





Owner/Client

E.ON Bulgaria

Location

Varna, Bulgaria

Completion

2006-2007

After privatization of the power distribution market sector in Bulgaria the multinational corporation E.ON purchased the right to operate the power distribution network in North East of Bulgaria. The scope of the project was to connect all E.ON offices with headquarters and substations in order to increase the efficiency of the power distribution network. The network was deployed by using point to point digital microwave radio SparkWave for the backbone network. Routers and licence free microwave links have been used for the access to the backbone. The network is in use for data and voice transmission and telemetry.





Owner/Client

RosTelekom

Location

Tver, Russia

Completion

2009

RosTelekom is the sole operator of nationwide fiber network in Russian Federation. Iskra Sistemi's projects included delivery of SparkWave SDR SDH microwave radio and SparkLight SDH muxes in order to connect new corporate clients to the existing fiber backbone. The system combines Gigabit Ethernet for data traffic, TDM for voice and EOW (Engineering Order Wire) for monitoring of 3rd party equipment at sites (power supplies, access control). In order to achieve high reliability of the network and reduce costs of antennas, high power RF modules were installed. The microwave radio equipment passed severe tests during 2010 summertime when climate was particularly unfavourable. As if not enough, there was huge fire in the area but this did not affect the equipment performance.





Owner/Client

GazProm

Location

Tomsk, Krasnodar,
 St Petersburg, Volgograd,
 Nizhniy Novgorod, Russia

Completion

2003-2010

A long-term cooperation of Iskra Sistemi with Gazprom Russia started in 2003 after considerable investments in R&D in order to meet tough climatic requirements of Russian GOST standard agency, demanding customers' expectations and security parameters in order to smoothly operate the communications along pipeline networks in North Polar area and Siberia. All systems are fully redundant and support operation under extreme conditions of -50 degrees Celsius. So far, five regional backbone networks have been deployed in St Petersburg, Ukhta, Volgograd, Tomsk, Arhangelsk, Sochi and Krasnodar, summing up to over 5.000 km of span. The PDH and SDH links deployed are used for voice communications, video, data transmission, telemetry, Tetra and communication of PBXs.



**Owner/Client**

Kegok

Location

Almaty, Kazakhstan

Completion

2008-2010

The national power transmission and distribution company of Kazakhstan is using PDH and SDH digital microwave radio for Scada network. They connect substations in areas where no fiber is available. The radio systems are redundant in order to provide uninterrupted operations. Due to the vast area of Kazakhstan and many remote sites the radio links are becoming more popular also for corporate backbones. In fact, the redundant microwave radio systems prove to be more reliable than optical fibers.



**Owner/Client**

Telasi

Location

Tbilisi, Georgia

Completion

2010

Telasi is the largest power distribution company in Georgia. In 2010 the company started an ambitious program of modernization of the power distribution network, cofinanced by the World Bank. The scope of the project is deployment of a Tetra network for Scada needs and maintenance of the power distribution network. The network is based on SparkWave DRL GA+ and Rohil Tetra base stations.



Microwave Links at Bruxelles Airport

**Owner/Client**

Bruxelles Airport

Location

Bruxelles, Belgium

Completion

2005

When the Bruxelles Airport was about to connect the ground radars around the runways they faced an embarrassing fact: they lacked fibres to do the job. Iskra Sistemi proposed a microwave solution which was functionally equivalent but far easier to implement and deploy. Digital microwave radio SparkWave has been installed to connect ethernet interfaces from the radar stations to the main tower. The application is used by the airport operator to monitor and manage the grounded airplanes after touch-down on the runways.



**Owner/Client**

Post and Telekom of Kosovo

Location

Prishtina, Kosovo

Completion

2006

Between 2000 and 2004, Post and Telekom of Kosovo (PTK) installed 50 microwave links using Iskra Sistemi's PDH generation SparkWave GA devices. In 2006 PTK decided to upgrade the network and expand the capacity. 43 lines with the new family SparkWave SDR HSP digital microwave radio have been deployed in configuration 1+0. The SparkWave SDR HSP is used for transmission of the rapidly growing IP traffic in the fixed network. The microwave links span the difficult terrain to interconnect pure ethernet switching nodes over distances.



UN OSCE Mission Microwave Network in Kosovo and Albania



Owner/Client

OSCE

Location

Prishtina, Kosovo

Completion

2001-2005,
2009-2010

The UN peacekeepers in Kosovo, OSCE mission, are using 50 radio terminals Sparkwave SDR for TDM traffic in 1+1 configuration. The network has been constantly expanding since 2005. In 2009 the customer started upgrading the network by reducing the TDM capacity and increasing the Ethernet capacity, using the SDR platform. Due to the poor coverage of rural areas the deployment of the microwave network was unavoidable in order to enable the Mission's operations in the territory. The network has been used for voice and data communication among regional offices, headquarters and mobile stations.



