InfiNet wireless

InfiNet Wireless Solutions for Digital Oilfields

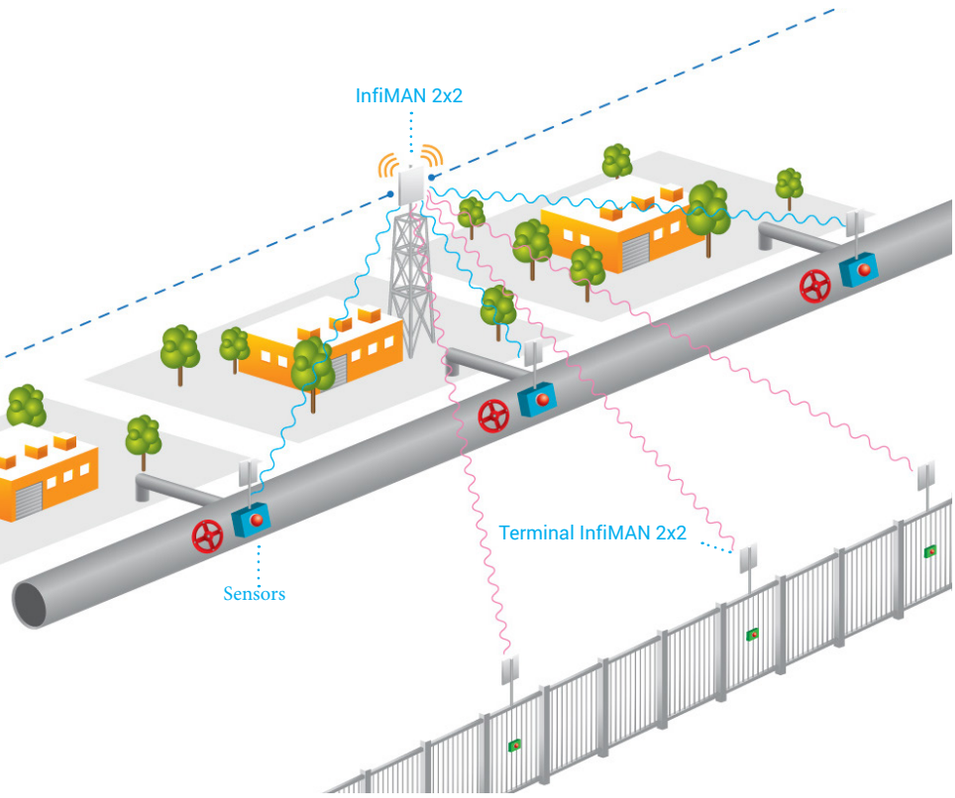
- Real-time Telemetry & SCADA: two-way transmission of data
- Offshore-to-onshore connectivity
- Remote asset monitoring and management
- Reliable even in the harshest conditions

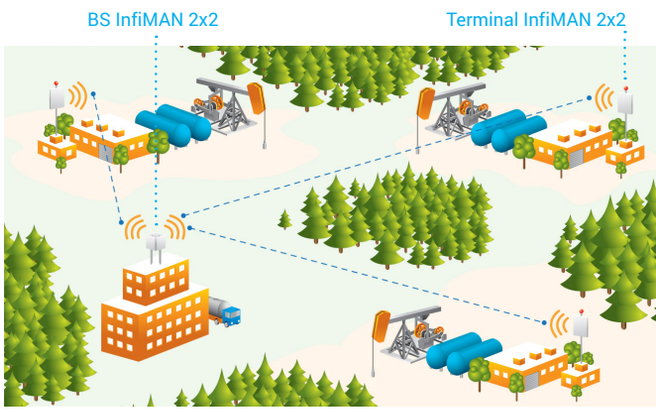
Application Notes

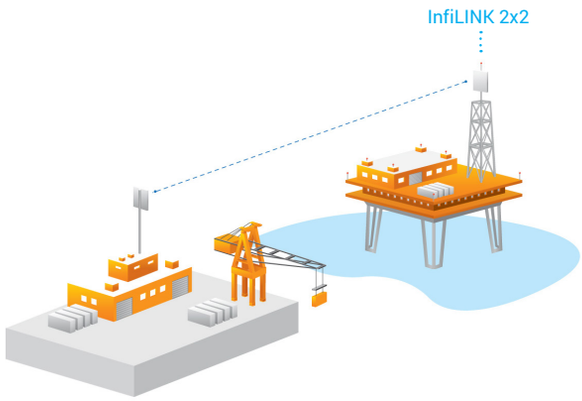
What do oil companies expect from their communication infrastructure?

