MAY/JUN 2019 Vol.6 No.4

comms critical

PUBLIC SAFETY | UTILITIES | MINING | TRANSPORT | DEFENCE

impulse WIRELESS

YOUR TOTAL PTT **TWO-WAY COMMUNICATIONS** SOLUTION

Backed by superior coverage, reliability and years of experience.

TRY IT FOR YOURSELF AND DISCOVER THE IMPULSE WIRELESS DIFFERENCE TODAY.

02 8705 3778 // IMPULSEWIRELESS.COM.AU

T PARTNER

critical comms

Inside

May/Jun 2019

READ ONLINE! *This issue is available to read and download at*
www.criticalcomms.com.au/magazine

ON THE COVER

Widely used in public safety and utilities industry, narrowband network communications devices are necessary for emergency communication. In addition to voice scheduling, users require additional services such as video surveillance, remote data collection and multimedia broadcast. In other words, users want to not only hear each other but also see each other clearly.

With development of commercial LTE technology, its most significant attributes such as low latency and high bandwidth have brought great changes to the way we communicate. LTE technology has now been brought into the field of private communications. Its capability of transferring large volumes of big data and videos helps us to see the world more clearly.

Relying on the integration of the narrowband and broadband network, the Hytera convergent solution achieves voice, data and image transmission through multi-mode smart terminals. The solution helps users facilitate collaboration across public and private networks. Accordingly, users can enjoy instant dispatching and a seamless connection in mission-critical communication.

iBS — integrated base station — supports multiple modes and multiple standards, SDR architecture, LTE and PMR etc. It works as an outdoor base station or a stand-alone system and supports multi-site networking, narrowband and broadband networking. It also saves site resources through wall-mount, post-mount and tower-mount installations. It adopts aviation connectors, is adaptive to harsh environments and supports enhanced DPD technology with high-power amplification efficiency and high adjacent channel index.

Hytera Communications (Australia) Pty Ltd
hytera.com.au

Transmit

In this issue we take an in-depth look at communications developments across the world. Taking centre stage is FirstNet, the pioneering public safety mobile broadband (PSMB) communications network for US first responders. Our thanks to Ed Parkinson for taking the time to answer our questions — make sure you don't miss his keynote address at Comms Connect Sydney in June. We also have profiles of Finland's upcoming VIRVE 2.0 system and Mexico's Red Compartida. Each of these projects is very different to the others, but all of them are right at the cutting edge of large-scale, 21st-century communications network design. It's interesting to compare and contrast the diverse approaches being taken, and the technical, geographical and political reasons why each jurisdiction has chosen its own particular route.

We're also grateful to Ian Thompson, head of BAPCO in the UK, for his report from the recent BAPCO annual meeting. He makes some very interesting observations about the state of play of communications in the UK, and how rapidly changing technological developments are forcing operators, legislators and vendors to meet the challenges of the modern world.

Make sure you're don't miss Comms Connect Sydney — it's only a few weeks away now — where you'll get the latest news of developments in mission- and business-critical communications in the Australasian region and beyond. There are lots of great speakers and presentations lined up. Head to sydney.comms-connect.com.au for full program and registration details.

Looking ahead to later in the year, WF Media and BISCI South Pacific have formed an agreement to run their Comms Connect Melbourne and BICSI conferences and expos side by side at the Melbourne Convention & Exhibition Centre in November. This'll be a great opportunity to bring the comms and networking world together under the one roof.

Jonathan Nally, Editor
jnally@wfmedia.com.au

Calendar

May

Critical Communications World 2019
18–20 May
Kuala Lumpur, Malaysia
critical-communications-world.com

June

20th PSCE Conference
4–6 June
Lancaster, UK
www.psc-europe.eu

Australian and New Zealand Disaster and Emergency Management Conference 2019
12–13 June
RACV Royal Pines Resort, Gold Coast
anzdmc.com.au

Comms Connect Sydney 2019
12–13 June
Rose Hill Gardens
comms-connect.com.au

August

APCO 2019
11–14 August
Baltimore, USA
apco2019.org

AFAC19
27–30 August
Melbourne Convention & Exhibition Centre
afacconference.com.au/afac19-powered-by-interschutz/

November

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

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

wfmedia connecting industry

Westwick-Farrow Media
A.B.N. 22 152 305 336
www.wfmedia.com.au

Head Office
Cnr. Fox Valley Road & Kiogle Street, (Locked Bag 1289), Wahroonga NSW 2076 Australia
Ph +61 2 9487 2700 Fax +61 2 9489 1265

Editor: Jonathan Nally
cc@wfmedia.com.au

Editorial Assistant: Amy Steed

Publishing Director/MD: Geoff Hird

Art Director/Production Manager: Julie Wright

Art/Production: Colleen Sam

Circulation: Dianna Alberry, Sue Lavery
circulation@wfmedia.com.au

Copy Control: Mitchie Mullins
copy@wfmedia.com.au

Advertising Sales

Tim Thompson Ph 0421 623 958
tthompson@wfmedia.com.au

Liz Wilson Ph 0403 528 558
lwilson@wfmedia.com.au

Caroline Oliveti Ph 0478 008 609
coliveti@wfmedia.com.au

Print Post Approved PP100007393
ISSN No. 2202-882X
Printed and bound by SOS Print + Media
+61 2 9549 2119

Off Grid Power for Telecommunications Infrastructure

powerbox®
Powering Progress

ENATEL GREENSHELF SOLAR SYSTEM

- Perfect for Off-Grid / Grid-Hybrid Sites
- Available in Standalone Version (V1) or combine with existing Enatel DC Power infrastructure (V2)
- Up to 8KW in 1RU configuration
- Hot Swappable / Modular Design with Surge Protection, Earth Fault Detection and Back-feed Protection
- Remote Site Monitoring via TCP/IP
- Choice of Solar Modules (SM1848HE / SM2048HE)

ENATEL SM1848HE ELV SOLAR CHARGER

- Industry leading MPPT design for greater solar harvesting
- Nom. Input Voltage: 100Vdc
- DC Input Range: 60 – 140Vdc
- Start Up Voltage: 60Vdc
- Max. Input Current: 18A
- Output: 48Vdc @ 37.5A (1.8kW)
- CEC Approved

CE+T E-ONE INVERTER

- Cost Effective, Compact with High Efficiency DC/AC conversion.
- 48Vdc Input
- 350vA or 1kVa Output
- AC Output via IEC Socket
- Rack Mount (1RU) or Wall Mount

Powerbox Australia Pty Ltd

Sydney Head Office
4 Beaumont Road,
Mt Kuring-Gai, NSW 2080
Australia

p: +61 (0)2 9457 2200
f: +61 (0)2 9457 2255
e: sales@powerbox.com.au
powerbox.com.au

Powerbox Pacific Ltd

New Zealand Sales Office
1a Henry Rose Place,
Albany, Auckland
New Zealand 0632

p: +64 (0)9 4158 320
f: +62 (0)9 4159 780
e: sales@powerbox.co.nz
powerbox.co.nz

FIRSTNET'S FIRST YEAR

Jonathan Nally

More than 5000 agencies across the US have signed up to FirstNet, with more than 425,000 active connections on the mobile broadband network.

Images courtesy FirstNet.

FirstNet provides the more than 60,000 public safety agencies in the US with a dedicated broadband communications platform. Individual agencies and municipalities can sign up for service in all 50 states, five US territories and the District of Columbia, and benefit from seamless and interoperable mobile broadband.

The FirstNet public–private partnership with AT&T marked its second anniversary on 30 March, the core network capability going live 12 months ago. As of January 2019, more than 5250 agencies, across all levels of government and disciplines, were using more than 425,000 connections on FirstNet.

We spoke with Ed Parkinson, the First Responder Network Authority's acting CEO, to get more insight into the way first responder agencies are using FirstNet, the benefits it is providing and what the plans are for the future.

Can you give an example of FirstNet in action?

FirstNet is already having an impact on emergency response in the United States and has supported public safety from wildfires to floods, hurricanes and more. For example, local agencies used FirstNet during the response to Hurricane Florence last year. Specifically, in the City of Whiteville, North Carolina, FirstNet helped responders stay connected when all other communications systems went down. The city's public safety agencies use FirstNet for day-to-day operations including for connections to mobile data terminals in police patrol cars. At the height of the storm, the county's land mobile radio system was damaged and during this time the city used a push-to-talk app on FirstNet mobile devices to communicate. At one point, Whiteville's public safety personnel on FirstNet were the only ones able to talk in the area.

How are emergencies handled in remote locations, away from the network?

FirstNet is driving innovation and setting the bar high for dedicated public safety broadband services. One of the things emergency responders told us they needed was access to deployable assets, like Satellite Cell on Light Trucks (SatCOLTs) to help keep them connected when they need it most. I'm proud to say FirstNet delivered, and we have a fleet of 72 dedicated deployables. FirstNet SatCOLTs can be requested by agencies subscribed to FirstNet at no cost to public safety. These assets have been deployed to support response and recovery efforts for natural disasters like Hurricane Michael and other types of emergencies, as well as to support public safety operations at large planned events — like the 2018 Boston Marathon.

Through our contract, AT&T is responsible for deploying and operating the network and it continues to hit the ground running. AT&T has a Response Operations team that assists in deploying the SatCOLTs and the fleet is maintained by AT&T.

What are the costs involved with FirstNet for user agencies?

FirstNet understands the unique needs of first responders. For example, the Stockton, California Fire Department moved to FirstNet at a cost saving of more than $350,000, according to the Fire Chief — all while ensuring interoperable communications with neighbouring jurisdictions. FirstNet is helping the Department efficiently and effectively serve and protect its community with seamless communications. So, I believe FirstNet is best positioned to deliver the value and experience responders expect — with key capabilities like priority and pre-emption and a growing applications and devices ecosystem — at a highly competitive price point.

What sort of feedback have you been getting from users?

We are very pleased with the progress of FirstNet to date. It's been one year since we launched the FirstNet core network — this is the brains and nervous system of the network, and it separates public safety traffic from commercial traffic giving emergency responders a dedicated network. It's

Images courtesy FirstNet.

also been one year since the launch of the FirstNet buildout in each state and territory — we are adding spectrum for public safety to boost coverage and capacity where they need it most. During the past 12 months, FirstNet has been used by emergency responders in hurricanes, floods, wildfires, active shooter situations and more. It is also being used day to day to help public safety personnel in the field as they serve and protect their communities.

Have there been any unexpected benefits?

I would say reaching public safety personnel where they are has been an important aspect of FirstNet that is crucial to smaller agencies or volunteer departments. For example, 70% of local firefighters in the US are volunteers. AT&T has enabled them to walk into a retail store and sign up for FirstNet service if they qualify. This is really important for the many smaller communities across the country — FirstNet is for all responders.

How are you encouraging efforts to go beyond voice and into data services?

Everyone is familiar with their smartphone. Some of us might have more than one mobile device, like a tablet. So, it would be easy to assume that all public safety personnel have a work-assigned smartphone or other data-enabled device, but this is not the case in the United States. FirstNet is helping to get technology into the hand of first responders so they can stay connected to keep themselves and their communities safe. How to operationalise public safety broadband and fully understanding how FirstNet can help is an exciting part of our mission and the FirstNet Authority looks forward to continuing to work with public safety on this front.

Is FirstNet set in stone, or will it be an ever-evolving system?

FirstNet will continuously evolve to meet public safety's critical communication needs. The First Responder Network Authority (FirstNet Authority) has developed a sustainable business model through which we will invest back into the network. We are currently working with public safety to further understand their current and future needs for the network, and using this feedback, we will develop a roadmap to guide the advancement and evolution of the network. This is truly a unique aspect of the network and we are looking to public safety to guide us — that is key.

What advice would you give to other nations as they move towards PSMB?

Consulting with public safety is a must. FirstNet is truly public safety's network — we worked hand in hand with them to understand their needs and input their feedback into our proposal process. We met with public safety in every US state and territory over a few years' time and I know we would not be where we are today without that process. It wasn't easy, but public safety fought for this network, and our agency is committed to serving on their behalf.

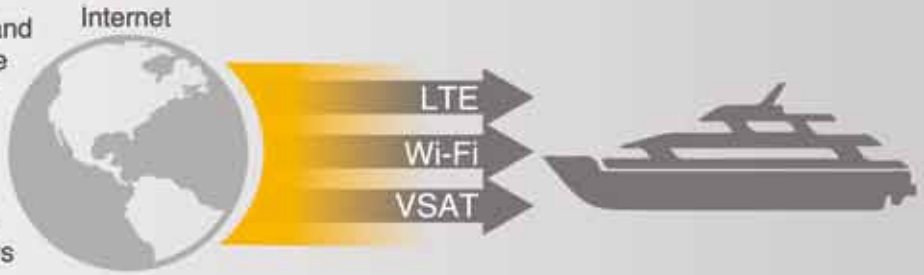
When it came to planning FirstNet, it was important that it be built to international standards for LTE technology. Building to consensus-based standards helps ensure interoperability and [has] increased the economy of scale to drive down costs and increase competition for things like devices. Because of this, we are seeing a growing and dedicated marketplace for public safety broadband — not just in Australia and the US, but across the globe. There are more than 30 countries interested in or planning for a public safety network. This is an exciting time for emergency communications, and the FirstNet Authority looks forward to continuing to share lessons learned with our international partners as we drive innovation for public safety.

Ed Parkinson will be attending Comms Connect Sydney in June, where he will present a keynote address on 'Insights and lessons learned from the US FirstNet public safety broadband program'.

SpeedFusion Unbreakable VPN

Combine Multiple LTE, Wi-Fi and VSAT for Unbreakable Videostreaming

No matter where your ship is, you expect fast and reliable connectivity. However, a single connection cannot deliver that. Enter SpeedFusion. This patented technology combines the bandwidth of all your available connections for ultra-fast, ultra-reliable connectivity. Also, SpeedFusion is a VPN technology, so you can enjoy your favorite shows from anywhere in the world.



HD2 Dome

IP67 outdoor dual-cellular SD-WAN endpoint. Threaded screw mount and pole mount. PoE Powered for easier cable management.

HD4 MBX

Quad-cellular SD-WAN endpoint, upgradeable cellular modules. 8x PoE+ to power cameras and phones. Integrated Wi-Fi WAN.

MAX Transit

Dual-cellular SD-WAN, SpeedFusion optional. Integrated Wi-Fi WAN. Compact rectangular form factor.

BR1 IP67

IP67 outdoor single-cellular SD-WAN endpoint. Integrated W-Fi WAN. PoE Powered for easier cable management.

SIM Injector - Support More SIM Cards, Easier to Reach

Traversing between multiple countries means switching between multiple cellular providers. The SIM Injector gives you up to 8 additional SIM cards to choose from. This enables you to load local SIM cards for all the countries the yacht will be visiting, and seamlessly switch service providers. What's more, the SIM Injector can be placed up to 100m away from the SD-WAN endpoint, making SIM card switching a breeze.

WirelessTech
Unit 1, 63-79 Parramatta Road, Silverwater NSW 2128, Australia
sales@wirelesstech.com.au | www.wirelesstech.com.au | (02) 8741 5080

News

© Stock.Adobe.com/au/laremenko

TESTING BASE STATION RF EXPOSURE

The International Electrotechnical Commission (IEC) has published a new technical report on evaluating human exposure to RF fields in the vicinity of base stations, including 5G and small cells. The report — which illustrates test methods and worked examples on 5G trial sites — will be of benefit to facility managers, building owners, governments, local communities and other stakeholders. "As 5G advances at a rapid rate and networks are deployed, testing base stations to ensure they meet the radiofrequency (RF) exposure standards is an essential step for operators, regulators and the community, providing a reassurance on safety," said TC 106 Chair Mike Wood, who is also Chair of the Australian Mobile Telecommunications Association RF Safety Program EME Governance Committee.

More info: bit.ly/2Ig7GwR

© BillionPhotos.com/Dollar Photo Club

FINE FOR ILLEGAL TRANSMITTER USE

A New Zealand man has been fined NZ$2250 in the Tauranga District Court for offences relating to the possession and use of unlicensed radiocommunications equipment. On 24 August last year, Elvis Johnstone was stopped by police in the Whangarei area. Upon searching his car, they located a Baofeng UV-5R two-way radio. When switched on, the device was found to be set to the same frequency as the Northland Police channel. Radio Spectrum Management (RSM) laid charges against the man under sections 113 and 114 of the Radiocommunications Act 1989. The judge imposed a fine of NZ$3000, discounted by 25% for an early guilty plea, resulting in a fine of NZ$2250 plus court costs.

More info: bit.ly/2vcytlb

Ruggedised smartphone

The ToooAir PTT SmartDevice LTE (Band 28) TE-590 is a ruggedised smartphone with dedicated PTT software and mechanical features. The mechanical design and form factor are suited to gloved and wet hand operation with a large side PTT button, stubby antenna, rotary 'channel' selector and M5 accessory interface for covert or speaker microphones accessories.

An interchangeable 4200 mAh battery, dedicated emergency button and 2 W front-facing speaker make the TE-590 suitable as a LMR/PMR PTT solution. The unit also includes Bluetooth, Wi-Fi, NFC, G sensors, front and back camera and GPS (satellite and triangulation). These all combine to make the TE-590 a powerful device when driven by the ToooAir PTT application.

Dedicated security, utilities/facility and logistics applications running on the TE-590 Android engine will enable companies to issue one device to fulfil all their communication, reporting, safety and management requirements. This often used to require the use of a phone, two-way-radio, security wand, modem and PC or tablet.

The TE-590 is supplied with a desktop drop-in cradler that has the facility to charge a spare battery and belt clip holster. Built tough and conforming to IP68 and MIL810G durability specs the TE-590 is a versatile communication device.