Power Distribution Disaster Recovery Network in Bulgaria

**Owner/Client**

City System Operator

Location

Sofia, Bulgaria

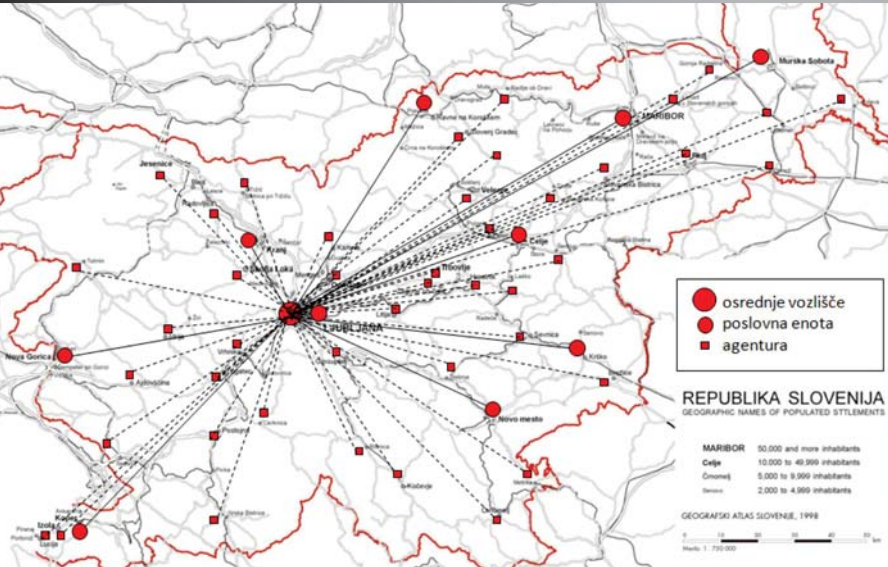
Completion

2005-2008

The electrical power segment is of strategic importance for Bulgaria. Until recently, Bulgaria was exporter of power to the EU, and decided to build up a new power plant. Being located within an area where three power networks are interconnected (the ex-Yugoslavian network, Eastern European Network of former Soviet Union and the Turkish network) it imposed responsibility and gave an opportunity to Bulgaria to play an important role in the EU. The scope of the project was to establish a redundant management center to take over the control in case of a natural disaster, war or other unexpected situations. In order to connect the Disaster Recovery Center to the power plants, they needed a new network. Iskra Sistemi's microwave solution has been selected as it provided a rapid deployment and was much more resilient to natural disasters than optical solutions. During the 2008 gas crisis, this network was used to manage the power plants remotely from Sofia in real time, reducing the great financial losses significantly. The end users in this project are NEK, BulgarGaz, TPP Mini Maritza 2, NPP Kozlodui, Ministry Of Defence, etc. The network infrastructure is based on SparkWave SDR microwave radio.



Vzajemna Health Insurance Countrywide Network



Owner/Client

VZAJEMNA

Location

Slovenia

Completion

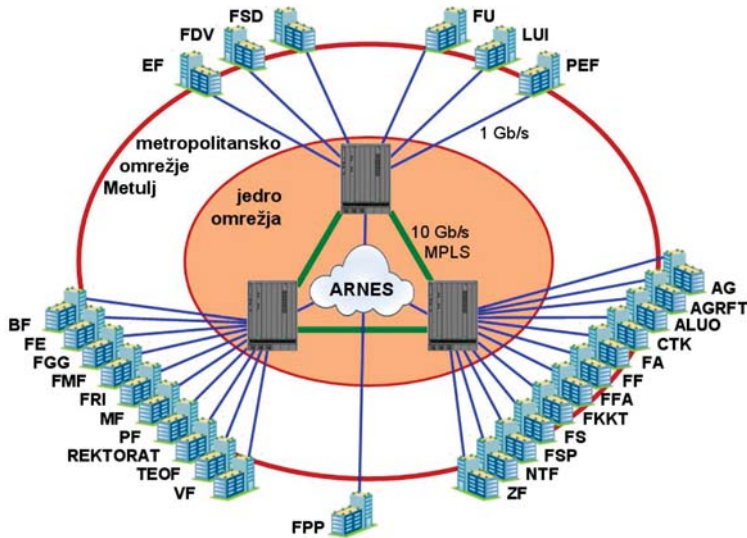
2005-2010

Vzajemna Health Insurance d.v.z. is the largest insurance company for optional health insurance in Slovenia. Vzajemna produces over 21.000.000 of confidential documents per year, which are transferred over a reliable, secured network. Iskra Sistemi built the core network at the central location, a countrywide VPN network, and the network for the Disaster Recovery Center. Active components of the networks are routers, firewalls, intrusion prevention systems, core switches, load balancers and microwave links.

Iskra Sistemi provided a complete cycle in this project - from a feasibility study, design, installation, configuration, down to network management and maintenance of the network.



