

WHITEPAPER

INTEGRATED SOLUTIONS – OIL & GAS

IMPROVING SAFETY, REAL-TIME DECISION MAKING AND ASSET CONTROL IN HIGH-RISK OIL AND GAS ENVIRONMENTS

sepura

Going further in critical communications



In high-risk environments, clear, accurate communication is a vital and a strategic element of worker safety. But a powerful voice and data network can have benefits far beyond worker protection.

By linking people, devices, remote assets, processes and back-office systems, a 'connected enterprise' can automate and streamline essential business processes, providing accurate and consistent real-time data, increased onsite security and superior asset protection.

A fully integrated voice and data network can also drive capital and operational efficiency, helping to preserve margins and maintain the reinvestment rates necessary to grow production.

This white paper examines the role that voice and data communications play in tackling the daily operational challenges of the oil and gas industry and creating the connected enterprise.



CHALLENGE: Integrating Devices

The **Oil & Gas sector** may be struggling from excessive reserves and production issues which are preventing Exploration & Production (E&P) development, opinion suggests that the Mid-Stream and Downstream activities require further economies in business processes, asset management and integration. With 60-70% of these installations still having analogue radio technology, there is opportunity to give real tangible business benefits to these installations through migration to a digital TETRA based infrastructure and the integration of work flow, asset management and personnel management data on the handset – replacing manual/human error and reducing Non Productive Time (NPT) and improving safety.

Whilst the majority of Oil & Gas companies have previously selected the defacto brand, there are now other players entering the market who are hungry and fleet of foot in building real value into their collaborative solution offerings.

When combined with a unified Critical Communications **hybrid LTE/TETRA infrastructure**, there are compelling business benefits to consider, where voice, data and real-time video services enable visibility, control, monitoring, maintenance and communications using a common platform, command and control architecture.



The **Sepura Group** has been working for **more than 40 years** designing, manufacturing and deploying critical communication systems for voice and data in professional segments as Public Safety, Public Transport and Energy, including in this latter sector, systems for Refineries, Pipelines, nuclear plants, etc...

While **SCADA and telemetry** protocols have been optimized for **narrowband data transmission** over some years, a new horizon for including the integration of corporate applications with the aim of **providing real-time information** to optimize decision making.

Besides these data transmissions, the solution is supplemented with **voice communications and video surveillance systems**.

Sepura has in its portfolio **systems that integrate different technologies** that provide the appropriate means to meet the communications requirements demanded by the Energy sector. Some of these solutions are listed below:

- **Voice communication** solutions for on-site personnel.
- Applications that exchange different type of **data** with **SCADA based telemetry systems and with Control Centres that manage and control remote assets**.
- **Video surveillance** solutions customized to these specific environments.

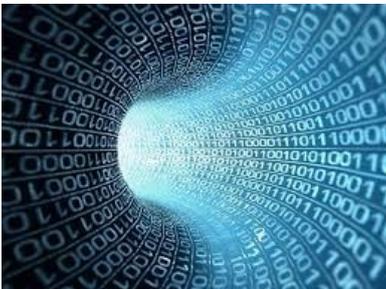
Voice Communications



TETRA offers **group, individual, broadcast, emergency, ambience listening calls**, etc. in order that every on-site personnel may communicate between themselves, between Groups and with the Control Centre.

Additionally, TETRA allows for the **integration with other external networks** in crisis and emergency situations (police, fire brigades, etc.) to work in a coordinated way during resolution.

Telemetry



Depending on the nature of data to be transmitted, it may be necessary to have either a **narrowband or broadband technology**.

In the Energy sector, we can distinguish between **real-time services** where we can include continuous monitoring in terms of Keep-alives and alarms and **operational services**, which could be the remote control of various network elements and data collection. Often, the transmission of such data can be solved using narrowband technology like **TETRA**. For other types of **real-time data transmission** for specific applications that require a higher bandwidth, it would be necessary to have complementary technologies that provide such higher capacity, as the **LTE** standard.

Video surveillance



To complement the essential functionality defined above, it may sometimes be relevant to have **video surveillance** functions, such as:

- Access control.
- Real time video to monitor specific areas of the plant from the Control Center.
- Real time monitoring in case of emergencies.
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To do this, it is necessary to **complement** the narrowband voice and data network for critical communications with a **broadband access radio layer** as for example **LTE**.

Competitive advantages of Sepura solutions

Some of the differentiating features that have made TELTRONIC a consolidated leader in providing solutions for professional radio are reflected in the following table:

CHARACTERISTICS	BENEFITS
Control of designing and manufacturing processes	Product and solution customization . Flexibility: integration of all solutions supplied by Sepura.
Wide range of solutions according to the required functionality	Adaptation to the needs of each project.
Integration with the facilities operation	Possibility of integration with other subsystems as access control, telemetry control systems, etc.
Unified, multiservice system	Profitability and economic viability .
Service delivery in mobility	Radio technologies specially adapted to mobile environments .
Redundant configurations	Maximum availability and reliability .
Standard services and protocols	For both radio access, frequency bands, standard voice and data services , as well as for video IP applications using standard compression H.264 and ONVIF compatible solution.
Adapted equipment to the Utilities sector	Both voice and data terminals, as specific data terminals and products specially designed for video .
Specially applicable standard services: status messages, SDS, packet mode data and circuit mode data, massive data transmission efficient protocols,...	Specific functionality for Utilities sector.
100% IP solution	Scalability in installation, deployment and systems capacity. Efficient and distributed maintenance.
Technology with capacity for growth	For future network expansion, integration of new services and ready to evolve towards new standard releases.
Gradual installation, easy maintenance, turnkey projects	Facilities for the customer.



