Global Sky Park

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Pioneers with space-based support

Utility company Stadtwerke Osnabrück relies on satellite technology for network management

Electricity manufacturers and energy suppliers must remain reliable in an increasingly complex working environment. This applies to generating plants, the electricity grid and downstream infrastructures for distributing and controlling the energy being supplied. Here, the focus lies on the issues: stability, management, security, control and monitoring. In this connection, satellite-supported supervision and communication systems are gaining enormous importance. This is demonstrated by pioneering municipal utility companies such as Stadtwerke Osnabrück in Lower Saxony, Germany.

Reliable communication networks via satellite

The administrative requirements placed on energy producers, network operators and utility companies are increasing presenting these firms with continuously greater challenges with regard to reliability and security. Innovative solutions for communication and connections are particularly interesting when locations are situated in remote regions and the supply networks are beyond the range of conventional terrestrial broadband infrastructures. This does not only apply to renewables such as offshore wind farms, solar energy installations in rural areas or hydroelectricity from mountainous regions. Municipal utility companies too, with their numerous transformer substations and switching units, are dependent upon flexible communication infrastructures.

This is where Global Sky Park (GSP) and its European associated company EuroSkyPark GmbH (ESP) comes into play. Since 2005, the GSP/ESP companies have been providing industrial enterprises, energy suppliers, plant manufacturers and the security sector with their proprietary solutions. Their performance spectrum ranges from the planning, through the setup, to the subsequent management of communication networks. Here, the satellite is the best, and particularly economic, alternative when it is a question of reaching all parts of the globe. An example are systems which are individually tailored to the client's requirements such as SCADA services (Supervisory Control and Data Acquisition). These systems enable providers to use their resources in an optimum manner, register breakdowns immediately and to monitor and control their installations at all times - even in the most remote locations. „Especially for utility companies, we have some exciting propositions particularly with our solutions in the SCADA field", Thomas Maul, CEO of Global Sky Park, explained. „We are becoming increasingly aware that the potential of our technology in this field is being recognised and employed more and more."

SCADA

Our SCADA Access Services connect two or more networks via one or more geostationary satellites using PVC in a Virtual Private Network (PVC is the abbreviation for a Permanent Virtual Connection). This can be realised as either a point-to-point or multipoint connection - in all cases it decidedly supports the highest possible quality level. Depending on the application, for transmission, selection is made from a link budget of SCADA 8 to 128. The link is available 24 hours a day 7 days a week and permits unlimited data transmission from router to router. ESP sets up the connection with both an IEC 60870-5-101 protocol as a serial connection and with an IEC 60870-5-104 protocol as an IP service.

Surmounting distances

One of the pioneers of the use of satellite-supported systems in the municipal utilities field in Germany is Stadtwerke Osnabrück - a company which belongs to the city of Osnabrück. In the Osnabrück region, this innovative enterprise operates its own electricity network of 2,273 kilometres and, in 2012, supplied more than 36,000 households with a total of 940.9 Gwh.

About 500 transformer stations and distribution points are attached to the network which must be controlled and monitored by the utility company. Here, for remote and unmanned stations, the company relies on remote control technology for monitoring all installations from a distance. Some years ago, the municipal company set up a new Network Operation Centre (NOC) with innovative technology. All the information and performance parameters from the various locations comes together at this ultramodern NOC in Osnabrück via a proprietary telecommunications network (glass fibre and copper) and public lines. In the NOC, specialists process the data and, in case of malfunctions, take immediate steps to restore functionality. Also, the NOC allows the utility company to provide technical network management as a service for third parties and thus exploit more business opportunities in an extended network area – and it was just these new services which then required other ranges which could not be reached with the previous communications network.

About two years ago, Stadtwerke decided to implement satellite links for five transformer substations and the remote terminal in Osnabrück. The transformer substations are located about 100 kilometres north of Osnabrück – terrestrial connections for remote control technology at this distance cannot be realised economically. The partner for this innovative project was ESP which, thanks to years of experience and state-of-the-art technical know-how, was able to offer a precise solution for the task at hand. At every location, ESP has installed a satellite system specially equipped with SCADA technology and put this into operation. The satellite systems send the acquired data, such as meter readings or fault reports, securely, in fractions of a second, via a satellite 36,000 kilometres away to the operation centre of the Stadtwerke Osnabrück. Moreover, the operation centre can also carry out switching operations using this connection. The performance of the systems used is scalable. An upgrading of the satellite-supported services with new functions and the connection of further locations is possible at all times.

Emergency satellite telephony

As a result of natural disasters or accidents temporary disturbances or even complete blackouts of terrestrial and mobile telecommunication networks can occur – even in industrialised countries. The flooding last year was again sad evidence of this. Stadtwerke Osnabrück are well prepared for an emergency: special satellite telephones make them completely independent of conventional terrestrial telecommunication infrastructures. Also in this respect, the utility company from Lower Saxony is a pioneer within Germany.

Interview: Ulrich Clausmeyer, Head of Network Management and Markus Wierwille, Head of Electricity Network Management at Stadtwerke Osnabrück

How did you learn about satellite communication?

Ulrich Clausmeyer: We first heard about this innovative technology just over two years ago, at a symposium. Shortly after that, we were indeed faced with the situation that we had to connect 5 locations for a service client to our network and our NOC which were roughly 100 kilometres away. These locations were outside the range of our own telecommunications network and setting up a direct terrestrial connection would have been far too expensive.

What was it about the solution that convinced you?

Markus Wierwille: Almost out of nothing, so to speak, we could could link up these sites to our net in the shortest possible time. For data transfers we require speed and reliability and the transmission protocols we use could be adapted very quickly for faultless transfer via satellite. The solution then proved itself in practice. Apart from operating data and disturbance reports, our switching commands are also communicated through these satellite connections.

Where do you see the potential for integrating satellites?

Ulrich Clausmeyer, Markus Wierwille: Generally, these rapidly available solutions are appropriate in all places where one's own or public communication networks are not available. The satellite connection is always there. In combination with e.g. VPN connections, redundant network infrastructures can be created which offer network operators the highest degrees of security and reliability. If a terrestrial connection should be capped, for example the famous bulldozer accidents, the operator always has his satellite connection as a reliable back-up – this offers many advantages, also from an economic point of view.

Stadtwerke Osnabrück: The enterprise for quality of life

Stadtwerke Osnabrück

With its services, products and facilities, the Stadtwerke Osnabrück company shape and influence many important aspects of daily life in the city and region of Osnabrück. As well as supplying electricity, heating and water, the Stadtwerke run three public baths as well as the 250 acres harbour site and drainage installations. The „quality of life enterprise" employs about 1,000 people directly and a further 200 in subsidiaries. With a revenue in 2012 of over 350 million, the company is not only an important economic factor in the region but also a shining example for innovation and sustainability.