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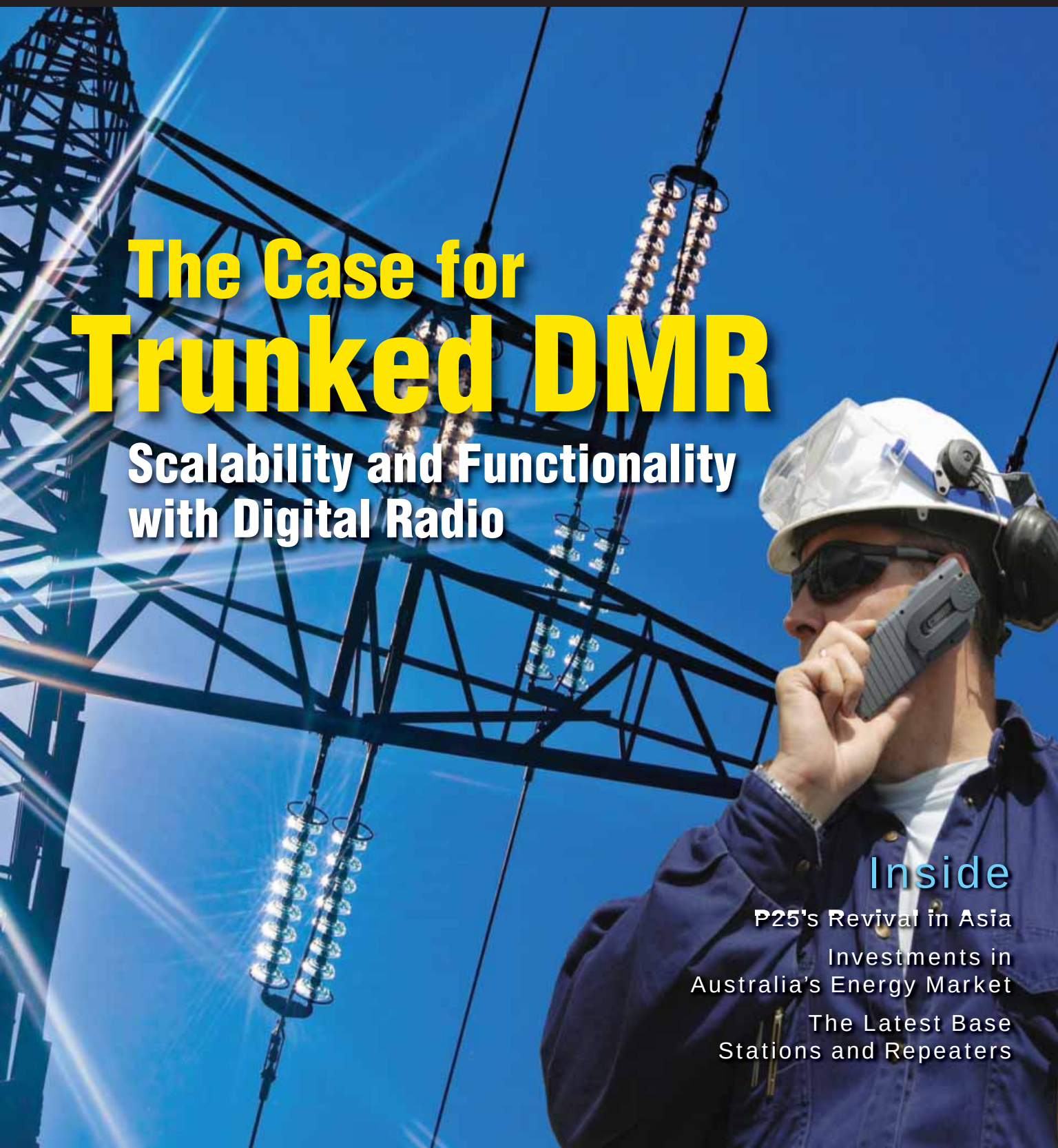

The Case for Trunked DMR

Scalability and Functionality with Digital Radio

Inside

P25's Revival in Asia

Investments in Australia's Energy Market

The Latest Base Stations and Repeaters

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RadioResource INTERNATIONAL

Quarter 3 2014

CONTENTS

Vol. 28, No. 4

20 CCW Roundup from Singapore
Critical Communications World 2014 focused on TETRA's global future and how other technologies can be used to augment it.
By Paulla A. Nelson-Shira

22 The Case for DMR Tier 3
Scalable Digital Mobile Radio (DMR) trunked networks offer many advantages for operability and functionality.
By Max Zerbst and Winfried Schultz

30 Australia's Energy Market
Australasian oil and gas firms favor TETRA for intrinsically safe equipment and efficient data for their mission-critical communications networks. *By Kevin Graham*

36 P25 Revival in Asia
The Asia Pacific and Middle East are unique and diverse, and the Project 25 (P25) standard is an ideal fit for many countries and organizations. *By David Lum*

ONLINE: RRImag.com

FIFA World Cup

Mission-critical communications systems are helping coordinate events and keeping spectators safe.

Industry Update

The latest contract announcements and technology upgrades from around the globe.

IN EVERY ISSUE

Dispatch 6
The future will see broadband and voice upgrades. *By Sandra Wendelken*

World News 8

Product Expo: Base Stations and Repeaters 40

New Products 45

Events 52

Global Forum 54
Qatargas addresses a communications gap on an LNG tanker.
By Michelle Zilis

READER SERVICES

MarketPlace 50
Subscription Form 53
Advertiser Index 53
Cover photo courtesy Radiodata

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Important Voice Network Upgrades

Two announcements from the same European emergency services operator during recent weeks speak volumes to the future of the industry.

ASTRID, the Belgian TETRA operator, launched one of the first mobile virtual network operator (MVNO) services to address the increasing need for public-safety data services in Europe. See "World News" on Page 8. The Continent has yet to allocate broadband spectrum for public-safety agencies. Therefore, some TETRA operators, including Airwave in the U.K., are partnering with commercial mobile operators for data services enhanced with public-safety requirements such as security and priority features.

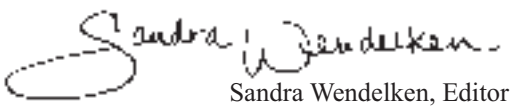
ASTRID launched the new mobile data service April 29, and less than three weeks later, the carrier also announced it would refresh its TETRA infrastructure. "TETRA remains the very best technology for mobile voice communications in the public-safety sector," said Daniel Haché, ASTRID's director of external relations.

As the industry gathered in Singapore for Critical Communications World (CCW) in May, there was much buzz around Long Term Evolution (LTE) and the migration to broadband services. However, ASTRID and other operators investing heavily in TETRA technology are proof that mission-critical voice networks are here to stay and critical to the daily and incident management needs of public-safety officials in Europe and around the world.

Germany is another European country that is building out a TETRA network and not likely to abandon the vast investment anytime soon. A 2013 TETRA + Critical Communications Association (TCCA) working group report said acceptable quality voice services over LTE for mission-critical users are not expected until at least 2020. Much work in standards, spectrum policy allocation and technology must be completed before mission-critical communications users can even begin to consider abandoning their current TETRA or Project 25 (P25) networks.

We value your opinions! Please email your feedback to me at swendelken@RRMediaGroup.com.

While it's important to consider the future in terms of LTE, it's also critical to ensure voice networks are updated and fully maintained for the users who rely on them for daily life-saving needs.



Sandra Wendelken, Editor
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RadioResource INTERNATIONAL

RadioResource International delivers wireless voice and data information for mobile and remote mission-critical operations for professionals who reside or do business outside the United States and Canada. The magazine covers private and trunked mobile radio, wireless data, location technologies, public safety communications, microwave radio, satellite, paging/messaging, remote monitoring, and other wireless applications. Editorial content is international in scope and encompasses emerging technologies, industry reports and trends, innovative applications, product information and comparisons, news, standards, and troubleshooting tips.

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EUROPE

Belgian Operator Launches Data Service, Upgrades TETRA

ASTRID, a TETRA network operator for Belgian emergency and security services, launched Blue Light Mobile, a mobile broadband data service that uses three Belgian commercial networks. The carrier also plans to renew its TETRA infrastructure.

Blue Light Mobile enables the emergency and security services in Belgium to use commercial 3G networks for data. A single subscriber identity module (SIM) card gives priority access within a secure environment to three Belgian operators, as well as 11 operators in four neighboring countries. This gives the service provider the best coverage in Belgium and in the border regions. There are 49 police zones along Belgium's borders.

Daniel Haché

In locations where the coverage of one network is too low, the user's tablet or laptop will automatically switch to a network with greater coverage. ASTRID users have priority over other users, meaning that even when data traffic is heavy, the connection is still guaranteed. ASTRID built in additional guarantees with regard to the network's data security.

The SIM card gives access to the emergency and security services' private cloud, via which they can securely access their own applications, as well as shared applications used within a multidisciplinary environment. Bringing the various emergency and security services onto one shared platform promotes the exchange of data between disciplines.

"Blue Light Mobile means that the police, fire services and ambulance teams will be able to work more efficiently," said Daniel Haché, ASTRID's external relations director. "Ultimately, this benefits society, public safety and the safety of the service provider. Ambulance teams will receive data about the patient faster, even as they are travelling to the scene. The police will have a photo of a missing or wanted person more quickly at hand. In other words, the work performed by the emergency and security services will get better."

With Blue Light Mobile, ASTRID becomes in part a mobile virtual network operator (MVNO), supplying services via third-party networks. ASTRID first announced the plan in 2012. Several other TETRA operators, including Airwave in the United Kingdom, have announced similar MVNO-based broadband services since then.

"We are the first in the world to use this formula," said Christian Mouraux, project leader for Blue Light Mobile. "Already quite a few experts from abroad have been contacting us with an interest in creating a similar service. In the 1990s, ASTRID was involved at the birth of digital radio networks. With Blue Light Mobile it once again leads the way forward."

During recent months Blue Light Mobile has been thoroughly tested within 10 police zones and fire services. The police zone for Beveren in the province of Oost-Vlaanderen was the first of these pilots. Experiences have so far proved positive, according to Niko Lardenoit, functional and technical manager for the Beveren police zone.

"Our police zone lies right along the border with the Netherlands and covers a large port area, which affects available coverage," Lardenoit said. "However, our teams in the field report that data communications via Blue Light Mobile is even faster than via a fixed computer back at the station."

In 2014, ASTRID is offering the Blue Light Mobile license at the same price as the current IP over TETRA license, which is €249 (US$345) per year plus 21 percent VAT or €20.75 (US$28.78) per month. ASTRID expects the current "data IP over TETRA" users to be the first to switch to the Blue Light Mobile license.

ASTRID also said it will replace the core TETRA network infrastructure and monitoring systems. The core radio network's 11 provincial switches (DXT) will be replaced, the architecture optimized and the technology evolved into IP. The operator placed an order with the Cassidian-Belgacom consortium.

The network monitoring system also will be replaced. The existing ASTRID service center will be equipped with the latest technology. ASTRID contracted Hewlett-Packard for the technology.

"Following the launch of the 3G services via Blue Light Mobile, we will continue to invest in TETRA," Haché said. "TETRA remains the very best technology for mobile voice communications in the public-safety sector."

LONDON — Datatec formed Mason Advisory within its consulting division. The new company, previously a division of Analysys Mason, will see Datatec partner with Steve Watmough, the new CEO and shareholder of Mason, to develop a highly focused independent IT advisory business.

The core focus of the separated business will be consulting on the IT, cloud, security and mobile technology requirements of major public and commercial enterprises.

"The separation of the division from Analysys Mason, which will continue to focus on providing strategic telecom, media and technology consulting services and research, and the return of Watmough, will bring increased management focus and new talent," Jens Montanana, CEO of Datatec, said. "This new structure will allow Mason to maximize opportunities presented by the fundamental shifts in technology and increasingly specialized client demands."

Watmough is an experienced industry professional and entrepreneur who spent four years at Mason Communications prior to it being acquired by

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Brazil's LTE Trial Extends to Rio de Janeiro

The Brazilian Army announced it will extend the Long Term Evolution (LTE) trial at 700 MHz to Rio de Janeiro. The trial began in May 2012 in Brasilia with a US$2 million investment from Motorola Solutions.

The expansion includes a new site, which will be installed at the Duque de Caxias Palace to cover the Maracanã stadium area. It may also be moved to support the Army in ensuring law and order (ELO) during the "San Francisco Operation" in the region of the Maré Complex.