Metropolitan Academic Network of Ljubljana University



Owner/Client

UNIVERSITY OF LJUBLJANA

Location

Slovenia

Completion

31.12.2007

University of Ljubljana is the biggest public university in Slovenia with over 50.000 students. Academic environment requires special approach which public ISPs are not able to deliver with their commercial services. That's why they decided for implementation of their own academic network, connected directly to the national academic provider, Arnes. University has developed non-commercial services for 27 faculties which are connected to this network. Implementation of 10G MPLS network started with the goal of virtualizing the physical network. The core is built on fully redundant switches, with load balancing. The redundant links to public networks are secured with IPS devices. The wireless part of the network enables pan-European connections to any European university.

Iskra Sistemi has been living with the Ljubljana University network for the last 15 years. In the latest network implementation Iskra Sistemi managed the whole project, together with the University, from the initial studies to design, installation, configuration and commissioning. The network is maintained and monitored by Iskra Sistemi as well.



Mercator Supermarket Chain National Network

**Owner/Client****MERCATOR****Location****Slovenia****Completion****31.5.2008**

Mercator is the biggest supermarket retail chain in the Balkans, and only in Slovenia it has over 17.000 employees. With centralization of the data centers, Mercator needed a reliable, redundant and high-speed core network. Iskra Sistemi configured and implemented two redundant modular core switching systems. Finishing the core phase, the project continued on the distribution level - by equipping over 1000 remote locations in Slovenia with LAN networks. Iskra delivered, installed and configured the whole distribution level of the national network. The new network provides a sound platform and a stable environment for the new card payment system of Mercator.

Besides delivering the design and the equipment, Iskra Sistemi also helped Mercator to carry out the project with Iskra's professional services in the field.



National Bank Gyro Clearing and RTGS Network in Bosnia and Herzegovina



Owner/Client

CBBH

Location

Bosnia

Completion

31.12.2001

CBBH (Central Bank of Bosnia and Herzegovina) network interconnects 42 commercial banks of three national entities with three national bank centers in three main cities. Its function is Gyro Clearing among commercial banks and Real Time Gross Settlement. The network has been designed and constructed in a fully redundant way. Commercial banks are connected to their respective national bank centers by a primary and a secondary connection with two different communications media. The national centers are connected in the same way with the country's main banking node in Sarajevo. The equipment in Sarajevo is fully redundant so that there is no single point of failure. In case that one of the national centers fails, the network is programmed to seamlessly recover this situation automatically. In such a case the commercial bank would bypass the national center and do the clearing in the country's main node in Sarajevo.

There were 42 nodes set up for the commercial banks, plus aggregation nodes in Sarajevo, Banja Luka and Mostar. In 9 years of operation there was not a single failure of the network, though there have been outages of individual operator lines, but the network automatically recovered every time. The network has been under a maintenance and management contract since the commissioning.



Reconstruction of Uzbek Energo Power Utilities Communications Resources

**Owner/Client**

UZBEK Energo

Location

Uzbekistan

Completion

2000-2010

Project included design, delivery, installation and commissioning services for reconstruction of old PLC communication links and construction of the "last-mile" access, using new PLC, microwave and optical communication links. More than 400 PLC terminals of type ET8, and more than 40 microwave and optical terminals of type SparkWave and SparkLight, assure main and backup communication links from Sub Stations all around Uzbekistan to the Regional Centers and National Center in Tashkent.



Reconstruction of PLC Communications and Teleprotection Systems of FSK



Owner/Client

MES Volge
 MES Centra

Location

Russia, Samara
 Russia, Kirpichnikovo

Completion

2005-2007
 2008-2009

Project included design, delivery, installation and commissioning services for reconstruction of old PLC communication links and construction of new communications links, using new PLC communication links for voice communications, data and protection commands for radial networks. System has been constructed with PLC terminals of type ET8, and protection device of type DPA8. This setup provides communication links from Sub Stations to the Regional Centers.



**Owner/Client**

KESH
TURKMEN Energo

Location

Kazakhstan, Aktobe
Turkmenistan, Balkanabat

Completion

2008-2010
2010

Project included design and delivery of new communications links, using new generation of PLC equipment for voice and data communications. System has been realized with PLC terminals of type ET8 which provide communication links between oil fields and Sub Stations to the Regional Control Centers.



Cost Effective Communication Access for SEPON Gold Mines

**Owner/Client**

Electricity of Laos

Location

Laos, Thakek

Completion

2010

Project included design, delivery, installation and commissioning services. PLC communication has been used as an alternative cost-effective communication solution in comparison to OPGW. System was realized with PLC terminals type ET8 and Teleprotection terminals type DZ8. It delivers the communication platform between SEPON facilities.



**Owner/Client**

ELES

Location

Slovenia

Completion

2008-2010

Project included design, delivery, installation and commissioning services. Teleprotection devices type DZ9 have been used for protection of 110-220kV HV lines over PDH/SDH network. All devices have been integrated into the Centralized Management Control System over an Ethernet network.