Tooo Air Pty Ltd

www.toooair.com.au

Modular high-density platform

The AFL ASCEND platform is a high-density AFL global solution aimed at the enterprise/data centre market.

The platform comprises 144F/1RU MTP cassettes, splice and patch modules, as well as WDM/passive connectivity.

In addition to the above, the solution will include 1, 2 and 4RU enclosures/housings, platform specific MTP cable assemblies and new AFL branded LC Uniboot patch leads.

It is used in data centres, central offices, headends and structured cabling networks.

Main features include high-density 1RU/144F, 2RU/288F and 4RU/576F; 19/23″ rack-mountable; galvannealed steel construction; and hinged front and rear doors and removable back cover.

AFL Telecommunications Pty Ltd

www.aflglobal.com/au

R&S®Cable Rider ZPH Combi Analyzer.

Expect fast, expect efficient, expect more.

The new R&S®Cable Rider ZPH Combi Analyzer is explicitly designed for fast and efficient installation and maintenance of antenna systems including interference hunting. It features fastest measurements in two-port cable and antenna analysis as well as in spectrum mode plus an internal bias tee. Accelerate your field service: cover more sites and never worry about incorrect settings with the guided wizard function.

www.rohde-schwarz.com/zph

sales.australia@rohde-schwarz.com

ROHDE&SCHWARZ

News

COUNTERNARCOTICS ADOPTS BARRETT RADIOS

A contract to supply radio equipment to a US-funded program in Central Asia has been awarded to Barrett Communications. The Counter Narcotics Global Threats program will receive a range of PRC-2090 HF manpacks and vehicle stations with tracking software. The HF systems will provide critical communications and tracking capabilities to forces, which will assist in securing their border and controlling illicit narcotics trafficking. The Barrett PRC-2090 is designed to be smoothly and easily interchangeable between vehicle and manpack configurations. "We are committed to providing products and solutions suited to our customer's needs. Intuitive ease of use is paramount in operations such as these," said Andrew Burt, Barrett Communications CEO.

More info: bit.ly/2GlXock

AUSTRALIA #3 FOR 5G LEADERSHIP

The 5G Country Leadership Index has been released, identifying South Korea as number one, followed by the United States, other 5G leaders included Australia, Qatar, Switzerland, Finland, Spain and United Arab Emirates. Regionally South East Asia is most advanced, with South Korea using the Winter Olympics as an opportunity to showcase its leadership. The US is among the first to launch commercial 5G services. Gulf Cooperation Council (GCC) countries are also ahead, while Europe as a continent is lagging due to heterogeneous infrastructure and fragmentation, as well as outstanding/ongoing spectrum allocation processes in many countries.

More info: bit.ly/2GpxLrb

Digital handheld radio

The Icom IC-F1100D/ IC-F2100D series is an economical standard IDAS digital handheld radio. It has a compact size, ease of operability and is a lightweight entry-level digital transceiver.

Key features include a high power handling capacity speaker for 1500 mW of powerful audio, and a modified speaker grill structure allowing for more capacity for the front of the internal speaker. In addition, a custom-designed, high-output power speaker results in the doubling of the audio output power.

Other key features include a waterproof durable design (IP67/55/54 and MIL-STD-810-G); over-the-air alias (OAA) function displays the caller's name without programming; AquaQuake function clears water away from the speaker grill; motion/stationary detection, man down and lone worker functions; up to 18 h of operating time with the supplied BP-280 battery pack; IDAS conventional and Type-D single site trunking; high power transmitting even in a low battery situation; and LCD display allows for not only individual ID or Talk group ID display but also the status message and SDM (short data message) capability.

Icom Australia Pty Ltd

www.icom.net.au

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

RFI
TECHNOLOGY SOLUTIONS

Introducing
LoRa Solutions

Long Range Connectivity.
License Free.

Learn more at **rfi.com.au/lorasolutions**

COMMS CONNECT SYDNEY 2019

12–13 JUNE, ROSEHILL GARDENS, ROSEHILL

Jonathan Nally

Sydney's premier critical communications event is back — don't miss it!

Comms Connect returns to Sydney in June. This conference and exhibition is always a don't-miss opportunity for those in the business- and mission-critical communications sector to come together and share and learn from one another. Once again the event will be held at beautiful Rosehill Gardens, very close to Parramatta in the geographic and demographic heart of the greater Sydney region.

Sessions, workshops and panels

In addition to speaker presentations — including some from the world's top authorities — this year's conference will include several special workshops, an IoT industry forum and a country-specific forum from Finland.

The first day will begin with a keynote address from Heikki Riippa, Senior Adviser, Suomen Erillisverkot Oy Authority, Finland, on the topic of 'Moving to the VIRVE 2.0 mission-critical broadband service'. This will be followed by a keynote address from Ed Parkinson, acting CEO of the FirstNet Authority, who will speak on the 'Insights and lessons learned from the US FirstNet public safety broadband program'. It will be interesting to listen to these updates and compare and contrast the two countries' approaches to public safety mobile broadband (PSMB).

Following the morning break, the conference will then split into two streams — public safety and emergency management, and technology. The former will include presentations from Mary Egan (NSW Telco Authority) and Luke Brown (Department of Home Affairs), both of whom will speak about PSMB developments in Australia, while Tony Gray (TCCA) will speak on mission-critical narrow- and broadband standards. The technology stream will include presentations from Alex Rizgalla (Keysight Technologies), Brad Welch (TPL Systems Asia Pacific) and Sohan Domingo (Tait), who will cover 5G, hybrid technologies and multi-bearer switching.

After lunch, there will be two parallel workshops to complete the day's sessions. The first will be hosted by the Australasian Critical Communications Forum (ACCF) and The Critical Communications Association (TCCA) on the subject of 'Critical communications standards supporting a multi-vendor and interoperable environment for all mission- and business-critical sectors'. The other workshop will be hosted by Ged Griffin and Geoff Spring (both University of Melbourne), Geoff McKernan (ACRNA) and Mark Holmes (Circadian Australia), who will lead a discussion on 'Sensors, smart cities and the implications for critical control rooms'.

The first day will conclude with networking drinks between 5 pm and 6 pm in the exhibition hall, followed by the ARCIA In-

Comms Connect Sydney 2019

Conference: 12 June (8.50 am–5.00 pm), 13 June (9.00 am–3.30 pm)
Exhibition: 12 June (9.00 am–5.00 pm), 13 June (9.00 am–3.30 pm)
Where: Rosehill Gardens
Who: More than 500 delegates and 25-plus exhibitors
Web: sydney.comms-connect.com.au

dustry Networking Dinner at 6 pm at the Rosehill Gardens venue (see below).

Second day

The second day will begin with a plenary address from Steve Hwang, Business Development Manager, Nokia Enterprises Korea, who will provide an update on the SafeNet Forum, South Korea's PSMB project. Again, it will be interesting to compare SafeNet with FirstNet and VIRVE 2.0.

The public safety and emergency management, and technology streams will continue until the morning break. The former will include presentations on 'High bandwidth air-ground communications system for ACT emergency services' (Dale Stacey, SAT Pty Ltd) and 'Transitioning to a data-enabled world in a mission-critical environment' (Graham Tait, Fire and Rescue NSW). The technology stream will have presentations on 'Tower auditing using CSI techniques' (James Reed, Titan ICT) and 'Ensuring your next critical communications project is a success' (Robert Tait, Nova Systems).

Following the morning break, there will be two special parallel sessions. The first will see representatives from Finland — including Tero Pesonen (TCCA) and Elina Avela (Beaconsim) — bring us up to date with mission-critical communications developments in their country. The other session will be presented by the IoT Alliance Australia, and will focus on security and data sharing — presenters and panellists will include Geof Heydon (IoT Alliance Australia) and Ian Oppermann (NSW Chief Data Scientist).

Following the lunch break, the technology stream will continue with wireless, mesh and LMR presentations from (respectively) Eddie Stephanou from Cambium Networks, Grant Jamieson from Wireless Innovation and Hamish Duff from ARCIA.

At the same time, there will be a special ARCIA professional development training workshop on multicoupling and filtering, facilitated by Chris Stevens (SLSA communications advisor) and Mark Mezzapica (RFI Wireless). This workshop — which has also been held in Melbourne and Perth with great success — can be booked and attended separately by non-conference attendees if required (see arcia.org.au for details) or as part of an overall Comms Connect registration.

The final part of the day, after the afternoon break, will see a continuation of the ARCIA workshop through to 4.30 pm. Simultaneously, the overall closing panel session will be held, moderated by ARCIA's Ian Miller, on the topic of 'The Q&A of PSMB — what have we learned, or more importantly what do we still need to learn?' A similar panel held last year at Comms Connect Melbourne was very well attended and threw up all sorts of interesting questions and responses.

Exhibition

One of the best parts of Comms Connect is the opportunity to meet and greet with exhibitors. It's a chance for equipment users and their suppliers/manufacturers to compare notes, give feedback, get up-to-date information on the latest technologies (often including pre-release or developmental details) and generally build connections within the industry. Dozens of companies, large and small, are booked in as exhibitors... so make sure you come along to meet and greet and create some sales or buying opportunities. If you can't stay for the whole conference, you can register for a free exhibition pass.

Networking and ARCIA dinner

Another highlight of Comms Connect is the opportunity to catch up with colleagues old and new, from near and far, and share knowledge and experiences. While this can be done all throughout the conference, there will be two special opportunities for networking and socialising. The first will be the networking drinks, from 5 pm to 6 pm on the first day. The second will be the ARCIA Industry Networking Dinner, to be held from 6 pm that same day, also at Rosehill Gardens. Make sure you book for the ARCIA dinner at http://www.arcia.org.au/news-events/industry-events.html.

Comms Connect Sydney is the perfect opportunity for you to hear from the experts, discuss your requirements with leading vendors and suppliers, and share the challenges faced by industry colleagues and professionals who use communications technology in their working environments. Make sure you register today to guarantee your place. See you there!

Images courtesy BICSI South Pacific

The Comms Connect and BICSI South Pacific conferences and expos will run side by side in Melbourne in November.

COMMS AND ICT CONFERENCES COME TOGETHER

Jonathan Nally

BICSI South Pacific, the peak industry body representing designers and installers of information and communications technology (ICT) systems, has entered into a partnership with WF Media (publisher of *Critical Comms*), with the aim to enhance and develop BICSI's national conference and expo.

To that end, the 2019 BICSI conference and exhibition will co-locate with WF Media's flagship event, Comms Connect, at the Melbourne Convention & Exhibition Centre from 27–28 November.

BICSI's conference will continue to be organised and run by BICSI, while WF Events will take on responsibility for exhibition and sponsorship sales, along with marketing and event logistics, and will work closely with BICSI to deliver a focused audience and quality experience for all.

"We see this as an excellent opportunity to take the BICSI Conference and Exhibition to another level," said BICSI South Pacific CEO Paul Stathis. "Running BICSI conferences with just our own limited resources for several years impeded our desire to expand their scale. WF Media brings quality, targeted media channels to the mix, which we believe will result in an energised event for our members and the broader ICT infrastructure sector. The fit is a good one."

Comms Connect organiser and WF Events Director Paul Davis has welcomed the opportunity to work with BICSI to enhance the event. "We're looking forward to working closely with BICSI on this project, with a view to a mutually beneficial, long-term alliance," he said. "Communications infrastructure, whether wireless or wired, is critically important and the co-location of these two events will give those responsible for all aspects access to a broad range of world-class providers."

BICSI South Pacific membership encompasses ICT professionals in the residential, commercial and government sectors, with interests spanning not just voice and data (including outside plant and LAN) but also audio, video, life safety and automation systems.

This year's 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:** Key members of standards committees will give presentations, including on AS/NZS 11801.1, AS 11801.2-6, AS/CA S008:2019 and AS/CA S009:2019.
- **IoT, smart buildings and smart cities:** The conference will feature case studies, with academics and industry experts sharing their vision of trends and developments.
- **Data centres:** This year the focus will be on edge DCs, their unique characteristics and some of the solutions to the challenges they bring to the industry.
- **5G infrastructure:** Network architecture, deployment methodologies and infrastructure will feature prominently in the conference program and in the exhibition hall.

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. "After two days, delegates will walk away with a far better perspective of what's on, and what's beyond, the digital technology horizon," said Stathis.

"The exhibition hall will bring together in one place at one time, all the subject matter experts from the industry, all keen to speak with the market and answer whatever questions are thrown at them," he added.

As well as the Comms Connect conference and exhibition series, WF Events also runs the SAFETYconnect conference and exhibition in partnership with the NSCA Foundation.

The Power of Reliability

DOES YOUR CRITICAL COMMS RELY ON THIS FOR DC POWER?

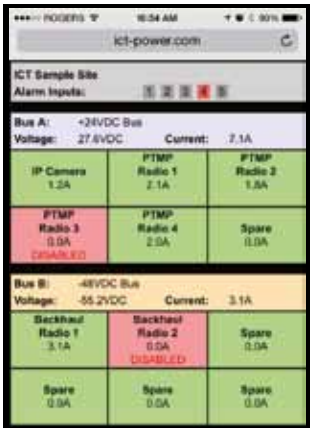
There is a better way.

DC power solutions from ICT provide high reliability, fewer points of potential failure, and remote monitoring and power control of your DC powered devices remotely over an Ethernet link.

- High efficiency DC power supplies and hot swappable rectifier systems from 600 to 5600 watts of output power for 48, 24 or 12 volt DC systems
- Single and dual bus DC distribution panels allow you to connect and remotely manage 12 independent devices such as backhaul radios, routers and switches
- Input connectors for site monitoring sensors will send open door, power, water and smoke alarm messages to your inbox
- DC to AC inverters provide fully managed power to AC devices

Integrated, easy to use graphical user interface makes setup and management a breeze. Increase your quality of service and reduce unplanned site visits by monitoring and power cycling connected devices over an Ethernet link with the click of a mouse button, or from your smart phone.

Your operating costs will go down, while your site reliability and quality of life goes up.



Powering Communications For
Emergency Services
Mining and Resources
Government
Fleet Operators
Transportation
Utilities

Available From

HELIOS POWER SOLUTIONS

www.heliosps.com.au
Email: sales@heliosps.com.au
Tel: (02) 7200 9200

©ITU/A. Munisamy

IMPROVING EMERGENCY TELECOMMUNICATIONS

The development of innovative tools and partnerships within emergency telecommunications is crucial to saving lives, according to the ITU.

Government, industry and community leaders gathered at the Global Forum on Emergency Telecommunications (GET-19) in Balaclava, Mauritius, on 6–8 March, to explore ways to save more lives through the better use of emergency telecommunications.

"We are at a pivotal time in disaster management. Developments in disruptive technologies such as artificial intelligence, the Internet of Things and big data are transforming how we approach emergency telecommunications," said International Telecommunications Union (ITU) Secretary-General Houlin Zhao.

The ITU presented guidelines that aim to assist national authorities and policymakers in the development of national emergency telecommunication plans, and promote communication and information sharing across all levels of government, within communities at risk and between public and private organisations.

The ITU is currently helping to develop such plans in Guatemala, Papua New Guinea, Samoa, the Solomon Islands and Vanuatu.

The Government of Mauritius, which hosted the GET-19 Forum, is working on ways to review and update the nation's multi-hazard early warning system.

"With the growing intensity and frequency of natural disasters, there is a constant need to enhance the use of technology for disaster management," said Yogida Sawmynaden, Minister of Technology, Communication and Innovation.

"Several automatic weather stations have been set up with sensors to capture real-time data on weather conditions around Mauritius. The island is also equipped with a tsunami warning system which gives a lead time of five to seven hours before a tsunami may hit the coast."

One of the initiatives the ITU presented is a 'disaster connectivity map' (PDF) that aims to provide real-time connectivity information when disasters strike. Information on the type, level and quality of connectivity is vital to identify gaps, and to make decisions on where and when to deploy resources to restore services.

A number of ICT industry sectors — mobile network operators, ISPs and internet and social media platforms — have data that can identify and monitor the status of connectivity, in near-real time.

The disaster connectivity map is being developed in partnership with the Emergency Telecommunication Cluster.

"GET-19 has reaffirmed the need for a collective understanding of risks as well as all phases of disaster management, and the importance of data and trust for strengthening coordination and cooperation among producers, implementers and beneficiaries of emergency telecommunications," said Doreen Bogdan-Martin, Director of the ITU Telecommunication Development Bureau.