"Rio de Janeiro was chosen for its relevance to major events, especially the World Cup and the 2016 Olympics," said Santos Guerra, TIC deputy head of the Department of Science and Technology (DST) of the Brazilian Army. "In addition, the Brazilian Army is very active in the region in terms of ELO operations. To continue to test the scope and size of LTE technology in real situations is a great opportunity for the country."

The technology can be tested in practical situations with a focus on real-time video transmission from vehicles in motion. In addition, it expands voice communications, provides interoperability with commercial networks and Project 25 (P25) standard radios, and improves the quality of the Army Operations Center (AOC), which will be able to access more information. The Army will also be able to access command-and-control information in any Brazilian region using its own network (EBNet).

Rio de Janeiro

The trial already features four sites installed in Brasilia covering the entire Esplanade of the Ministries and the areas of interest of the Army, such as the airport, the Mane Garrincha stadium and critical infrastructure. The sites can be used by other security agencies of the federal capital as well. The trial remains under the command of the Army center in Brasilia. A secure link will connect the two cities.

Tests will be performed using cameras installed on police escort motorcycles transmitting information in real time to the operational center that was installed at the Military Command of the Planalto (CMP). The Army will request telecom regulator Anatel's approval to perform the trial on the 700 MHz band, currently not used in Rio de Janeiro.

Datatec. Prior to joining Mason Communications, he held senior technical management roles at Boots for more than 10 years.

Duncan Swan, an existing partner of Analysys Mason, will join Watmough in management of Mason Advisory. Duncan, who has more than 25 years of industry experience, joined Mason Communications in 1995. Swan is an editorial advisor to *RadioResource International* magazine.

Datatec operates in three principal areas of the information communications technology (ICT) industry through its three respective divisions: Westcon Group, Logicalis and Datatec Consulting Services, comprising Analysys Mason, Mason Advisory and Via Group providing strategic and technical consulting.

INTERNATIONAL

SCHAUMBURG, Illinois, United States — Motorola Solutions agreed to sell its enterprise business for $3.45 billion in an all-cash transaction to Zebra Technologies. The acquisition, which excludes Motorola's iDEN products, will be funded through a combination of cash on hand and new debt.

"Our enterprise business is an ideal fit for Zebra," said Greg Brown, Motorola Solutions chairman and CEO. "This transaction will enable us to further sharpen our strategic focus on providing mission-critical solutions for our government and public-safety customers."

Zebra Technologies, with 2013 sales of $1 billion, manufactures barcode and enterprise printing, asset tracking, Internet of Things (IoT) solutions, and motion and location sensing. About 4,500 employees are expected to join Zebra upon completing this transaction. Motorola Solutions will retain its iDEN product portfolio that was part of its enterprise business and will continue its government business, including its professional commercial radio product portfolio.

"Last year, we undertook a thorough review of our strategy and

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concluded that the synergies between our government and enterprise businesses were not as great as the value we could create by being singularly focused on our core government and public-safety business," Motorola's Brown said. "Going forward, we will have absolute clarity of purpose and mission as we serve customers globally with our suite of mission-critical communications solutions. This business is truly distinctive in its industry leadership, strong pipeline position, long-term track record of consistent profitability and cash flow, and an array of growth opportunities."

With 2013 pro-forma sales of about $2.5 billion — excluding sales of its iDEN products — Motorola's enterprise business is an industry leader in mobile computing and advanced data capture communications technologies and services. Through this transaction, Zebra will enter the segment where Motorola's enterprise business competes and strengthen its position in key industries including retail, transportation and logistics, and manufacturing and serve approximately 95 percent of the Fortune 500.

CAMBRIDGE, United Kingdom — Sepura announced that it acquired **Fylde Micro**, a U.K.-based radio trunking solutions company. The value of the transaction was not disclosed.

Fylde was instrumental in delivering the analog MPT 1327 standard to a global market and, more recently, closely involved in writing the European Telecommunications Standards Institute (ETSI) digital standards for Digital Mobile Radio (DMR) and digital Private Mobile Radio (dPMR). The 30-year-old company develops and manufactures trunking controllers that are used in base stations, forming the core of the radio infrastructure. Fylde's latest product, the Multi-Lingo controller, creates a network that can use multiple standards, such as DMR, dPMR and MPT 1327, simultaneously.

"Our acquisition of Fylde Micro adds a further dimension to our critical communications portfolio, and specifically enhances our recently launched DMR offering," said Gordon Watling, CEO of Sepura. "Combining our DMR portfolio with Fylde's innovative trunking solutions increases our ability to offer customers cost effective, flexible solutions to migrate their existing analog networks to digital."

Fylde Micro represents Sepura's third acquisition in the past two years. Sepura acquired 3T, an Austrian supplier of TETRA infrastructure, in 2012, and Portalify, a Finnish applications developer, in July 2013.

FREDERIKSSUND, Denmark — Procom purchased U.K. company

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Skymasts Antennas, an antenna manufacturer of wireless base station antenna products and accessories for a global market.

The value of the deal was not disclosed.

Skymasts Antennas products are used in a wide range of industries and applications within the 25 MHz and 5.8 GHz frequency range. This ranges from small two-way communications systems or a simple wireless application to large-scale and complex national infrastructure for civil, public safety and defense applications.

Procom executives said the acquisition will complement its range of antenna, filter and combining products.

"We are very excited about the partnership, given the product mix, years of experience and the reputation for quality of both companies, we have the most exciting lineup for the wireless communication dealer, its great news and business continues as normal from our distribution and technical headquarters in Kent," Michael Hudson, Procom UK systems sales director said. "The merger will see no change for our dealers, except for the addition of some fantastic products to our range of solutions."

DORSET, United Kingdom — Aeroflex Holding entered into a merger agreement with **Cobham**, a U.K.-listed manufacturer of equipment, specialized systems and components for the aerospace, defense, energy and electronics industries. Under the terms of the transaction, Cobham will acquire Aeroflex for about US$1.46 billion, including the assumption of Aeroflex's net debt of $540 million at 31 March.

The agreement, approved by Aeroflex's board of directors, represents a premium of about 26.1 percent over Aeroflex's closing stock price 19 May, the last trading day prior to the announcement of the transaction, and a 28.4 percent premium to Aeroflex's volume-weighted average price over the prior 30 trading days.

"This all-cash, premium transaction provides significant and immediate value to our stockholders," said Len Borow, Aeroflex's CEO. "We believe Aeroflex and Cobham are a natural fit and that Aeroflex will benefit from the larger scale, market presence and resources of the combined organization. We look forward to working with Cobham to ensure a seamless integration for our teams and customers around the world."

The transaction, expected to close during the third calendar quarter, is subject to regulatory approvals.

NEWBURY, United Kingdom — The **Open Mobile Alliance** (OMA)

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said it is collaborating with the Third Generation Partnership Project (3GPP) to develop Long Term Evolution (LTE) standards and specifications to address public-safety service requirements. OMA's initial effort to address the market is the Push-to-Communicate for Public Safety (PCPS) v1.0 project, and version 1.0 is expected to be released in the fourth quarter.

OMA, which supports interoperable end-to-end commercial mobile services, said PCPS will incorporate LTE, as well as support multiple access technologies enabling ubiquitous coverage, and management of resources and levels of services across multiple access technologies. PCPS will be based on the OMA Push-to-talk over Cellular (PoC) Enabler.

PoC standardizes a two-way form of communications that allows users to engage in instant communications with one or more users by pushing a button on the handset. The OMA PoC standard has been prototyped, developed, and with multiple commercial deployments in the market, is a strong baseline for further enhancements to meet public-safety broadband use cases, an OMA paper said.

PCPS will incorporate the 3GPP public-safety LTE enhancements as they are defined in 3GPP. OMA also has and continues to develop other standards that may be applicable for public safety including device management, location and presence.

The OMA Device Management Enabler (OMA DM) is a framework that enables device customization and services configuration remotely, which will allow public-safety devices to be managed in an efficient and standard way. OMA has developed several location and positioning enablers focused on user plane, such as Secure User Plane Location (OMA SUPL).

The U.S. First Responder Network Authority (FirstNet) and the U.K. Home Office recently joined OMA to support this focus on public-safety standards development, the alliance said. In addition, companies including AT&T, Fujitsu, Harris, Kodiak Networks, Motorola Solutions, NextNav, T-Mobile USA and Thales Group also support OMA's PCPS project. The alliance first announced its public-safety LTE work in January.

LATIN AMERICA

SANTO DOMINGO, Dominican Republic — The Dominican Republic Ministry of the Presidency awarded **Hytera Mobilfunk** a contract in April to extend its TETRA radio system. In 2013, Hytera won an award to provide radio communications and a

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secure 9-1-1 service for the Santo Domingo area.

The radio system is part of a project that includes a 9-1-1 system, camera surveillance system and the communications infrastructure with its respective terminals. The TETRA radio system consists of six base stations, one switching unit and a network management system. In 2014 Hytera will extend this system by four base stations. The radio system covers the National District and Santo Domingo province together with neighboring municipalities.

MIDDLE EAST

DOHA, Qatar — The Ministry of Interior (MOI) of Qatar and **Airbus Defence and Space** partnered on the development of a TETRA group communications over Long Term Evolution (LTE) service using the existing LTE and professional mobile radio (PMR) communications networks of the MOI. The new service will be made progressively available to the country's public-safety users.

The system will be based on LTE technology, offering the ability to stream high-quality video and transport large data files, while including fundamental TETRA service characteristics such as push to talk (PTT) and talk group communications. The most important benefit will be the seamless interoperability of users across existing MOI TETRA and LTE networks and the complete reuse of all MOI assets, including networks, control room dispatching and resource location applications.

A dedicated TETRA system was so far the only viable alternative for mission-critical voice and data communications. The new TETRA group communications over LTE system will be able to deliver to the field resources, converged group communications services, LTE mobile video, a network of sensors and broadband data exchanges.

"This partnership marks an important milestone in the development of LTE for PMR users," said Jean-Marc Nasr, head Europe, Middle East and Africa (EMEA) at Airbus Defence and Space. "It makes the MOI of Qatar the first public-safety organization in the Middle East and in EMEA that is exploiting the added benefits of the LTE and TETRA convergence."

In addition to the group communications over LTE voice feature, individual voice calls and short data service are also implemented, enabling instant communications between two or more people at the push of a button. This feature and the ability for users to communicate in groups using TETRA dispatching features are essential for public-safety users.

Isn't it time you discovered more about dPMR?

dPMR is a low cost, low complexity, high performance digital radio protocol specifically designed to offer solutions to users requiring an ETSI compliant*, fast deployment two-way radio solution.

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CCW 2014

Focuses on TETRA's Global Future

By Paulla A. Nelson-Shira

Panel members of "Exploring the Possibilities for Deploying LTE for Professional Users" left to right: Eric Davalo, CTO Security Solutions, Airbus Defence and Space; Ian Brown, CEO, Axell Wireless; Scott Mottonen, vice president, private broadband, Motorola Solutions; Felix de la Fuente, chief sales and marketing officer, Teltronic; Jerome Brouet, director innovation, Alcatel-Lucent; and Norman Frisch, marketing director, enterprise wireless solutions, Huawei

This year's message at Critical Communications World (CCW) 2014 was quite different from last year's focus on Europe's plan to lobby for spectrum for Long Term Evolution (LTE) technology. Since the conference was set in the Asia Pacific region, the theme centered on TETRA's future, and how other technologies, such as LTE, might be used to augment it.

The resounding message was clear: TETRA is here to stay, at least for the foreseeable future. Last year set a record for shipments of TETRA terminals. With new systems underway and existing networks being upgraded or replaced with updated TETRA technology, it appears that TETRA will remain a formidable solution for secure networks around the world.

However, it's no secret that the hunger for data is exponentially growing each year. According to Paul Steinberg, senior vice president and chief technology officer (CTO) of Motorola Solutions, 90 percent of all data was created in the past two years. As more people use smart devices to manage their lives, they expect the same level of functionality in their work environment.

The question remains, how can TETRA accommodate this need? Many people see LTE as the solution. In the United States, spectrum has been allocated for a public-safety LTE network. The network logistics are proving to be more difficult than expected and the cost to build out a network is exorbitant. If you want a dedicated LTE network, two things are necessary, spectrum and money — lots of it. In some parts of the world, LTE will probably never be an option.

With all the hype about LTE, it's no wonder people are confused. At the panel discussion, "Exploring the Possibilities for Deploying LTE for Professional Users," the message was confusing. On one end, Norman Frisch, marketing director, enterprise wireless solution, Huawei, said safe, secure LTE is here today. On the other end, Eric Davalo, CTO security solutions, Airbus Defence and Space, said secure LTE for critical communications is about 10 years out, and more likely 15 – 20 years away. Panelists from Axell Wireless, Motorola Solutions, Teltronic and Alcatel-Lucent said the answer falls in between.

