RadioResource INTERNATIONAL

THE GLOBAL INFORMATION RESOURCE FOR MISSION-CRITICAL COMMUNICATIONS

Public-Safety LTE
A Global Review

Inside

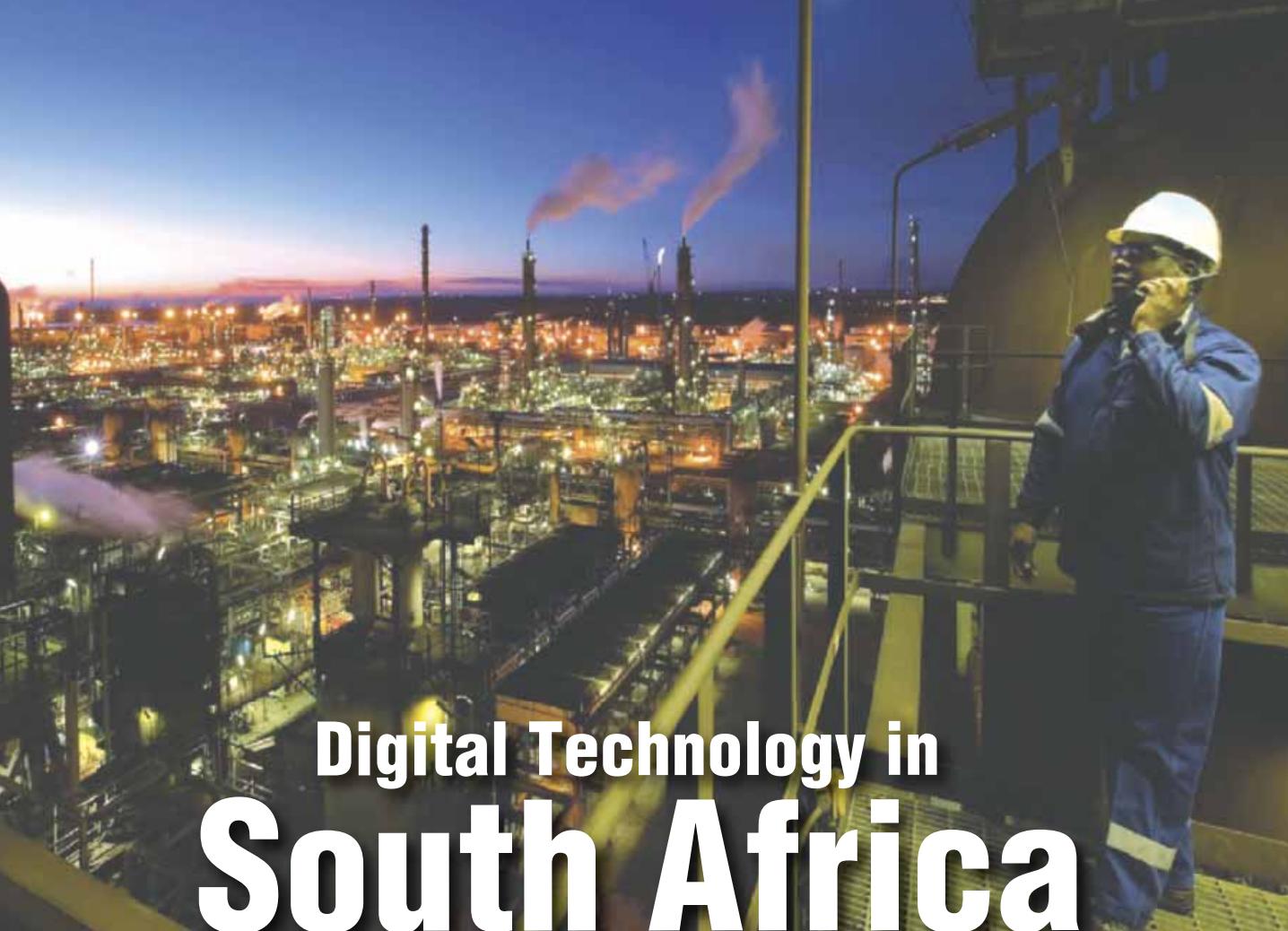**Digital Technology in South Africa**

Communications Cooperation in Finland

TCCA Renews Focus on Standards, Spectrum

Digital Technology in
South Africa

The critical communications market in South and Southern Africa is continuously developing with an increasing awareness of the need and value of safe and secure wireless communications in key industries across the economy. Contributing factors include the planned migration from analog to digital wireless communications and stricter regulations from government on the safety and security of employees and business operations. An increasing awareness, by relevant industries, of the value of safe and secure wireless communications is also present.

During the past year, new professional mobile radio (PMR) systems and upgrades to current systems have been put in operation in Southern Africa in the mining, safety and security, and oil and gas sectors of the economy. A commodities price slump had a significant impact on capital projects and expansion in the region,

As many critical infrastructure sectors upgrade to digital, energy company Sasol expands its TETRA network and features.