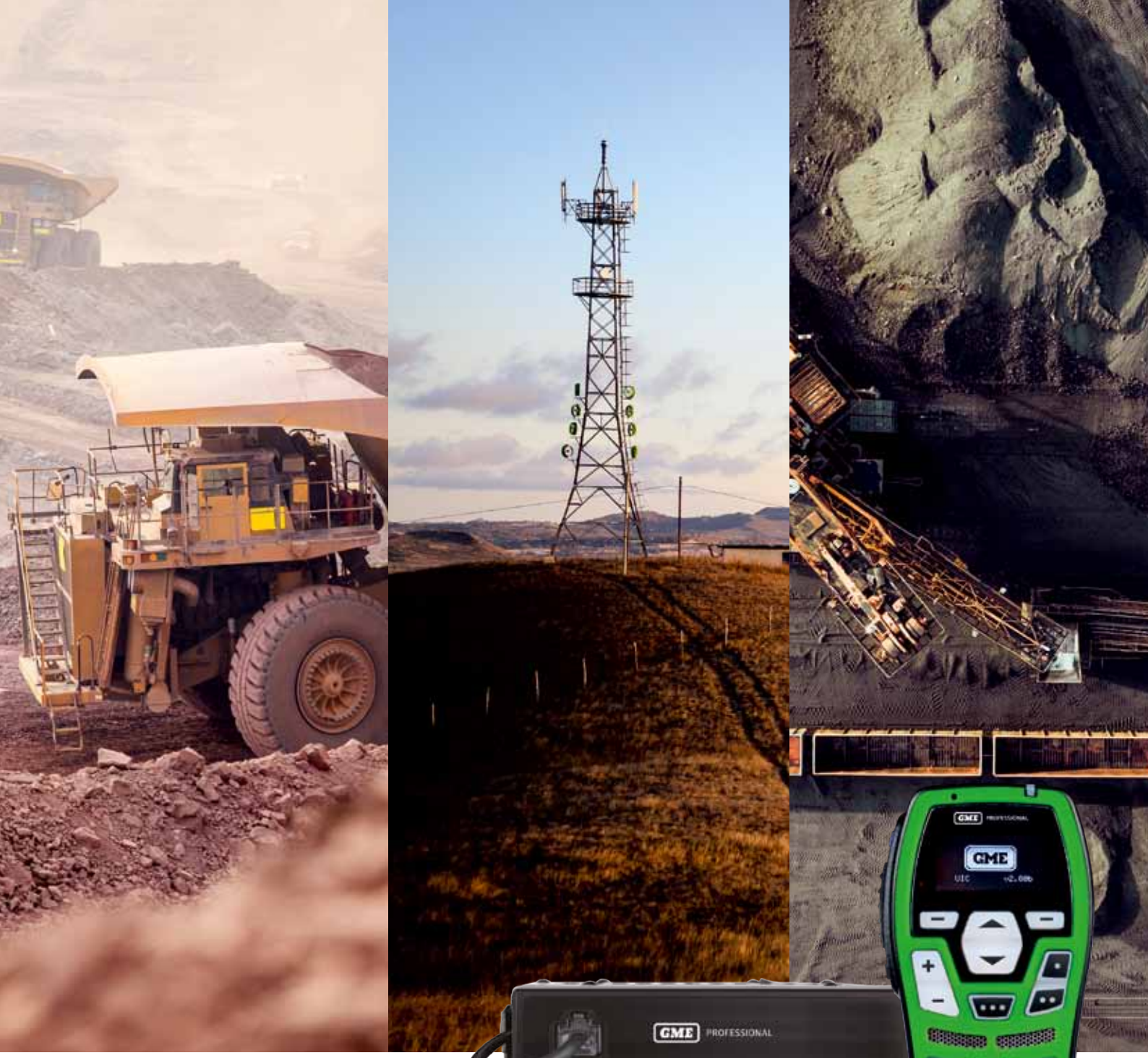
According to the ITU, older technologies such as satellite imagery and seismometers are "still the most important methods for detecting, monitoring and accessing disasters".

Nevertheless, as part of its work, the ITU has issued recommendations for governments, relief agencies, the private sector and assistance agencies to maximise the benefits offered by disruptive technologies such as artificial intelligence, the IoT, big data, robotics and drones. Those recommendations include:

- Systematising and standardising of emergency technologies to make the benefits accessible to all. Open standards will help to lower costs, ensure interoperability and enhance scaling.
- Establishing a global repository with information on how digital technologies are being applied for disaster management.
- Training to understand how to properly and responsibly deploy new and emerging digital technologies in crisis settings.

ITU and the United States Telecoms Training Institute (USTTI) have launched an emergency telecommunications competition for nationals of developing countries. Successful candidates will be trained in the use of ICT for disaster risk reduction and management, and the development of their national emergency telecommunications plans.

Organised by USTTI, the training will be taught in English and will take place from 21 October to 1 November 2019 in Washington, DC, with training, travel and accommodation expenses covered by ITU and USTTI.



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.

GME

gmeprofessional.com

AUSTRALIAN MADE

P25

Solar shelf with modular MPPT solar converters

GreenShelf is a 1RU, 19″, mounted 48 V solar converter solution for off-grid and hybrid-powered critical network infrastructure.

The GreenShelf, by Enatel Energy, offers >97.5% efficiency and advanced MPPT algorithmic response times of 99.5% efficiency. The product also offers good utilisation of available PV generation, critical for off-grid and hybrid telecommunications infrastructure.

GreenShelf can be used as a standalone solar system with integrated controller (V1 Version) or easily coupled with existing Enatel DC Power equipment (V2 Version).

The integrated SM36 energy controller in standalone applications is easily configured for individual site demands and includes advanced battery management features for various battery chemistries, as well as logging and communications for remote monitoring via TCP/IP. Additional features include battery and load MCB, integrated DC isolator for solar input, surge protection device (SPD), earth fault detection and backfeed protection.

GreenShelf can be configured with two variants of solar converter modules. The SM1848HE provides up to 1.8 kW per module with a nominal DC input voltage of 100 VDC. The lower nominal DC input voltage ensures any on-site ELV requirements can be easily met. The SM2048HE converter provides up to 2 kW per module with a nominal DC input of 220 VDC. This enables a configuration of up to 8 kW in a single 1RU shelf.

Both SM1848HE and SM2048HE solar converter modules appear on the CEC-approved equipment list.

Powerbox Australia Pty Ltd
www.powerbox.com.au

Industry Talking

It's been a very busy start to 2019 for ARCIA and its committee members. Over two days in February the committee and partners gathered in Brisbane to discuss all things wireless. There were wide-ranging discussions on policy and the activities that ARCIA undertakes, and the event was conducted with great spirit. Each year these planning days really help to crystalise the efforts the Association undertakes, and I thank all members and partners for their tremendous support.

One key point from the planning days was expressed by a partner who was surprised by the breadth and scope of the activities that ARCIA conducts each year. This opened an excellent discussion about how ARCIA presents membership value to our community, and we all agreed we have not done enough to remind both our members and the industry in general of our efforts. You can expect to see more information and more detail on value this year; we have already started presenting it to our partners at events.

It is also important to understand that, over time, ARCIA has evolved to represent all comms users and different sectors, regardless of the technology basis for the sector. The days of LMR being an isolated industry are over and ARCIA understands that, when it comes to access to spectrum, we need to advocate for all users. As an association we have working towards protecting the spectrum and providing benefits for all users, not just our own sector.

In March I headed to the IWCE conference in Las Vegas, during which I attended the board meeting of the US Government Wireless Technology & Communications Association (GWTCA). In 2018 ARCIA and GWTCA signed an MOU to share information, and it was a pleasure to be able to attend this meeting. The GWTCA represents a broad range of users and has a shared mission with ARCIA in advocating for spectrum. It was fascinating to hear of similar challenges in the US market — how the lack of spectrum or the poor use of spectrum is hampering sections of government and industry. It seems many of the same factors in spectrum management appear around the globe, with governments trading spectrum rights across sectors rather than focusing on the productivity benefits of spectrum as a whole. The meeting included a very interesting presentation on the use of spare TV datacasting channels for high-bandwidth transmission for public safety applications. It certainly seems to me that our wireless future lies in technical collaboration between sectors, and this plan to harness the benefit of broadcasters for public safety is an excellent idea.

On a different tack, at the end of March ARCIA held its networking dinner in Perth. Members gathered to support the industry, and Hank De Jong was named the Western Australia Industry Professional of the Year for his long career and mentorship. For 2019 it was decided that instead of having a Comms Connect event during the day, ARCIA would run a training workshop on multi-coupling followed by an information session with the AMCA's compliance section. To my surprise, 49 people booked in for the multi-coupling training held across morning and afternoon sessions. It was fantastic to see the Western Australian membership, businesses and users support this training in such numbers, and ARCIA is very fortunate that RF Industries once again supported the workshop.

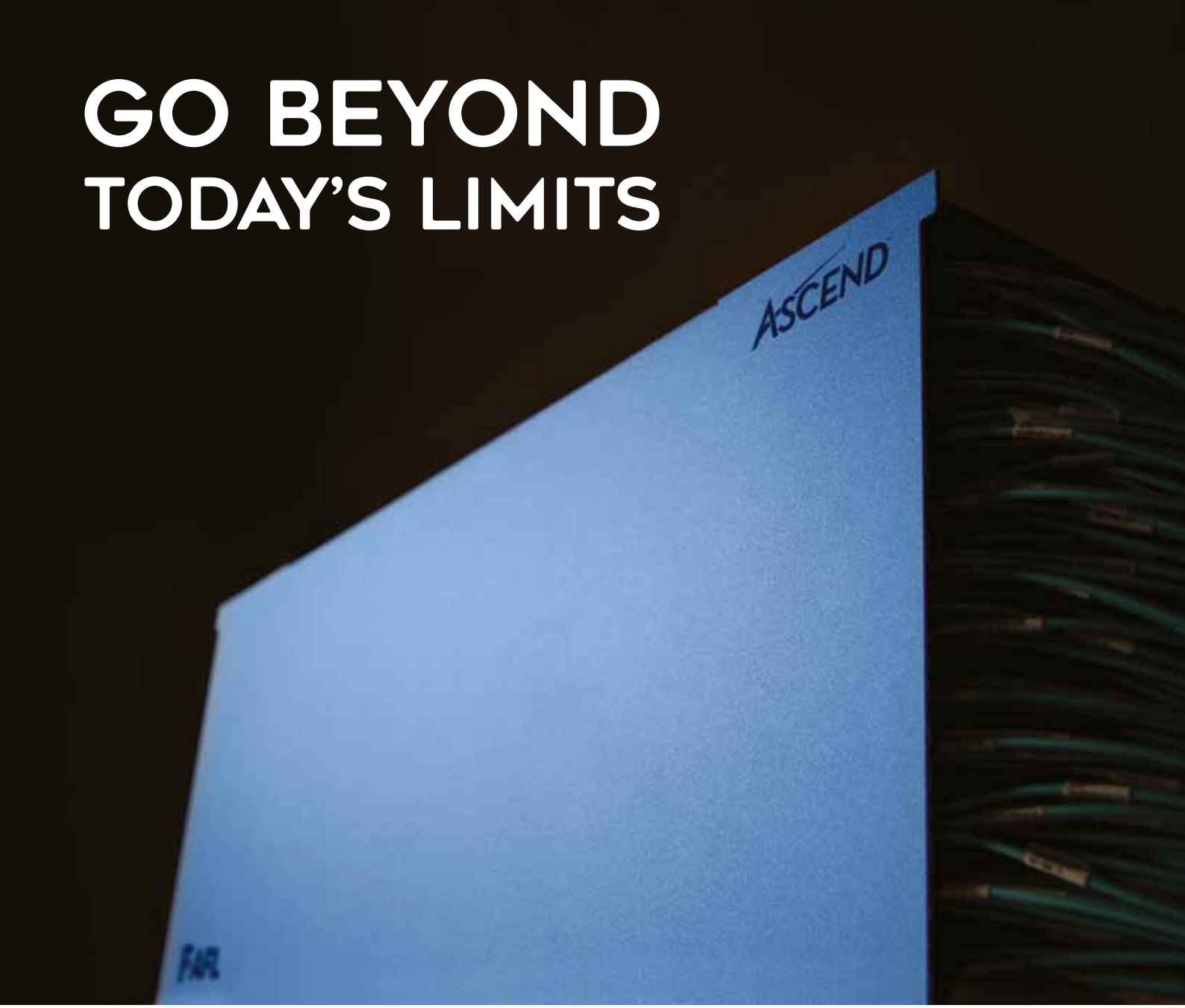
Following on from the training sessions, Chris Fosten, head of the ACMA's compliance section, provided a briefing on the areas of compliance the ACMA is involved in and data on the kinds of interference mechanisms, devices and risks that the ACMA deals with. In summary, the LMR industry is held in high regard with very low rates of issues for the ACMA — when problems do occur, there is a very high degree of willingness to comply with regulations. There is still a need to work even closer with the ACMA — as a regulator, it faces many of the same challenges that industry does and it is very clear that we need to work on co-regulation now and in the future.

It is becoming clearer to me, listening to all the groups that we deal with, that we all face a huge challenge — where will the next generation of trained people come from? This topic is coming up again and again between regulators, industry groups and business. ARCIA has been asking these questions over the last few years and trying to figure out how we can arrange training to be available through TAFE and other institutions. However, I think we are now at the point where the industry needs to act. We would be happy to hear from anyone with views and suggestions on this topic.

I look forward to seeing you at the Sydney ARCIA and Comms Connect events in June.

Hamish Duff, President
Australian Radio Communications Industry Association

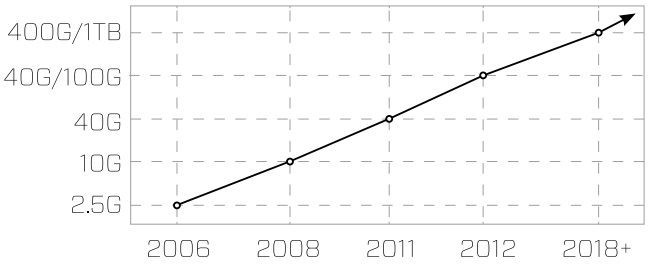
GO BEYOND
TODAY'S LIMITS



With increasing bandwidth demands, you must rise above today's standards.

Every year we see exponential growth in bandwidth consumption. AFL's new **ASCEND**™ platform is not built for what you need today, but what you will need tomorrow. To be ready for tomorrow's networks, you need to be flexible. Get to 800Gb and beyond with **ASCEND**.

Optical Network Progression



Learn more at AFLglobal.com/ASCEND

Australia: 1300 232 476
New Zealand: 09 927 7140

AFL

News

JORN RECEIVER 'SWALLOWS THE SPECTRUM'

The Australian Defence Force's (ADF) Jindalee Operational Radar Network (JORN) monitors the HF spectrum to track objects across Australia's northern and western air and sea approaches, and plays a vital role in supporting the ADF's air and maritime operations. In the past, JORN has only been able to focus in on a single radar channel at a time, limiting its capability. But a newly developed common aperture receiver receives almost the entire HF spectrum at the same time, enabling tasks to be run in parallel — monitoring different aspects of the ionosphere and simultaneously tracking multiple radar channels, each with full receiver aperture gain.

More info: bit.ly/2Uzjscc

NT'S NEW BUSHFIRE INFO SYSTEM

The Northern Territory Government has launched a Bushfires Emergency Management System (BEMS) to improve safety for both firefighters and citizens. The government worked with Telstra to develop a solution that will provide volunteer firefighters with real-time information about weather conditions, crew locations, fire status, permit burns and messages from Bushfires NT in the field, using tablet devices. These devices operate on the secure government IT system using the Telstra mobile network. More than 25 are already being used in the field by volunteers, with more to be issued in the near future. An online interface, Field Connect, has been developed for volunteers and staff to access BEMS when outside of the mobile coverage area.

More info: bit.ly/2UUTGOY

Cable modem network analyser

The VeEX CM3000 Cable Modem Network Analyser can assist users with service and plant verification testing and troubleshooting solutions. It has an intuitive user interface with VGA colour touchscreen and Windows CE operating system. It is available to rent from TechRentals.

The analyser has a Fast Spectrum with 0.3 μs sample rate and equaliser stress, frequency response and group delay measurement in Digital and Cable Mode. Its i-QAM option identifies impairments in a QAM signal and it features gated CCN, CSO, CTB and HUM tests on active channels.

It offers a high-resolution true non-interfering 5 to 1000 MHz downstream sweep system with manual and automatic gain and slope offsets, as well as fast 5 to 200 MHz upstream sweep, plus ingress detection and display.

TechRentals

www.techrentals.com.au

DC power supply and battery charger

The ICT IntelliCharge Series is a high-efficiency, power factor corrected DC power supply and battery charger that allows the battery charge to be regulated independently from the DC outputs. This means that the battery will always receive the optimal charging current without the load being affected.

The product is available with optional OLED high-resolution display and 1RU 19″ rack mounting kit. Temperature compensated charging is supported with the optional battery temp sensor.

Product highlights include wide-ranging power factor corrected AC input; 12, 24 and 48 VDC models with 180 or 360 W of power; 90–93% efficiency; independently regulated battery backup charging terminals; intelligent three-stage battery charging; internal low-voltage disconnect; user-selectable flooded, AGM and gel battery types; user-definable bulk charge current setting; temperature-compensated charging; optional 1RU rack mount kit; optional high-resolution OLED display; and Form C alarm contacts.

Helios Power Solutions

www.heliosps.com.au

E-band radio

The Cambium Networks PTP 820E E-band radio is a compact, full outdoor high-capacity backhaul operating in the E-band (70-80 GHz).

The radio supports 62.5, 125, 250 and 500 MHz channels and delivers up to 2.5 Gbps Ethernet throughput. It also supports multiband configurations with PTP 820C or PTP 820S and shares a single multiband antenna. Multiband configuration enables operators to benefit simultaneously from the high capacity of E-band and the high reliability of microwave. The radio shares the same UI and similar features as the PTP 820 series.

Cambium Networks Ltd

www.cambiumnetworks.com

BAPCO SHOW 2019 REPORT

*Ian Thompson**

The ESN, data privacy, drones and technological change were some of the topics of focus at BAPCO's annual conference.

British APCO's (BAPCO) annual conference and exhibition — the BAPCO Show, as it is known — was held in March at the Ricoh Arena in Coventry, in association with TCCA's Critical Communications Europe (CCE) event. The collaboration between the two associations was born from a desire to provide more to members, delegates and exhibitors and a realisation that interest in the event is not limited to the UK.

We all know that issues of public safety are not constrained by borders — locally, regionally or nationally. At BAPCO, we believe solutions involving public safety technology and critical communications should not be either. For this, as well as for many other good reasons, there is tremendous interest in any solution, technology or approach that is being tried in one place but which could be relevant and of benefit to another.

We've always seen interest at BAPCO events in what the UK is doing. This increased hugely when the replacement for the UK's Airwave (TETRA) network was announced to be the Emergency Services Mobile Communications Programme (ESMCP), to be based on LTE technology using the same network as consumer traffic. Subsequent work on the Emergency Services Network (ESN) roll-out and development has only increased that interest. With similar projects being considered across the world, it was almost inevitable that the BAPCO Show and CCE would find common ground.