Most panelists felt an open standard must be established before moving forward with dedicated, secure LTE networks. With technology advancing at Mach 1, is it possible for a safe, secure LTE open standard to keep up with it? In the meantime, companies will use commercial LTE for non-secure information to augment their secure TETRA networks, where available, and continue using TETRA Enhanced Data Services (TEDS) for mission-critical data. In Belgium, ASTRID is acting as a mobile virtual network operator (MVNO), by working with local 3G carriers to provide secure data.

Video applications that enhance security and remote monitoring were hot on the trade show floor, as were smaller, lighter terminals. The trend in systems is to combine different features for a robust turnkey solution. For other products announced at CCW, see "New Products" on Page 45.

The future of critical communications solutions depends on geographic location, available funds and the local regulatory environment. If spectrum is not secured for dedicated LTE in a particular region, then it won't be developed. Other technologies will serve the needs of the government and critical industry, TETRA being one of them. ■

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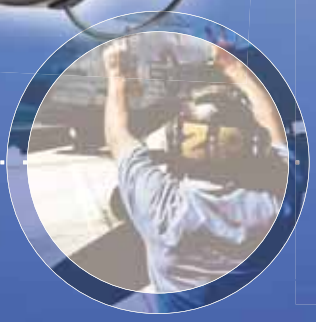

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The Case for DMR Tier 3

Images courtesy Radiodata

Scalable Digital Mobile Radio (DMR) trunked networks offer many advantages for operability and functionality. **By Max Zerbst and Winfried Schultz**

Medium-sized utility companies in Europe service areas of about 10,000 square kilometers for the supply of electricity, water and gas and for wastewater. In less densely populated regions of the world, service areas may be much larger.

Apart from their core business, utility companies often operate professional mobile radio (PMR) networks to control and supervise their mobile workforces. Especially during power outages, it is essential for an electric utility to have a radio system that still remains available for its work. In some cases, the radio network is also exploited to support wireless supervisory, control and data acquisition (SCADA) applications.

Many of these radio networks used to be conventional or trunked analog systems. However, many new digital deployments are based on the Digital Mobile Radio (DMR) standard and others. DMR is a TDMA radio technology with two time slots as logical communications channels within a radio channel bandwidth of 12.5 kilohertz. As a specification of the European Telecommunications Standards Institute (ETSI), it is free and publicly available.

While the radio coverage area of a PMR network normally will match the service area of a company, capacity requirements are more difficult. Capacity depends on the number of technical facilities, such as electricity, transformer and switching substations, which are distributed over the service area and likely coincide with the population or customer density. Thus, the required capacity will be higher in urban and suburban areas and considerably lower in rural areas.

Scalability is understood as the maximum number of base station sites that can be integrated in a PMR network and the maximum number of transceivers equipped at a site. Other factors contribute to scalability — for example, the control channel in its operating modes in a trunked radio network and whether standard and simulcast sites can be mixed within the same radio network. Furthermore, the availability of spectrum has a strong impact on the design of a radio network. PMR frequencies are a scarce resource, and regulators normally are reluctant to generously allocate frequencies.

Conventional vs. Trunking

In contrast to a conventional digital PMR system, a trunking air interface offers a larger scope of functionality that simplifies, facilitates and even enforces certain control and monitoring functions of the radio network. Deciding in favor of a trunking air interface, such as DMR Tier 3, is inevitably a decision based on the specific structure and mode of operation for a radio network.

A DMR Tier 3 trunked radio network owns and administers a number of base station sites as radio cells, and within a radio cell, a number of radio channels. The channels are logically divided into a control channel and a

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number of payload channels for voice and data communications. Mobile stations are using the control channel to register in the radio network, to set up voice and data calls, and to transfer certain data telegrams required for roaming in a multisite network. Because the call setup includes automatic allocation of a payload channel, there is no need for manual channel selection at the mobile station in a trunked radio network.

When using a control channel to coordinate traffic on multiple channels, the trunking effect is an important aspect, which allows serving more mobile subscribers per channel than in a conventional configuration. However, in a radio network with a small number of subscribers in a large area, this effect is of minor importance. The advantages of structure and mode of operation of a DMR Tier 3 trunked radio network prevail.

Nevertheless, the control channel of the DMR Tier 3 air interface is a key feature because of its several modes of operation:

- A dedicated control channel is firmly assigned to this function, operates permanently and is used for a site with a large number of channels;
- A composite control channel is nondedicated and may also be used as a payload channel on demand. It is applied if the peak capacity requirement is anticipated to exceed the payload capacity installed; and
- An in-active control channel is operating asynchronously. In this operation mode, all signaling on the control channel is completely suspended, and it requires the mobile station to send a "wake-up" call prior to setting up a call.

The control channel also opens special options to perform data transfers. Data transfer over the control channel secures fastest delivery. Up to 127 status messages with pre-defined meanings can be exchanged between mobile subscribers in a radio network. Also, short data messages up to a maximum of 367 bits (equal to about 45 bytes) can be transferred via the control channel.

A further advantage of a trunked radio network is its switching function and its interfacing capabilities, incorporated in a switching subsystem that controls and monitors the entire radio network and handles the integration of a mobile workforce into the voice and data communications of an organization. Most important is interfacing to a private branch exchange (PBX) for voice — via four-wire E&M, integrated services digital network (ISDN) and VoIP — and to a local area network (LAN) for applications such as fleet management and interconnecting to control centers. Access to the public-switched telephone network (PSTN) can normally be facilitated via a PBX.

A DMR Tier 3 trunked radio network owns and administers a number of base station sites as radio cells, and within a radio cell, a number of radio channels.

Finally, a trunked radio network provides network management functions designed for all technical and organizational purposes of a radio network. Hence, it serves to establish the operability of the radio network and ensures its availability during operation. In general, it provides tools for configuring all components of the radio network, monitoring the operation of the radio network, fault management, and administering mobile stations, mobile subscribers and mobile talk groups.

Fault management permits the fast detection and localizing of faults by means of alarms and information about the operational status of network components. All important operational events, including access to network management and call data, can be recorded and retrieved at any time and used for statistical purposes. Most functions and features of a trunked radio network show a clear predominance over a conventional system.

Radio Coverage vs. Frequencies

Traditionally, PMR networks have operated in high or low VHF frequencies. In some parts of Europe, regulators accepted that duplex was the preferred mode for voice communications. Duplex communications means improved safety when working at hazardous locations, such as power substations.

A DMR Tier 3 trunked radio network may be operated in all commonly used frequency bands, from low VHF up to UHF. When replacing an existing analog radio system with a DMR Tier 3 system, some regulators even allow allocated frequencies to be kept. This can substantially reduce cost when re-using existing sites with power supplies and antenna installations. Apart from this cost advantage, it is generally beneficial to operate the radio network using lower frequencies because this can minimize the number of radio sites required for a given coverage area.

Capacity Requirements

The number of mobile users and their calling behavior determines the required capacity for the coverage area of a site. Depending on call type (individual, dispatch and group call) and mode of operation (semi-duplex or duplex), the duration of a call on average may differ between 15 seconds and several minutes. This directly influences the number of radio channels and the operational mode of the control channel at a base station site.

In practice, a base station site is scalable between one and eight radio channels, i.e. transceivers receiving the uplink and transmitting on the downlink frequency. Thus, a pair of frequencies separated by the duplex distance is necessary to operate a

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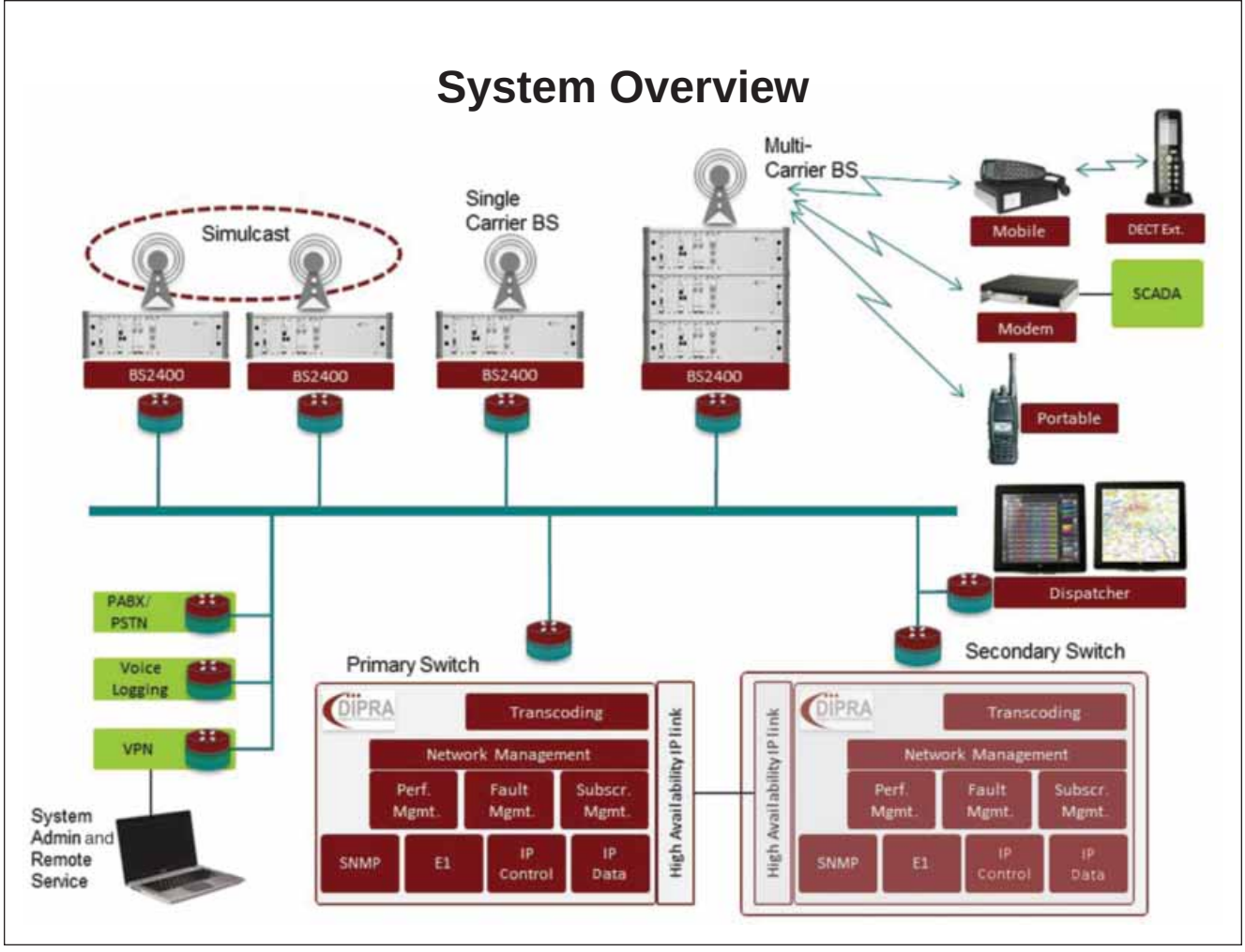

A diagram of a trunked Digital Mobile Radio (DMR) Tier 3 network

single radio channel.

When the density of mobile users in an area is low, there is a trade-off cost of base station equipment against the number of frequencies to apply for. So it depends on the regulator and its allocation decision whether standard or simulcast equipment must be installed. The cost for simulcast is almost twice as much as standard equipment.

Nevertheless, for a large area of low mobile user density, a user can either install sites with just one radio channel with a nondedicated or inactive control channel all configured with different frequencies, or for the same number of sites, install simulcast equipment, each with an identical set of frequencies. The control channel can then either be dedicated or nondedicated.

It is important to understand that both standard and simulcast equipment use the same air interface protocol. With a DMR Tier 3 trunked radio network, all simulcast sites together will be handled as one logical cell. In an urban area with a higher mobile user density, standard equipment for base station sites is generally the preferred choice. Facilitating a maximum of eight radio channels at a base station site, including a dedicated control channel, even high urban capacity requirements can be fulfilled.

Service and Safety

Radio coverage always is first when discussing radio service availability. In addition, redundancy measures must be taken to maintain operation of the network in case of technical failures. That includes, for example, a second switching subsystem as hot stand-by and linking to base station sites in a ring configuration. Both measures can substantially improve service availability.

Usually mobile stations for VHF frequencies are built into vehicles and are used in them. To enhance the coverage outside the vehicle, a digital enhanced cordless telecommunications (DECT) solution connected to the mobile station can be used. The cordless DECT phone with almost the same user interface as the mobile station enables mobile users to enter hazardous workplaces without waiving voice communications.

