the comms and ICT worlds coexist.

For full details of the BICSI event, visit the BICSI South Pacific website, https://www.bicsiconference.com.au.

Don't miss it

Comms Connect Melbourne is a once-per-year opportunity to see all of Australia's leading business- and mission-critical experts and exhibitors under the one roof… with the added benefit in 2019 of co-location with the BICSI South Pacific conference and exhibitions.

Check out the Comms Connect conference program and exhibitor list online (melbourne.comms-connect.com.au) and watch for last-minute updates on the Critical Comms (critical-comms.com.au) and Comms Connect websites — on the latter you'll also find full details of the registration process for the conference, workshops and exhibition (including a free trade expo pass option).

This year's Comms Connect Melbourne promises to be the best one yet. Make sure you're there to participate!

Radio Matters

There has been a lot of hype recently concerning the pending spectrum assignment for 5G services. This new technology will provide higher data bandwidth and lower latency but with smaller cell footprints (requiring more sites). These services will be ideally suited to data-heavy applications such as streaming video, but also smaller data payloads associated with large numbers of devices such as Internet of Things (IoT) applications.

There are a number of stakeholders interested in access to the spectrum, including the telecommunications providers, wireless internet service providers and emergency services, as well as other smaller integrators and user organisations. Due to the smaller coverage footprint, there is a greater ability to reassign frequencies geographically, which could enable targeted solutions to be deployed outside the established urban consumer footprint. As a result it is important that the spectrum can be utilised by as many of the stakeholders as possible to balance the needs of all.

As higher-bandwidth technologies develop, data is becoming an increasingly important part of everyday business. Accordingly the reliance on this data means it is more and more critical operationally. A reduction in the availability of this data can have a significant impact on business or organisational effectiveness and service delivery.

For years, mission-critical communications have been defined by digital land mobile radio technologies such as TETRA, P25 and DMR. Some now view LTE (Long Term Evolution) and, eventually, 5G as replacements for these narrowband technologies for critical voice as well as data applications. New broadband technology won't replace narrowband overnight, if at all. Complementary to broadband, narrowband retains a role in mission-critical communications and business continuity, as well as efficient use of spectrum. Nonetheless the transition to embrace broadband data has already begun, and users should start planning now for this future.

Our message to readers is a call for calm until all issues have been considered by government.

To stay informed about the complexities of 5G in the NZ market, please sign up for the RFUANZ newsletter if you are not already receiving it (rfuanz.org.nz).

Corey Weir
Chairman, RFUANZ

Analog handheld radio

GME's 5 W CP50 450–520 MHz analog handheld radio features Bluetooth data interface, selectable low-power transmit mode and digital signal processing. It delivers access to open standard APIs, enabling third-party software developers to innovate and create bespoke features. Standard features include RSSI Voting, MDC1200 compatibility, multi-tone selective-call, CTCSS/DSC, plus 1 W of audio output power.

The CP50's selectable 100 mW low-power transmit mode coupled with the 2600 mAh LiFe battery pack offers extended operational hours. Programming flexibility and simplicity is enabled via multiplatform Bluetooth link programming and upgrading. IP67 waterproofing and adherence to military environmental standards provides durability even under harsh operational conditions.

The CP50 is available in two packaging formats: as a full standalone package with single-slot charger or the CP50X version without a charger intended for clients purchasing multiple radios and wishing to utilise the multicharger. It can use a range of professional-grade optional accessories, including carry cases, a 6-way multicharger, speaker/microphone and headset/microphone.

Standard Communications Pty Ltd
www.gme.net.au

Tracking system

Barrett Communications has launched the 4077 HF Map & Track, which provides a fully automated (no operator training required), scalable and independent situational awareness system for commercial, non-government and government agencies.

The HF tracking solution is independent of infrastructure, has no ongoing costs of operation and offers good data security through encrypted transmissions to all locations and weather conditions. All maps are open source and downloadable, ensuring system operability even in locations where internet access is unreliable or restricted.

When paired with the Barrett 4050 HF SDR Transceiver, the system effectively eliminates the field operator's need to manually send GPS transmissions. The 'GPS Push' feature automates multichannel encrypted GPS transmissions from the mobile(s) to the tracking station where the 4077 Map & Track system plots and displays on multilevel mapping software.

Barrett Communications Pty Ltd
www.barrettcommunications.com.au

CRITICAL COMMUNICATIONS ON SHOW IN KUALA LUMPUR

Anton Abrahams, Chairman, ACCF

The Australasian Critical Communications Forum (ACCF), already an active participant in the Australian Comms Connect conferences and workshops, played an active role in supporting this year's TCCA Critical Communications World (CCW) 2019 conference and exhibition, held in Malaysia from 17–19 June.

Since Kuala Lumpur is at the heart of one of the most vibrant critical communications markets in the world — the Far East, and in particular Southeast Asia — it was therefore a great opportunity for the industry and users to come together to absorb valuable learning in order to get ahead of the game for the coming year.

