Integrated solution for Utilities sector

The Utilities market is a key sector in the development and growth of societies today since it is an essential piece in the productive economy and provides the more and more demanded welfare among the population.

Constant change in the industry due to continuous technological innovation makes new challenges for solutions providers for this market appear.

It is necessary to be adapted to new forms of energy distribution on smart grids at the same time ensuring energy efficiency; that means to optimize energy consumption and in turn costs.

To do this, the communications systems must be able to provide a continuous and reliable service to ensure that energy systems are recovered as soon as possible in case of failure or emergency since the services they provide are vital for the population: hospitals and medical centres must be quickly restored from electrical outages, nuclear power plant incidents must be dealt with swiftly and accurately, and downed wires must be isolated and de-energized quickly to minimize danger.

Business customers manage complex tasks which could mean significant gain or loss of productivity to their organizations. Communication systems need to be operational 24x7 and be able to provide workers the tools to boost performance.

Sepura's TETRA solution provides standard mission-critical voice and data communication features, as well as lone worker / man down functionality and data transmission over radio for SCADA-based telemetry applications. Besides, the communication systems can be complemented with video surveillance solutions tailored to each facility.
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1. Professional communications solutions for Utilities

SEPURA 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 or Utilities, including this latter systems deployment for Utilities companies, generation-distribution plants, nuclear plants, etc...

While SCADA and telemetry protocols are already optimized for narrowband data transmission for years, a new horizon for managing smart grids is open for professional communications networks providers.

Based smart grids systems have to integrate information and communications with the Utility infrastructure. The aim is to provide real-time information to make more efficient the use of the grid to fully optimize the power consumption and cost reduction.

Besides these data transmissions, the solution is completed 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 Utilities sector. Some of these solutions are the next:

- **Voice communication** solutions for the facilities staff.
- Applications to exchange different type of data with SCADA based telemetry systems and with Control Centres that manage the Smart grids.
- **Video surveillance** solutions customized to these specific environments.

1.1 Voice communications

TETRA offers group, individual, broadcast, emergency, ambience listening calls, etc. in order to every staff people can communicate between them and with the Control Centre.

Besides, allows the integration with other external networks in crises and emergency situations (police, fire brigades, etc.) to work in a coordinated way during its resolution.
1.2 Telemetry

Depending on the nature of data to be transmitted will be necessary to have a narrowband or broadband technology.

In the utilities sector, we can distinguish between real-time services where we can include continuous monitoring in terms of Keep-aliases 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 with the narrowband technology TETRA. For other types of smart metering or massive 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.

1.3 Video surveillance

To complement the essential functionality defined above, in this type of installations can be interesting 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
- ...

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.
2. Competitive advantages of SEPURA solutions

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

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

The following summarizes the main features offered by the TETRA standard and Sepura solutions for the Utilities 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 work 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
4. Data traffic. Case study

The CAIDI (Customer Average Interruption Duration Index) gives the average outage duration that any given customer would experience. Can also be viewed as the average restoration time.

Improving the required time to detect power outages can minimise the time to solve them and therefore involving a great economic saving to power utilities.

In some countries, the decreasing of this index can be a big economic saving in cost or the goal to obtain grants due to the services improvement.

It is therefore a key point to have a quick refreshment of remote units state to detect a possible problem as soon as possible and reduce the CAIDI.

Following, a practical example of traffic data in a typical Utilities system is shown. It compares the use of TETRA standard data transmission and the Sepura optimized algorithm SDM for sending bulk data.

Considering a rate of up to 10 messages per second per control channel with SDM, in 100 zones and using only one control channel, it is possible to send up to 1000 messages per second, that means that is possible to update the state of the 10000 remote units in 10 seconds using this technique.

If besides this, we use all the power offered by the eNEBULA system, we can use up to 3 secondary control channels per zone besides the main control channel, and the refreshment time could be even shorter.

The SDM allows also sending the information contained in the Utilities typical protocols (IEC 60870-5-101/104, DNP3, …). The received packets in eNEBULA, with a typical size of 120 bytes (and maximum 255 bytes according to these protocols), would be encapsulated in 20 bytes packets and sent by SDM. Towards the SCADA system, the opposite process would be performed, the packets would be grouped and delivered to the SCADA system in a transparent manner.

eNEBULA features a powerful command set called N2A (Network Interface IP Access), which allows to integrate any third party application based on IP to perform the IEC 60870-5-101/104, DNP3, … protocol conversion to SDM and vice versa.
In this scenario, using the SDM protocol we could also absorb the GPS position refreshment of the vehicle fleet operating in the Utilities. Up to a 2000 vehicles fleet, the refreshment times of remote units state and vehicles GPS position, would not suffer a significant increase.