Most important is the emergency call function. An emergency call must work under all circumstances, as long as radio coverage is provided. This must be independent from the availability of the control channel and must work when a site is equipped with only one transceiver and both logical communications channels are in use. In this case, one logical channel will be cleared and allocated to the emergency call.

Conclusions

When going digital, a DMR Tier 3 trunked radio network is a good choice to replace an existing analog conventional or trunked PMR system. Control channels at each base station site process roaming data and call setup requests of mobile users in the

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When the density of mobile users in an area is low, there is a trade-off cost of base station equipment against the number of frequencies to apply for.

network. The versatile modes of operation facilitate the fine-tuned adaptation to capacity requirements and thus contribute to scalability. Call setup includes automatic allocation of a payload channel, avoiding any manual channel selection at the mobile station by a mobile user.

Frequency allocations have a strong impact to what extent standard sites or simulcast sites have to be deployed, therefore again challenging scalability. Technique, control channel mode and number of transceivers equipped are chosen site by site. However, simulcast sites with the same set of frequencies are handled by the trunked radio network as one large single cell.

A DMR Tier 3 trunked radio network comprises base station sites and a switching subsystem with interfaces to PBX/PSTN and LAN and integrated network management functions. The structure and network management functions facilitate full control and supervision of the entire radio network, maintaining its operability and high level of radio service availability.

Finally, safety-related features are important aspects in the design of a DMR Tier 3 trunked radio network. Apart from good radio coverage provided for mobile stations built into vehicles, coverage may be enhanced by an integrated DECT solution, permitting users to leave the car without losing radio contact. The emergency call is pre-emptive in case all channels are in use, and with sufficient radio coverage, will work under all circumstances, even without a control channel. ■

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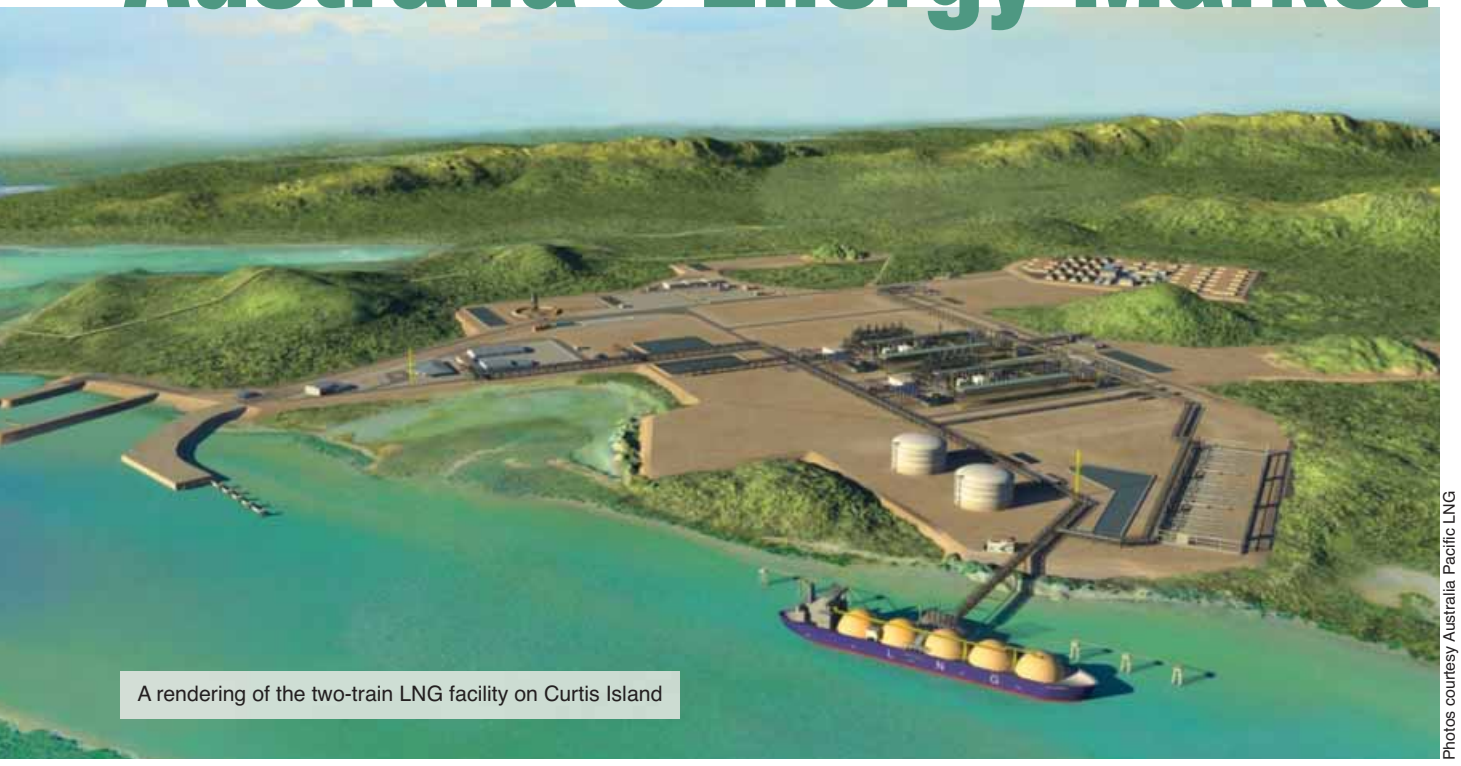

A rendering of the two-train LNG facility on Curtis Island

Photos courtesy Australia Pacific LNG

Australasian oil and gas firms favor TETRA for intrinsically safe equipment and efficient data for their mission-critical communications networks.

By Kevin Graham

The oil and gas sector is an important industry in Australia that requires reliable and mission-critical radio communications networks. During the past four years there has been significant expansion and major investments in new liquefied natural gas (LNG) projects, as well as upgrades to several existing oil and gas refining facilities. Interestingly, most of the projects have chosen TETRA-based digital trunked solutions for their communications.

In the Gladstone region of Queensland, three new LNG projects, costing in excess of $60 billion total, are progressing. The Santos-led Gladstone LNG (GLNG), Origin Energy, Sinopec and ConocoPhilips' Australia Pacific LNG (APLNG) and Queensland Curtis LNG (QCLNG), led by U.K. gas group BG's local subsidiary Queensland Gas Corp. (QGC), have been under construction and are moving into the latter phases of their vast and complex developments. QCLNG is expected to move into operational production in late 2014 with the others following during 2015. By 2016 – 2017, the region will be a world-scale LNG exporter generating earnings of about $8 billion per annum. All three projects involve major inland coal seam gas field plants and pipelines — in excess of 400 kilometers (km) in length — that connect to the coastal processing and port facilities.

The Gorgon LNG project, a $55 billion Chevron-led joint venture with ExxonMobil, Shell and three smaller Japanese stakeholders, is taking shape on Barrow Island off northwest Western Australia. The project is the largest single resource development in Australia's history. Sub-sea gas gathering systems in 200 to 1,350 meters of water and pipelines 65 to 130 km long deliver gas, most of which will be exported, to the Barrow Island liquefaction plant. The island also hosts a domestic gas plant supplying the needs of Western Australia.

The Ichthys LNG Project in the Browse Basin located offshore of Western Australia is a joint venture between INPEX group companies (the operator), major partner TOTAL group companies and the Australian subsidiaries of Tokyo Gas, Osaka Gas, Chubu Electric Power and Toho Gas. Gas from the Ichthys field will undergo preliminary processing at the

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By 2016 – 2017, the region will be a world-scale LNG exporter generating earnings of about $8 billion per annum.

offshore central processing facility (CPF). Condensate will be pumped to a floating production, storage and offloading facility anchored nearby, from which it will be transferred to tankers for delivery to markets. The gas will be transported from the CPF through a sub-sea pipeline more than 885 km to the onshore LNG processing plant being constructed in Darwin, Northern Territory.

In addition to these greenfield LNG projects, replacement of aging analog trunked radio systems with digital trunked TETRA has been completed at existing Shell, Caltex and BP oil refineries in Queensland and Victoria.

Communications Needs

For the oil and gas sector, safety is paramount during the construction and operational phases of projects. Access to clear, secure, wireless voice and data communications is always vital during construction phases where coordination of diverse teams of project managers, on-site crews, contractors, suppliers and other fly-in/fly-out resources is needed. The remote nature of most locations, as well as adverse weather and environmental conditions, demand rugged and reliable operation. This combined with the volatile and hazardous nature of oil and gas products encountered in construction and operational production phases dictates that radio communications solutions must comply with extreme equipment performance and strict safety specifications in addition to other mandatory business voice and data functionality criteria.

In all cases, one of the most important mandatory requirements is availability of intrinsically safe (IS) products that are rated to meet the stringent international standards for operation in the potentially hazardous gas atmospheres encountered at these facilities. The TETRA vendor community boasts an extensive range of handheld radios and accessories that comply with the variety of specification categories required. This fulfills the desire by customers to have open standards-based competitive choice of not only the network solution but also the vital IS handheld devices, and equally importantly, accessories that meet personal operational use scenarios. Sepura, Motorola Solutions, Selex, Airbus Defence and Space (formerly Cassidian) and Funkwerk have already supplied intrinsically safe TETRA radios to Australian oil and gas customers, with Hytera Communications recently releasing compliant products.

Australia, similar to many countries, established strict occupational health and safety legislation, and the oil and gas sectors strive for “zero harm” workplaces. Insurance underwriters of such businesses also impose compliance

conditions, and therefore, oil and gas companies undertake careful selection processes with all equipment suppliers.

The IS standards are quite involved, and the oil and gas customers carefully study and match product ratings for gas, dust and temperature environments to their applications and other product criteria for water ingress and impact performance required for harsh operational environments. IS radios are often referred to as being "ATEX radios." The International Electro-technical Commission (IEC) is the body that defines and publishes the test criteria for worldwide use. IECEX refers to the IEC test criteria for intrinsically safe equipment. The "EX" comes from the first two letters of "explosive atmospheres." ATEX is the name given to the European directives that govern the application of the IEC test criteria in Europe. The standards are continually enhanced, and testing methods have become more rigorously defined and prescribed in recent versions.

In Australia the international rating systems are accepted. All IS radios must specify the compliance rating to which the products have been certified in each test category, including temperature ranges. TETRA suppliers are able to satisfy conformance for Australian oil and gas customers including products that meet the latest IECEX version 6 standards. In addition, TETRA IS radios that also comply with water submersible/dust ingress performance up to stringent IP67 levels are available. Some IS products provide Bluetooth interconnectivity that allows untethered connection of IS-rated audio and other accessories that minimize safety concerns over cables potentially "snagging" users.

A well head in the gas fields

Deployments

Gorgon – Barrow Island Gas Project. Thiess Kentz was awarded a telecommunications package by Chevron Australia that included the deployment of a large private converged voice and data TETRA network. A nine-site Damm Cellular Systems solution with 50 carriers uses a site-wide IP backbone. Some individual sites have 16 TETRA base stations, providing up to 64 individual simultaneous voice and data transactions. More than 3,000 Selex and Sepura ATEX handhelds and hundreds of mobiles are operational. The TetraFlex system integrates on Barrow Island to on-site automated vehicle/person location (AVL/APL), Zetron dispatch consoles, IP telephony and alarm monitoring systems and

includes links back to the Perth headquarters. All TETRA equipment supplied by GMG Solutions was installed, commissioned and maintained by Simoco Australia.

QCLNG Project. Motorola Solutions has been working with QGC on the deployment of the 28-site digital radio network since 2011. The microwave and TETRA digital radio system provides a wide-area communications network, linking the central processing plant in the gas fields to its processing plants, field compression stations, main line valve stations, regional Chinchilla office and logistics facility, and the corporate office in Brisbane. The microwave and TETRA telecommunications infrastructure includes vehicle terminals with GPS tracking, handheld terminals, desk terminals, dispatcher console and voice recording facility. To date, more than 1,500 Motorola subscribers have been deployed for staff on the ground.

One of the most important mandatory requirements is availability of intrinsically safe (IS) products that are rated to meet stringent international standards for operation in the potentially hazardous gas atmospheres encountered at these facilities.

Using the microwave infrastructure throughput capacity of about 200 Megabits per second (Mbps) on larger links within the network, QGC uses the network to not only enhance safety, but also meet its exploration schedule by gathering telemetry information and transmitting critical data such as maps and seismic readings across remote sites. In addition, the data capabilities enable QGC to use the TETRA network for all of its critical voice and data communications in the field.