That mutual understanding and interest has its roots in public safety technology and critical communications, the lifeblood of our sector. This was reflected at the event, where many of the conference sessions in a packed program (as well as some of the technology on display) was about making the most of in-place TETRA solutions… squeezing maximum value, functionality and sometimes life from them whilst at the same time acknowledging the inevitable move to broadband solutions based upon LTE.

The ESN reset has meant the UK moves from the leader in TETRA replacement to one of the first to change. FirstNet in the USA is moving at pace, while South Korea's solution, sometimes called SafeNet, is progressing well. Delegates heard from Ed Parkinson, CEO of FirstNet, in a keynote presentation about its progress.

The ESN reset has seen a resurgence in the TETRA devices market in the UK. Many agencies thought they had bought their last Airwave radios; they were prepared to sweat the assets, as the saying goes, expecting to buy an ESN terminal in the next phase of their communications strategy. But with the probability

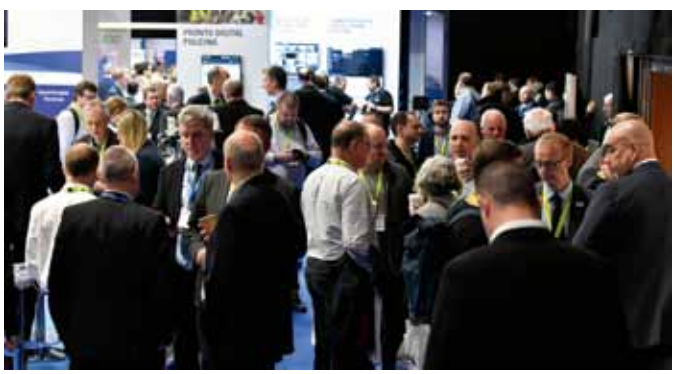
Ian Thompson, BAPCO's CEO, speaking at the 2019 BAPCO Show.

MOST PUBLIC SAFETY AGENCIES IN THE UK STILL STRUGGLE WITH THE ABILITY TO RECEIVE ENHANCED DATA, SUCH AS VIDEO, NEVER MIND SHARE IT WITH EACH OTHER.

of remaining on TETRA for another three years at the very least, those assets can be sweated no more and we are seeing Airwave radio procurement taking place again. The Metropolitan Police, the UK's largest force, has recently announced the purchase of more than 32,000 radios… an indication that it thinks it will be using TETRA for critical voice communications for some time to come.

The need to provide best service from the technology is as much an issue for the developers, manufacturers and suppliers as it is for agencies and users. They must work to provide best value from existing solutions and keep updating them while knowing a change of technology is coming, bringing with it the ability to do so much more. At the same time the demand from the public, driven by consumer experience and relentless technology updates, risks those solutions being left looking outdated and expensive.

Whilst there is always, quite rightly, a focus on what is being used now and what is coming, there can be danger, challenge and opportunity from new technology that arrives 'suddenly' (suddenly in emergency services terms, that is). At BAPCO 2019 we saw a 'drone zone' for the first time and a dedicated presentation stream. This was one of the most popular features at the event, with visitors showing tremendous interest in the technology and the range of solutions already available. UAVs are no longer just toys or for the exclusive use of the military or larger agencies. There are real operational benefits and cost savings for public safety agencies using and sharing this technology.



All images courtesy BAPCO.

Drones/UAVs highlight one of the biggest issues for our sector. New technology, rapidly and easily adopted and available, is providing a raft of information to inform the common operating picture.

If only it were that easy. The technology raises so many questions. Who owns the data? How is it transferred? Where is it stored? How is it shared? And so on. Most public safety agencies in the UK still struggle with the ability to receive enhanced data, such as video, never mind share it with each other. It is still common for agencies to have to telephone each other to share information about an incident they are both working on or when something needs passing on. The Multi Agency Incident Transfer (MAIT) protocol was established in the UK some five years ago to help solve this issue. It has laid largely unused for much of that time, but it's great to be able to report a recent resurgence of interest and an appreciation amongst suppliers and users that this work needs to be done and on a hub basis across the country.

As ever, it's an exciting, as well as challenging, time for the public safety and critical communications sector. What we have needs to be maintained and remain effective; lives depend upon it. At the same time, we must always be looking forward to what is coming and be ready to implement that technology. This brings its own challenges as the amount of data and information available to our emergency services and public safety agencies increases. That's before we even consider the proliferation of devices on the Internet of (Public Safety) Things and what information they are already providing. Perhaps we'll need artificial intelligence to help us manage that? What we do know is that it should never be acceptable not to use information or technology that keeps people safe. That's the biggest challenge.

**Ian Thompson is CEO of BAPCO. You can find more information about the BAPCO Show at bapco-show.co.uk/bapco-tv.*

Wireless Innovation

PTT mMESH

Introducing PTT mMESH. Offering secure backhauled WiFi which can exceed kilometres in range, can stream HD video but can also provide voice communications where traditional radios cannot.

Specifically designed for the Public Safety sector, it utilises scatter technology previously only available to the military but now in a form factor suitable for first responders.

PTT mMESH is a self forming and self healing mesh product that ensures you have connectivity wherever you are in the form of a personal WiFi node. It allows the use of existing WiFi devices at greater distances, allows video footage to be live streamed back to base and provides full IP connectivity for the user all utilising the scatter backhaul technology. Call us today to see how PTT mMESH will enhance your capability.

- \\\ All IP Design
- \\\ Intelligent Routing
- \\\ Ease of Operation
- \\\ Advanced Encryption
- \\\ Light-Weight
- \\\ Compact

CALL US TODAY
+61 7 3198 2459

Wireless Innovation
www.wirelessinnovation.com.au

North Island network

New Zealand's largest private DMR network is helping Powerco keep the lights on for more than 330,000 connected customers.

Powerco operates and maintains the largest network of electricity lines in New Zealand, with about 335,000 customers connected to its electricity networks. Its footprint is separated into two major regions: the eastern region covers Tauranga, Coromandel, Thames Valley and eastern and southern Waikato, while the western region covers Taranaki, Whanganui, Rangitikei, Manawatu and Wairarapa. In these areas Powerco has its electricity distribution network comprising more than 27,000 kilometres of cables, overhead lines and sub-station assets.

Naturally, such a critical and wide-ranging operation requires reliable communications. Powerco had previously been using an analog radio system that was more than 10 years old. That system covered only about 65% of its electrical network, but the company needed greater than 95%.

After a long appraisal process, Powerco chose to implement a new Hytera DMR Tier III system. Now up and running, it is the largest, industry standard, private digital mobile radio network deployment in New Zealand.

Given the critical nature of Powerco's business and the need to encompass the very wide geographic spread of its assets, the company spent a great deal of time evaluating potential systems before making a decision on DMR Tier III. Requirements scoping was conducted in the first half of 2015, with RFIs released in Q3 of 2015. Evaluation of the responses and shortlisting also took place in Q3 2015, with proof-of-concept testing for console systems conducted in Q4 2015. RFPs were issued to selected vendors in Q1 2016, with console and DMR vendor evaluation and selection spanning Q1 and Q2 2016. Contracts were signed in Q3 2016.

The key business objectives of the project were to:

- Provide a safer working environment for personnel in the field by establishing a primary communication radio system that has full coverage across the Powerco network;
- Improve the efficiencies of the NOC through improved and integrated communications; and
- Provide Powerco with control of the communication network, enabling prioritised access to communications with its field personnel during business-as-usual as well as in emergency and critical situations, such as during storm events.

The company was also seeking to achieve high availability, handover and auto-roaming, as well as the required 95%-plus coverage of its electricity asset base.

According to Powerco's Network Operations Manager, Phil Marsh, there were a number of qualities and characteristics of DMR Tier III that made it the suitable choice for the new system, including that it has an open-standard, IP-based modular design, an interconnection interface, open protocol SIP, and easily connects to any PABX/PSTN system.

In addition to those attributes, the Hytera product offered a one-stop solution, IP-connected dispatching client and voice recording system.

The new system has and is supported by:

- A new packet transport network based on Juniper tiered architecture, installed at over 60 comms and substation sites
- Upgraded power and environmental systems at 35 comms sites
- Installation of Hytera DMR Tier III at 35 comms sites

Images courtesy Powerco.

> "Powerco staff and contractors have been positive with the new systems, particularly knowing that now they have reliable comms." — Phil Marsh, Network Operations Manager

- A new Zetron ACOM console solution at the Network Operations Centre (NOC)

The mobile vehicle radio models are the Hytera MD782G, and the handhelds are the PD782G.

Ensuring coverage

"In the past, when we used the RT system that had a far smaller reach, we had fault staff needing to drive for half an hour to the top of a hill to get coverage so they could contact the control room," said Marsh.

"There were places in areas such as the Tararuas, Wairarapa and Rangitikei where they simply didn't have any comms or cellphone coverage — losing all communication with the control room, which is dangerous, particularly in an emergency."

But with the new Tier III system, "in the eastern region we are achieving 95%-plus coverage," said Marsh. "Testing is in progress in the west, but it's looking promising."

There are 35 radio sites, but the company has plans to expand the network to achieve greater than 95% coverage, particularly on the fringe of its asset footprint.

Powerco has upgraded most of the sites with additional batteries due the increased loading from the PTN and DMR equipment. Some critical sites have also had generators installed. At some sites the air conditioning has been upgraded, and Powerco also took the opportunity to replace a few masts.

"The DMR system is fully integrated into a Zetron ACOM console system which was installed at the same time. The ACOM system manages all telephony and radio calls, presenting calls into queues for the NOC operators 24/7. The telephony calls are delivered via SIP trunking," said Marsh.

In addition to being used by its own staff, the DMR system is also used by maintenance staff from Downer New Zealand, Powerco's prime maintenance provider.

Putting it to the test

According to Marsh, "Installations have been smooth and uneventful, except on the odd occasions where high winds have prevented riggers climbing towers to install antennas and feeders. Also, during the winter months, a few sites had track access constraints due to wet weather conditions."

"Powerco staff and contractors have been positive with the new systems, particularly knowing that now they have reliable comms from most of Powerco's footprint to the Network Operations Centre (NOC) for day-to-day work instructions, and emergency situations," added Marsh.

"The feedback during training and subsequent field use has been positive. Powerco has set up 'DMR Users Forum' for staff and contractors to resolve any issues and suggest future enhancements."

One unexpected and welcome benefit has been more efficient operations at the New Plymouth NOC during times of heavy workload.

"During major storms or natural disaster events before this system was introduced, the NOC would activate the 'Storm Room' to take overflow telephone and radio calls to prevent the NOC operators being overloaded," said Marsh. "Since commissioning the DMR and ACOM systems, the operators can handle the telephony and radio traffic much more efficiently during events, and the Storm Room has not needed to be activated."

Hytera

Hytera Communications Australia Pty Ltd
www.hytera.com.au

FREE EXHIBITION ENTRY

COMMS 2019 CONNECT

Events for critical communications users and industry

SYDNEY

ROSEHILL GARDENS | 12-13 JUNE 2019

Public Safety | Transportation | Utilities | Government | Enterprise

SPEAKERS INCLUDE

STEVE HWANG
Operational chair,
Korea SafeNet forum

HEIKKI RIIPPA
Senior Advisor
Suomen Erillisverkot Oy Authority

EDWARD PARKINSON
Acting CEO
First Responder Network Authority

STATION OFFICER GRAHAM TAIT AFSM
Operational Communications Systems Officer
Fire & Rescue NSW

MARY EGAN
National PMO Lead
Public Safety Mobile Broadband
NSW Telco Authority

PLUS

500+ users and industry experts | 40+ exhibitors | 40+ speakers | 3 training workshops
Finnish critical communications stream — NEW | IoT Alliance Australia stream — NEW

TRAINING WORKSHOPS

included in conference package

- **Sensors, smart cities and the implications for critical control rooms**
- **Critical communications standards supporting a multivendor and interoperable environment for all mission- and business-critical sectors**
- **ARCIA Professional Development Training workshop — multicoupling and filtering**

IN CONJUNCTION WITH
ARCIA INDUSTRY NETWORKING DINNER
12 JUNE 2019
Book with your conference package or visit arcia.org.au

Networking Drinks Sponsor
Wireless Innovation

Media Partner
comms critical

Association Partner
ARCIA

Supporting associations and media organisations
TCCA
THE CRITICAL COMMUNICATIONS REVIEW
IWCE
IoTA IoT Alliance Australia
RadioResource INTERNATIONAL

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

GREEN LIGHT FOR BROADWAY'S NEXT STAGE

David Lund, Project Coordinator, BroadWay

The next step has been taken on the road to enabling a pan-European mobile broadband system for public protection and disaster relief.

On 19 February 2019, a request for tender (RFT) was published by the BroadWay project (broadway-info.eu) to procure solutions to enable a pan-European mobile broadband system for public safety. The goal is to enable 'operational mobility' — the ability for public safety responders to carry out their operations wherever they are in Europe, whenever they need to, and in collaboration with responders located in and from anywhere in Europe.

Crime and disasters are not limited to fixed geographical borders, and there is a need for European first responders to be able to communicate, share and access information regardless of the country in which they will respond. This is the challenge tackled by the BroadWay project. A team comprising 11 government/agency procurers from 11 European countries have come together to procure innovation activity to enable a pan-European mobile broadband system for public protection and disaster relief (PPDR). Europe is naturally geopolitically fragmented, with no harmonised spectrum for PPDR mobile broadband and no single mobile carrier covering the whole of the continent.

Pre-commercial procurement

BroadWay procurers share a 'common challenge' to find innovative solutions that surpass the current minimal operability. BroadWay will spend approximately nine million euros following a pre-commercial procurement (PCP) process that will comprise three phases — design, prototype and pilot.

Up to five supply teams will be selected to provide designs. Three of the best team designs will be taken forward to develop prototypes. The final pan-European pilot will be developed by the suppliers of the best two prototypes. The process remains competitive throughout with pilot systems expected to be live to Technology Readiness Level 8 within 2022.

The BroadWay group of procurers is represented by Astrid-Belgium, acting as a procurer in its own name and on behalf of the BroadWay group of procurers, also including:

- French Ministry of Interior
- Italian Ministry of Interior
- Spanish Ministry of Interior
- Police of the Netherlands

SINCE RELEASING THE RFT, MORE THAN 80 INNOVATIVE SUPPLIERS HAVE EXPRESSED AN INTEREST IN PARTICIPATING.

- An Garda Siochana, Ireland
- NAKIT, Czech Republic
- State Infocommunication Foundation, Estonia
- State Security Networks (VIRVE), Finland
- Ministry of Citizen Protection and Security, Greece
- Special Telecommunication Services, Romania

The program is 90% funded by the European Commission. Public Safety Communication Europe (PSCE) Forum acts as project coordinator. PSCE is also based in Brussels and acts as the contact point with the European Commission. Legal firm Bird & Bird provides legal expertise to support the PCP process, which is a derivation from the European Public Procurement Law.

The challenge

This BroadWay 'common challenge' is divided into objectives which are set out in the RFT. Pan-European governance, architecture, availability and security form the primary focus. All solutions must be standardised, technically validated and most importantly, evaluated and accepted by real end users. Future ecosystems of applications, devices and further innovation must be supported, with the aim to leverage the fast development of mobile technology.

The BroadWay Practitioner Evaluation Team (PEVT) currently brings together 49 experts from all responder disciplines across Europe. It will prepare the process and carry out the evaluation of the final pilot system in 2022. PEVT is led by the Bavarian Red Cross (based in Munich), a key end user of the resulting technology. PEVT will use the Trial Guidance Methodology (TGM). TGM is a key outcome of the Driver+ project (driver-project.eu), which develops techniques to assist public safety practitioners to trial and evaluate new innovations, such as those that will be developed during BroadWay.

Dialogue with innovative suppliers

An open market consultation ran from June to September 2018, involving dialogue with around 60 potential suppliers, 27 of which responded to a comprehensive questionnaire. This helped us to shape the BroadWay RFT.

Since releasing the RFT, more than 80 innovative suppliers have expressed an interest in participating. Consortia comprising different skills are expected to deliver against the BroadWay objectives, with a compulsory inclusion of mobile and/or satellite operators and independent and impartial test and validation capabilities. Test and validation will also include security assurance and practitioner evaluation capabilities.

Decade of development

PSCE was formed 10 years ago as a membership forum with the aim to become a sustainable organisation. This has been achieved through the involvement in many European-level initiatives including research projects and policy activities. PSCE runs a conference twice per year, each one held in a different country with the aim to bring the discussion close to the public safety practitioner end users.

PSCE has three committees — end users, industry and research. The aim is to foster the dialogue between these three committees towards the improvement of communication systems for public safety.

In 2014, several members of the PSCE end-user committee approached PSCE to ask for help to begin this process. The process began to form the original team of 17 partners to carry out project BroadMap (www.broadmap.eu). BroadMap ran for 12 months and produced two key deliverables:

- End User Requirements Knowledgebase — around 700 end-user requirements were validated by 270-plus public safety organisations across 18 European countries and all major public safety disciplines.
- SpiceNet Reference Architecture — an abstract business architecture covering harmonisation, interoperability, governance, networks and users.

These deliverables helped the European Commission to structure the requirement for a PCP project. The BroadWay team was then formed, a proposal submitted in August 2018, and a contract agreed with the European Commission for BroadWay to begin on 1 May 2019.

Several other external activities led by PSCE support the BroadWay goal:

- PSCE is a Market Representation Partner of 3GPP.
- PSCE co-hosted together with FirstNet the second annual International Public Safety Broadband Leaders forum for government executives on 24 May 2018 in Brussels, Belgium.
- PSCE acts as vice-chair in two new standardisation activities: the CEN Workshop on the semantic and syntactical interoperability for crisis and disaster management and the CEN Workshop on the Trial Guidance Methodology.