Example: Requested time to manage the “keep-alive” and alarms signals for a set of 10000 remote units registered in a network of 100 Base Stations with uniform distribution.

- 10000 remote units
- 20 bytes of information
- 100 SBS

>2 Hours

<10 Seconds

In this scenario, using the SDM protocol we could also absorb the GPS position refreshment of the vehicle fleet operating in the Utilities. Up to a 2000 vehicles fleet, the refreshment times of remote units state and vehicles GPS position, would not suffer a significant increase.
5. Migration

Often Utilities have older analogue networks (PMR, MPT-1327, ...) which in addition to not providing key features such as redundancy, limited data services, reduced spectral efficiency, etc., they are limited in growth and therefore have saturation problems. This limitation makes they cannot grow into new services and future needs.

Sepura is able to provide migration solutions to the new digital network that will be capable of satisfying the real and future needs of a professional communications network.

The Sepura migration platform, CeCoCo, allows in an easy manner that the previous and the new network can survive whilst the different migration phases are carried out.
6. Complete and integrated solution

The diverse applications scenario described above is solved sometimes by several independent and not integrated communications systems.

This, in addition to coordination problems, especially serious in critical situations, can result in high investment and maintenance costs. The unified multiservice solution proposed by SEPURA combines all the communication needs on an integrated system, thus optimizing operating costs and maximizing the return on investment.

- Telecommunications infrastructure (TETRA & LTE)
- Network Management System (NMS)
- Communications and migration control centre (CeCoCo)
- Handheld terminals for staff (voice and data)
- Mobile terminals for maintenance vehicles (voice and data)
- Desktop terminals for offices (voice and data)
- Special terminals for data

6.1 Telecommunications infrastructure eNEBULA

ENEBULA is the SEPURA mission critical radio infrastructure for integrated communications.

It is a multi-technology platform:

- TETRA standard voice and data services.
- Broadband data services through LTE radio access.
- Guaranteed compatibility with TETRA systems already deployed and in operation.
- Scalable solution to adapt the network deployment to the customers needs.

And with a single NMS as a unique operation and management point.

It is a Sepura 100% design and manufacturing without dependence on third parties, which allows providing the user with a PMR professional service both narrow-band communication (TETRA) and broadband (LTE): group communication, redundancy management, fault tolerance, fallback operation modes, etc ...
Being a single network with two natively technologies (TETRA and LTE), the required CAPEX is reduced to the minimum and protects the existing investments in narrowband technology.

6.2 Network Management System (NMS)

The NMS (Network Management System) is based on FCAPS industry standard (Fails, Configuration, Alarms, Performance and Security), it provides an intuitive but powerful tool to configure, monitor and check the performance of all components of the TETRA and LTE network, including a unified subscriber management.

eNEBULA carries out an internal control of its status and sends different alarms that can be displayed in the NMS client, reporting the potential identified problems.

It also supports SNMP (Simple Network Management Protocol), is part of the infrastructure IP access (N2A protocol), and is located in the services belonging to the IP standard.

SNMP is a way to be connected to eNEBULA through conventional IP services, which can be used to connect external applications that monitor the infrastructure state in a centralized mode along with other client subsystems that need to be monitored.
6.3 Control Centre CeCoCo

The Sepura control centre allows having a unique platform from which all the system voice communications (radio, telephone,…) are managed from a single interface and enabling the integration of different technologies to make easier the migration process.

The CeCoCo services module allows having reports with all event or emergency data. Improves daily operations by creating periodic activity reports and following up of incidents.

On the other hand, in the GIS module an integrated cartography that allows locating both vehicles and people is displayed.

Besides, enables the integration with the SCADA applications operating in the system.

6.4 Terminals range

Sepura has different alternatives depending on the communication needs of each component of the Utilities sector and the environment in which they will move.

Following is a brief summary of the main features of the different terminals that Sepura proposes for this sector:

Radiomodems

- Integration by 3rd Party developers
- Advanced solutions

- SRB Board
- DCM300
- DCM400
SRB Board:
A slim-line, high performance, voice- and data-capable TETRA radio board, the SRB provides a customisable TETRA engine to meet the requirements of third-party solution providers.