Located in remote and harsh environments, oil and gas fields are complex operations, regardless of geographic location. They need to be adaptable to the ever shifting environment, with drilling fields sometimes being in remote locations. The successful operation of such fields relies heavily on reliable, stable connectivity between departments and assets, whether manned or automated. A good communication infrastructure must therefore seamlessly integrate a number of applications ranging from telemetry/SCADA and video surveillance to office automation. All of this must be delivered instantly, securely and reliably.

The best communications infrastructure technology available today for oil and gas companies is wireless broadband. InfiNet Wireless offers a number of bespoke solutions for the deploymentand operation of entirely private and reliable infrastructures, each one enabling companies to increase efficiency and productivity while reducing operational costs and ultimately increasing profits.



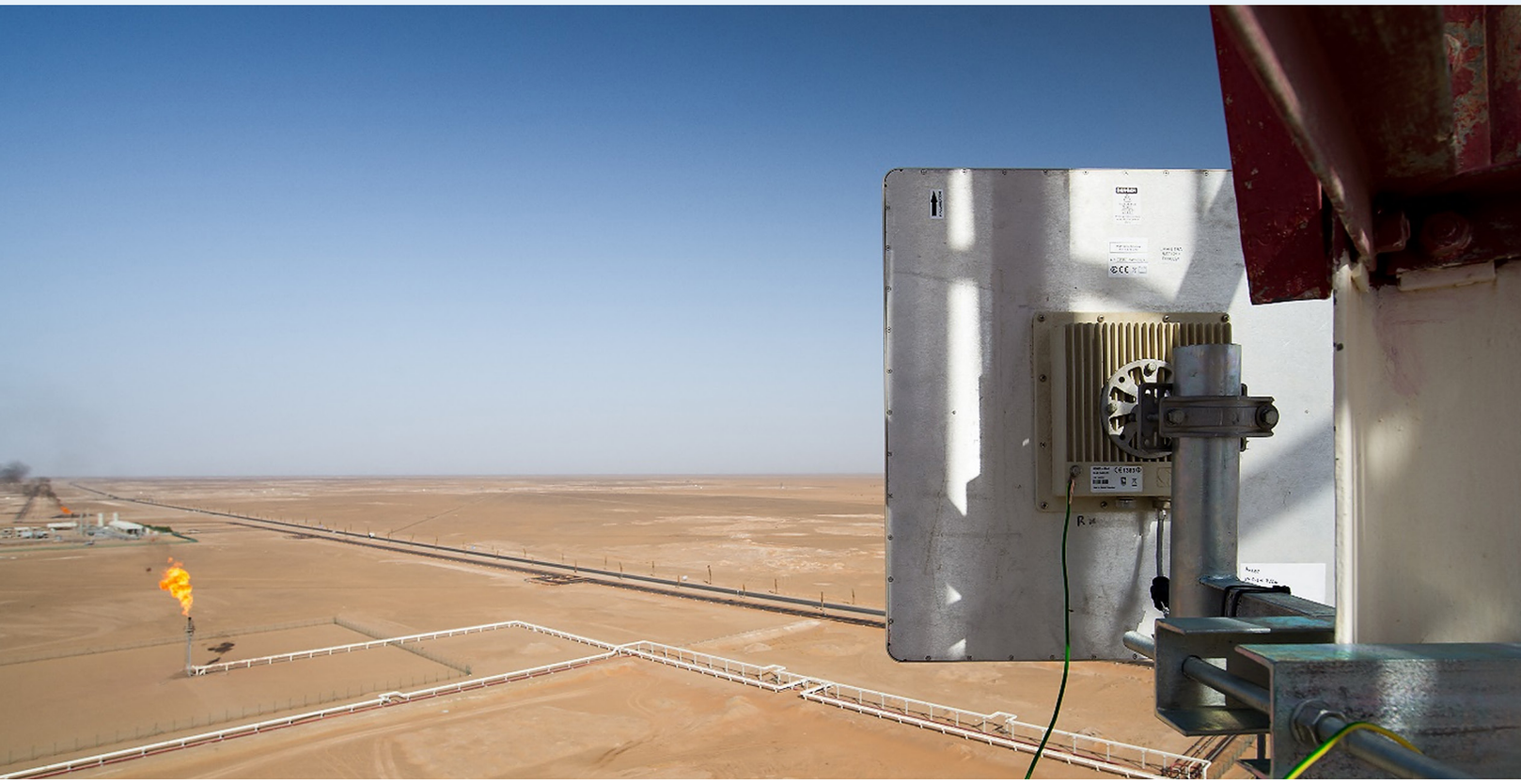