Santos GLNG Project. Bechtel, the project front-end engineering design contractor, and Simoco Australasia in partnership with local company Jones Communications, was awarded a contract to supply and install a TETRA system to Bechtel GLNG. Bechtel selected a TETRA solution from DAMM distributor GMG Solutions with Sepura TETRA radios. The TetraFlex system covers a radius of about 8 km around the main facility, supporting initially more than 500 radio users equipped with IS portables. The system is required to provide multiple simultaneous trunked group communications, direct mode operation between individual radios, packet data and data transfer services.

Australia Pacific LNG Project. Kordia was awarded the telecommunications subcontract for this project, which has six sites operational of an eventual network deployment of about 28 sites, using two carriers per site to support more than 1,000 handheld and mobile radios. GMG solutions provided the Damm TETRA IP infrastructure with Sepura ATEX handheld and mobile radios. The network interfaces with a console system from C4i and supports a full range of voice, data and telephony requirements for the facility during construction and operational phases.

Favored Features

The oil and gas sector as a whole faces a range of challenges, which affect its communications requirements. In several of the projects cited, the direct mode and direct mode repeater capability were employed during early stages of the greenfield projects as infrastructure including trunked mode TETRA radio sites were constructed. As the exploration and gas field regions expand, trunked/direct mode operation (TMO/DMO) gateways are used to extend mobile and handheld coverage range away from the installed trunked sites. The ability for TETRA to service a large number of simultaneous virtual user groups with group, individual and duplex voice calls and while also transferring information using status and short data services for location, workforce management messaging was important to the companies. As control centers were established and telephony systems were interfaced, the duplex voice call capability was also exploited, giving fixed line users an easy call experience and field users simple operation in situations where hands-free is the safest and most convenient.

The ability of TETRA main and secondary control channels to handle multiple data transfers simultaneously with priority voice communications enables many short data and telemetry applications to be exploited over the same infrastructure. Back office workforce management and work flow processes are interfaced to the TETRA networks and extended to TETRA radio users in the field who confirm progress using simple short data applications that reside in standard TETRA radios.

The lone worker and man-down features coupled with GPS location, time stamping and pre-emptive priority emergency calling that are standard in TETRA were also factors that convinced the oil and gas companies to choose the technology. Although multiple solutions were previously deployed for voice, data and wireless telephony, the oil and gas industry is recognizing through operational practice that digital radio standards are delivering secure, resilient, interoperable and multivendor innovations in a single core platform. Companies also understand that current and future mission-critical voice and data in shared user environments is possible during exploration, construction phases and transitioning into operational production. ■

Kevin Graham is a director of the Australasian TETRA Forum (ATF), which comprises more than 20 major vendors, integrators, consultants and distributors. Visit www.tetraforum.com.au for more information. Email feedback to editor@RRMediaGroup.com.

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The Asia Pacific and Middle East are unique and diverse, and the Project 25 (P25) standard is an ideal fit for many countries and organizations.

By David Lum

The Asia Pacific and Middle East region is the most dynamic region in the world. The region covers half the world's time zones — 12. Of the top 13 most populous nations in the world, eight — China, India, Indonesia, Pakistan, Bangladesh, Japan, Philippines and Vietnam — are in this region. Two of the three largest economies in the world, China and Japan, are located in Asia. Most of the world's infrastructure growth has been in Asia and the Middle East, with many new airports, seaports, roads, highways and train systems being built. Unfortunately, the region also has been in the news for many negative reasons: major earthquakes, tsunamis, typhoons and cyclones, mudslides, ship accidents, political strife, armed skirmishes and major flooding.

All of these situations create hardship on the population and add to the government's already tough job of growing their economies. It is clear that for the Asia Pacific and Middle

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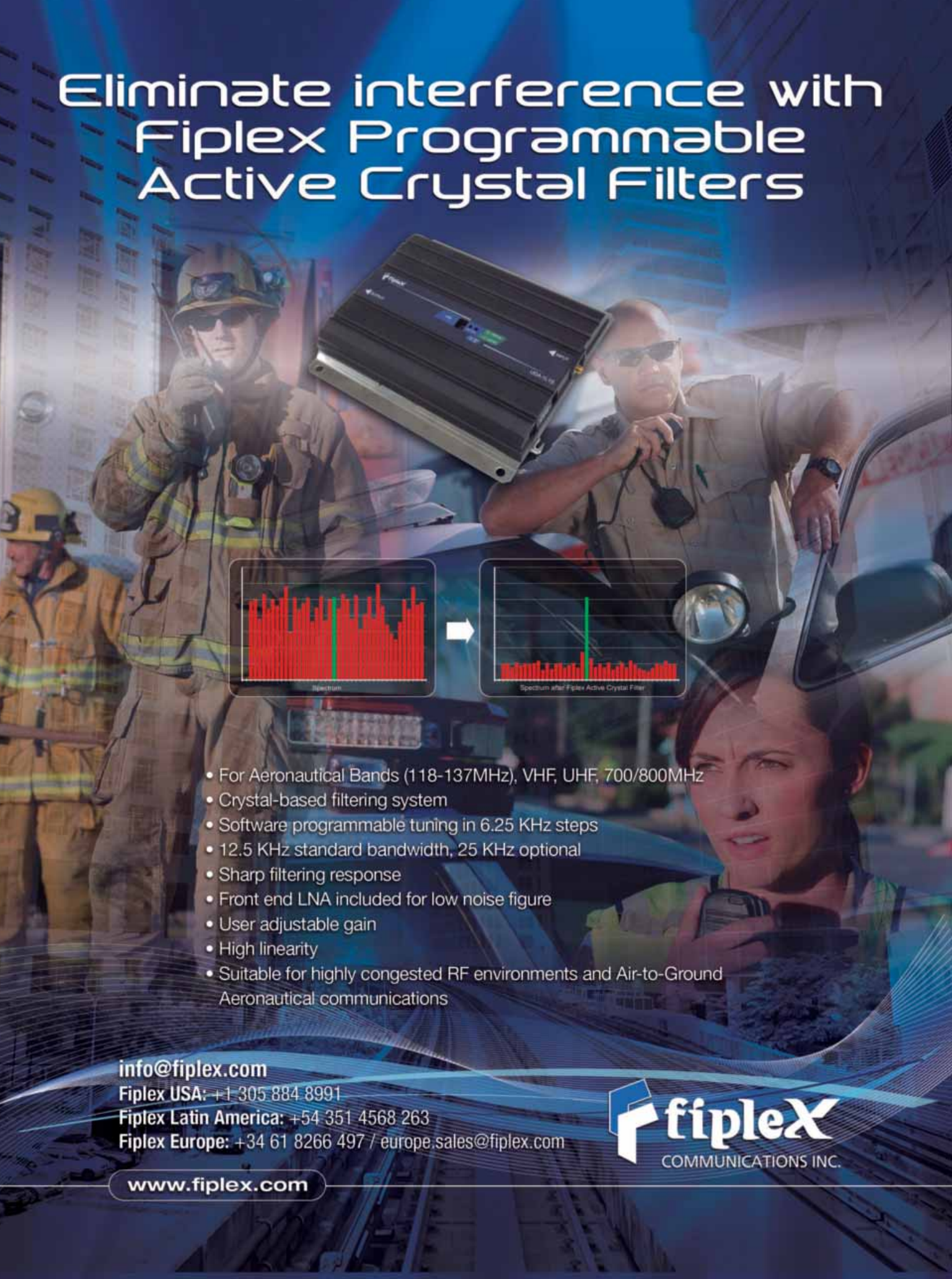

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East region to grow economically, two-way radio will remain one of the best tools for emergency response and disaster management.

The region is undergoing a recent revival with users across many industries having a second look at the Project 25 (P25) standard for mission-critical communications. Several conditions make this dynamic region ready again for P25.

Despite the Asian economic crisis in the late 1990s and the global economic slowdown during the 2000s, the region still had a lot of growth in foreign direct investments in many industries, which drove numerous two-way radio procurements. This, in turn, created a huge demand for radios.

Regulatory Environment

Many of the Asia Pacific and Middle East regulators have seen increases in the number of applicants for frequencies during the past 20 years. To meet the demand for more frequencies, many regulators narrowbanded VHF and UHF spectrum from the traditional 25-kilohertz to 12.5-kilohertz channels. This created churn within the industry, because many of the end users who own analog two-way radio systems purchased new digital two-way radio systems that give them more capabilities. They are investing toward the future.

One unique aspect of spectrum planning is that many of the regulators have also successfully integrated TETRA spectrum requirements of 380 – 400 MHz and 410 – 430 MHz with a 10-megahertz transmit-receive (TX-RX) pairing into the traditional professional mobile radio (PMR) bands. Almost all countries have aligned their PMR spectrum to the spectrum bands available globally — the traditional VHF, UHF and 800 MHz bands. As such, the regulatory environment creates a wonderful marketplace for all analog and digital technologies, allowing open competition to flourish and unrestricted end-user choice. In some countries, the regulators imposed a technology requirement that any new deployments must be digital to encourage spectrum efficiency.

The combination of narrowbanding, desired use of digital for spectrum efficiency, and continued use of the traditional mobile radio bands all allow the use of P25 and Digital Mobile Radio (DMR) as open standards within this region.

Desires and Constraints

The narrowbanding requirement created the opportunity for many users to learn about their options. Many discovered that digital radio offers them new capabilities that provide greater data integration with their IT systems. A major advantage to digital radio is the ability to transmit data back and forth at higher rates than analog, with security if required. This opened the door to new possibilities limited by analog radios. Industries could now locate and track personnel or assets. Management could monitor vehicles for maintenance purposes or use rates. Field personnel could retrieve data from the field to accomplish tasks faster and more productively. A digital radio system helped extend IT networks to the field so that information can be captured and flow faster.

As beneficial and promising as digital radio is to the end user, the technology also comes at a slightly higher price than an analog radio system. Even though the region has enjoyed economic growth, many cannot afford a state-of-the-art trunked two-way radio system to provide large geographical coverage, especially into rural or low-density areas. As a consequence, some have opted for digital conventional radio systems because a conventional radio is cost effective for rural or low-density areas. The largest deployment of a digital conventional system belongs to the Western Australia Police.

P25's design specification of high power and high sites and the requirement to have both conventional and trunking architectures gives users design architecture options that minimize cost. Several diplomatic security organizations in the region also use conventional radio operations because of the technology's rapid deployment capability and ease of transport.

In Asia, wireless has exploded everywhere and along with it, many security concerns and breaches. Cybersecurity is a major concern and need within the region. Another major factor in the interest of P25 is the use of advanced encryption standard 256 (AES-256), the latest in encryption technology. Embedding with this robust algorithm, the P25 design standards have enabled the interoperability of secure voice and data across the entire P25 digital line of radios. This makes deployment and mixing of vendor products possible and easy.

In any open standard, it is ideal to have several manufacturers supplying products in compliance with the standard. This shows that the open standard has the support of manufacturers. Several P25 manufacturers are active in the region and have won open tenders for P25 projects. This has given end users more confidence that P25 is truly an open digital radio standard because competitive activity is good and promises to be even more active in the coming years.

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Why P25?

The success of P25 can be attributed to the contributors, end users and manufacturers. Without cooperation to support the open digital radio standard, it would not enjoy the longevity and the acceptance in the open marketplace and in the world. P25 is successful because it truly is end-user driven. The users of the equipment are the same people who drive the P25 functional requirements. The manufacturers will supply the technical know-how and engineering expertise to create the standard's documentation necessary for all manufacturers to create standards-compliant products. User involvement in defining the functional requirements of the standard ensures that the manufacturers will make products that meet the users' need, which in turn ensures that end users will buy the products. Functional requirements driven by users include:

- Backward compatibility with analog radio, allowing for smooth long-term migration from analog to digital or for interoperability with other users who are still analog;
- High power for greater range;
- Operation on the same frequency as before, allowing for an easy swap-out from analog to digital;
- Maintaining the same coverage and keeping site development costs to zero; and
- Trunking modes of operation that optimize the cost between low and high density of users and provide rural coverage in a cost-effective manner.