PSCE recently launched a new working group in collaboration with the GSM Association to explore scenarios and needs for mission-critical IoT — a highly complementary viewpoint to the standardised mission-critical 3GPP standards that BroadWay expects to build on.

LTE solution

The Cambium Networks cnRanger LTE solution is a fixed wireless point-to-multipoint solution that uses LTE (Long Term Evolution or 4G) protocol. However, it simplifies it by embedding and virtualising the evolved packet core (EPC) into the baseband unit (BBU).

This platform supports the 2.5 GHz bands, TD-LTE Bands 38, 40 and 41 at launch. There will soon be support available for 3 GHz, TD-LTE bands 42, 43 and 48 (CBRS).

Cambium Networks Ltd

www.cambiumnetworks.com

Flexible modular TETRA system

The Motorola Solutions DIMETRA Express is a flexible modular TETRA system. It can be quickly integrated into a network, provisions multiple subscribers, and can be completely installed easily using browser-based apps and tools.

The system is fully integrated, with a one-box or modular system with switch and base radios, which makes it easy to set up and deploy in 15 minutes. The small physical footprint means it requires less space and power, with fewer components.

Full TETRA capability means enabled voice, short data and telephony services. It offers loud and clear communications for safe day-to-day operations or text messaging for times when quick information is needed. It also offers the ability to make VoIP telephone calls outside the network.

Other features include the ability to easily add base radios to a site and get additional channels for more capacity, or add another site to broaden the coverage area; while web-based applications include a system health monitor, radio control manager and simple dispatch program with existing Android or Windows PC and tablets.

Motorola Solutions Australia Pty Ltd

www.motorolasolutions.com.au

MEXICO'S NATIONAL NETWORK

Jonathan Nally

Mexico is in the middle of rolling out Red Compartida, one of the world's most ambitious mobile broadband network projects.

In 2013, Mexico, faced with a very non-competitive telecommunications sector, took the extraordinary step of amending its constitution to include a measure that would ensure true independent competition would be brought to the country. That a nation would need to go so far as to implement constitutional change to improve telecommunications gives a clear indication of what the situation was like.

Thus was born Red Compartida, a national 4G-LTE network that would be operated on a public–private partnership basis, with a completely independent wholesale operator charged with ensuring the provision of telecommunications services that would progress the public interest. Importantly, the aim is to provide mobile broadband services to almost the entire country, including smaller and rural communities that had been overlooked by the incumbent providers.

Red Compartida is seen as being more than just another mobile phone network — it is a piece of national infrastructure that is vital to the nation's economic and social development.

To find out more about Red Compartida, its status and how it will work, we spoke with Isabel Prieto, Corporate Director (in charge of institutional relations, regulatory affairs and legal strategy) at ALTÁN Redes, the network's wholesale operator.

Why was there a need for a new network such as Red Compartida?

Today, Mexico has over 40 million people with no access to broadband internet services, which represents approximately one-third of the Mexican population. The government identified the need to break the duality, which on the one hand is a modern country of 'the connected' — with access to quality broadband services primarily in urban and suburban centres — and on the other hand, a country with limited or non-existent broadband services, particularly in communities with fewer than 10,000 inhabitants. This digital gap between Mexicans limits the digital capabilities and inclusion (financial, social, educational, health) within the society. Red Compartida intends to increase access to and penetration of broadband services.

Furthermore, Mexico has a predominant mobile operator that controls nearly 70% of the mobile market, so there is a strong need to promote competitiveness in the market to accelerate the trend of providing better services and prices for the end users through a neutral, wholesale, shared network. This new entity would benefit both existing operators by reducing the capital expenditure requirements to cope with the exponential growth in data consumption, as well as incentivising new entrants such as MVNOs or existing cable and internet providers to provide and bundle mobile services.

Can you describe the public–private partnership?

The public–private partnership agreement (PPP agreement) contemplates the design, deployment, operation and maintenance of a wholesale mobile network by the developer, which in this case is ALTÁN Redes (ALTÁN). ALTÁN was awarded the PPP agreement in November of 2016 (and eventually signed in January of 2017), since it was the only bidder that met both the technical and financial requirements set forth in the tender and offered a coverage of 92.2% of the population (well above the 85% minimum required). The company is composed of leading international institutional investors, international and local pension funds, international and local investors, and leading Mexican cable operators. The PPP agreement was awarded through an international public tender organised and led by the Ministry of Communications and Transport.

The PPP agreement includes the exclusive use of the full 90 MHz of the 700 MHz spectrum (Band 28) and approximately 25,000 km of a pair of optical fibre lines of a nationwide backbone network from the state-owned electricity company (CFE). Supervision and oversight of the Red Compartida project is the responsibility of Promtel, which is a decentralised government entity. For the fibre optic lease, TELECOMM, which also is a decentralised government agency, is responsible for its oversight.

How is the project being financed?

The project is fully funded with US$750 million in committed equity and approximately US$1.5 billion in committed debt. ALTÁN's financing received several awards from recognised institutions as it represents one of the most important infrastructure projects in progress worldwide.

ALTÁN's technological partners (Huawei and Nokia) provided US$800 million in long-term financing, and CAF, a multilateral development bank for Latin America, provided a further US$50 million in long-term financing.

Finally, the Mexican Development Banks, which include Banobras, Nafinsa and Bancomext, provided a stapled long-term financing package of MXN13 billion, in addition to a liquidity line of up to MXN4.75 billion.

How will the wholesale nature of the system operate?

Capacity is sold to customers under non-discriminatory conditions. The PPP agreement outlines the requirements for ALTÁN, which include: (i) the coverage milestones that need to be met by set dates and reaching 92.2% by 2024, (ii) the guarantee of a minimum quality (assured up-link and down-link at peak traffic hours at cell edge outdoors), (iii) a non-discriminatory commercial reference offer and (iv) 4G-LTE Advanced continuity in all of the network's footprint. We are not permitted to sell directly to the end user, but rather through our over 30 customers to date. This guarantees that we are a truly neutral and non-discriminatory wholesale network that only seeks its clients' success (we always say that their success is our own).

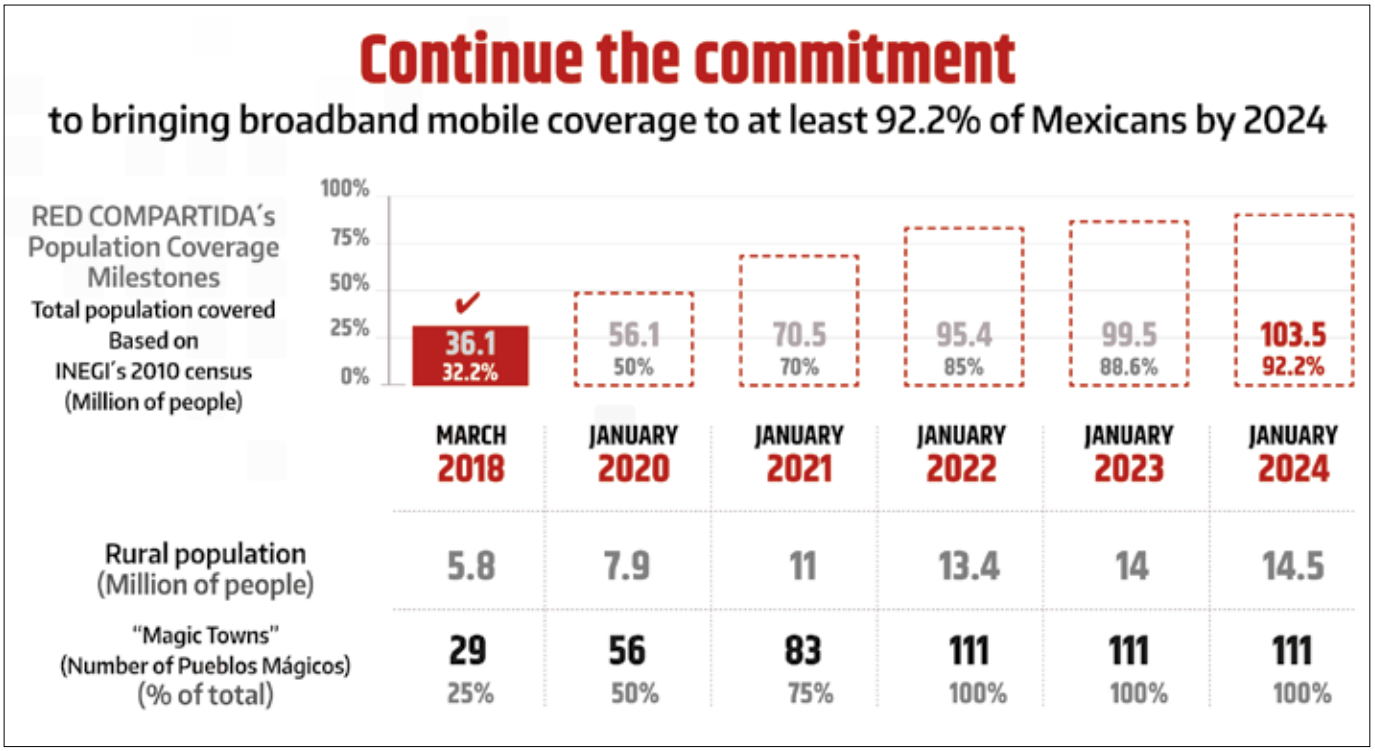
The wholesale products and services available are offered through an approved commercial Reference Offer that is contracted under non-discriminatory policies — all clients have the same prices and conditions; any modifications are communicated to all equally.

We have created tailored solutions for better integration with our clients, which include wholesale packages for home broadband (HBB) services that have been very successful as it is a plug-and-play solution for high-speed wireless internet for homes and small businesses; and wholesale data plans for mobile services for MVNOs and new convergent offerings (quadruple play). We constantly say that we aim to produce the most efficient GB in the market.

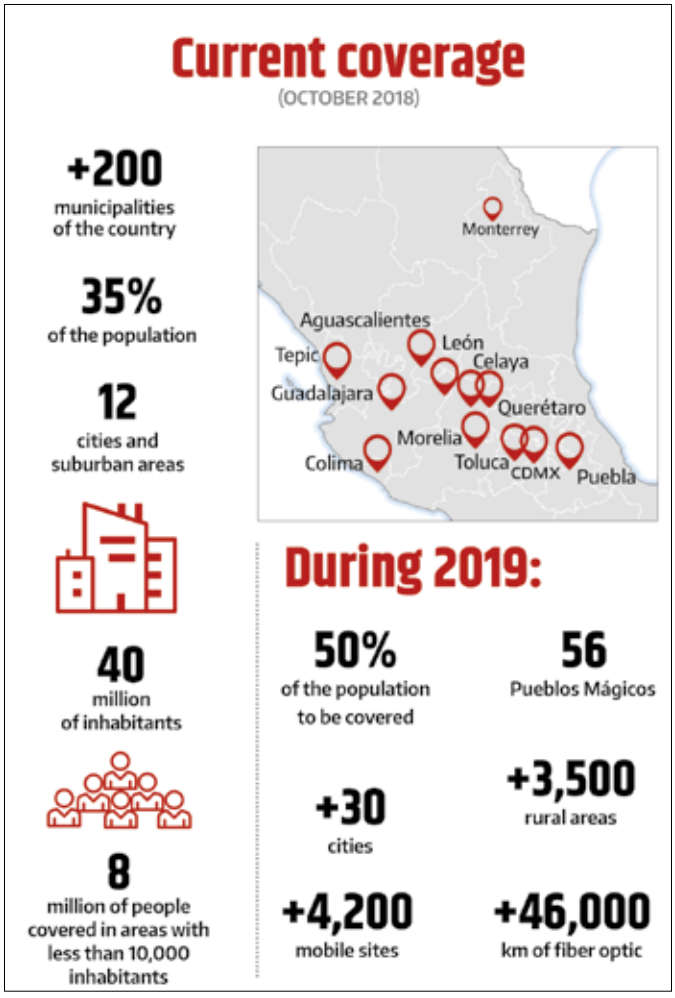
Which factors were vital in helping ALTÁN Redes secure the contract?

Critical factors were the establishment of the proper legal framework and political support for Red Compartida. In 2013, the federal government, with the support of all the main political parties, enacted constitutional reform including wide-reaching changes to the Mexican telecom landscape. The Red Compartida project was included in the Mexican constitution and explicitly denied the participation of existing mobile network operators in Mexico from having a significant influence in its board. It enjoyed the support of all major political parties given the social impact of the project, as well as the need to modernise and incentivise the Mexican telecom sector.

Additionally, the tender required a population coverage commitment of at least 85%. This meant that the extensive expertise of our investors and managing team was needed, so an important consideration was the analysis and work performed by ALTÁN's strategic partner, Multitel, a Spanish investor group responsible for the development of ONO, the successful broadband company that was eventually sold to Vodafone; and the strength of the shareholders — Morgan Stanley Infrastructure, International



Red Compartida aims to connect 103.5 million people by 2024.



The huge Red Compartida network already serves an impressive number of people.

Images courtesy ALTÁN Redes.

Finance Corporation (the private sector arm of the World Bank), the China-Mexico Fund, international and Mexican pension funds, Mexican cable operators and private investors. It also required ALTÁN to secure a US$50 million bid bond.

What is the status of the project, and what developments are expected for 2019?

We met and surpassed our first milestone obligation on 21 March 2018, covering 32.2% of the population and surpassing the 30% milestone (this represented 36 million people across 12 cities and over 1900 towns and villages). We presently cover over 40 million Mexicans. During the second half of 2019, we expect to reach the 50% population coverage milestone, reaching nearly 60 million people across 30 cities, with 14 million of those people living in communities with fewer than 10,000 people. The obligation set forth in the PPP agreement requires ALTÁN to reach the 50% milestone by January 2020. In addition, we are already designing the 70% milestone, which is due by January 2021.

Since March of 2018 when the commercial activities commenced, we have signed with over 35 clients. We have dynamised the competitive nature of the telecom sector with the development of product niches in the market such as HBB (an appealing product for cable companies to complement their existing offering) as well as new MVNOs for educational, security and social purposes. The strong interest of companies entering the telecom market is proven by the 156% increase of new permits granted since 2016.

What are the Pueblos Mágicos, and why are they important?

Pueblos Mágicos (or Magical Towns) is a program developed by the Tourism Ministry in 2001 with the support of other government agencies that recognises towns with fewer than 20,000 people that have protected cultural and historic traditions, indigenous past, colonial legacy, natural environment and biodiversity. There is currently a total of 122 Pueblos Mágicos across Mexico.

Although these Pueblos Mágicos receive thousands of tourists each year, and they are relevant economic drivers in their respective regions, they seriously lack telecommunications infrastructure and connectivity that can benefit their residents and their visitors.

In a recent study by Promtel on the positive effects detected from the launching of Red Compartida, it was confirmed that in seven of the current 33 Pueblos Mágicos covered by ALTÁN, ALTÁN's LTE network is the only network serving them with high-speed connectivity (in most cases they only had 2G connectivity).

Who are the major technology suppliers?

We have two main technology providers responsible for the radio access network deployment: Nokia and Huawei. To comply with the milestones in such a short time span, we needed two vendors with proven experience and capacity. We gave each vendor a different mobile region — Mexico is divided into nine regions; Nokia has the north regions, Huawei has the centre and south regions — and elements of the network (core and NOC by Nokia). By doing so, we have created an optimal balance between both and no specific dependence. Both providers have fulfilled their tasks to date with satisfactory results.

Our network has deployed the latest LTE-Advanced version (Release 13), which already has some 5G capabilities, so we are '5G ready'. The network is completely virtualised (cloud-based) so client integration is simpler and faster, and we have the ability to migrate seamlessly to new technologies. The network is presently 85% connected through fibre optics, which is essential for the migration to a low-latency environment of 5G.

Will Mexican government agencies use Red Compartida?

Any agency (government, NGO, public entity), companies and even individuals (ie, app developers) can access Red Compartida through an existing client to deliver services to their current and potential end users, develop an MVNO or integrate through an MVNE (enablers) model that works as an intermediary/access entity to the network. There are real opportunities of growth in the virtual operator and enabler models as there is still immaturity in the market for these types of entities (there was no real driver of MVNE development before the creation of Red Compartida).

Will there be call priority and pre-emption capabilities?

Red Compartida has the right to market services, to critical sectors and vital industries, that imply prioritisation of the network ('call priority'), as long as such services are commercialised in a non-discriminatory manner, through a public reference offer (like any other ALTÁN wholesale service), and in compliance with the criteria that, ultimately, the Mexican regulator, IFT, issues regarding the net neutrality. It is important to point out that Mexican legislation does not allow, under any circumstance, pre-emption capabilities.

Will Red Compartida work with the government's IRIS Tetrapol system?

ALTÁN has met with the authorities and the people in charge of IRIS, as well as other providers of connectivity services to the security agencies. They are all interested in integrating with Red Compartida, as it has the latest 4.5G technology and is ready to migrate to 5G. In addition, no network provider today provides a nationwide LTE network, as will be the case with Red Compartida. The federal government strategy is to migrate to a completely digital IP network, compatible with the different networks currently in use since not all use the IRIS Tetrapol (some use P25, Harris, satellite).

What's one thing we might not know about Red Compartida?

A curious fact for your readers: ALTÁN means "to communicate" in the Mayan language (a'al + t'aan), so we have the pride and mission for our country in our name.

Understanding GPS Antenna Alignment Tool errors

Use of the right alignment tool can significantly minimise multi-path and RF interference errors when aligning antennas.

Multiwave Sensors Inc. is the manufacturer of the Smart Aligner Tool, which is a GPS Antenna Alignment Tool. Multiwave has designed the Smart Aligner Tool to minimise or eliminate the error conditions described in this article and quotes accuracy as absolute.