Presented by TCCA, CCW is a leading event for all stakeholders in mission- and business-critical communications looking for unparalleled access to authoritative content, up-to-the-minute policy, insight and intelligence alongside real-world case studies and best practice advice, combined with access to the latest technological innovations. This year's event attracted more than 4000 visitors.

The vast scope of critical communications was reflected in the event's masterclass and conference program, with contributions from industry experts across the spectrum. These included representatives from 3GPP, TCCA, manufacturers, integrators and national operators, as well as a range of vertical markets.

There was much conversation around the shift from narrowband to broadband. It's clear that 4G and 5G — alongside other apparently game-changing technology such as AI and big data analysis — have the potential to revolutionise how we do business.

Exhibition

There was a great deal of innovation on show from many global manufacturers and integrators. In the exhibition hall there were more companies than last year (CCW 2018, Berlin), displaying portfolios of mission-critical communications solutions, new terminals (including a VHF TETRA terminal and base station), multimode terminals, hybrid solutions (LMR/LTE), gateways and repeaters, and AI-based video and control-and-command security solutions.

The ACCF was on hand to represent its members with an information booth, and a large space on the exhibition floor was occupied by Critical Communications Finland (CCF) — a conglomerate of agencies and manufacturers representing the innovation taking place in that part of the world.

Conference

The conference sessions covered a range of topics. Highlights included 3GPP Chair Georg Mayer reporting on the progress being made in relation to 3GPP standardisation of mission-critical features. He began by giving an update on the ongoing standardisation process, with Release 16 scheduled to be completed by March of next year and with work on Release 17 to start around the same time. The standardisation of 5G began with Release 15 several years ago, and in Mayer's words it is now clear "what 5G will look like in the first deployment phases".

The sessions also highlighted the ongoing global relevance of current open standard, narrowband technologies such as TETRA and P25. The innovation that is continuing with these technologies, the standards, real-life deployments, and significant investment in network and subscriber refreshes reaffirms confidence in the capability these systems are delivering.

The event also showed how users are embracing and exploiting the rich messaging/data and security capabilities of narrowband beyond just voice communications, while they consider augmentation with mission-critical broadband.

PSMB proposals

A series of presentations looked at specific national rollouts of critical communications. Malaysia, which currently provides first responders with nationwide TETRA coverage in

Malaysian emergency services and communications authorities, with TCCA's Tero Pesonen.

The Motorola Solutions display at CCW.

the form of the SAPURA-developed Government Integrated Radio Network (GIRN), has embarked on efforts to improve the country's connectivity through its national fibre and connectivity plan, a development which was announced in October 2018.

The Malaysia-focused presentations were followed by two more that dealt with specific national public safety communications systems. The first of these was delivered by the president of Germany's BDBOS, Andreas Gegenfurtner. BDBOS is currently upgrading the German national PPDR TETRA network to its next phase, which will provide the migration of data and voice to broadband.

The second presentation was by Nina Myren from the Norwegian Directorate for Civil Protection (DSB), who discussed the situation in that country and Norway's experience with roaming between national TETRA networks, with its own system (Nødnett) already linked with Sweden's (Rakel) and Finland's (VIRVE). She stated that "in the future, it is likely that

all public safety [critical communications] services will run over commercial networks or in close cooperation with them. It allows the users to get experience with that future, which has great value for us but no big risk as we are not [swapping] Nødnett for something else."

There was a real sense at CCW 2019 that the industry is taking future mission-critical communications technology seriously. Whereas in previous years this would have meant LTE — at least in the main — the disruptive technologies of today are now increasingly considered to be 5G, artificial intelligence and so on.

Masterclasses

Masterclasses held during the event covered 'TETRA Today and Tomorrow', 'Pushing the Boundaries of Innovation Across Transport, Utilities and Industry', 'The Global Flavour of Critical Broadband' and 'Critical Broadband Masterclass'. These classes provided a

reality check in relation to mission-critical broadband terminals, highlighting the industry's dependence on chipset manufacturers and where the interest in private broadband networks for non-public-safety verticals "may help stimulate a virtuous cycle of innovation that drives the industry forward", as one participant put it.

Other masterclasses concentrated on exploring the broader strategic picture of different models for mission-critical networks and paths complimentary to, or as potential future replacements for, current narrowband digital technologies. For instance, dedicated, shared RAN with dedicated spectrum usage; shared RAN with dynamic spectrum usage; and secure MVNO — comprising LTE MCPTT/MCVideo, VoLTE, MBB and NB-IoT, and the second phase (in development) comprising the adoption of 5G New Radio for high and flexible capacity, along with URLLC (ultrareliable low-latency communications).

The 'Insights into Malaysian and APAC critical communications' masterclass was chaired by Kevin Graham, Director of the ACCF. In-depth discussion of mission-critical communications in the Asian region, along with case studies in key vertical markets (public sector, transport, energy, resources and industrial), was presented.

Coming up

The ACCF will once again support the Comms Connect conference and exhibition in Melbourne, from 26–28 November 2019, by conducting an ACCF/TCCA workshop. The workshop will include presentations by local and international experts in standardised critical communications, including TETRA, P25, DMR and mission-critical broadband 4G, 5G and hybrid solutions.

The next CCW will be held in Madrid from 17–19 June 2020.