InfiNet Wireless connects people and vital assets through around-the-clock, high-speed network, creating a truly Collaborative Work Environment (CWE). The solutions available comprise of robust wireless devices that have proven to continually operate without interruptions even in the harshest environments.

Some of the applications we have delivered so far include, but are not limited to:

- Telemetry & SCADA data for planning, reporting and management of exploration and production assets
- Access Control & Perimeter Protection
- Field Automation
- Process Management
- Environment Monitoring
- Video surveillance to monitor drilling activity and secure assets
- PA – Emergency Communications Broadcast
- Rig-to-ship and rig-to-shore communications
- Nomadic connectivity to mobile drilling assets and operational offices
- General office communication: emails, corporate messaging, CRM and ERP systems, voice over IP services, video conferencing, etc.



Challenge #1

REAL-TIME COMMUNICATION

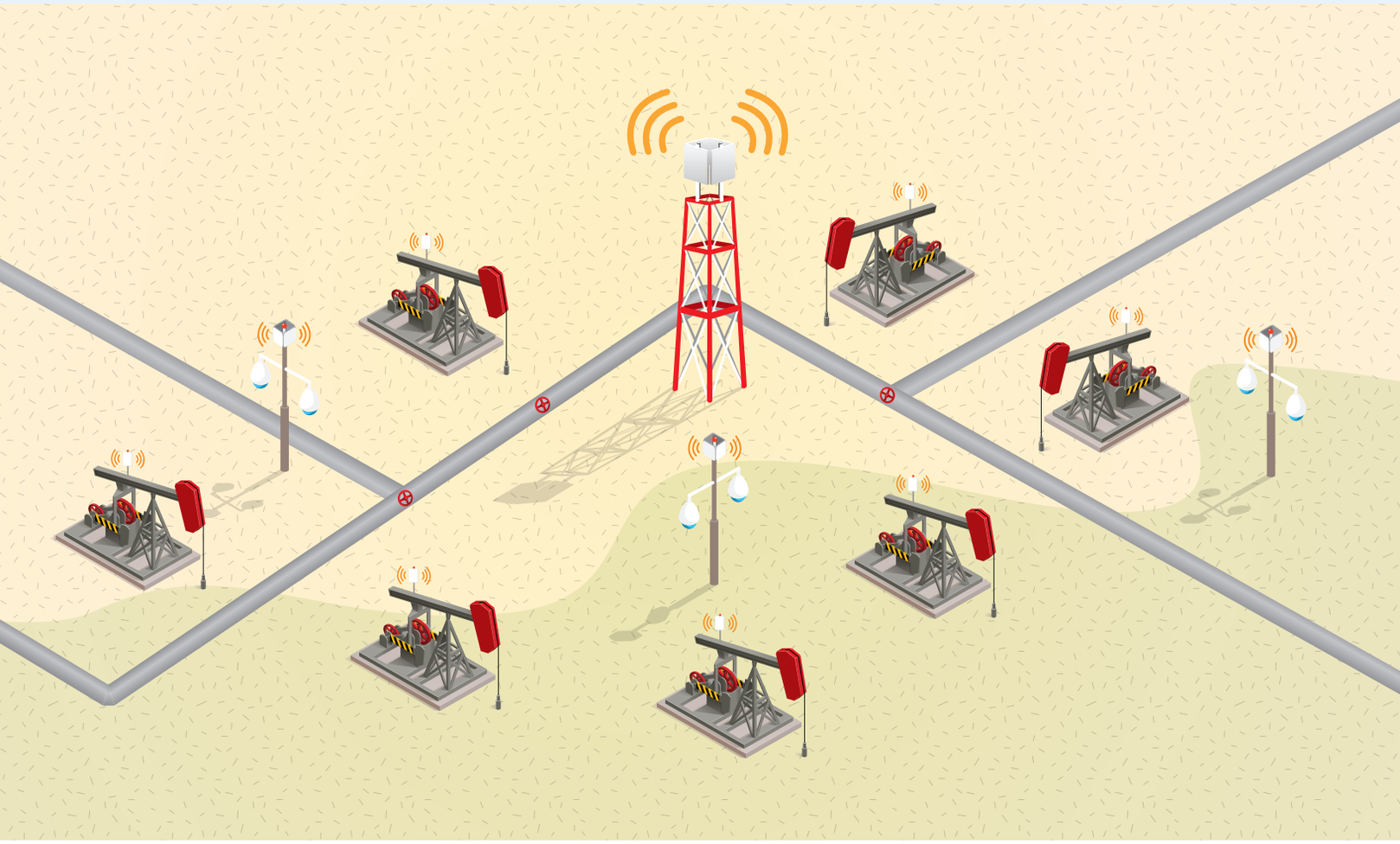
Exploration and production assets often have to be deployed in remote areas across difficult terrains and with limited road access.