Abstract

The use of GPS Antenna Alignment Tools to align (or orientate) antennas is becoming a requirement from the telecommunication carriers. Based on the accuracy specified by the Tool manufacturer, the carrier will approve the use of that Tool for its network. Usually the Tool manufacturer will specify the accuracy based on ideal conditions, however, being on a tower or rooftop is not an ideal condition. This article will outline some of the conditions that can adversely affect the azimuth error by up to 12x the 'published accuracy'. The most prominent error is that of GPS multi-path. The Smart Aligner Tool has been designed to minimise or eliminate multi-path errors by a patent pending antenna extension and folding mechanism.

Introduction

The overall accuracy of a GPS Antenna Alignment Tool is made up of several factors such as the Ideal Condition Accuracy, GPS multi-path effects, mounting and RF interference. For this article, we will assume that the tool is square with the backplane of the antenna and, thus, presents no mounting errors. We will briefly discuss RF interference and how it can be mitigated. We will, therefore, only focus on the Ideal Condition Accuracy and GPS multi-path errors.

Ideal condition accuracy

Most of the Tool manufacturers quote the accuracy of the core board manufacturer. The core board manufacturer specifies the azimuth accuracies as RMS under ideal conditions. This accuracy can be very misleading as it does not represent the absolute accuracy. The absolute accuracy is the total deviation of the azimuth at any time during the azimuth verification. The RMS accuracy quoted is very high, but the absolute accuracy can be 3–4x the RMS accuracy. The absolute accuracy is very close to the R99 accuracy as specified by some tool manufacturers. Some of the published Tool accuracies are shown in Table 1. The absolute accuracy, shown in Table 1, is a Multiwave derived value, based on extensive testing, which compares the RMS accuracy (from the core board manufacturer) to the absolute accuracy of the Tool.

As can be seen from the table, the absolute accuracies range from 0.25° to 3.0°. The difference is due to the GPS receiving antenna spacing on the Tool. The larger the separation, the better the absolute accuracy; however the trade-off becomes accuracy vs size. For the very high accuracies, the Tool length is greater than 2m. This can present handling difficulties while on the tower. The shorter-separation Tools result in degraded accuracy of up to 3.0°. The Smart Aligner Tool has been designed with a separation of 0.5m, but is able to be folded to under 0.5m when being transported.

Figure 1 is a graph showing the azimuth fluctuation of the Smart Aligner Tool under ideal conditions. The data shown is the error for any azimuth verification measured by the Smart Aligner Tool. The core board manufacturer specifies a 0.17° RMS, but as can be seen, the absolute accuracy is 0.5° to 0.7°. The majority of measurements (>99%) are between –0.5° and 0.5°.

Tool	RMS Accuracy	R99 Accuracy	Absolute Accuracy
Tool #1	0.75°	Not specified	2.25° to 3.0°
Tool #2	0.30°	0.75°	0.9° to 1.2°
Tool #3	0.15°	0.40°	0.45° to 0.6°
Tool #4	0.08°	0.25°	0.24° to 0.32°
Tool #5	0.5°	Not specified	1.5° to 2.0°
Smart Aligner	0.17°	Not specified	0.5° to 0.7°

Table 1

GPS multi-path errors

GPS multi-path errors are a result of the signal from the GPS satellites not reaching the GPS receiving antennas on the Tool in a straight path. If one of the GPS receiving antennas on the Tool is below and next to the antenna to be aligned, then multi-path effects may be happening. Check the literature and images of the Tool manufacturer to determine if one or both of the GPS receiving antennas are below and next to the antenna to be aligned (Figures 2 and 3).

The error caused by multi-path is dependent on the GPS satellite geometry, so that in some cases, the error may be negligible, but in other cases it can be up to 3° or more. As can be seen from Figures 2 and 3, one of the GPS receiving antennas is receiving a signal from the GPS Satellite that is reflected off the mast and antenna to be aligned. The path of the reflected signal is longer than the direct path, resulting in an azimuth error.

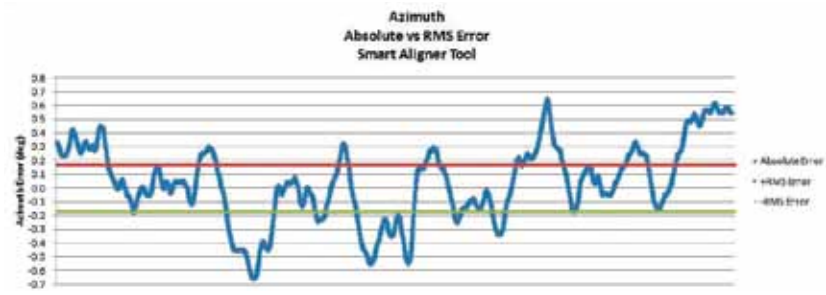


Figure 1

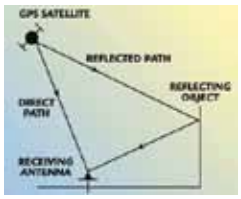


Figure 2

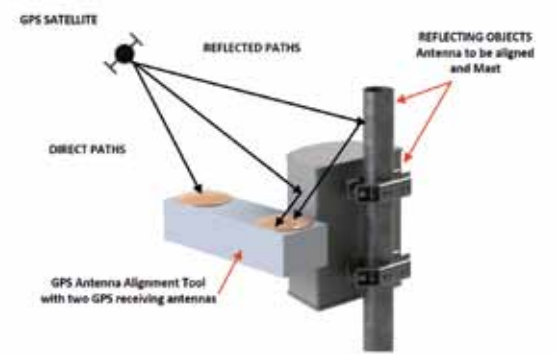


Figure 3

Figure 4

Figure 5

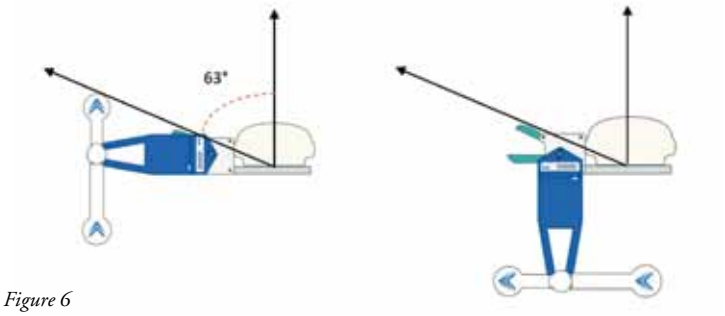


Figure 6

Demonstrating multi-path errors using a GPS antenna alignment tool

Multiwave performed a series of tests with the Smart Aligner Tool to show how the error is manifested. The Smart Aligner Tool was set up in an ideal condition. The antenna/mast was brought close to the Smart Aligner GPS receiving antennas (close to the first antenna, second antenna and in between the two antennas) and the azimuth increased or decreased by up to 3°. See Figure 4.

As can be seen from the graph above multi-path can cause a positive or negative error to the azimuth depending on where the multi-path object is placed. Therefore it is very important to have the Tool GPS receiving antennas extended away from the antenna to be aligned. The Smart Aligner Tool extends the GPS receiving antennas away from the antenna to be aligned in order to eliminate the errors as seen in the graph above. See Figure 5.

RF interference

RF interference occurs when live antennas are being aligned. If the GPS receiving antennas on the Tool are in the path of the live antennas, there is a possibility that the interference will cause excessive noise in the Tool, resulting in no azimuth solution being obtained. Most of the Tools are well designed to shield RF, however, since the GPS receiving antennas cannot be shielded, there is the possibility of interference occurring. Some Tool manufacturers recommend turning on the Tool in a different location that is away from the live antenna and then moving and mounting the Tool to the live antenna. When mounted on the live antenna, it will be swamped with noise and will start to rely on the gyros. This is a last resort method as the gyro can be affected by how the tool is carried (tilting and rolling or carrying it upside down) and the solution will only last for three minutes due to excessive drift of the gyro. The ideal scenario is to move the GPS receiving antennas on the Tool out of the path of the RF. The Smart Aligner Tool can be mounted on an antenna in 18 different positions so that the Tool GPS receiving antennas can be moved out of the way of the live antenna. Figure 6 shows two of the ways that the antennas can be moved out of the live antenna RF path. The azimuth, tilt and roll offsets are then calculated automatically.

Conclusions

This article illustrates that the GPS Antenna Alignment Tool absolute accuracy can be much larger than the 'published accuracy'. If the two errors (Absolute error and Multi-Path error) are combined it is possible that the antenna could be misaligned by 3.0° to 4.2° (Max Error = sqrt (3^2 + 3^2) = 4.2°) resulting in errors up to 12x the published accuracy. The contractor or turf vendor would be using a tool that he believes is very accurate but, in reality, it is not. The Smart Aligner Tool accuracy is specified as absolute accuracy and, due to the extension of the GPS receiving antennas multi-path is eliminated. The Smart Aligner Tool can also be mounted in such a way that RF interference is mitigated.

Distributed exclusively in Australia by Maser; phone 02 9452 6062.

Smart Aligner
Maser Technology Group
www.maser.com.au

POWERING NSW POLICE'S DATA CENTRE

Schneider Electric and Dell EMC recently partnered to help complete a full refurb of the NSW Police Force's radio communications data centre.

The NSW Police Force serves a population of more than 7.8 million people via a network of 430 police stations, and employs around 20,000 operational and administrative personnel. It receives approximately 2.1 million requests for assistance from the public each year via Triple Zero and the Police Assistance Line (131 444).

Police still use LMR as their primary means of communication when operating in the field, for everything from routine enquiries about a vehicle registration through to the coordination of hundreds of officers during major events and emergencies.

It is critically important that this communication capability has high availability, so close attention to the reliability of all layers of the solution is required — from the radio terminal all the way through to the environment in which components of the back-end infrastructure are housed.

Challenging environment

The facility housing the NSW Police Force mission-critical radio communications infrastructure had barely evolved over recent years to cater for the growing demand of additional equipment and services. Due to significant advances in technology and the introduction of increasingly sophisticated, and often sensitive, ICT infrastructure, new power and cooling systems, server racks and equipment cabinets were required.

During the construction phase of the refurbished centre, a number of challenges had to be met:

- The facility needed to continue full-time operation with minimal interruption to ensure the ongoing provision of radio communications to frontline police.
- Stringent security and workplace safety requirements meant that those working on the project were required to meet NSW Police standards at all times.

- The location of the building within the Sydney CBD, home to numerous operational policing units, complicated delivery of product and external installation work.
- The work could not impede the day-to-day operations of policing services.

The specific requirements of the new data centre set out by the customer meant that the design was quite complex. Part of the reason for this was that the specific electrical load was unknown, requiring a solution that would suit a data centre of between 50 and 70 kW.

Police power

Reliability of systems was the number one objective for the NSW Police Force. After a competitive tender process, APC by Schneider Electric worked with the police engineers and their IT partner, Dell EMC, to offer a turnkey solution.

Right from the start, Schneider Electric appointed a project manager. In the early days of the project, this person worked with the end user and the solution partner to ensure the scope of the project was fully understood. Upon gaining a deep understanding of the situation, the project manager worked with the team, and the wider Schneider Electric community, to evaluate possible systems to suit the communications centre upgrade. In particular, multiple cooling options were investigated during the process.

After stringent evaluation, a solution was devised with multiple redundancies and high-quality products to ensure continual uptime. Supporting this equipment is Uniflair Access Flooring, which enables cabling for server racks and equipment to be run neatly under the floor. APC by Schneider Electric server racks, fitted with electromagnetic locks for increased security, power distribution units and InRow cooling units have all been installed to produce an energy-efficient, robust and reliable solution. The APC by Schneider Electric equipment also features variable speed drives to reduce overall power usage.

Successful solution

Completed on schedule and within budget, the refurbishment of the radio communications data centre has been deemed a success, partly because of the initial deep engagement by the Schneider Electric sales team lead by Sergei Vovchak as well as the work performed by the company's delivery team under Project Manager Andrew Spicer.

"No matter the project, we work hard to maintain the uptime of our customers, and the quality of our products and solutions, as well as the expertise of our personnel, supports this," said Joe Craparotta, Vice President, Schneider Electric Secure Power and Strategic Segments.

"The NSW Police Force communications centre provides a critical service to the citizens of this state," said Jade Porter, Senior Director, Infrastructure Solutions, Dell EMC ANZ. "We're proud that Dell Technologies infrastructure solutions underpins this vital data centre."

Schneider Electric IT Australia
www.schneider-electric.com/ups

Radio Matters

The RFUANZ committee is pleased to announce that New Zealand's Minister for Broadcasting, Communications and Digital Media has agreed to end the moratorium imposed on the 800 MHz band. Radio Spectrum Management (RSM) advised it will be updating the Statement of Government Policy and Directions to the Chief Executive of the Ministry of Business, Innovation and Employment soon. In the meantime, the 800 MHz band is now available for new and long-term licences.

The TS (800 MHz) band supports many industrial and enterprise users across New Zealand. The enterprise and government users in this band contribute to a significant percentage of our economic prosperity and citizen safety. A moratorium was issued in 2016 on this band preventing any future long-term licensing without specific prior written approval from RSM. RFUANZ has engaged with RSM regularly on this topic on behalf of some of the key stakeholders utilising this band in order to open it back up for short- and long-term licensing, and to allow it to be better utilised for national economic benefit.

To date we have no way of confirming how many radios that use this band have been sold; however, the lifting of the moratorium has enabled two major users to progress with large infrastructure projects. This has been a small victory for RFUANZ, but a major achievement for the industry.

G band or 174–184 MHz was made available to the radio industry after careful deliberation of all major users of the spectrum, in conjunction with RSM. A significant effort by RFUANZ was put into the 174–230 MHz spectrum with a number of face-to-face meetings with RSM and radio industry spectrum users to prepare the final submission which led to this outcome.

This band is now available for licensing use with efficient digital technology; however, to date there has been little uptake. Our challenge, now, is to get the industry and manufacturers to utilise this new spectrum. Going forward we are aware of the global trend and need for allocation in New Zealand of spectrum for private LTE.

Another challenge faced in the New Zealand radio industry is attracting youth to undertake training. RFUANZ now offers a Level 3 installers course, run in conjunction with E-tec and the Manukau Institute of Technology. We are also conscious of seeking replacements of our long-standing consultants/radio engineers in the industry. Their knowledge and expertise is invaluable, therefore training youth is imperative for the future of radio in New Zealand.

RFUANZ recently held two very successful breakfast forums in Auckland and Christchurch, presented by Daniel Ephraty, Director of Sales Engineering at Siklu Communication (United Kingdom). We are now very keen to undertake similar forums and are seeking informative topics from the industry for consideration. Some suggestions include an RSM question and answer forum, robotic development, simulcast technology, and telcos — the next wave of communication. Our biggest challenge is finding experienced speakers available to present such topics. If you have any suggestions, we would love to hear from you.

Corey Weir
Chairman, RFUANZ

RFUANZ
Radio Frequency Users Association of New Zealand

Embedded network hardware appliances

The i-keytec Fusion Series self-contained embedded network hardware appliances monitor all on-site systems and distribute alerts to the appropriate personnel or device as critical events occur.

It helps to improve staff and customer communication with real-time two-way messaging to almost any wired or wireless device including smartphones, email, Wi-Fi/DECT handsets and low-cost pagers. All modules are self-contained embedded network appliances in standard 19″ rackmount enclosures — meaning that a server and software are not required.

The product has built-in web client GUI for configuration and two-way messaging. Users can configure escalations, common messages, reminder messages and configurable user access rights/privileges. The product is suitable for applications such as aged-care sites, nurse call/fire panel/BMS integration, mine site emergency notifications and IT or industrial site monitoring. All modules were built from the ground up with critical messaging in mind.

i-keytec
www.fusionseries.com

Vector network analyser

The PicoVNA 106 is a USB-controlled, professional and laboratory-grade 300 kHz to 6 GHz vector network analyser.

Despite its small size, the instrument has a full-function, minimal-error, 'Quad RX' four-receiver architecture. This supports both 8- and 12-term calibration without the uncorrectable switching errors and delays of traditional three-receiver designs. The instrument supports convenient calibration methods such as 'enhanced isolation correction' and 'unknown thru'.

The analyser has a dynamic range of up to 118 dB at 10 Hz and only 0.005 dB RMS trace noise at its maximum bandwidth of 140 kHz. It can gather all four S-parameters at just 190 μs per frequency point. The analyser is suitable for for classrooms, small businesses and amateur workshops, while also able to meet the needs of the microwave laboratory and expert. It comes with bias-Ts for the convenient injection of a bias or test stimulus.

Emona Instruments Pty Ltd
www.emona.com.au

Remote video microphone

The Sepura sRVM remote video microphone is a recording device combined with remote speaker microphone functionality for body-worn video cameras.

Designed specifically for public safety users, the microphone can be either connected directly to a Sepura SC2 Series TETRA radio, wirelessly connected using Bluetooth or used as a standalone product. The device includes GPS tracking for remote monitoring and includes a removable SD card for recording storage.

Recording can be initiated and paused with a single sliding button, ensuring that critical information is instantly captured, even during an operation. Recorded video can be reviewed on site or downloaded at a later date when the device is charging in its docking station.

As well as video recording functionality, the sRVM features the functions expected of a remote speaker microphone. These include loud, clear audio through a powerful 2 W speaker and easy access to operational buttons.

Additional features include a 3.5 mm jack socket, for use with an earpiece where discretion is required or the environment is noisy. Furthermore, the lens has been designed to expel water and can be angled downwards so that even tall officers keep their subject in view.

Sepura PLC
www.sepura.com

Advanced design system software

The Keysight Technologies Power Electronics Professional (PEPro) software is an add-on to the PathWave Advanced Design System (ADS). It enables designers to visualise effects of switched-mode power supply (SMPS) designs without the need to build and test time-consuming prototypes.