The Airbus team at CCW.

Outdoor power system

The Eaton OPS1 is an outdoor power solution, housed in an IP65 sealed enclosure. It's rated at 48 V, 1 kW and intended to power Telecom 4G and 5G remote radio units (RRUs), critical communications equipment and industrial Internet of Things (IoT) equipment.

Typically it will be mounted on poles, towers or buildings close to critical loads. The power system is compact and provides efficient AC-DC power conversion and can have a separate external sealed lead-acid or lithium battery added to produce a battery-backed DC-UPS.

To improve efficiency and reduce operating costs, the power system uses the Eaton Energy Saver 48 V Access Power Rectifier, which provides operating efficiency in excess of 96%.

The power system includes an Eaton SC200 system controller. The SC200 provides advanced control and monitoring features including remote monitoring of AC and DC voltages, system power, DC current, temperature and battery state of health.

In-built data and event logs are included to aid maintenance. The SC200 offers an array of communications options with Ethernet or volt-free contacts. It includes an in-built web server for simple remote monitoring.

Other applications for the OPS1 include providing secure power backup for CCTV PoE cameras and Wi-Fi access points. The power system is preconfigured and all system settings are adjustable in software and stored in transferable configuration files for repeatable and quick one-step system set-up.

Eaton Industries Pty Ltd
www.eaton.com

Subscription-based group service

Motorola Solutions' WAVE PTX is a subscription-based group communication service that connects teams across different devices, networks and locations. The service expands critical communications capabilities beyond existing LMR networks to include broadband users on the devices they already have (via a BYOD service).

For government agencies, WAVE PTX is hosted on Microsoft Azure Australia Central Regions, a mission-critical cloud designed for government and critical infrastructure sectors. Azure Central is compliance certified by the ASD and delivered from Australian-owned, onshore facilities in Canberra.

With WAVE PTX web dispatch software, users can log in from any internet connection and manage a mobile workforce from anywhere.

Service features include: PTT (private and group calling), presence, instant personal alert, messaging (text, image, video, location, PDF, MS Office files), voice messaging, priority talkgroup scanning, broadcast calling/messaging, geolocation and geofencing, emergency calling and alert, ambient and discrete listening, user-check and user monitor, large group (300) and areas-based dynamic grouping.

Motorola Solutions Australia Pty Ltd
www.motorolasolutions.com.au

Fibre-optic test equipment

With a 37 dB dynamic range, FlexScan Quad OTDR tests multimode and singlemode networks (850/1300 nm and 1310/1550 nm), including FTTH PONs and POLANs up to 1:64 split ratio, while still detecting and measuring events <2 m apart.

FlexScan QUAD OTDR maintains the same advantages of the current SM FlexScan, and is designed to enable both expert and novice technicians to quickly, reliably and accurately detect, locate, identify and measure optical network components and faults.

After applying industry-standard or user-set pass/fail criteria, the network is displayed using FlexScan's intuitive, icon-based LinkMap view. Results can be printed to PDF and stored internally or externally. FlexScan automates test set-up, shortens test time and simplifies results interpretation, improving test efficiency and cost.

Applications include FTTX networks and passive optical networks.

Main features include a 37 dB dynamic range; the ability to test Passive Optical LANs up to 1:64 split ratio; easy use for both expert and novice technicians; and quick identification and measurement of optical network components and faults.

AFL Telecommunications Pty Ltd
www.aflglobal.com

RoIP gateway

The IPR400 S2 is a multi-channel RoIP and interoperability gateway, combining VoIP extensions for analog radio equipment and interoperability between disparate radio systems. The four ports of the IPR400 S2 can be linked together internally to the IPR400 S2 or with VoIP in many combinations, making the device suitable for connecting repeater sites. The gateway also features SIP connectivity for use with dispatch consoles such as RediTALK-Flex, altusomni or omnicore.

The product offers isolated 4-wire E&M interfaces, multicasting, voice activity detection, voice compression, CTCSS, SELCALL and DTMF signalling, encryption and RS-232 data tunnelling. It also incorporates software configurable E&M signals — using a web browser, the user can configure contact, voltage or switched (power or ground) operation for both the M (PTT) outputs and the E (Busy) inputs. PTT over Cellular (PoC) is supported via the ESChat application as is Remote Control over IP, using the omnilink web application.

Omnitronics Pty Ltd
www.omnitronics.com.au

Modem router

The RBMTX-Lite 4GX modem router from Teleorigin is designed for users looking for robust mobile internet access, without the need for installing software or drivers.

With the impending shutdown of 3G networks, it is suitable for those with an existing 3G device. The compact router is made for wireless m2m applications, supporting 3G or 4G, optional Wi-Fi, Bluetooth, Ethernet networks and RS232, RS485 and USB interfaces.

The product features an easy-to-configure web interface, with rugged housing, a built-in serial port and low power consumption. In addition, the device supports OpenVPN, including optional Wi-Fi and Digital I/O. When paired with Control Logic's SmartVPN service, it is a good low-cost connectivity solution.