♦ 1.8W RF power for enhanced coverage in TMO and DMO
♦ 2 independent serial peripheral equipment interfaces
♦ Voice interface allows apps to implement voice calls
♦ Air Interface encryption and authentication options
♦ Multi-slot packet data
♦ Circuit-mode data
♦ Status messages
♦ SDS

DCM300:
Advanced configuration of radio modem board

♦ Capture, processing and data transmission from other equipments: sensors, measuring equipment ...
♦ Designed to operate in the most adverse conditions: ATEX, IP65 or IP67 cases
♦ Compatible with main SCADA protocols: IEC 60870-5-101 / 104, DNP3, PAKBUS, MODBUS ASCII, SINAUT...
♦ Supports air interface encryption for a secure information transmission

DCM400:
DCM400 manages dual communications, embedded GPRS and/or external TETRA radio via PEI interface. Depending on preferences and network availability, it switches between GPRS or TETRA (Packet Data or TCP/IP over SDS).

♦ DIN rail mounting enclosure
♦ Linux operating system
♦ Capture, processing and data transmission from other equipments: sensors, measuring equipment ...
♦ Compatible with main SCADA protocols: IEC 60870-5-101 / 104, DNP3, PAKBUS, MODBUS, DF1...
♦ Multiple I/O interface for external digital signal input/output
SC20:

- **Broadband-ready**: UNIQUE second data bearer allows data access via a broadband data network, such as Wi-Fi or, in the future, LTE
- **Class 3 high-power TETRA RF** transmission and exceptional receive sensitivity for extended operational range
- Powerful **2W audio** with enhanced fidelity ensures clear voice communication, even in high-noise environments
- **2.4” high-resolution** QVGA screen anticipates increased apps usage and allows easy viewing in all light conditions
- **Enhanced apps capability**, via SDAs
- **UNIQUE notification bar**
- **UNIQUE water-porting technology** maintains clear communication even in the harshest of weather
- **Integrated RFID tag**
- **DMO repeater**
- **Super-sensitive GPS capability**
- **Glove-friendly design** with haptics
STP9000 & STP9100:

♦ Class 3L TETRA RF power (1.8W)
♦ IP66 and 67 environmental protection
♦ Large colour screen with ‘twist and zoom’ feature
♦ Integrated Bluetooth option
♦ Integrated RFID tag
♦ DMO repeater
♦ Super-sensitive GPS capability
♦ SDA radio apps, WAP and status-triggered functions
♦ Optional Man-Down alarm
♦ Coloured bezel options

STP9200:

♦ Class 3L TETRA RF power
♦ Monochrome screen
♦ IP67 environmental protection
♦ Integrated RFID tag
♦ DMO repeater
♦ Super-sensitive GPS capability
♦ Coloured bezel options

STP8X000 & STP8X100:

♦ V6 IECEx/ATEX-approved
♦ IP67 rating (dustproof, waterproof, submersible)
♦ Long battery life
♦ Bluetooth connectivity
♦ Optional GPS and Man-Down alarm
♦ MicroSD card slot
♦ SDA radio apps, WAP and status-triggered functions
SRG3900:

- IP54 environmental protection
- **10W** RF power provides the greatest operational range of any TETRA radio
- **8W audio** drive
- Gateway
- DMO repeater with call participation
- Optional GPS
- SDA radio apps, WAP and status-triggered functions
- Air Interface and end-to-end encryption options
- Support for up to six accessories
- **Dual remote console** support
- Large, high-resolution colour display with night mode to reduce glare
- Up to three audio accessories per console
- Coloured bezel options
7. References

Below, a list with the main SEPURA references in the market of utilities and similar segments:

- TGP (Peru Gas Transportation), Peru
- MCS Digital / Thales Mulwala, Australia
- BC-Hydro, Canada
- MCS Digital, Shell Geelong refinery, Australia
- COELCE, Brazil
- CST Arcelor Mittal Tubarao Iron and Steel Company, Brazil
- MCS / Rio Tinto, Australia
- Medgaz, Algeria
- CFE (Comisión Federal de Electricidad), Mexico
- Metragaz, Morocco
- Enagás, Spain
- Itelazpi / Bilbao Bizkaia Water Supply Consortium, Spain
- Guadiana Hydrographic Confederation, Spain
- Emcali, Colombia
- Kazakhstan Temir Zholy (KTZ), Kazakhstan
- Ontario Power Generation (OPG), Canada
- Agnico Eagle Mines / Meadowbank mine, Canada
- PROTAB / Sierra Gorda mine, Chile
- Diverse Power, COBB EMC, Flint Energy, EEUU

Some of these references are more detailed in next points:

- **COELCE, Brazil**

  Coelce, Endesa distributor in Brazil, supplies to 184 municipalities in Ceará, with a population of more than 8 million people and 149 square Km. It is the third largest distributor in the Northeast traded volume of energy: 99 substations, 1024.284 km of distribution lines and 4503 Km of transmission.