Solution:

Our proprietary transport protocols MINT couples with TDMA technology and QoS policies for traffic prioritization even on L2 level.

Benefits:

1. QoS for selection priority data with incoming traffic.
2. Proprietary MINT protocol to schedule priority data first in-row.
3. TDMA technology to control latency and more important jitter.



Challenge #2

ASSET SURVEILLANCE AND MONITORING

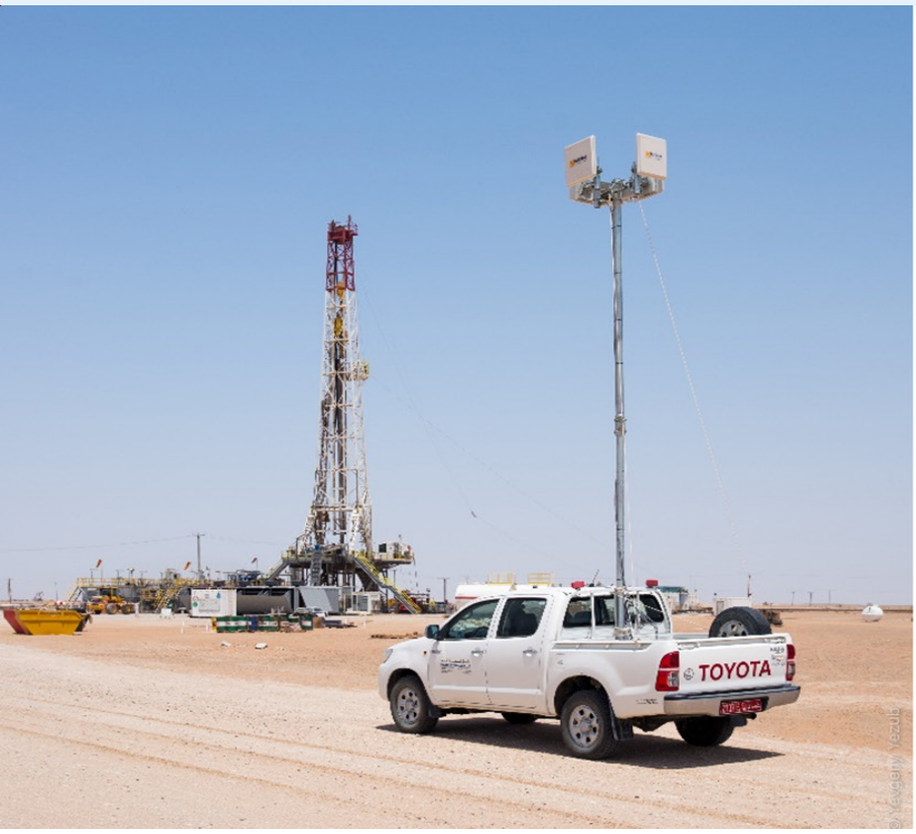
Isolated pipeline and expensive well heads located in isolated areas often make an attractive target and can be easily vandalized, costing the operating companies millions in lost revenues.

Solution:

Our proprietary video transmission protocols, coupled with advanced interference mitigation and QoS policies, enable uninterrupted connectivity 24x7x365.