Distributed by Control Logic, the RBMTX-Lite is suitable for many applications including metering, traffic systems, transportation and logistics, security, vending machines and facility management.

Control Logic Pty Ltd
www.controllogic.com.au

UK TO IMPROVE
TELECOMS SECURITY

Jonathan Nally

The UK Government will introduce new security legislation and enforce better cybersecurity practices across the telecommunications sector.

The UK's Digital Secretary, Jeremy Wright, has announced plans to "improve security standards and practices across the UK's telecoms sector, including in new 5G and full fibre broadband networks".

Those plans include tabling new legislation to "enforce stronger security requirements in the telecoms sector and protect the UK from threats".

The move came on the same day as the Telecoms Supply Chain Review report was published, 22 July.

The Review sets out a series of new telecoms security requirements, overseen by Ofcom (the UK's telecoms regulator) and government, with telecoms operators required to design and manage their networks in accordance with the new standards.

Operators will be subject to "rigorous oversight" of their procurement and contract management processes and will be required to "work much more closely with suppliers to ensure that there is proper assurance testing for equipment, systems and software".

"With the growth of our digital sector and transformative new services over 5G and full fibre broadband in the coming years, this is not something to compromise on," said Digital Secretary Wright.

"People expect the telecoms sector to be a beacon of safety and this review will make sure that safety and security is at the forefront of future networks.

Under the new security framework, operators will have to:
• build and operate secure and resilient networks;
• manage their supply chains with security in mind;
• assess any risks posed by vendors to network security and resilience, and manage those risks appropriately.⟨br⟩

The Review identified a lack of diversity in the supply chain. It also recommends that regulations must be strengthened to enforce telecommunications cybersecurity.

The government will develop legislation and provide Ofcom with stronger powers, and in the meantime will work together with industry to develop "new security requirements".

Commenting on the development, Ciaran Martin, CEO of the UK's National Cyber Security Centre, said, "As the UK's lead technical authority, we have worked closely with DCMS on this review, providing comprehensive analysis and cybersecurity advice.

"These new measures represent a tougher security regime for our telecoms infrastructure, and will lead to higher standards, much greater resilience and incentives for the sector to take cybersecurity seriously.

"This is a significant overhaul of how we do telecoms security, helping to keep the UK the safest place to live and work online by ensuring that cybersecurity is embedded into future networks from inception," Martin added.

Dealing with high risk vendors

In a statement released 22 July, the UK Government said that it "continues to consider its position relating to high risk vendors".

"Following action by the US Department of Commerce and uncertainty around the implications for the telecoms market as a whole from the entity listing, the government is further considering its position relating to high risk vendors. Decisions in this area will be made in due course."

This is a clear reference, of course, to concerns about the security implications of including Huawei products in telecommunications networks.

The Telecoms Supply Chain Review's report states that both the "2018 and 2019 Huawei Cyber Security Evaluation Centre (HCSEC) Oversight Board reports have highlighted major quality and security issues with Huawei's engineering, leading to the Board only being able to provide 'limited assurance' that risks to UK national security from Huawei's involvement in the UK critical networks have been sufficiently mitigated".

Copper and fibre optics inspection kit

The Fluke DSX-5000QOi contains the DSX-5000 copper analyser, CertiFiber Pro OLTS quad wavelength, Optifiber Pro OTDR quad wavelength and a USB fibre inspection probe. It is available for rent from TechRentals.

The DSX-5000 copper analyser is designed to enable testing and certification of twisted pair cabling for up to 10 Gigabit Ethernet deployments and will handle any cabling system from Category 3, to 6A and Class C, to FA at Level V accuracy.

CertiFiber Pro Optical Loss Test Set offers efficient fibre optics certification. Featuring a simple user interface, the device helps eliminate errors and speeds troubleshooting. It performs Tier 1 (basic) fibre certification in 3 s and complies with all applicable cabling standards, which call out the Encircled Flux launch condition requirements for optical sources.

The Optifiber Pro OTDR offers SmartLoop technology that tests two fibres in a single test, eliminating the need to travel to the far end of the connection to perform tests. It performs Tier 2 (extended) fibre certification and displays a graphical EventMap to help trace interpretation.

The Fiber Inspection probe enables users to inspect and certify fibre optic connector end-faces in 1 s.

TechRentals
www.techrentals.com.au

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For more information or to register visit www.melbourne.comms-connect.com.au

COMMS
ABOVE THE CLOUDS

High-altitude balloons, long-duration UAV and centimetre-accurate positioning are under test in Japan.

Japan's SoftBank, a telecommunications and internet service provider, is taking to the skies with new technology that aims to improve connectivity across the globe.

The company is working with unmanned aircraft manufacturer AeroVironment, and also with Alphabet and its Project Loon, to study the potential for providing high-altitude communications platforms that can stay airborne for weeks or months at a time.

In April 2019, AeroVironment announced that it had achieved a significant milestone with its solar HAPS project, with assembly of the first HAWK30 solar HAPS for the HAPSMobile joint venture with SoftBank. HAPS stands for high-altitude pseudo-satellite or high-altitude platform station.