All of these features make P25 attractive to many users in the Asia Pacific and Middle East region. Not surprisingly, many of the end users in the Asia Pacific and Middle East region also have the same communications and functional needs that the creators of the P25 standard have, providing for greater marketability of the P25 standards-based products in the region. So for now, P25 will enjoy a revival of sorts in this region of the world. ■

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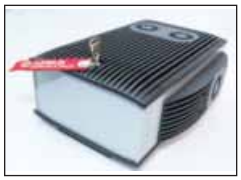
Product Expo: Base Stations and Repeaters

Airbus Defence and Space

The TB3hp is the world's smallest high-power mini TETRA base station, according to company officials. The base station provides up to 15 watts of RF power with power consumption of 100 watts. The unit



is beneficial for filling coverage gaps or providing hot spot coverage in places where a normal network may not reach, such as underground car parks or tunnels. The device can be adapted to the transmission network that is available by using conventional time-division multiplexing (TDM) and IP transmission. Approximately the size of a small suitcase, one person can carry it to the site, install it and set it up within minutes, officials said. The device can be mounted on a wall or used in a vehicle to provide rapid deployment coverage. Suitable for establishing wide-area radio coverage, for stand-alone use or as part of a bigger TETRA network, the device can be operated and maintained via a remote connection.

http://airbusdefenceandspace.com

Alligator Communications

The Alligator Model 1800 frequency synthesized, redundant base station/repeater is available in the 400 MHz, 900 MHz and 1.4 GHz bands. The Common Time Base technology provides zero frequency

offset between four internal RF modules. A single adjustment of the transmit frequency calibrates the entire unit. Down time to perform tedious calibration of receivers is eliminated. Built-in intelligence performs automatic checking of a warm standby transmit module and schedule rotation of the transmit modules. When a replacement module is installed, it automatically programs to the operating frequency. The unit features a built-in automatic answer device for dial-up diagnostics.

www.alligatorcom.com

Barrett Communications

The Barrett 2050 high frequency (HF) base station transceiver combines current technologies with intuitive operation. The transceiver's

software-defined core is readily upgradable, providing extended service life. The transceiver, teamed with other 2000 series products, provides the ideal interface for email, fax, telephone and data connectivity within an HF network and onward to the international telephone networks and Internet.

www.barrettcommunications.com.au

BridgeCom Systems

The ComLink BCR-40U/50V FM repeater system is a feature-rich repeater/base station. Packed with 40-watt and 50-watt continuous

duty RF power, the dual fan-cooled unit can be a community repeater or a 16-channel base station. The product can manage a channel in a logic trunked radio (LTR) system. The unit includes a built-in 10-amp power supply, battery backup, community tone/code and decode/encoder and can handle air-time logging. The repeater is ideal for air-time service and emergency management, company officials said.

www.bridgecomsystems.com

CalAmp

The Viper SC base station was designed for industrial applications in a variety of environments. The unit operates over an extended tem-

perature range and provides reliability in harsh environments. The unit operates the MultiSpeed Rate Controller, supporting speeds up to 128 kilobits per second (kbps) at a 50-kilohertz channel for FCC/Industry Canada (IC) and up to 48 kbps at a 25-kilohertz channel for European Telecommunications Standards Institute/Australian Communications and Media Authority (ETSI/ACMA) operation. MultiSpeed operation allows each remote base station to communicate to a base station at the fastest channel speed supported by a given signal strength.

www.calamp.com

Codan Radio Communications

The Vizor is a portable, rapid transportable repeater that delivers instant communications and extended Project 25 (P25) digital radio coverage. The repeater ensures safe, interoperable and coordinated

communications between agencies. The repeater is housed in a rugged and transportable Pelican case and can be configured as a repeater, base station or repeater/base station combination. The platform delivers the same features expected from a site-based product such as P25 compliance, full encryption, cross-band capability and low power consumption.

www.codanradio.com

Comsystems

The COMSTRBO - RDS-B/M is a transportable repeater that can be used as a rapid deployment system or as a base station and/or repeater station with or without MOTOTRBO radios. The unit features up to 45 watts RF in high power. The unit is designed to be easily

configured for uni, bidirectional or back-to-back repeater. The option of cross-band repeaters allows interoperability between different networks. The carrying case is 48.76 by 38.6 by 22.86 centimeters. Other features include a power supply auto of 110/220 VAC, 20 amps, battery backup module, high-capacity battery, switch AC, switch DC, and cable plug in AC and DC.

www.comsystems.com

Damm Cellular Systems

Damm TETRA base stations are optimized for maximum user friendliness. Outdoor base stations, BS421, can be installed with up to four carriers at one site. The indoor base stations, BS418, can be

installed with up to 16 carriers. Designed for a fully distributed IP system, scalable from single to large multisite networks, the base stations come integrated with LogServer, dispatcher and network management, and with an internal GPS receiver. The BS421 can be mounted directly in the mast, close to the antennas, providing full dual receive diversity for optimal sensitivity and offering a built-in duplex filter with an output power to the antenna of up to 10 watts.

www.damm.dk

Harris Public Safety and Professional Communications (PSPC)

The Harris MASTR V is a flexible, compact base station that allows up to eight channels per cabinet and provides secure digital trunked

communications. The base station operates on 700 MHz, 800 MHz, VHF and UHF frequencies in Project 25 (P25) trunked, linear simulcast and conventional modes. The solution employs an easy-to-use software interface that provides flexibility, simplified setup and easy field upgrades, as well as remote programming. The modular design of the base station makes maintenance and servicing simple and fast.

www.pspc.harris.com

Hytera Communications

The RD622 is an indoor Digital Mobile Radio (DMR) and analog dual-mode repeater in a compact design, embedded with a power supply

and optional mini duplexer. The product's design enables it to easily support wall-mount installation with AC/DC power. Auto switch between analog and digital mode allows for an easy digital migration. Two repeaters can be interconnected to provide interoperability between UHF and VHF. Multiple sites can connect via IP, along with the RD982 to support flexible wide-area and large building coverage. The unit can be integrated with Hytera Dispatch System or other third-party GPS dispatching software.

www.hytera.us

Icom

The IC-FR9010/FR9020 is a VHF 110 watt or UHF 100 watt 100 percent duty cycle repeater/base station combining Project 25 (P25) digital and analog FM modes with mixed-mode function. The repeater can be installed in a 2U height, 19-inch rack mount chassis.

The four-by-20 character display, 16 key buttons, 500 memory channels and internal speaker allow the repeater to operate as

a simple base station or to check repeater activity. A programmable D-SUB 25-pin accessory allows connection with an external P25 trunking controller or external remote control devices. The repeater can be powered by 100 – 120 VAC. A built-in backup system supports automatic switching to an external power supply (13.6 VDC) if the AC power supply fails.

www.icom.co.jp

Kenwood

Kenwood continues to evolve its core NXR-700/800/900 and NXR-710/810 NEXEDGE series repeater/base stations. The NXR-x00 series firmware adds a conventional IP interface for use by Kenwood solution developers to offer new dispatch and radio messaging solutions. Both series repeater/base stations support IP connection and analog/digital dual-mode operation. The NXR-x00 series (available in VHF/UHF/800 MHz) is designed as a systems product for use in single-site to large multisite trunked radio systems. The cost-effective NXR-x10 series (available in VHF/UHF) products are aimed at nontrunked, conventional, single or multisite systems.

www.kenwood.com

Midian Electronics

The PR-10 simplex repeater maker with selective repeat records up to three minutes of incoming voice and paging tones and then regenerates them into dead spots. The unit also features a tone decoder to only retransmit validated pages (DTMF, two tone, five tone or pulse tone) for applications such as fire departments retransmitting two-tone pages into remote areas with poor radio coverage. The unit can expand coverage into buildings, basements and mountainous areas. Preconfigured cables for some radios are available.

www.midians.com

Midland Radio

Midland Project 25 (P25) VHF, UHF and 700/800 MHz stations are 100 percent continuous duty (5 – 110 watts), providing a remote site operation reliability rate of greater than 99.9 percent, company officials said. The units are programmable by channel for digital, conventional or mix mode, and can be programmed by channel for base station or repeater operation. The low standby current draw feature extends operation of battery and/or solar-powered equipment, reducing service and maintenance issues (VHF 120 mA/UHF 160 mA). IP and tone remote interfaces are available. Base Tech Series radios feature a five-year warranty.

www.midlandusa.com

Motorola Solutions

The reliability and serviceability of the full-featured ASTRO 25 system

makes it ideal for mission-critical systems. The product allows users to meet demand for IP networks and narrowband radio operations with the high-performance GTR 8000 base radio/expandable site subsystem. The GTR 8000 offers software-based upgrades and migrations, no single point of failure, hot swap hardware, front access serviceability and integrated battery charging. The compact design enables everything from analog conventional to advanced Project 25 (P25) TDMA trunking on the same hardware.

www.motorolasolutions.com

Royal Communications International

MICOM high frequency/single-sideband modulation (HF/SSB) transceivers operate in the 1.6 to 30 MHz band and come standard with embedded automatic link establishment (ALE). The units have been tested and certified compliant with Mil-Std-188-141B. The product complies with Mil-Std-810F and electromagnetic interference (EMI) requirements, and meets many regulatory standards. The unit can be controlled, operated and programmed from a remote location via RS-232, IP, leased phone line or fiber optics. The base station transceivers are rated at continuous-duty transmission for voice and data at 125-, 500- and 1,000-watt options.

www.royal-communications.com

Selex ES

The ElettraSuite VS 4000 is a TETRA Enhanced Data Service (TEDS)-capable mobile radio that provides wideband data connectivity, boosting most advanced data applications such as image/video transmission. The FPG3 Plus front panel provides a built-in Wi-Fi hot spot capability, and the TEDS wideband connectivity can further be extended to handheld devices. Ready to support dual-mode functionality to allow soft migration from conventional FM to TETRA, saving costs and operational effectiveness, the unit fulfills demanding mobile communications requirements of mission-critical users supporting direct mode operation (DMO) repeater/gateway, air interface, end-to-end encryption features and integrated GPS receiver.

www.selex-es.com

Sepura

Sepura's 25-watt TETRA base stations provide up to eight carriers in the 400 MHz or 800 MHz frequency bands. Compact, modular and with a rich array of features, along with the Sepura TETRA infrastructure, the base stations provide a highly efficient, secure and cost-effective IP-based radio network. Meanwhile, the company's SBR8000 provides the core of a Digital Mobile Radio (DMR) network. Featuring power up to 40 watts for UHF and 45

watts for VHF, along with ease of installation and advanced functionality, the product provides extended radio coverage for users across a broad spectrum of sectors.
www.sepura.com

Simoco Group

Simoco expanded its Digital Mobile Radio (DMR) line with the SDB680 base station/repeater. Part of the Simoco Xd range, the unit delivers 6.25-kilohertz equivalent digital communications at 50-watt

transmit power with 100 percent transmit duty cycle. A common hardware platform supports analog, DMR Tier 2 conventional and Tier 3 trunked modes and features session initiation protocol (SIP) telephone connectivity. The unit offers full compliance with European Telecommunications Standards Institute (ETSI) open DMR standards in the VHF and UHF frequency bands. The device can be interconnected over an IP backhaul to form wide-area radio systems without any additional or centralized switching components.
www.simocogroup.com

Sonik Messaging Systems

The PTX-150 all-digital paging transmitter is unlike other paging transmitters that are modified conventional analog transmitters limited

to two-level-only POCSAG paging, company officials said. The unit is available with a 100-watt or 250-watt internal power amplifier (PA) and an optional internal isolator. The unit handles the entire VHF spectrum from 138 – 174 MHz, is designed for continuous-duty applications, handles all digital paging protocols on the fly and includes Windows-based diagnostics software. The transmitter is designed for 19-inch rack mounting and includes a 5- or 10-megahertz reference input.
www.sonik.com

Spectra Engineering

Spectra Engineering completed interoperable tests on MX800 Project 25 (P25) base stations with various P25 console brands covering U.S., European and Australasia markets. New extended controls

manage audio and data messages via consoles with compliance to the P25 Digital Fixed Station Interface (DFSI) standard, offering interoperability between base stations and consoles of different makes, ensuring easier equipment selection based on needs, performance and budget. An extension to the company's modular design is an IP-based network capability where all radio sites sync and link

automatically, forming a multicast IP-mesh network without additional or external voting hardware.
www.spectraeng.com.au

Tait Communications

The TB9400 is built on the Tait TB9100 pedigree and provides performance and reliability for organizations around the world. The unit

delivers on cost-effective deployment and operational efficiency with Phase 2 upgradability for spectral efficiency, linear simulcast modulation (LSM) for greater coverage and remote network management for effective operations. For efficient network management, the device features remote management and monitoring options, including inbuilt diagnostics and access-level control, multiple user accounts, remote fault diagnosis and detailed alarm monitoring and management via IP.
www.taitradio.com

Teltronic

The Portable Base Station (PBS) is a wheeled unit designed to be easily carried, and the Deployable Base Station (DBS) enables quick installation to provide coverage. Each PBS is made up of one TETRA carrier that can be expanded with an extra unit to provide two-carrier coverage. When linked to an existing eNEBULA system, the PBS

works as an additional base station. If a connection or fixed system is not available, the PBS can operate as a single-site TETRA system without additional components. The unit can also consist of a Long Term Evolution (LTE) eNodeB. The DBS can be adapted to different configurations.
www.teltronic.com