Benefits:

1. Keep an eye on your high value assets, with real-time visibility wherever you are.
2. Significantly reduce maintenance costs through pre-emptive asset monitoring and management.
3. Upcoming operation planning requires online assets assessment.



Challenge #3

MOBILE UNITS AND OFFSHORE OPERATIONAL SUPPORT

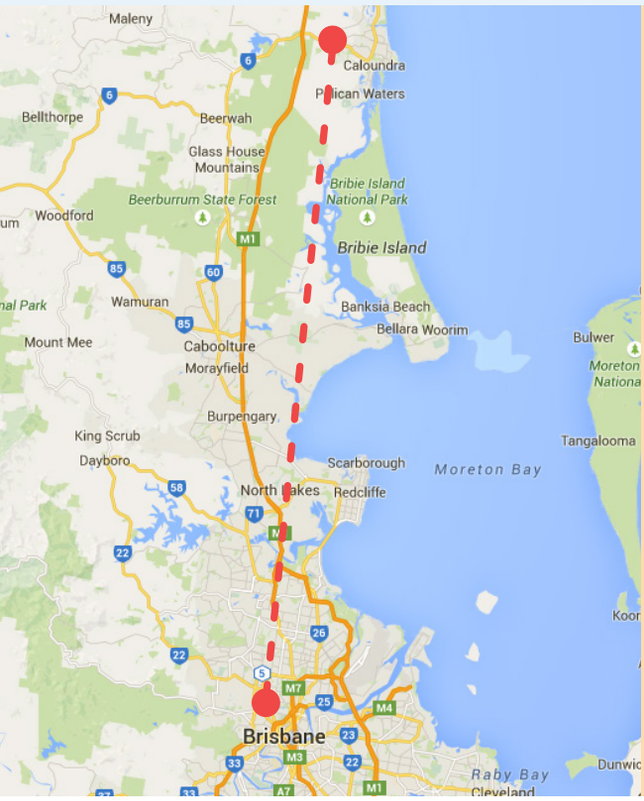
Keep crews and vessels on the move permanently connected and give them access to VoIP, SCADA data and email when traveling between sites. Transmit critical information to and from an inbound tanker or maintenance boat. Deploy a temporary location in the shortest time possible.

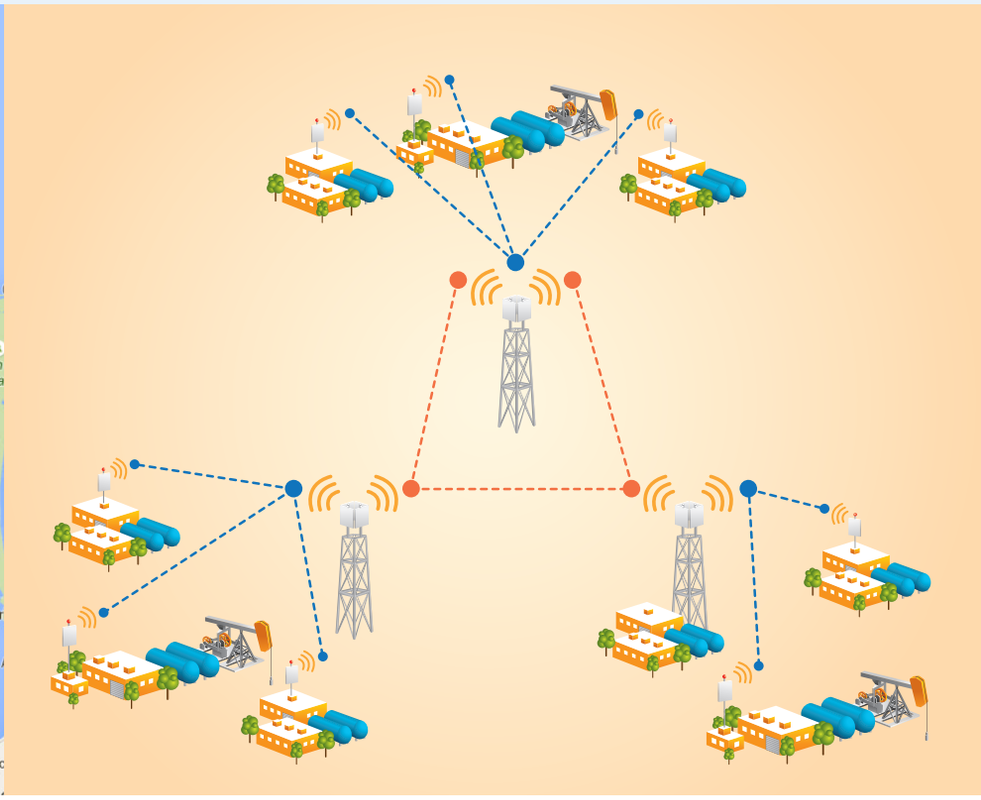
Solution:

Infinet Wireless provides plug-and-play technologies with quick setting up and alignment, automatic base station tuning and a special InfiMUX switch for aggregation, all designed specifically for nomadic units and mobile vessels.