  SEPURA supplied COELCE a TETRA system to provide coverage throughout the metropolitan area of the state capital, Fortaleza. The system primarily serves staff and maintenance COELCE services and is growing from the beginning of operations in 2008.

  The current system can be reused and extended (if needed) to secure communications solution in the future and provide economic and secure data applications.
• **BC-HYDRO, Canada**

The BC Hydro and Power Authority is a Canadian electric utility in the province of British Columbia. It is the main electric distributor, serving 1.8 million customers in an area including over 95 percent of British Columbia's population.

For the efficient and safe execution of fieldwork during normal and emergency operating conditions, BC Hydro crews require reliable and convenient mobile voice communications at all substations, dams, and generating stations, and along all distribution and transmission lines. Although the main requirement is for voice, BC Hydro will also use the mobile communications system for data applications such as short data messaging and remote telemetry.

The BC Hydro PowerTrunk network covering Vancouver and surrounding areas consists of 25 TETRA 409-430 MHz site base stations, connected via the BC Hydro IP backhaul network, and up to 820 TETRA terminals as 450 mobiles, 350 handhelds, 20 fixed. To give support to 14 operators, PowerTrunk provides 3 CeCoCo command and control centres that interface to BC Hydro's legacy VHF system.

• **CFE (Comisión Federal de Electricidad), Mexico**

CFE, the most important electricity company in Mexico which generates and distributes energy for 25.8 million customers, has chosen SEPURA terminals to improve operation and versatility in its TETRA network.

SEPURA has supplied 250 mobile terminals in the region of Guadalajara and another 88 radios for use in other Mexican states, and plans to supply further HTT-500 TETRA handportables in the near future.

The MDT-400 TETRA mobile radio presents a wide range of options which allows numerous possibilities for the customer such as programmable I/O option, internal GPS with LIP protocol, PEI interface, etc.
Regarding the HTT-500, thanks to its 3W output power, radio service is significantly improved in areas with poor coverage; a key point for this project.

This project is a clear example of the successful interoperability process in TETRA technology, as the SEPURA terminals are completely integrated with the infrastructure from another vendor.

- **ARCELOR MITTAL, Brazil**

  The Tubarao Steel Company (CST) is one of the two most important plants belonging to Arcelor Brazil. The communications system implemented in this project required high reliability and redundancy, especially in sensitive areas such as blast furnaces. Work conditions could be extreme including high temperatures, a large amount of iron powder, high salt levels, as well as damp, tropical, industrial environments subjected to significant vibrations. Highly aggressive operational environments within the plant demanded a communications system with fast reaction times. Plant productivity depends on the efficiency of its operations which is reflected in increased profitability.

  SEPURA was selected as the network provider and also provided maintenance service.

  The network has been designed so that it achieves the requirements of wide-area coverage reaching all areas of the plant such as sintering, railway, blast furnaces and offices. The new system is integrated with the public telephone and corporate networks; the plant uses SCADA systems and 24-hour monitoring with CCTV cameras and alarms. Communications recording is also available.

  SEPURA’s NEBULA infrastructure provides redundancy and also fulfils the requirement of allowing network growth. A second phase is therefore planned to increase the number of base station carriers, allowing more communications channels as well as the acquisition of another 1,000 hand portables and hundreds of mobile terminals.
Kazakhstan railways

SEPURA has supplied to the Kazakhstan Temir Zholy (KTZ), Kazakhstan’s national railways company, the first ever TETRA network to support a rail signalling solution based on the European Traffic Control System (ETCS). This solution has been named Radio-based Train Control (RBTC) in Kazakhstan.

Until now TETRA technology has been deployed in such mass transit systems as buses, subways and tramways. The KTZ project is the first to rely on TETRA to support the signalling data requirements in a long-distance railway. The SEPURA TETRA communications system meets all requirements for ETCS rail signalling system communications and is more efficient and cost effective than the routinely deployed GSM-R technology. TETRA also operates at lower frequencies, improving coverage and reducing equipment costs. Call set-up times are also much faster over TETRA.