Wireless Pacific

The RDX Pico is a small, self-contained Project 25 (P25) suitcase repeater. Designed for instant deployment in most radio environments, it permits six configurations and features MERLAN P25, a way to instantly deploy IP connected to end-to-end encrypted multi-site P25 networks anywhere. The 8.5-ampere hour (AH) inbuilt battery management system provides more than 12 hours operation at 10-percent duty cycle and can be recharged by any available 8 – 30 VDC power source or AC power. RF output power is set to 5 watts to ensure balanced talk-in/talk-out to field portable units. The unit delivers exceptional P25-analog repeater performance, and global Internet connectivity from any LAN, Wi-Fi or 3G network.

www.wirelesscorpltd.com

New Products

DMR Radios

Hytera Mobilfunk launched Digital Mobile Radio (DMR) two-way radios, including the PD3, PD5 and PD6 series. The PD3 radios are pocket-sized devices designed for business use. The license-free radios include micro-USB charging capability. The PD5 series includes two-way radios that support direct mode operation (DMO), true two-slot and secure communications. The devices are small and light and provide long battery life, company officials said. The PD6 series are DMR two-way radios with a small, light frame. The devices cover the 400 – 527 MHz frequency range and support dual-mode operation. The radios ensure a smooth analog-to-digital migration and are compliant with military and IP67 standards for water and dust.

www.hytera.com

TETRA Radios

Sepura released the STP9000 series hand portables and the SRG3900 mobile TETRA radios for the 344 – 400 MHz and 800 MHz bands. The IP67-rated portable is designed to operate in challenging environments and includes a new generation of highly sensitive GPS with predictive ephemeris, as well as an intuitive user interface and improved full duplex audio and battery performance. The radios are compatible with existing STP8000 accessories and software. The mobile radios include dual remote console support, a 10-watt (W) RF power rating, and full gateway and repeater functionality.

Sepura also introduced a handset-based console, the HBC2, designed to operate in harsh environments. The console features an ergonomic design, high-quality audio and a high-resolution color display. The console can be configured as a handset or a fist microphone console and includes new vehicle-oriented features like night mode. The product shares a common control layout and user interface with the company's STP9000 handheld, STP8X intrinsically safe series and SRG3900 radio terminals. A compact design allows the product to be concealed in a glove compartment for semi-covert use, and it is resistant to dust and water ingress.

www.sepura.com

TETRA Handheld

Teltronic unveiled HTT Lite, a compact, lightweight handheld TETRA radio. The unit is 102 millimeters long. The radio includes an IP67 enclosure, location services based on a built-in GPS receiver and secure communications through a loudspeaker. Other features include dynamic group number assignment (DGNA), ambience listening, air interface encryption and call authorized by dispatcher. A simplified four-key keypad and an informative display combined with optimized multimedia interface (MMI) software enable easy access to the most widely used TETRA functionalities, company officials said.

www.teltronic.es

DMR Tier 3 Console Interface

Catalyst Communications Technologies developed a console subsystem open Digital Mobile Radio (DMR) interface using the Application Interface Specification (AIS) developed by DMR Association members for Tier 3 trunked radio systems. The IPIAIS gateway software supports digital audio and user control to the Tier 3 DMR radio system through an Ethernet interface. Dispatch user control and communications are achieved through a Windows-based graphical user interface (GUI). The company's IPIConsole product provides dispatch for DMR Tier 3 systems and supports features such as unit identification with alias translation, texting, emergency signaling, group calling, emergency group calls, custom graphics for talk groups, roaming for dispatchers and

instant playback. Communications elements including analog and digital, conventional and trunked professional mobile radio (PMR), session initiation protocol (SIP) telephony and other systems can be managed from the same console.
www.catcomtec.com

Enterprise LTE Trunking

Huawei's 4G-based enterprise Long Term Evolution (eLTE) broadband trunking solution integrates voice, video and data trunking, as well as multiple network applications into a converged wireless broadband communications infrastructure. The system provides a shared broadband network for multiple enterprises to exercise control and create synergy in managing communications, company officials said. A variety of eLTE services, including broadband trunking, video surveillance, eLTE quick deployment broadband trunking system and eLTE interoperation with Huawei's telepresence system, are supported in the new technology.
www.huawei.com

Digital Dispatch Console

RediTALK Air is a tablet-based dispatch console from **Omnitronics** that supports analog and digital radios. The console adds mobility to the company's RediTALK IP console, allowing dispatchers to be free from their desks, and managers and supervisors to communicate over a radio network. The product connects to digital radios over IP and is compatible with conventional and trunked radios through the firm's digital radio gateway (DRG) infrastructure. Functions such as individual and group calling, as well as text messaging and comprehensive integrated contacts list are supported.

www.omnitronicsworld.com

CAD Application Programming Interface

Zetron developed a CAD/AVL application programming interface (API) for its DCS-5020 digital console system. The API allows integration between the console and applications including Zetron's AVL software and third-party CAD and AVL solutions. When the API is used with AVL and CAD applications, dispatchers can initiate call setup, text messaging or status alerts, and enable setup of patches on the console directly via the API to resources connected to the console system. This allows users to control many call operations directly from the CAD or mapping resource instead of the console.

Zetron also announced it developed a second wired interface to a TETRA infrastructure for its Advanced Communications (AcomEVO) system. The interface

was developed for Airbus Defence and Space's TETRA system and supports key features including individual call, group call, priority call, emergency call, status, call alert, short data and short text. Wired interfaces provide more efficient communications for large radio networks and support greater voice and data capabilities than other forms of connectivity, company officials said.
www.zetron.com

Multi-Standard Base Station Platform

Airbus Defence and Space introduced a multi-standard base station (MBS) platform and a high-power (HiPo) modem that combines its professional mobile radio (PMR) technology with Long Term Evolution (LTE) technology from Alcatel-Lucent. Both radio network elements allow broadband services to be added to existing TETRA or Tetrapol networks with no impact on quality of voice services,

company officials said. The products operate across all traditional UHF bands. Both devices were tested and approved as part of the Safe City Test Bed project in Singapore.

Airbus also introduced a covert version of its TH1n TETRA handset. It is available for the 380 – 430 MHz and 800 MHz frequency bands. The new variation is equipped with appropriate accessories for covert use.
www.airbusdefenceandspace.com

Compact Repeater

MIC Nordic released TMR400, a compact repeater for confined indoor areas and vehicles to extend coverage to areas where the TETRA network is weak. The repeater weighs 1.7 kilograms (kg) and is easy to install, officials said.
www.micnordic.se

IP Control Room Platform

The 3020 LifeX from **Frequentis** is an IP-based integration platform for public-safety control room information communications technology (ICT) solutions that supports the evergreen philosophy. The platform includes easy in, easy out applications to deliver an improved user experience and management configuration while supporting now-and-then functionality from Frequentis or other vendors, which is part of the evergreen philosophy, said company officials. The platform includes a variety of mobile applications including radio status server and radio Web dispatcher functions.
www.frequentis.com

NFC Testing

Comprion's UT^3 platform for near field communications (NFC) testing was

approved by the NFC Forum for digital protocol functional testing and is listed as an approved test tool. The product can be used for conformance testing by manufacturers and for certification testing of NFC Forum devices by authorized laboratories. Comprion's NFC test solution includes the UT^3 platform hardware, the Device Test Center software as an application to manage test plans, and several test benches covering various NFC Forum requirements and test cases. The tool provides an intuitive user interface, simulation and monitoring capabilities, and allows debugging during product development. Test results are presented in PDF format. In addition to digital test benches, the platform also supports analog testing of NFC devices.

www.comprion.com

GPS Antenna Mount

Procom added a GPS combination mount to its portfolio of mobile antenna products. The XG-COMBI mount offers a GPS antenna with an external antenna for applications including VHF, UHF, TETRA and Long Term Evolution (LTE) 700 MHz. The mount can be installed anywhere on a vehicle with an 18-millimeter diameter hole, and it is especially suited for mounting on the narrow strip on the rear wing between the trunk lid and the car side. A bendable section in the mount makes the whip tiltable 30 degrees by hand. A variety of whips can be connected to the mount.

www.procom.dk

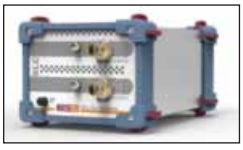
DMR Site Linking

The **MiMOMax Wireless** Tornado line of IP-based radios with Power over Ethernet (PoE) technology provides quick and economical implementation of a low latency and high-performance linked Digital Mobile Radio (DMR) solution. The PoE implementation reduces installation times and costs associated with tower, site RF and power cabling, company officials said. The product also improves system performance by minimizing cable RF losses. By housing all radio and network electronics in one weatherproof outdoor enclosure, the only cable required for a linking solution is one 50 volts direct current (VDC) PoE Ethernet cable. The solution uses high orders of modulation, advanced DMR traffic management schemes and narrowband multiple input multiple output (MIMO) technologies to provide low latency and spectral

efficiency linking of up to 13+1 trunked channels for DMR or digital Professional Mobile Radio (PMR), while leaving uncommitted Ethernet bandwidth available for other applications.
www.mimomax.com

Clock USB Synthesizer

Noise eXtended Technologies (Noise XT) introduced the SLC ultra-low jitter/dual clock synthesizer for the 2 MHz to 7 GHz frequency range. The product is a single- or dual-clock USB synthesizer in a small package with a noise floor of -170 decibels relative to carrier per hertz (dBc/Hz) at 10 MHz. The product offers two clean clocks in a package to achieve low jitter measurements. The compact synthesizer measures 8.5 by 11 by 20 centimeters.



www.noisext.com

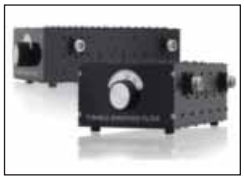
Analog Front End

The CMX983 analog front end (AFE) integrated circuit (IC) from **CML Microcircuits** bridges the gap between a digital radio's RF section and the digital signal processor/field-programmable gate array (DSP/FGPA). Designed for software-defined radios (SDR), the IC performs DSP-intensive functions, provides dual channel analog-to-digital and digital-to-analog conversion, includes two RF fractional-N synthesizers and embeds auxiliary analog-to-digital convertors (ADCs) and digital-to-analog convertors (DACs) for use within the radio system. The product is suitable for radio systems using modulation bandwidths up to 25.8 kilohertz, and it is especially suited to satellite communications, high performance wireless data and professional two-way radio systems. The product supports numerous sample rates and filtering characteristics, allowing a high level of functionality, integration and connectivity with RF building block ICs. The product is available in a 64-lead very thin quad flat non-leaded (VQFN) package.

www.cmlmicro.com

Tunable RF Filters

Fairview Microwave announced a line of band pass and band reject tunable filters. The filters can be used to test PCS, UHF, professional mobile radio (PMR), TETRA, Long Term Evolution (LTE) and Wi-Fi. The filters are effective in band selection or frequency discrimination with high attenuation greater than 50 decibels (dB) possible, allowing for excellent noise, harmonic and adjacent-band reduction, company officials said. Ruggedized aluminum castings and silver-plated surfaces make the filters durable in demanding environments. The line includes six bandpass filters capable of octave-band tuning from 125 MHz to 3 GHz, depending on configuration, as well as 5-percent pass band. The filters employ a five-section tunable design and have a mechanical dial accurate within 1 percent. The line also includes five band-reject models with octave-band tuning ranges from 100 MHz to 2 GHz depending on configuration and 1-percent reject band. The filters use a three-section design and have a mechanical dial tuner accurate to 0.5 percent.



www.fairviewmicrowave.com

Yagi MIMO Antennas

PCTEL introduced two enclosed yagi multiple input multiple output (MIMO) directional antennas for the 2.4 and 5 GHz frequency bands. The antennas are designed for long-range broadband wireless applications and provide high-speed directional Wi-Fi coverage and optimized data throughput in a rugged, low-profile housing. The products are ideal for point-to-point installations in challenging environments, company officials said. The 5 GHz model, WISP51583MIMO supports 802.11 ac/n 3 x 3 MIMO, while the 2.4 GHz model, WISP24252MIMO, supports 802.11n 2 x 2 MIMO. Both antennas feature a weatherproof design, rugged ultraviolet (UV) resistant housing and a mast mount built to withstand high wind speeds.

www.pctel.com

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www.RRImag.com

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23 – 25 June: LTE World Summit, Amsterdam. Informa Telecoms & Media: http://ws.lteconference.com