The software makes post-layout analysis as easy as pre-layout analysis. It includes automatic set-up that previously required an expert. In addition, it offers pre-built analyses of effects such as voltage spiking and electromagnetic interference (EMI).

Keysight Technologies Australia Pty Ltd
www.keysight.com

Modbus router

The EKI-1222R Modbus Router is designed to provide protocol conversion, routing functionality and security features. It is suitable for vertical markets such as transportation, energy and environment, intelligent factory and CNC machining. It is particularly suitable for applications requiring remote control and monitoring, high security and fast integration.

Supporting both Modbus RTU/ASCII and Modbus TCP, the EKI-1222R allows for protocol conversion and flexible connection of serial and Ethernet-based Modbus devices. With seamless communication between devices that use different protocols, this router helps users extend the life cycle of extant legacy devices and avoids the need for large-scale purchases when upgrading from a traditional facility to an industrial IoT facility.

Serving NAT/router mode, static routing, DMZ/port forwarding and IP/protocol-based QoS, the EKI-1222R acts as a bridge between private networks and the internet. It enables local network devices to communicate with remote computers via the internet.

The embedded security features (eg, OpenVPN client/server, firewall and MAC/IP/protocol-based filtering) provide a secure access tunnel with VPN and prevent attacks from the internet to protect local data. The EKI-1222R is also able to encrypt and authenticate packet data to protect against information leaks.

Advantech Australia Pty Ltd
www.advantech.net.au

Compact remote speaker microphone

The Sepura mRSM is a compact remote speaker microphone compatible with SC2 and STP Series TETRA terminals.

Small, robust and lightweight, the microphone has been specifically designed for users operating in a wide range of environments including public safety, commercial and industrial operations.

The intelligent design of the device ensures that users are protected in a range of conditions. The positive tactile feel of the PTT and emergency buttons ensure that the microphone is easy to use even in dark environments or when wearing gloves, while a 2 W speaker ensures good audio even in crowded or busy environments.

Despite its compact size, the microphone has IP67 environmental protection and WaterPorting technology, ensuring that, in common with the SC2 Series radios, the mRSM can maintain clear audio even in continuous, heavy rain.

Sepura PLC
www.sepura.com

Repeaters

The Motorola Solutions SLR 1000 repeaters ensure uninterrupted radio coverage for users and their teams. It enables them to easily extend the range of their network through dead zones and across remote locations. The compact size provides more installation options, and a low power, fanless design uses less space and energy.

Features include an IP65 rating for water and dust protection; cost-effective coverage that does not require an increase in the cost of ownership in order to increase the range; it can be deployed in more places when mounted on walls or poles — this improves coverage, and a fanless design means fewer HVAC planning options; it has compatibility with conventional and trunking systems that support voice and data, so it can continue to be used as the network is expanded. For conventional systems, it can be deployed with extended range direct mode, without the need for additional frequencies.

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

Mission-critical communications workstation

The Zetron CommandIQ is a mission-critical communications workstation designed to provide full operator console functionality in a compact, portable package.

While built for mobility and space efficiency to accommodate various remote and decentralised communications centre applications, the workstation runs the full version of MAX Dispatch, so all of its standard capabilities are accessible and functional.

The workstation is a lightweight, transportable console that runs the standard MAX Dispatch user interface on a high-resolution, 10.1″, ruggedised full touch screen. It includes a built-in conventional handset for high audio performance in even loud or poor service coverage areas, and can be easily augmented with a number of accessories to enhance situational operation, including a footswitch, remote speakers, headset or desktop microphone.

The workstation was developed to fulfil a wide and diverse set of remote, temporary and non-traditional dispatch operation use cases. However, in beta environments it was also shown to provide valuable supplemental workstation capabilities inside communications centres adjacent to full time consoles or in common areas for use by supervisors, employees on break, and temporary/training operators.

Zetron Australasia Pty Ltd
www.zetron.com

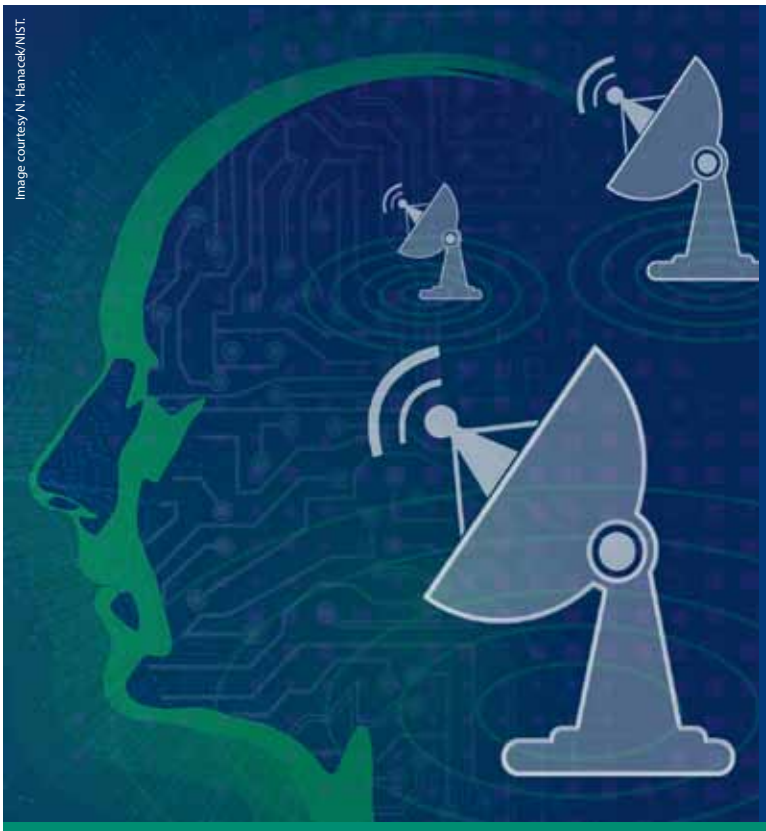


Image courtesy N. Hanacek/NIST.

AVOIDING RADAR TO AVOID INTERFERENCE

Artificial intelligence may be better than other methods for detecting radar signals, thereby facilitating spectrum sharing.

The US National Institute of Standards and Technology (NIST) is helping the US Federal Communications Commission (FCC) institute a plan for when commercial wireless providers and the US Navy attempt to share a desirable 150 MHz-wide section of the RF spectrum for communications.

In a new paper, NIST researchers demonstrate that deep-learning algorithms — a form of artificial intelligence — are significantly better than a commonly used, less-sophisticated method for detecting when offshore radars are operating.

Improved radar detection would enable commercial users to know when they must yield the so-called 3.5 GHz band.

In 2015, the FCC adopted rules for the Citizens Broadband Radio Service (CBRS) to permit commercial LTE wireless equipment vendors and service providers to use the 3.5 GHz band when it is not needed for radar operations.

Companies such as AT&T, Google, Nokia, Qualcomm, Sony and Verizon have been eager to access this band (between 3550 and 3700 MHz) because it will expand product markets and give end users better coverage and higher data rate speeds in a variety of environments where service is traditionally weak.

NIST helped develop 10 standard specifications that enable service providers and other potential users to operate in the 3.5 GHz band under FCC regulations, while assuring the Navy that the band can be successfully shared without RF interference. These standard specifications, including the algorithm for protecting military incumbent users, were approved in February 2018 by the Wireless Innovation Forum Spectrum Sharing Committee (WINNF SSC), the public-private standards body for the CBRS.

However, there are presently no official standards for determining when the military is using the band. The new study, reported in the journal *IEEE Transactions on Cognitive Communications and Networking*, represents the latest NIST research effort towards achieving that goal.

In current practice, radar signals from ships at sea are identified using automated detectors that look for energy rises in the electromagnetic spectrum. "However," said Michael Souryal, lead for the NIST spectrum sharing support project, "these energy detectors are not discriminating enough to consistently get it right, sometimes confusing other RF signals as radar or missing the radar signatures altogether."

Souryal and his colleagues turned to artificial intelligence (AI) for a potential solution. Eight deep-learning algorithms — software systems that learn from pre-existing data — were trained to recognise offshore radar signals from a collection of nearly 15,000 60-second-long spectrograms. These spectrograms were recorded in 2016 near naval bases in San Diego, California, and Virginia Beach, Virginia, for the National Advanced Spectrum and Communications Test Network (NASCTN).

After training, the deep-learning algorithms were pitted against energy detectors to see which performed best at identifying and classifying a set of spectrograms different from the ones used to educate the AI detectors.

"We found that three of the deep-learning algorithms appreciably outperformed the energy detectors," Souryal said.

The best deep-learning algorithm and the spectrogram collection were used to develop 3.5 GHz band 'occupancy statistics', datasets that describe when the band is available and for how long.

Now that the NIST researchers have validated the use of the deep-learning algorithms, they plan to continue refining the AI detectors by training them with higher-resolution, more-detailed radar data, which they believe should lead to even better performance.

COME VISIT US AT
COMMS CONNECT, SYDNEY | STAND 14

Uncompromised Connectivity.

High performance antenna solutions
for new generation hybrid LTE/ GRN
Mission Critical Communications.

PANORAMA ANTENNAS

Maximise your Connectivity, Minimise your Antennas

TETRA

LTE

+61 1300 859 833 (AU)
au.sales@panorama-antennas.com

+44 (0)20 8877 4444 (UK)
sales@panorama-antennas.com

Body-worn camera

The Hytera VM780 is an all-in-one device designed to support emergency services out in the field. With a built-in body-worn camera, remote speaker microphone and 4G powerful hardware platform, it is designed to increase the safety of first responders.

The body-worn camera is tailored to capture, store and share video, audio and image evidences in the field. It integrates a body camera with a remote speaker microphone. The camera allows users to perform video dispatch and command over 4G, make voice communication and initiate an emergency alarm in the mission-critical conditions. The all-in-one device has been designed with multiple features so the user can simply carry the one device.

Long battery life enables >9 h of continuous video shooting with the 3500 mAh battery. The device has an anti-tamper mechanism so users cannot tamper or erase the digital evidence directly from BWC. The data will only be exported by the evidence collection station. All the captured evidence (including image, audio and video) will be protected with the AES256 encryption algorithm.

Users can choose to stamp different watermarks on the video and photo, such as data time, device ID or user ID. With a colour screen, users can easily access and play back the audio, video and image files on site.

When the emergency button is pressed, BWC will automatically start video recording, and immediately trigger the emergency alarm to control centre. With the built-in GPS, the BWC can upload its positioning information back to the control centre.

Hytera Communications Co. Ltd
www.hytera.com.au

Network packet collection and performance monitoring device

The Ixia Vision Edge 1S (E1S) visibility solution provides network performance monitoring and visibility to remote sites and edge computing. It combines network packet broker functionality with application and synthetic monitoring in a single appliance. The product offers advanced packet broker features that filter and distribute traffic from the edge (up to 10G line rate) enabling centralised security and monitoring tools to receive relevant data for monitoring, as well as application monitoring with remote packet capture and enriched flow monitoring (Netflow/IxFlow) to monitor application performance at the edge.

It also provides performance monitoring through synthetic traffic generation (up to 10G line rate) to predict the performance of applications and verify network capacity and performance at the edge and remote and real-time control through the easy-to-use Hawkeye web interface.

Ixia
www.ixiacom.com

DC UPS

The SRHi Series DC UPS is designed to provide DC power to lead-acid batteries for critical back-up applications. No-Break DC UPS systems maximise the integrity of standby battery installations, while optimising the life and availability of backup batteries. They are available with Serial and Ethernet Communications options.

The No-Break system is suitable for critical systems of 100 to 250 W (and above, using parallel operation); and applications requiring continuous online monitoring of battery and charger status.

The UPS has separate outputs for load and battery; battery detection — regular battery presence and battery circuit integrity checks; battery deep discharge protection; power loss and battery system alarms; no transition switching to back-up battery; rugged design and construction for long life and challenging environments; and maintenance and repair service.

Optional features include communication port (RS232 ASCII — SR485 — MODBUS RTU — SNMP, webpages); digital input/outputs — customisable 3 digital inputs and 1 digital output; battery condition test option auto test enabled on start-up; mounting, DIN rail, rack mount 19″ with V/I meter available, wall mount; N+1 redundancy; and boost charger.

Helios Power Solutions
www.heliosps.com.au

Industrial IoT router

NetComm has expanded its Industrial Internet of Things (IIoT) portfolio with the launch of the NTC-220 4G LTE Category 1 Industrial IoT Router, which will deliver secure medium-bandwidth connectivity using universally available LTE networks.

The introduction of medium-bandwidth IIoT connectivity, offering speeds in the order of a few Mbps, will enable fast deployment of a variety of IIoT applications in the market. It enables machines to send data over the network quickly while also still ensuring an optimised battery life, thereby increasing the performance lifetime of the IIoT product in the field.

The use of LTE Category 1 technology will provide near ubiquitous network coverage, which will enable wide IIoT deployment. The Linux-based NetComm operating system (OS), meanwhile, allows solution architects and system integrators to create their own applications using NetComm's software development kit (SDK), while built-in GPS enables the router to track on-the-move assets from anywhere.

NetComm Wireless Limited

www.netcommwireless.com.au

Directional antenna

The Panorama Antennas WMM8G-7-38 2x2 MiMo is a 5G-ready, wall-mount directional antenna.

The antenna is a wide beam width, high gain, directional 2x2 MiMo antenna. It is suitable for use with client devices requiring effective MiMo and diversity support for 2G, 3G, 4G and 5G networks. With 6 dBi of peak gain at 698–960 MHz and 9 dBi peak gain at 1710–3800 MHz, the antenna provides extra gain for future generations.

Incorporating two separately fed wideband elements in a single rugged weather-resistant housing, the antenna is suitable for network operators and service providers, ensuring a stable link with improved data rates for subscribers. The antenna is supplied with fitted low-loss, double-shielded twin cable, along with wall and mast brackets, enabling simple cable management for easy installation.

Panorama Antennas Pty Ltd

www.panorama-antennas.com

FINLAND'S PLANS FOR PPDR MOBILE BROADBAND

Jonathan Nally

Finland is served by a national TETRA public safety radio network called VIRVE, which is used by a variety of public agencies — the Emergency Response Centre Agency, fire and rescue services, police, social services, the defence forces, border guards, customs, railway operators and vital businesses such as the energy sector. VIRVE is operated by Suomen Erillisverkot Group, a non-profit company owned by the Finnish government. The system has 41,000 subscribers and more than 1300 base stations spread across the nation. On an average day, VIRVE users make 150,000 group calls and send 7.5 million short data messages, the latter being far higher than for any other country.

As is the situation in many countries, Finland's public safety radio network provides reliable voice and short data services but not mobile broadband, while the country's commercial mobile broadband providers have good coverage in terms of population compared to many other countries. But commercial broadband does not quite cover everywhere and, importantly, it does not offer a mission-critical level of service (even though it is common for VIRVE users to benefit from commercial mobile broadband services, but not for mission-critical purposes). A solution to bridge the gap between mission-critical narrowband services and best-effort commercial broadband services has been the introduction of multi-access routes and connection-aware applications that adapt to the service available.

One option for the provision of mission-critical broadband would be for the government to build a dedicated nationwide network, but this would require substantial funding and bandwidth below 1 GHz. This is not possible, however, as commercial network operators hold all the licences for spectrum in the 700, 800 and 900 MHz bands. The situation, then, is that the commercial networks will have to satisfy the needs of public safety agencies. To that end, Erillisverkot is to become a virtual operator — later to be upgraded to service provider status — and will have public safety priority and pre-emption powers.

The planned new mobile broadband capability has become known as VIRVE 2.0. In 2018, the Finnish government, through the Ministry of Finance, set a completion date of the end of 2025 for VIRVE 2.0, although this will depend on the project beginning on time… and the project can't commence until it can be shown that it will actually meet the needs of public safety users.

To that end, Erillisverkot formed a Department of Mobile Technology Development and Strategy charged with managing the development and transition from TETRA to mobile broadband. As a first step, Erillisverkot issued a request for information (RFI) to industry to get an idea for possible solutions and to assess the challenges facing the project. That RFI, which was based upon a number of national goals, brought 11 responses from industry (which were followed up in workshop sessions with each respondent).

National goals

The high-level national goals set for VIRVE 2.0 are as follows:

- It must provide secure, 3GPP-based, mission-critical mobile broadband with wide geographic coverage, high availability, QPP functions and national roaming.
- The service must be competitively priced in order for it to become the network of choice for PPDR users.
- Erillisverkot will be the service operator, handling subscriber services and application development using open standards.

- It must support mission-critical and non-mission-critical services based on different user needs, and eventually provide 3GPP MCPTT, MCVideo and MCData services.
- Availability must be ensured through improved power supplies, transmission links and redundant network elements.
- Security must be top of mind during and after development to ensure services and data are protected and unauthorised use prevented.
- Interoperability is the aim for all Finnish public protection and disaster relief (PPDR) users, plus the system should enable them to work with other European PPDR mobile broadband users.
- Access must be available to any 3GPP-based terminal, while Erillisverkot will be responsible for implementing a high-security terminal ecosystem.
- A solution will be implemented to ease migration from TETRA, and there will be integration of other systems such as the ERICA national emergency response system.
- It will be based on open 3GPP standards, with the minimum requirement being Release 15.
- The system will be hardened in terms of supply and preparedness, eg, in terms of coverage, availability, usability, data security, and power resilience.

RFI and responses

The June 2018 RFI was issued to industry in order for Finland's decision-makers to "gain a better understanding of the status of the related technologies and the network operators' ability to provide MC broadband services". The aim was to solicit information and "start a discussion with the industry without restrictions".