HAWK30 has a wingspan of approximately 28 metres and has 10 electric motors powered by solar panels covering the surface of the wing, propelling the craft to a cruise speed of 100 kilometres per hour. High-energy-density lithium-ion batteries will store electricity to power the craft at night.

Cruising at a typical altitude of approximately 65,000 feet — well above almost all clouds and turbulent weather — the craft is designed for continuous missions of up to months' duration without landing.

HAPSMobile's communications relays will use the same frequencies as those used by ground-based cellular networks, which means that ordinary smartphones will be able to connect. The low altitude compared to satellite orbits will contribute to low latency, and handovers between the HAPS and terrestrial stations are expected to be smooth and undisrupted.

SoftBank said that HAPSMobile will be useful for establishing stable internet connection environments at locations not presently served by telecommunication networks, such as mountainous terrain, remote islands and in many developing countries.

The system's independence from conditions on the ground means that it should prove very useful during times of crisis and natural disaster, when traditional telecommunications networks might be off the air.

"The result of decades of experience developing and flying solar HAPS, our team designed, developed and assembled the entire HAWK30 in only 24 months. This is very rapid for a HAPS of such large size and significant payload capacity," said Wahid Nawabi, AeroVironment's President and CEO.

The HAPSMobile joint venture will conduct R&D and flight tests in coordination with authorities in a number of countries, targeting 2023 for HAWK30 serial production and service launch.

Up, up and away

In another deal, SoftBank's HAPSMobile and Alphabet's Loon have formed a long-term relationship to advance the use of high-altitude vehicles such as balloons and unmanned aircraft systems for telecommunications connectivity.

So serious are the two parties about the future of these kinds of systems, that HAPSMobile has invested US$125 million in Loon while Loon has acquired the right to invest the same amount back in HAPSMobile in the future.

Loon's experimental stratospheric balloons so far have floated more than 30 million kilometres around the globe and connected hundreds of thousands of people, according to Alphabet.

Artist's impression of the HAWK30 high-altitude pseudo-satellite aircraft.

In April 2019, HAPSMobile and Loon entered into negotiations concerning a number of areas of potential collaboration, such as:

- A wholesale business that would allow HAPSMobile to use Loon's vehicle and technology. In return, Loon would be able to use HAPSMobile's aircraft, currently in development, upon its completion.
- A jointly developed communications payload that is adaptable to multiple vehicles and various ITU compliant frequency bands.
- A common gateway or ground station that could be deployed anywhere in the world and used by both parties to provide connectivity via their platforms.
- Adapting and optimising Loon's fleet management system and temporo-spatial SDN for use by HAPSMobile.
- Forming an alliance to promote the use of high-altitude communications solutions with regulators and authorities worldwide.
- Enabling vehicles from each company to connect and share the same network in the air.

"Building a telecommunications network in the stratosphere, which has not been utilised by humankind so far, is uncharted territory and a major challenge for SoftBank," said Junichi Miyakawa, Representative Director and CTO of SoftBank and President and CEO of HAPSMobile.

"Working with Alphabet's subsidiary Loon, I'm confident we can accelerate the path toward the realisation of utilising the stratosphere for global networks by pooling our technologies, insights and experience.

"Even in this current era of coming 5G services, we cannot ignore the reality that roughly half of the world's population is without internet access," Miyakawa added. "Through HAPS, we aim to eliminate the digital divide and provide people around the world with the innovative network services that they need."

Loon CEO Alastair Westgarth said that he sees joining forces with HAPSMobile as "an opportunity to develop an entire industry, one which holds the promise to bring connectivity to parts of the world no-one thought possible".

Precise positioning

Not content with boosting communications from above, SoftBank has announced that from the end of November 2019 it will provide a positioning service with centimetre-level accuracy in Japan.

The solution will use real-time kinematics (RTK), a positioning method that uses fixed and mobile stations to receive signals. Data is exchanged between the two points to achieve highly accurate positioning.

Since July 2019, SoftBank has partnered with Yanmar Agribusiness, Kajima Corporation and SB Drive Corp to conduct joint trials in phases to achieve commercialisation in different industries, such as agriculture and transport.

The service will use signals received from the GNSS network, such as QZSS (Quasi-Zenith Satellite System), to conduct RTK positioning with centimetre-level accuracy.

SoftBank will use its nationwide network of 4G and LTE base station locations to install over 3300 unique control points that are necessary for RTK to work.

More specifically, a 'Positioning Core System' provided by ALES Corp. will generate correctional data based on signals received and transmitted by SoftBank's own control points.

This correctional data will be sent to agricultural and construction machinery, self-driving cars, drones and other equipment embedded with GNSS receivers (mobile stations) using SoftBank's mobile communications network.

By conducting RTK positioning using this correctional data and signals received by GNSS receivers, highly accurate positioning can be done in real time.

Furthermore, by having a dense distribution of control points across Japan, stable positioning within extremely short time spans and handovers can be achieved.

Accordingly, highly accurate positioning can be achieved continuously across long distances when GNSS receivers cross over control points.

SoftBank's control points will use the Geospatial Information Authority of Japan (GSI)'s approximate 1300 GPS-based control stations.