3 – 6 August: APCO Conference & Expo, New Orleans. Association of Public-Safety Communications Officials (APCO) International: www.apco2014.org

4 September: TETRA in Peru, Melia Lima, Peru. TETRA + Critical Communications Association (TCCA): www.tandcca.com

9 – 11 September: Critical Communications Expo, part of General Police Equipment Exhibition & Conference (GPEC), Leipzig, Germany. Exhibition & Marketing Wehrstedt: www.ccexpo.de

9 – 11 September: IACP Interseg, Florianopolis, Brazil. International Association of Chiefs of Police (IACP): www.feirainterseg.com.br

14 – 16 September: Critical Communications Middle East, Dubai. TETRA + Critical Communications Association (TCCA) and IIR Telecoms & Technology: www.criticalcommunications-me.com

17 – 19 September: VSAT, London. Informa Telecoms & Media: http://vsatevent.com

23 – 25 September: LTE Asia, Singapore. Informa Telecoms & Media: http://asia.lteconference.com

24 – 25 September: Emergency Services Show, Birmingham, United Kingdom. Broden Media: www.emergencyuk.com

30 September – 2 October: CommsConnect, Melbourne, Australia. Westwick-Farrow Media: www.comms-connect.com.au

7 – 8 October: LTE Voice Summit, London. Informa Telecoms & Media: http://voice.lteconference.com

14 – 16 October: EENA Members Workshop, Brussels. European Emergency Number Association (EENA): www.eena.org

22 – 24 October: EUTC 2014, Monaco. European Utilities Telecom Council (EUTC): www.eutc.org

28 – 29 October: Offshore Energy Exhibition and Conference: Amsterdam. Navingo: www.offshore-energy.biz

4 – 6 November: CBTC World Congress, London. Global Transport Forum: www.globaltransportforum.com/cbtc-world-congress

11 – 13 November: LTE Africa, Cape Town, South Africa. Informa Telecoms & Media: http://africa.lteconference.com

12 – 13 November: Future LTE Public Safety Systems, Munich. Arico Technologies: www.arico-tech.eu

25 – 27 November: PMR Expo, Cologne, Germany. PMR Expo: www.pmrexpo.de

26 – 28 November: SmartRail Asia, Bangkok. Global Transport Forum: www.globaltransportforum.com/smart-rail-asia

2 – 3 December: Transport Security Expo, London. Nineteen Events: www.transec.com

7 – 10 December: ITU Telecom World, Doha, Qatar. International Telecommunication Union (ITU): www.itu.int

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16 – 20 March: International Wireless Communications Expo (IWCE), Las Vegas. Penton Media: www.iwceexpo.com

13 – 15 April: LTE Latin America, Rio de Janeiro. Informa Telecoms & Media: http://latam.lteconference.com

19 – 21 May: Critical Communications World, Barcelona, Spain. TETRA + Critical Communications Association (TCCA) and IIR Telecoms & Technology: www.criticalcommunicationsworld.com

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ConnecTel Inc. www.connectel.eu	12
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dPMR Association www.dpmr-mou.org	19
Eventide www.eventide.com	16
Fiplex Communications www.fiplex.com	37
HAL Communications Corp. www.halcomm.com	39
Hytera Communications Corporation www.hytera.com	31, 55
Icom Inc. www.icom.co.jp/world	7
JCK Jean Couk Enterprise www.jeancouk.com	21
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MobilitySound www.mobilitysound.com	27
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Narda Safety Test Solutions www.narda-sts.us	29
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PMRExpo www.pmrexpo.de/en	52
Procom A/S www.procom.dk	33
Radio & Trunking Distributors International www.radioandtrunking.com	32
RadioResource International www.RRImag.com	43, 46
Radiotrans Comunicaciones S.A. www.radiotrans.com	47
Selex ES selex-es.com	28
Simoco Group www.simocogroup.com	23
SoftWright www.softwright.com	49
Spectra Engineering www.spectraeng.com.au	25
SuperGUIDE www.RRImag.com	48
Tait Communications www.taitradio.com/untangle	15
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2. Which of the following best describes your organization?
❑ A Mobile Communications Dealer/Reseller
❑ B Distributor, Agent, Importer, Exporter, Rep
❑ C Commercial Trunked Radio and Other Wireless Service Providers
❑ D Government/Public Safety/Military
❑ E Business/Industrial/Transportation User
❑ F Communications Manufacturer/OEM/Software Developer
❑ G Engineering and Consulting Firm
❑ Z Other—please specify _____

3. What is your function?
❑ A Corporate/Senior Management
❑ B Operations/Administration Management
❑ C Technical/Engineering Management
❑ D Sales/Marketing
❑ Z Others Allied to the Field—please specify _____

4. Do you recommend, specify or purchase mobile communications equipment or services?
❑ A Yes ❑ B No

5. Is there any servicing of mobile communications equipment at your location?
❑ A Yes ❑ B No

6. In what areas of the world do you do business? (mark all that apply)
❑ A Western Europe
❑ B Eastern Europe
❑ C Middle East
❑ D Asia
❑ E Australia/New Zealand
❑ F Africa
❑ G Mexico/Central and South America
❑ H United States/Canada

7. What wireless technologies does your organization plan to use/buy over the next 2 years? (check all that apply)
❑ A Conventional Two-Way
❑ B Cellular/Personal Communications
❑ C Paging/Messaging
❑ D Mobile Data
❑ E SCADA/Telemetry
❑ F Microwave radio
❑ G Trunking
❑ H Location Technologies
❑ I Tone Signaling (ANI, Encryption, etc.)
❑ J Interconnect
❑ K Satellite
❑ L CAD
❑ M Wireless Broadband
❑ Z Other _____

Q314

By Michelle Zilis

Qatargas Addresses Communications Gap on LNG Tanker

Qatargas, a liquefied natural gas (LNG) producer in Qatar, realized it had a gap in communications between crew member stations on an LNG tanker that was causing problem during loading operations.

When a tanker is loading condensate from the natural gas condensate fixed point mooring (FPM) outlets offshore, the bow of the tanker must be finagled to a precise location. Radio communications are essential for the lookout person to timely and accurately communicate the tanker's position in relation to the FPM. Qatargas' problem was that the radio signals used to carry out these maneuvers was repeatedly attenuated by the steel structure of the tanker, which lies within the line of sight between the bridge of the vessel and the FPM, located at sea level. This was causing the radio signal to break down, making communications between the bridge and vessel crew haphazard at best.

"LNG tankers are incredibly large from the bridge down to where the fixed point mooring is, which is where the LNG is pumped onto the vessel," says Clive Cushion, technical director, Fern Communications. "All the vessel infrastructure was hindering the radio signal … You get loads of steel structure and concrete, and it just basically absorbs radio signals."

Qatargas invited Fern Communications to test its FRX-1 radio repeater on a tanker while normal loading operations were being carried out. The repeater is unique because it is portable and ATX approved for use in hazardous environments, Cushion says. Fern Communications specializes in the design and manufacture of two-way radio communications systems for the international upstream oil and gas industries.

Photo courtesy Fern Communications

The Qatargas service lab during the four-day trial with Fern Communications

During a four-day trial, the Fern Communications team worked with members of the crew onboard the tanker to demonstrate two FRX-1 units, both UHF and VHF. By positioning the unit at strategic points on the vessel, the radio signal was able to travel from one crew member's radio around the steel structure to the receiving crew member's radio. Throughout the entire period, the Qatargas crew experienced uninterrupted radio communications while loading operations took place.

"It's basically a completely new system that they used on their LNG tankers, enabling the bridge to talk to various parts of the vessel," Cushion says. "We went on board with our repeater, put it half way down the vessel and cured the problem."

"For the first time ever, we experienced uninterrupted radio communications, so we were extremely impressed," says Rajkumar Koodali Tazathveetil with Qatargas. "Before the trials, we were dubious, if only because we simply did not know that the technology existed that could really solve the problem. The FRX-1 proved time and again that the radio signal could be reliably maintained, which convinced us to invest in units for our crews to use offshore."

Qatargas bought four repeaters and is still in talks with Fern Communications regarding future communications needs. Qatargas uses the repeater for the one particular loading task.

Other customers, including large oil and gas companies, use the repeater for daily operations, Cushion says. "It's a unique product because it's portable, lasts for way over 20 hours and is intrinsically safe."

The repeater was built to address another oil refinery's communications black spot. A man-down issue highlighted the problem for the customer because workers didn't realize the man was injured.

"That's where our equipment matters. Yes, it enables them to stay in contact, but when it really matters, it can save people's lives," Cushion says.

With electronics engineers and industrial designers in house, Fern Communications recognized that it could produce a solution to the problem. "So we did that specifically for them, but then we realized there was a niche market for this product and from then on it has grown," he says. ■

Michelle Zilis is managing editor of *RadioResource International*. Email comments to mzilis@RRMediaGroup.com.

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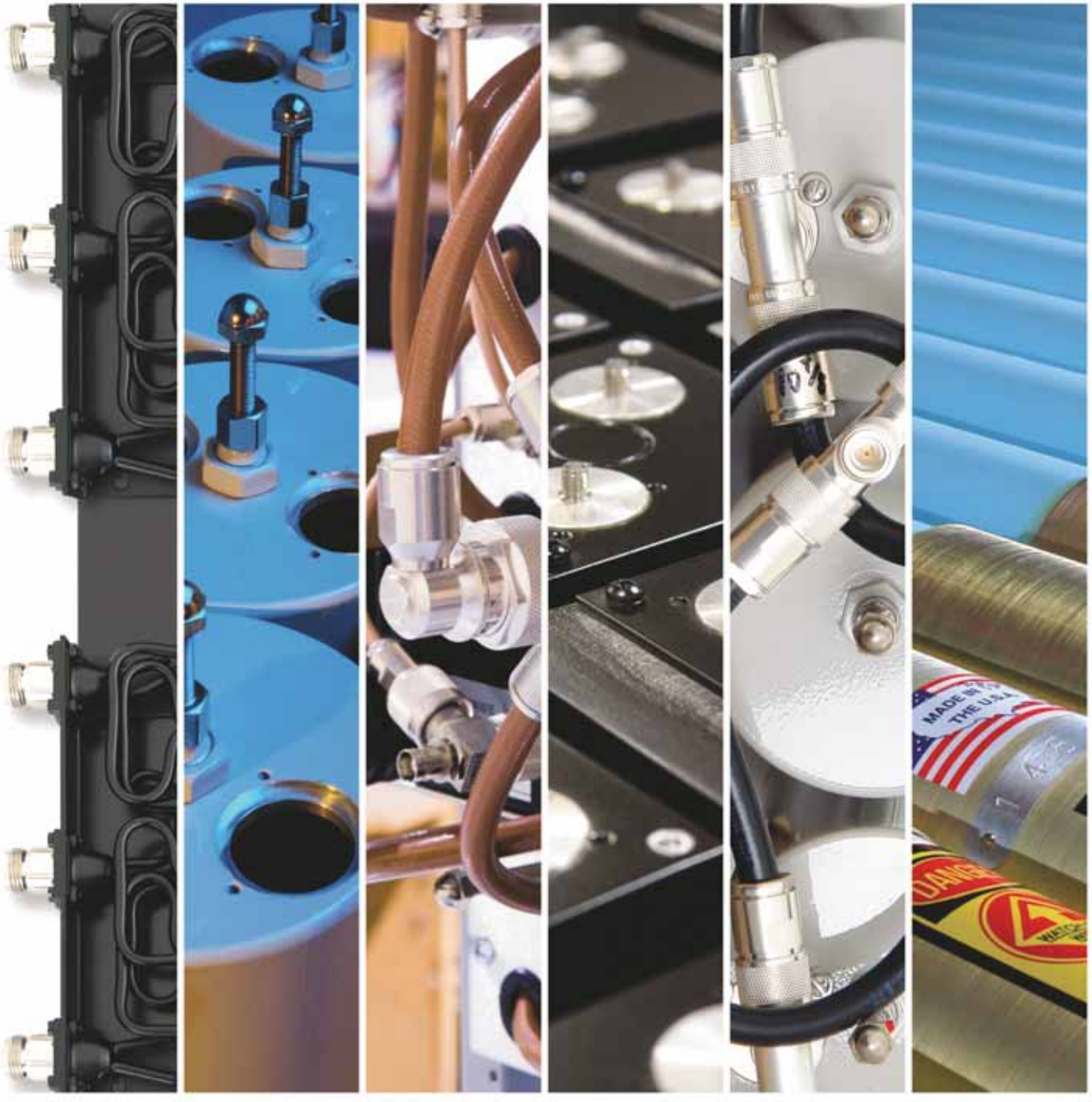

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