> THE EASIEST IMPLEMENTATION OF MISSION-CRITICAL LTE SERVICES WOULD COME FROM USING A SINGLE RAN, OBVIATING THE NEED FOR NATIONAL ROAMING ABILITIES.

Responses were received from Finland's three main mobile operators as well as core network vendors, each of which provided valuable feedback and insights.

As far as the radio access network (RAN) is concerned, the main challenge relates to coverage, with current mobile networks having city areas with extensive coverage while many rural areas have sparse coverage. In contrast, the current VIRVE TETRA network has almost complete national coverage.

The MNOs said that the easiest implementation of mission-critical LTE services would come from using a single RAN, obviating the need for national roaming abilities. The MNOs also offered public–private partnership models under which all capacity would be available for PPDR if needed.

In terms of core architecture, the MNOs agreed that the two schemes proposed — multi-operator core network (MOCN) and full mobile virtual network operator (MVNO) — are currently the best options, adding that the choice should be left to the service operator. Core network vendors gave their blessing to both schemes in general, but had some arguments against each of them.

All the suppliers agreed that the MOCN model "would provide more control, independency and possibilities to provide self-managed and customised end-to-end services". However, this was also seen as adding complexity to the network set-up. In summary, most of the suppliers recommended using the MVNO model in the early stage of VIRVE 2.0 deployment.

In terms of estimated costs, the respondents found it difficult or impossible to put figures to their suggestions, given the present uncertainty over proposed network details. However, the "total costs of the MOCN model were thought to be higher, even if some thought that the MVNO model could be more costly for the MNOs to support". One respondent did give a range of figures for various options, but the aforementioned uncertainty meant the minimum and maximum cost estimates varied almost five-fold.

As far as mission-critical services go, most suppliers agreed that those functionalities "are not yet there", with many stating that it would be "quite a long time" before this functionality becomes available. The year 2022 was suggested by most as being a realistic time frame for when both RAN operators and core suppliers would have implemented Release 15.

When it comes to security, a number of pros and cons were raised, including the need to consider security standards and certification of supplier companies. The importance of having a security operations centre, as well as security cooperation between operators, vendors, national authorities and other interested parties, was also raised. All of the operators expressed their willingness to implement additional security measures where needed.

Erillisverkot's intention to establish a device ecosystem produced generally positive feedback, with some suppliers going so far as to say it would be essential for the project's success. The respondents recommended that standardised equipment be used as much as possible, while adding that different PPDR requirements would see the need for a variety of equipment types, eg, COTS devices, hybrid (LTE+TETRA) terminals, hardened smartphones and IoT devices. It was noted that operations would require support not just from the network, but also from the device chipsets, SIMs and applications.

System status

New legislation assigning the Suomen Erillisverkot Group as the service operator for VIRVE 2.0 came into force at the beginning of February 2019. At the same time a Bill was passed mandating that radio access providers enable pre-emptive priority access over all their frequency licences as well as on all of their technologies, including 5G. A third important piece of legislation concerned national roaming — it will be mandatory for MNOs to support national roaming for VIRVE 2.0 subscribers. In practice, this will be valid for situations where the primary radio access service is not available either due to malfunction or lack of service coverage.

These legislative changes have enabled the procurement process to begin. On 13 March, public notices were issued for procurement of a RAN service for mission-critical users as well as for procurement of a 4G/5G core network. The aim is to issue a final RFT after the negotiations early in Q3 2019, leading to a decision by the end of this year.

Following that, the next stage will be to issue an RFI for a mission-critical application ecosystem in Q3 2019, followed by procurement of the mission-critical applications (planned to commence in Q1 2020).

Suomen Erillisverkot Group representatives — including Heikki Riippa, Senior Adviser in the Suomen Erillisverkot Oy Authority — will be attending Comms Connect Sydney in June, where they will provide an update of the VIRVE 2.0 process and a more detailed briefing of the findings so far, as well as the future roadmap.

cradlepoint

Everywhere you connect, we give you an Edge.

Secure, Ruggedised Network Connectivity for Emergency Services

Always-on Networks to Protect Communities

Cradlepoint LTE solutions provide emergency services with secure and reliable connectivity. Cradlepoint provides a portfolio of rugged and reliable wireless router solutions and cloud network management software for in-vehicle, headquarter offices, and IoT connectivity — helping teams stay safer, respond faster, and perform better.

IBR900

- Purpose-built for in-vehicle & IoT; compact
- Ruggedised for vibration, shock, dust, splash & humidity
- IP54 rated
- Supports advanced routing, wired & wireless & active GPS
- Advanced security, VPN & stateful firewall
- Extensibility dock for second modem & router SDK enables custom applications
- Fast & reliable connections allow ambulances to respond quickly without skipping a beat
- Reliable & secure solutions that keep police officers connected anywhere
- Proven, rugged solutions for fire & rescue that can take the heat

VISIT THE TELSTRA STAND AT COMMS CONNECT

UK ESN, US FirstNet, and AU Telstra LANES® Emergency network compatible

ACMA RELEASES 2019–23 DRAFT FYSO

Jonathan Nally

Image courtesy the ACMA.

The ACMA released its latest draft five-year spectrum outlook (FYSO) at the beginning of April, outlining its proposed approach to mmWave planning in the 26 and 28 GHz bands. It also announced the availability of scientific spectrum licences in the 26 GHz band.

This year's draft FYSO covers a wide range of wireless issues, including:

- Wireless broadband, including 5G
- Machine-to-machine communications and the IoT
- Satellite communications
- Government spectrum requirements
- New approaches to spectrum sharing
- Class licensing and the spectrum commons
- Amateur radio

According to the ACMA, "We are continually monitoring the environment to identify opportunities for improvements in spectrum management arrangements, and accommodating new and changed uses of spectrum while ensuring the continuation of existing uses of spectrum that are of value to the community."

The ACMA consults widely to prepare a fresh FYSO each year. Beginning last year, it also began publishing a draft document, followed later by a final FYSO informed by feedback from industry.

For this year's draft FYSO, feedback is sought by 16 May. You can read the draft here and submit your feedback here.

The upcoming World Radiocommunication Conference (WRC) also figures in the ACMA's plans.

"Working with the Department of Communications and the Arts (DoCA) to ensure Australia's interests are best represented at the World Radiocommunication Conference 2019 (WRC-19) in October and November — and then commencing work on the identification and implementation of relevant outcomes in our domestic planning arrangements — will be key priorities for the ACMA in 2019–20," the FYSO document states.

Future of the 26 GHz band

The ACMA has concluded a review of the 26 GHz band with the release of its Future use of the 26 GHz band–Planning decisions and preliminary views paper.

The 26 GHz band (24.25–27.5 GHz) is one of the bands at the forefront of the delivery of mmWave 5G wireless broadband services.

The release of the paper "signals the progression of the 26 GHz band to the 're-planning' phase of the ACMA's planning process", according to an ACMA statement.

"Completing the replanning of the 26 GHz band is a significant priority for the Australian Communications and Media Authority (ACMA) and important in providing certainty to stakeholders interested in this band."

The paper follows a period of consultation and study on how best to facilitate the deployment of 5G services in the 26 GHz band. Considerations detailed in the paper include:

- The proposed introduction of wireless broadband services in the band, along with proposed coexistence conditions necessary to ensure the ongoing, protected use of the band by various incumbent fixed-satellite, space-research and passive-earth exploration satellite services.
- The identification of a suite of possible spectrum, apparatus and class licensing measures to facilitate a broad range of wireless broadband use cases.

According to the ACMA, this combination of measures will "best maximise the overall public benefit derived from use of the band".

"We will shortly commence work towards providing new arrangements to facilitate the introduction of 5G wireless broadband services into the 26 GHz band," the ACMA statement said.

The ACMA has called for applications for scientific licences in the 26 GHz band for the purpose of enabling interested parties to conduct trials of 5G mmWave technology before the introduction of spectrum licensing in the band.

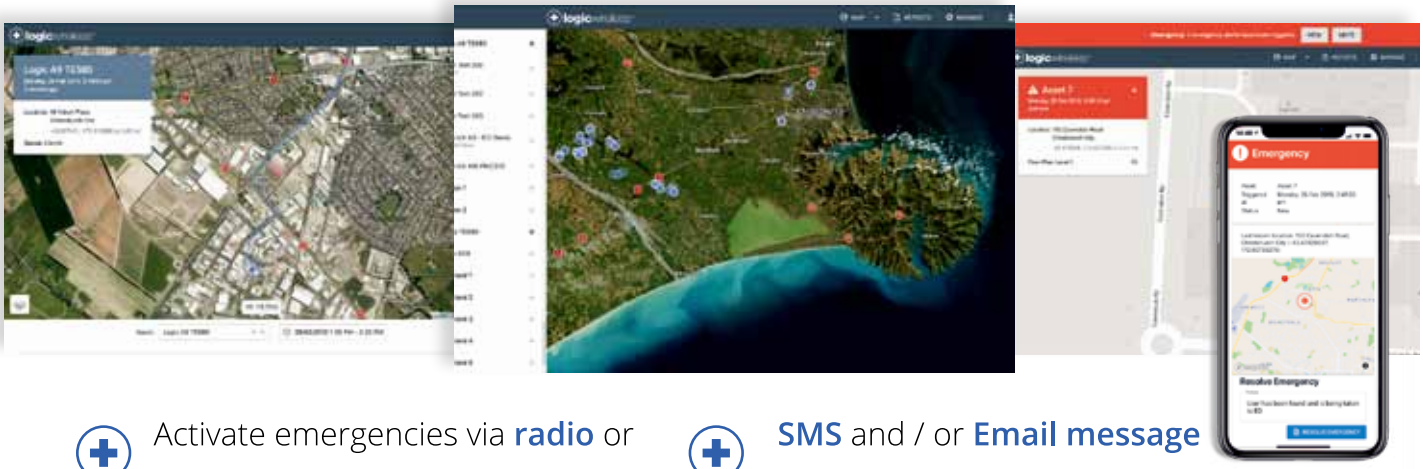
There are a number of conditions that need to be met by prospective licence holders, including:

- Applicants must be capable of completing a trial of 5G mmWave technology before the intended allocation of the 26 GHz band by spectrum licensing, which may be in Q3/Q4 2020.
- The proposed licence duration is up to 12 months, with the opportunity for a short renewal dependent on the timing of any auction.

LOGICCONNECT

cloud based application service

KEEPING PEOPLE **SAFE**

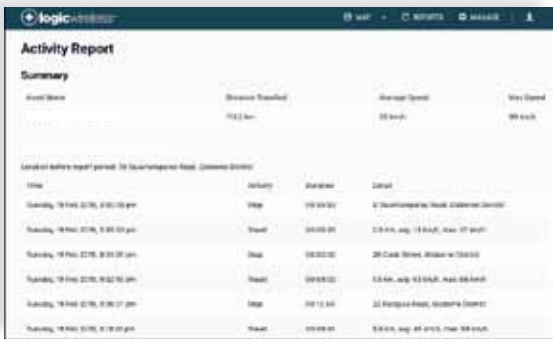


- Activate emergencies via **radio** or **android device**
- **SMS** and / or **Email message** to nominated responders
- **Visual alert** on web portal
- Messages include **links to emergency location**

INDOOR **LOCATION**

- **Indoor** maping overlay
- **Multi-level** support

FLEXIBLE **REPORTING**



- **Activity** report
- **Daily** summary report

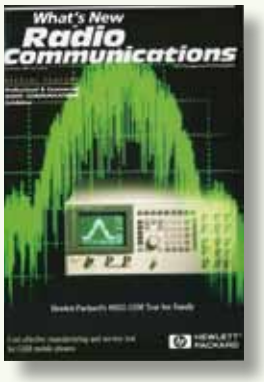
Compatible with tait communications Hytera android

AUSTRALIA: logicwireless.com.au | sales@logicwireless.com.au
NEW ZEALAND: logicwireless.co.nz | sales@logicwireless.co.nz
UNITED KINGDOM: logicwireless.co.uk | sales@logicwireless.co.uk

logicwireless™

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 June/July 1994 issue of *What's New in Radio Communications* featured the Hewlett-Packard 9822 GSM test set family, which came in four models for radio, base station and mobile RF testing. Inside, Westwick-Farrow spruiked the invitation-only Professional & Commercial Radio Communications Exhibition. The list of exhibitors featured some names that no longer seem to be around, but also plenty that are familiar to this day. We also reported on Blue Sky Communications teaming with Lotus Development to bundle Lotus cc:Mail Mobile with a Mobidem wireless modem and subscription to BellSouth's Mobile Data wireless communication network. EMC Technologies announced that its EMI/EMC test facility had become the first in Australia to achieve simultaneous NATA registration for three EMI/RFI standards: EMI from Information Technology Equipment, EMI from Industrial Scientific and Medical Equipment, and Mil-Std 285 RF shielding effectiveness measurement. And a beta site installation of a trunked radio cell extender was to be put in place in Apollo Bay, Victoria, by Stanilite, to solve coverage problems within the Victorian Public Transport Corporation's trunked network.

10 YEARS AGO. The cover of the May/June 2009 issue of *Radio Comms Asia-Pacific* featured the Rhode & Schwarz TSMW universal radio network analyser, described as a high-end platform for optimising all conventional mobile radio networks. Still on R&S, the company was reported to have won a contract to supply three transportable air operations towers for the RAAF. Elsewhere in the magazine we reported on New Zealand's TeamTalk rolling out a P25 network in Christchurch as a follow-on to a similar installation in Wellington the previous year. And Martin Cahill went in to bat for Aussie innovators, opining that companies should "hire and develop a new engineer for your next radio project instead of another accountant to write a cheque to an outsourcer!"

Spectrum

Comms in an automated transport world

In February 2019 I was invited to participate in public hearings associated with an inquiry into the 'Automation of Mass Transit' by the federal House of Representatives Standing Committee for Infrastructure, Transportation and Cities. The hearings sought further information from organisations that had made 52 submissions to the Inquiry. The University of Melbourne's Centre for Disaster Management and Public Safety (CDMPS) was one of these organisations.

Participation in these hearings enabled me to promote CDMPS's objective of stimulating a national conversation about the 'mission-critical public safety communications ecosystem'; recognition of the ecosystem as part of Australia's 'critical infrastructure'; and in this instance, the need to include future systems such as cooperative intelligent transport and mass transit systems in the ecosystem.

The CDMPS has consistently promoted this objective, as we did in our submission to the Standing Committee's previous inquiry into the role of smart ICT in the design and planning of infrastructure, tabled on 15 March 2016. That resultant report recommended the Australian Government recognise public safety communications systems as critical infrastructure and support the continuing development of these systems, including funding research, promoting implementation and providing national coordination in support of disaster planning and emergency response capabilities.

In the February hearings, the Committee noted my advice that after three years, there has been no government response to the Committee's Report and its recommendations, which, from an ecosystem perspective, are cornerstones for policy development, strategic and operational planning and future procurement by government of technology capabilities required by Australia's public safety agencies.

I sought assistance from the Committee to secure a government response to these earlier recommendations to provide important policy context for the leveraging of critical communications systems necessary to support automated mass transit systems, and strategic issues of national security and cybersecurity… as well as leveraging rapid advances in commercial consumer technologies and participation of the private sector in the ecosystem.

Procurement of a public safety mobile broadband capability will be a welcome new component of the ecosystem, but I advised the Committee this was only the first step as the future Next Generation Triple Zero service will be a component that must be able to communicate with automated mobility and mass transit systems.

The hearing also provided me the opportunity to tell the Committee about the need to adopt global open standards such as those being developed by the 3GPP, noting the US First Responder Network Authority recently asked 3GPP to leverage its standards research for vehicle-to-vehicle and vehicle-to-infrastructure in development of standards for mission-critical public safety communications.

The Australian Radio Communications Industry Association (ARCIA) and The Critical Communications Association (TCCA), in conjunction with the Australian Critical Communications Forum (ACCF), also made submissions to the inquiry, supporting the need for global standards and consideration of the technical skill sets required to support Australia's future critical communications infrastructure.

The Committee noted that the CDMPS, ARCIA and TCCA–ACCF submissions were the only ones specifically addressing mission-critical public safety communications. The sector needs to actively participate in government and departmental consultations about policy and strategy development relevant to the ecosystem or face being left behind and having other bodies set the future direction for the sector.

Geoff Spring is a Senior Advisor to the University of Melbourne's Centre for Disaster Management and Public Safety, and a member of the P25 Standards Steering Committee.

ZETRON®

ACOM Command & Control

Integrated Communications

Enhance Your Situational Awareness

Delivering interoperable command and control solutions for Public Safety, Transportation, Utilities and Resources.

For more information, contact us

Zetron Australasia +61 7 3856 4888 | **ausales@zetron.com**
www.zetron.com | @ZetronInc

The Power to Respond

CRS ACCESSORIES

...is your industry leading accessories supplier for all brand and model 2way radios. We have 2way radio accessories to suit:

KENWOOD · MOTOROLA · ICOM · sepura · tait communications · GME · TOOOAir · Hytera · KIRISUN · HYT · Vertex Standard · simoco · Uniden · RELM WIRELESS · CASSIDIAN

- AUDIO ADAPTORS
- CARRY CASES
- CHEST HARNESSES
- MULTIBAY CHARGERS
- CONVERTERS
- EARPIECE AND SURVEILLANCE KITS
- THROAT MICROPHONES
- LIGHTWEIGHT HEADSETS
- LISTEN ONLY HEADSETS
- HEAVY DUTY HEADSETS
- HELMET KITS
- MICROPHONES
- POWER SUPPLIES
- SPECIALIST ACCESSORIES
- WIRELESS PTT PRODUCTS

When you want the best *insist* on CRS

AUSTRALIAN OWNED AND OPERATED

Phone 1300 307 334

www.crsaccessories.com.au

CRS ACCESSORIES