SoftBank is developing proprietary GNSS receivers that can be installed at low cost so that more companies can utilise centimetre-level positioning services, and new services and market expansions can be achieved.

The company is also advancing the development of services that enable cloud-based RTK positioning, which enables services for devices without GNSS receivers.

Cloud-based RTK will enable centimetre-level, location-based services for equipment that needs to be miniature and energy efficient, such as infrastructure surveillance sensors and wearable devices.

A Project Loon high-altitude balloon.

Images courtesy AeroVironment and Loon.

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WIRELESS TECHNOLOGY TRENDS

Wireless technologies such as 5G, SDR, backscatter, millimetre wave and V2X will lead the way in the next five years.

New forms of wireless technology will become pivotal for emerging technologies such as robotics, drones and self-driving vehicles, according to Gartner.

The research firm has identified what it thinks will be the top 10 wireless technology trends for enterprise architecture (EA) and technology innovation leaders over the next five years.

"Business and IT leaders need to be aware of these technologies and trends now," said Nick Jones, distinguished research vice president at Gartner.

"Many areas of wireless innovation will involve immature technologies, such as 5G and millimetre wave, and may require skills that organisations currently don't possess.

"EA and technology innovation leaders seeking to drive innovation and technology transformation should identify and pilot innovative and emerging wireless technologies to determine their potential and create an adoption roadmap."

Wi-Fi

Gartner said Wi-Fi will remain the primary high-performance networking technology for homes and offices through to the end of 2024. Beyond simple communications, Wi-Fi will find new roles — for example, in radar systems or as a component in two-factor authentication systems.

5G cellular

5G cellular system deployments are beginning this year, with the complete rollout to take five to eight years. In certain cases the technology may supplement Wi-Fi, as it is more cost-effective for high-speed data networking for large sites, such as ports, airports and factories.

"5G is still immature, and initially, most network operators will focus on selling high-speed broadband. However, the 5G standard is evolving and future iterations will improve 5G in areas such as the Internet of Things (IoT) and low-latency applications," Jones said.

Vehicle-to-everything (V2X)

Conventional and self-driving cars will need to communicate with each other as well as with road infrastructure, and this will be driven by V2X wireless systems. As well as exchanging information and status data, V2X will provide many other services such as safety capabilities, navigation support and infotainment.

"V2X will eventually become a legal requirement for all new vehicles. But even before this happens, we expect to see some vehicles incorporating the necessary protocols," Jones said. "However, those V2X systems that use cellular will need a 5G network to achieve their full potential."

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ing will be integrated in a multitude of use cases, ranging from medical diagnostics to object recognition and smart home interaction."

Enhanced wireless location tracking

A key trend in the wireless domain is for wireless communication systems to sense the locations of devices connected to them. High-precision tracking to around one-metre accuracy will be enabled by the forthcoming IEEE 802.11az standard and is intended to be a feature of future 5G standards.

"Location is a key data point needed in various business areas, such as consumer marketing, supply chain and the IoT. For example, high-precision location tracking is essential for applications involving indoor robots and drones," Jones said.

Millimetre wave

Millimetre wave wireless technology operates at frequencies in the range of 30 to 300 gigahertz, with wavelengths in the range of 1 to 10 millimetres. The technology can be used by wireless systems such as Wi-Fi and 5G for short-range, high-bandwidth communications (for example, 4K and 8K video streaming).

Backscatter networking

Backscatter networking technology can send data with very low power consumption. This feature makes it ideal for small networked devices. It will be particularly important in applications where an area is already saturated with wireless signals and there is a need for relatively simple IoT devices, such as sensors in smart homes, offices and factories.

Software-defined radio

SDR shifts the majority of the signal processing in a radio system away from chips and into software. This enables the radio to support more frequencies and protocols. The technology has been available for many years, but has not yet taken off as it is more expensive than dedicated chips. However, Gartner expects SDR to grow in popularity as new protocols emerge. As older protocols are rarely retired, SDR will enable a device to support legacy protocols, with new protocols simply being enabled via software upgrade.

Long-range wireless power

First-generation wireless power systems have not delivered the revolutionary user experience that manufacturers had hoped for. In terms of the user experience, the need to place devices on a specific charger point is only slightly better than charging via cable. However, several new technologies can charge devices at ranges of up to one metre or over a table or desk surface.

"Long-range wireless power could eventually eliminate power cables from desktop devices such as laptops, monitors and even kitchen appliances. This will allow for completely new designs of work and living spaces," Jones said.

Low-power wide-area networks

LPWA networks provide low-bandwidth connectivity for IoT applications in a power-efficient way to support devices that need a long battery life. They typically cover very

large areas, such as cities or even entire countries. Current LPWA technologies include Narrowband IoT (NB-IoT), Long Term Evolution for Machines (LTE-M), LoRa and Sigfox. The modules are relatively inexpensive, so IoT manufacturers can use them to enable small, low-cost, battery-powered devices such as sensors and trackers.

Wireless sensing

The absorption and reflection of wireless signals can be used for sensing purposes. Wireless sensing technology can be used, for example, as an indoor radar system for robots and drones. Virtual assistants can also use radar tracking to improve their performance when multiple people are speaking in the same room.