SEPURA committed to delivering a fully integrated radio system to meet KTZ specifications, which includes functionality comparable to ERTMS Level 3. The European Rail Traffic Management System (ERTMS) is an initiative backed by the European Union to enhance cross-border interoperability and signalling procurement. Using SEPURA’s IP interfaces, the TETRA communications equipment has already been successfully integrated guaranteeing the high safety level required for rail signalling and control systems.

Although this project is not strictly related to the utilities market, it is a very interesting reference because the main application (radio communication to support data from train control – signalling) is based in TETRA data services, specifically Packet Data Service, being demanding by the application a high level of availability.

ITALAZPI / Bilbao Bizkaia Water Consortium, Spain

The project aims to provide the different stations of Water Supply consortium Bilbao Bizkaia in the valley of Arratia, the Durango and Undurraga stations communication between them and with the central control station through the TETRA network Itelazpi.

The scope of the project is 600 remote stations and TETRA DCM-300 equipment composed of TETRA TRM-300 SEPURA radio modem in every station. The DCM-300 is connected to the communications processors of Siemens and Schneider PLC’s, using the SINAUT and IEC104 protocol over TCP/IP.
The DCM 300 combines in a unique compact device all benefits of capture, processing and wireless data communication to provide coverage to telemetry, telecommand, telecontrol and remote management of PLCs systems.

- **Ontario Power Generation (OPG), Canada**

On March 11, 2011 a magnitude 9.0 earthquake followed by a tsunami struck the east coast of Japan, causing widespread damage, including a significant loss of safety equipment and a total loss of power at the Fukushima Daiichi Nuclear Power Station. Following the loss of back-up battery power, internal and external telecommunication links at the station were left either severely crippled or completely severed in the midst of one of the most significant nuclear disasters in our time.

In the aftermath of the Fukushima Daiichi event, thorough reviews were completed to assess the ability for OPG to respond to a Beyond Design Basis Event (BDBE) at the Darlington and Pickering Nuclear Stations similar to the event at Fukushima. The results of the assessments deemed that the existing telecommunications were not sufficiently robust to survive. In order to address this vulnerability to facilitate communication following such an event, PowerTrunk (subsidiary company of SEPURA in North America) was selected to provide a new Rapid Deployment Disaster Management Communication System.

The decision to go with a TETRA-based emergency communications system was the result thorough research by OPG of different radio technologies, and it was concluded that TETRA’s spectral efficiency, cost, voice quality, and data services provide the best overall solution.
Diverse Power, COBB EMC, Flint Energy, EEUU

Diverse Power Inc., an electric utility company based in La Grange, Georgia, has reached an agreement with PowerTrunk, Inc. (part of the Sepura Group) to upgrade and expand its digital TETRA two-way radio communications network. The project will consist of the integration of the PowerTrunk-T TETRA network infrastructure with the existing TETRA network owned by Diverse Power. Several additional site base stations will be added to the TETRA network in order to provide increased radio coverage over a wider area. Diverse Power furthermore has chosen to implement Sepura technology STP9000 TETRA portable radios and SRG3900 mobile gateways as the end-user equipment.

Besides, the current Diverse Power Control Centre has been integrated with PowerTrunk-T system through N2A protocol.

Diverse Power, besides providing coverage service to Diverse Power itself, there are other users of the Diverse Power network: Harris County Police, Georgia Right-of-way,...

On the other hand, Cobb EMC, an electric utility company based in Marietta, Georgia, will upgrade and expand its digital TETRA two-way radio communications network. The project will consist of the integration of the PowerTrunk-T TETRA network infrastructure, upgrading the existing TETRA network and joining the TETRA network owned by Diverse Power. Several additional site base stations will be added to the TETRA network in order to provide increased radio coverage over a wider area. Cobb EMC has also chosen to implement Sepura STP9000 TETRA portable radios and SRG3900 mobile gateways as the end-user equipment.

Other Utilities companies in the region are also planning to be joined to Diverse Power TETRA network, as recently has made Flint Energy EMC, that provides energy services to residential, commercial, industrial, and agricultural members in parts of 17 central Georgia counties.
8. Conclusions

- **Utilities** sector has requirements for both **voice and data** radio communications. Although there are several available PMR alternatives, **TETRA** offers the most advanced and most efficient means for simultaneous voice + data.

- **TETRA** is capable of providing a variety of services to support Utilities operational and maintenance activities as telemetry / SCADA, AVL tracking, emergency response, etc.

- **TETRA** can play a role within the advanced scenario for Utilities markets and also be integrated with Wireless Broadband solutions to form hybrid networks for Utilities applications. Thus, a **sustainable and robust solution** for the future is guaranteed (growth, integration of new applications, etc ...).