By Johan Hoolsema

mainly in the mining sector. However, Expert System Solutions' (ESS) experience has been that PMR system requirements in the different industrial/business sectors are mainly driven by strict government regulation of safety, health and security requirements. The requirements contribute to PMR projects being scaled down or extended across longer implementation timescales rather than canceling or postponing such projects. ESS has played a key development role within South Africa in the PMR industry by providing consulting, system engineering and system integration services to a wide spectrum

of key installations within South Africa. The number of solution-driven applications to unlock the true value of the infrastructure expenditure on critical communications systems is also increasing.

Energy Deployment

In the early 2000s, ESS proposed TETRA technology for Sasol to replace its legacy MPT 1327 radio network that could not handle its increasing capacity requirements. Sasol, an international integrated energy and chemicals company, has more than 32,000 employees worldwide, and its turnover is 4 percent of

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South Africa's gross domestic product (GDP). The firm has two locations in South Africa, Secunda and Sasolburg, that use TETRA technology for voice and supervisory control and data acquisition (SCADA) monitoring and control applications.

The 410 – 430 MHz system was engineered by ESS together with the Sasol Electronic and Communications team. Following a rigorous research and evaluation process, Sasol determined the Hytera Access-net-T system (previously Rhode & Schwartz) was best suited for its operational and user requirements. The system was put into operation in 2008. The initial system comprised 13 TETRA base stations and about 3,500 intrinsically safe handheld TETRA radio terminals.

The limitation on capacity caused problems with health and safety standards required for the firm's plant operations. The network was designed and built with a high degree of geographical separated redundancy. This made the network extremely reliable with an uptime better than 99.999 percent.

The robustness of the installed system has been proven through growth since its inception, with the system at times operating at more than double its initial designed capacity. To accommodate the growth and maintain the capability of the system, a "subscriber classes" functionality was added in 2014 to distribute the TETRA subscribers across the four high-capacity TETRA base stations. In 2015, the network's capacity was expanded by upgrading the IP infrastructure and equipping each TETRA base station in the plant area with eight carriers. The handheld terminal capacity increased to 12,000 subscribers. The current Sasol TETRA network in Secunda is one of the highest traffic-loaded systems in the world.

The success of the TETRA system at Sasol can be contributed to the sound and detailed process that was followed over an extended period of time in the design and engineering of

The transportable Health & Safety Announcement System is primarily used for temporary offices that require gas, fire and public-safety announcements.

the system requirements based on the company's operational and user specifications. From the start of the process, the Sasol Electronics and Communications team's active involvement helped support the success of the system's implementation and commission and ensured a well-trained and motivated team to support and maintain system operations. The operation of the Electronics and Communications section as a business unit has been an added value contributor. This initiative is a motivator for the team to unlock the full value of operational capabilities and features of the system to service any communications system driven requirements identified within the Sasol plant operations.

Telemetry Services

With its involvement in the TETRA system developments at Sasol and other installations, ESS identified that providing solutions and value-added services linked to

installed critical communications networks offered opportunities for a specialist communications enterprise. This formed a sound foundation for the development of its South African designed and manufactured TETRA remote terminal unit (RTU) to support telemetry/telecontrol services to its identified market.

The ESS TETRA-RTU was nominated by the TETRA + Critical Communications Association (TCCA) in the best TETRA innovation 2014 category. Having this in-house capability and expertise has positioned ESS well to benefit from a growing trend of expanding on available communications systems capabilities and unlocking value for the owners of the system. The ESS RTU is a valuable tool for providing operational monitoring and control solutions and optimizing system, safety and security features offered by the available communications system. A typical example is the increase in demand for automation, monitoring and control over PMR networks.

Typical ESS TETRA telemetry/telecontrol systems supplied to Sasol include pipeline monitoring, railway track monitoring and control, environmental monitoring and public address systems for indoor and outdoor applications. The public address system provides gas and fire alarms, as well as voice notifications in the case of incident and accident handling.

The RTU can operate on various wireless technologies such as TETRA, Digital Mobile Radio (DMR), digital Private Mobile Radio (dPMR), GSM and legacy MPT 1327. A built-in Linux microprocessor simplifies programming and allows the product to be adapted to client-specific requirements. The unit falls in line with ESS' development focus on providing solutions to meet the growing demand for wireless applications and data efficiency in the telemetry industry.

South and Southern Africa is expected to experience relatively good growth for 2016 and 2017 in

the trunked radio communications market. Various requests for information (RFIs) for digital wireless communications solutions that cover the transport, safety and security and mining sectors have been issued during the past couple of months. The South African RFIs issued indicate an increasing awareness of Long Term Evolution (LTE) for wide bandwidth applications in conjunction with mission-critical TETRA narrowband communications technology. A current constraint on LTE in South Africa, similar to experiences internationally, is the unavailability of sufficient spectrum for private communications networks. To address this, international suppliers provide a TETRA/LTE gateway to public LTE networks.

The debate on TETRA and LTE is ongoing internationally. In this regard, one can only reference the Netherlands' decision, which operated its C2000 TETRA network for 15

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years. In 2015, Dutch safety users investigated the latest reliable mission-critical communications technologies and found that TETRA, as a proven and mature technology, was still the best option for at least another 15 years. ∎

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