"Sensor data is the fuel of the IoT. Accordingly, new sensor technologies enable innovative types of applications and services," Jones said. "Systems including wireless sens-

Backhaul

Take a trip down memory lane as we look at what was happening in the comms sector of yesteryear.

25 YEARS AGO. The cover of the October/November 1994 issue of *What's New in Radio Communications* featured the Philips digiText modem, designed to enable the user to transfer data over trunked over conventional private mobile radio systems, and especially designed to be used with the Philips PRM80-series radios. Inside the magazine we reported on the NSW Government hoping to save $40 million over five years through the use of a workflow management system devised by Xedoc Software Development under contract to Telecom, and based up on Motorola's SmartZone technology. We also reported on an agreement on mobile radio services between Brisbane City Council, the Queensland Government, Q-Tel and Telstra that would enable state and local government agencies across Queensland to access Telstra's mobile radiocommunications network, Fleetcoms. And in good news for CB users, the then Spectrum Management Agency scrapped licence fees for CB radios and handphones, replacing the $18-per-unit charge with a class licence that meant individual users were automatically covered and didn't have to pay a cent.

10 YEARS AGO. The cover of the September/October 2009 issue of *Radio Comms Asia–Pacific* featured the Simoco SRP9180 portable, designed and developed in Australia. On the topic of Simoco, inside the magazine we reported on the acquisition by Simoco of ComGroup, the designer and distributor of Simoco-branded mobile radio terminals that had been acquired by Team Telecom Group and which was to be merged with the existing operations of Team Simoco. We also reported on Ansaldo STS winning a $2.5 million data communications contract from the Western Australia Police; the work was to expand the coverage area of the secure digital metropolitan radio network from 9000 to 20,000 square kilometres. And we profiled a system to track and monitor mining vehicles using a data recorder, GPS location data, an RF Innovations radio modem and communications link.

# ᴦ Spectrum

Data sharing as an innovation enabler

Whether you are talking about the first responder market or any other sector, digital information is exploding. Increasingly, information is real-time captured and stored and then analysed to produce actionable insights. The Internet of Things story is all about the rapid growth in the number and type of sensors that are being deployed to capture a huge array of information — all of which is stored in digital form. This digital information is enabling a whole range of new insights to be explored. The next generation of people will wonder how we made any decisions at all without the volume of and detail in supporting data.

Today, most data captured is being used to improve decision-making or to help solve an old problem in a new way. Tomorrow, all this data, when shared effectively, will help us understand new problems and deliver new insights that were previously unknown. Being able to link data from many sources and analyse it is emerging as a new and exciting discipline. Imagine being able to analyse data from a wide range of supposedly unrelated sources to be able to identify a complex breakdown in communications and collaboration between first responders, or even to identify a serial firebug.

Without siloed operations sharing data, these sorts of innovations would not be easy or even possible. And yet, one of the most challenging things for an organisation to do is proactively share data. There are a huge number of reasons (read 'excuses') for not sharing. These include such things as: not trusting the recipient to keep the data safe; not being willing to share your data because you are embarrassed by the errors you know are there; or even that you're not sure that you own the data and therefore have the rights to share it. These are three of many reasons I've heard. There are literally dozens of reasons to not share data. But without sharing there won't be opportunities to innovate.

Would it surprise you to know that there are today no standards for sharing data? Furthermore, would it surprise you to know that Australia is driving the technical input into the international standards bodies (IEC and ISO via the Joint Technical Committee, JTC1) on trust preserving data sharing, which is one of the most important areas of work for the Internet of Things. This work is progressing as a taskforce collaboration between the NSW Government's Data Analytics Centre and the Australian Computer Society with input from the IoT Alliance and several other agencies and private sector players. This work, via Standards Australia, is driving the standardisation process.

It's based on a trust framework for data sharing called the 'Five Safes' — originally developed by the UK government and now adopted by several agencies globally. Locally we have been using this framework to build a trust preserving data sharing approach that enables organisations to share data that contains sensitive personal information with partners, while dramatically decreasing the chance of personal re-identification — which is indeed one of the main reasons why little or no sensitive data is shared today.