Functionality

The following summarizes the main features offered by the TETRA standard and Sepura solutions for the Energy environment:

- **Critical voice communications between the staff and the Control Centre:**

- Individual calls, half and full duplex
- Group calls / broadcast
- Emergency calls
- Ambience listening calls
- Direct Mode calls (DMO)
- Interconnection of calls with security agencies



- **TETRA standard data communications:**

- Status messages with predefined content
- Short Data Messages (SDS) type 1, 2, 3 and 4, with or without TL
- Packet mode data transmission
- Multi-slot packet mode data up to 4 slots
- Circuit mode data transmission

- **Massive data transmission optimized method: SDM**

When in this particular Utilities sector we have hundreds or thousands measurement points, the network data traffic load is significantly increased.

The TETRA data transmission standard services, depending on the quantity of data to transmit, are not able to give the expected real time Service sometimes. To meet such traffic requirements, the system design and configuration become more complex, as many channels are needed per zone to cover such traffic.

Sepura has developed an optimized algorithm, the SDM (Synchronous Data Manager), that improves the performance and benefits of the standard, but at the same time allows to use all the TETRA power for the periodic data massive transmission, whether AVL positioning as telemetry.

With this method, up to 60% of necessary channels to obtain the same service compared with an asynchronous solution could be reduced.

- **Emergency response:**

In this type of environments it is very common to have workers carry out their works lonely, often in hazardous environments such as working at height or close to energy sources that can cause electric shocks. For this Kind of workers, TETRA offers the "lone worker / man down" functionality, so that if the person in question has an accident and falls, the terminal is able to detect and send an emergency signal to the control centre, also with the GPS position, so that it is faster and more efficient to send the help.

- **Broadband data communications:**

- Fixed video-surveillance (monitoring different areas of the plant, perimeter areas surveillance, intrusion detection, ...)
- Onboard video-surveillance (display real-time images from the various vehicles of the power plant and power sites)
- Files download and update on a regular basis and scheduled.

“An application can accelerate emergency response times by taking an image from any available source and distributing it simultaneously to a whole group of radio users.”



CHALLENGE: Workers safety

Maintaining safety of operation and dealing quickly with any unexpected incidents are key considerations for any organisation, but are of particular importance in high-risk environments.

- > Features such as **Man-Down** and **Lone Worker** combine with precise GPS location to ensure staff safety

Lone worker allows a user and control room to be 'linked' by the action of the reminder alert and button press to confirm. If a user does not press a key before the time expires, the radio automatically makes an emergency call or alert to a predefined address.

Man-Down is a combination of a hardware accelerometer and a software feature which detects motion (or lack of) and inclination (tilt). If a user falls and the radio tips past a predefined angle, or stops moving for a defined period, a loud alert will sound. If no user interaction occurs, an emergency call or alert is also made. Used in conjunction with GPS and STProtect indoor positioning, a control room can monitor the safety of the users in real time, even if they are alone.

- > **IECEx/ATEX compliant radios and accessories** allow quick and easy operation – even with gloved hands

Intrinsically Safe (IS) radios, such as the STP8X series, are essential for radio users working in hazardous environments; a highly tactile keypad can allow easy access to the extended functionality on the radio, even with heavily gloved hands.

IS-approved accessories save time and money by negating the need to move to a safe zone before connection or disconnection.

- > **Extended coverage in hard-to-reach areas**

Mobile gateways 'go with you', providing portable coverage for incidents and emergencies outside of the standard coverage area



CHALLENGE: Streamlining essential processes

Optimising the workload and maximising the efficiency of the workforce can help to reduce costs and accelerate production.

- > An app such as **Query** provides field workers with reliable, secure access to remote information - instantly. Providing mobile workers with quick and easy access to information held on multiple intranets and databases, the app combines results from concurrent queries in a single, concise response.

This streamlined information transfer improves accuracy and enhances response times, as well as freeing up valuable resources.



The Sepura Group is a global leader in the design, manufacture and supply of **digital radio products, systems and applications** for business and critical communications.

A **market leader** in over 30 countries, we're at the forefront of digital radio technology, and trusted by globally recognised entities such as FIFA, CERN, Disney, Audi and Shell, as well as some of the world's most prestigious public safety organisations.

From **TETRA and DMR to P25 and LTE**, our solutions encompass rugged and reliable radios; a network that's solid, powerful and easy to deploy; applications to boost organisational efficiency; and one of the broadest ranges of support tools and accessories on the market.

The Sepura Group comprises **Portalify, Fylde Micro** and, now, the advanced systems capabilities of **Teltronic and PowerTrunk**.

To learn more about what Sepura's solutions can do for you, get in touch with your local representative or visit www.sepura.com

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