Benefits:

1. Provide seamless connectivity to wherever communication is needed, e.g. on an offshore rig, an oil platform, a tanker, a mobile drilling platform or in the back office.
2. Transmit critical information to and from a tanker or maintenance boat.
3. Conduct a video conference or remote training session between an off-shore platform and corporate headquarters.





Challenge #4

CONNECTIVITY OVER DISTANCES

Cameras, remote video conferences, data exchange, sensors, I/O remote modules, event data and RTUs require a lot of throughput over long distances to aggregate l traffic from various locations and millions of M2M devices. This is even more important when consideringthe aggregation of multiple PtMP to operation Base Camps.

InfiLINK XG is specially designed to deliver high throughput for links up to 100 km.

Solution:

Infinet Wireless provides a range of wireless solutions, such as the InfiLINK XG, designed specially to deliver high throughput over distances of up to 100 km.

Benefits:

1. Real throughput up to 240 Mbpsin 20 MHz channel and up to 500 Mbps in 40 MHz
2. Maximum throughput decline as low as 7% at 100 km distance.
3. Extensive interference mitigation and NLOS toolkit

Practical Implementations

InfiNet Wireless has successfully supported the deployment of multiple solutions for digital oilfields. Some of these projects will be presented below as practical implementation references ▸

DONG YING OILFIELD, SHANDONG PROVINCE
CHINA PETROLEUM AND CHEMICAL CORPORATION

China

For this deployment, China Petroleum and Chemical Corporation required a reliable oil-well data collection- and transfer and the implementation of a video surveillance system to maintain the on-site security. It was mandatory a wireless solution that could carrying video surveillance traffic reliably, having highcapacity and availability in order to collect and transfer oil-well data. The implementation consisted of many «point-to-point» units of R5000-Mmx with 23 dBi integrated antenna gain, some locations were reached by utilising R5000-Lmn units with additional antennas, coupled with numerous «point-to-multipoint» R5000-Omxb base stations with R5000-Smnc and R5000-Lmnc as subscriber terminals deployed together with an InfiMONITOR network management system.This deployment created a reliable wireless solution that met the beneficiary requirements, capable of carrying telemetry and video surveillance traffic without jitter or delay, and allowed the whole oil field tobe managed by a single network management system.

LUKOIL

Russia

LUKOIL had requested a networking solution which could provide real-time control of SCADA systems at well clusters that allowed the extraction facilities to meet the latest industry ecological standards and safety policies. The equipment should be capable to operate in a harsh environment with temperatures as low as -40 °C, support quality of service for traffic differentiation and cover for around 15 km.

The solution included: A backhaul network powered up by InfiLINK 2x2 PRO units with more than 40 Mbps link throughput and a «point-to-multipoint» network designed with InfiMAN 2x2 Mmt integrated antenna base stations to provide the requested coverage, R5000-Smt and R5000-Lmt subscriber terminals to ensure minimum 512 Kbps link capacity. At the same time, it increased costs savings through licensing based on customer needs, smart spectrum utilization, QoS differentiation for data carried and very high MTBF operating all year round 24/7.

Solution key features and highlights

- Real-time telemetry, SCADA, remote access, monitoring, operation communication
- High capacity throughput up to 280 Mbps per base station sector
- High throughput backhaul links up to 500 Mbps
- Low latency and jitter thanks to Infinet Wireless' TDMA protocol
- Advanced QoS to guarantee required Service Level Agreements with the end users
- Non Line-of-Sight and near Line-of-Sight operation, across many frequency bands
- IP67 and IP66 protection available for all units, ensuring continuous operation in all weather conditions
- Compliance with HAZLOC and ATEX standards, able to operate in hazardous and hostile environments