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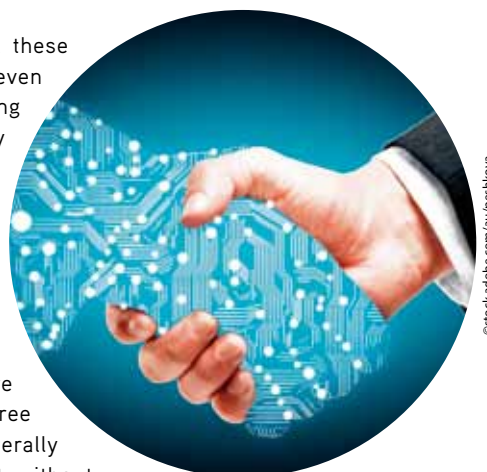
Geof Heydon is principal consultant and co-founder of the IoT Alliance, Australia, chair of the Australian Computer Society's Data Sharing Technical Committee and Associate in the Astrolabe Group. For more information on this topic, refer to acs.org.au/content/dam/acs/acs-publications/ACS_Data-Sharing-Frameworks_FINAL_FA_SINGLE_LR.pdf.
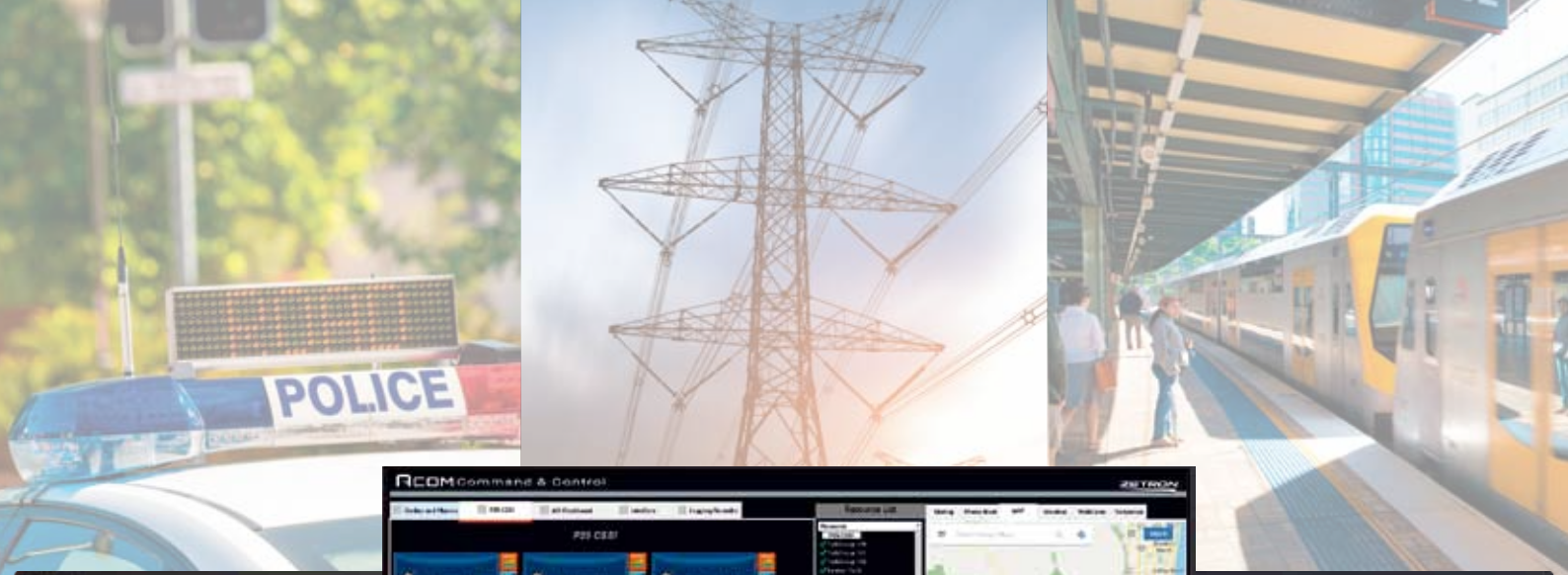
HYTERA's PTC680 has arrived!

We have extended our innovative series of Multi-mode Advanced Radios. The PTC680 combines a mission-critical TETRA radio with LTE technology and the benefits of an Android-based smartphone in a single device. This convergent solution provides seamless communication. The 325g lightweight and manageable PTC680 is also easy to operate with gloves with just one hand and has a large touch screen. The radio is the ideal solution for mission and business critical situations where fast reaction is required.

➤ **Comfortable operation:** With a width of 60mm, the PTC680 can be easily operated with one hand. It has a large PTT button and features a top display for quick view next to the main display. Five programmable buttons provide fast, direct access to key features of the PTC680.

➤ **Resilience:** Thanks to IP68 and MIL-STD-810 G, the PTC680 is protected against dust and moisture and particularly robust for use in harsh environments.

➤ **Clear audio quality:** The dual microphone with noise cancellation and powerful speech recognition filters out unnecessary ambient noise for a clear audio quality. Thanks to the 128 dB volume and the powerful 2W loudspeaker no information is lost even in noisy workplaces.

➤ **Control with the Smart MDM:** With the Hytera Mobile Device Management (MDM) client, you can track device activity and transfer apps and updates wirelessly to your modern radio fleet. This saves you time maintaining the radios. Excellent recording performance: The PTC680 has two HD cameras, with the main camera using 13 megapixels and supporting the transmission of real-time Full HD video. A variety of video formats are available for transmitting recordings.

➤ **Comprehensive safety guarantee:** The radio provides voice and data encryption with AIE, Soft E2EE, SD card-based E2EE to prevent voice and data theft.

➤ **Convergence solution:** Seamless communication will be available soon via Roaming-over-IP.

➤ **NFC feature:** In addition to Bluetooth, the PTC680 can be used with the help of the NFC module in scenarios in which NFC tags have to be read out, for example for information requests, etc.

To find out more about this new release contact one of our local sales managers.

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