



Monitoring the Operational Data of Wind Power Plants

IP Access

WLAN

ITK

VoIP / VoVPN

IT Security

Data Transfer through the Air via UMTS

Wind energy is currently a topic of much interest. Monitoring the plants, however, is a difficult and sensitive task, since outages and failures mean financial loss. Enertrag AG has opted for a completely new infrastructure for the transfer of operational data. The company located in the Uckermark uses the mobile communications standards UMTS and GPRS. The technical implementation of the data transmission was achieved with routers of Funkwerk Enterprise Communications.



Due to the increased promotion of regenerative energies by the political parties, the company feeds in a growing volume of power into the public supply network, which is generated by its wind turbines. As a result, however, Enertrag is also facing new demands, particularly with regard to the monitoring of the high-tech plants distributed all over Europe. To avoid outages in the power network, operators of wind turbines require the up-to-date operational data anytime: up-to-date information on the performance of the plant and on the wind velocity, revolutions for plausibility checks, as well as the current status reports, which detect failures and minimize downtimes.

First Steps with ISDN

Enertrag AG deals in wind or, more precisely, in power generated by means of wind energy. The company located in the Uckermark, a hilly region in the north-east of Germany, operates wind power plants all over Europe. The planning, financing, and the installation of decentralized power plants also belong to the core competences of the company founded in 1998. This means Enertrag is fully in trend.

Up to the beginning of 2007, this valuable information was transferred over secure ISDN lines to the company headquarters of Enertrag AG, Gut Dauerthal in the federal country of Brandenburg. Moreover, the power plants are controlled over this connection—for instance, as the direct reaction to a request of the network operators in terms of load limiting. Only via this direct connection can the operator prevent the network from being overloaded by excessive volumes of power fed in.

„We need a secure VPN connection to monitor and maintain the routers distributed across Europe. Apart from that, we knew that we would not be able to take UMTS for granted at every site. Because of that, we needed devices which are also able to transfer the data on alternative paths, via the GPRS network. But what can be done in the case of network outages? ... In this context, the bintec router has convinced us with its features—precisely speaking: its ISDN fallback,” says Manfred Saß, Director IT of Enertrag.

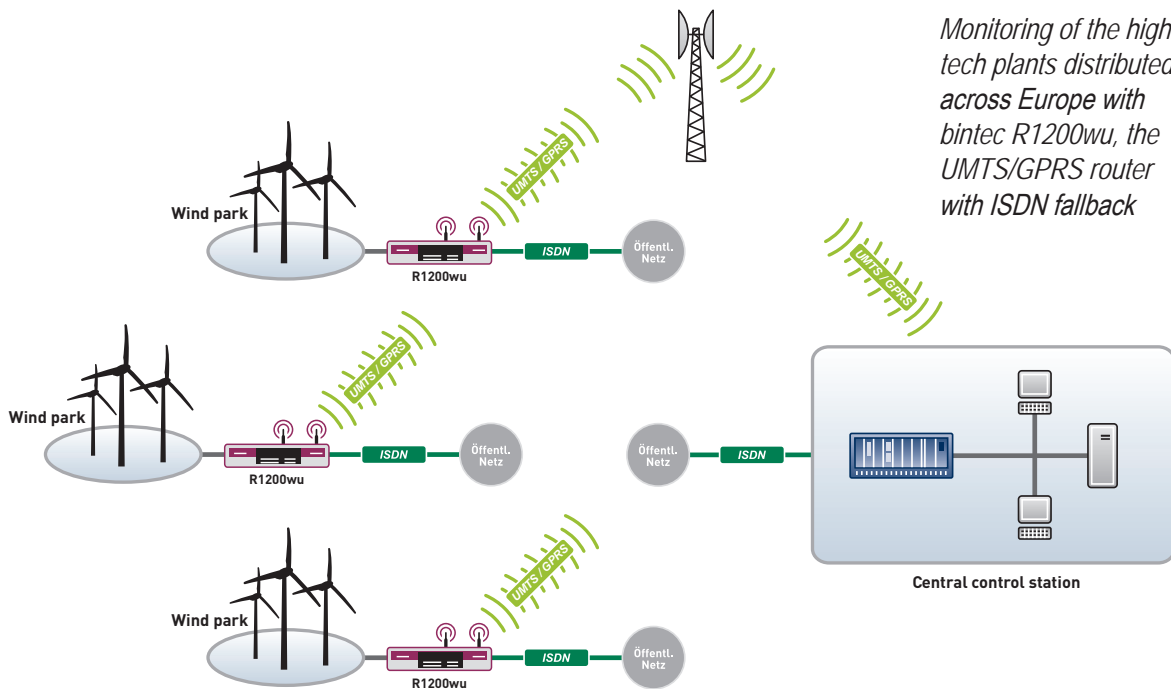


bintec R1200wu: UMTS router with ISDN back-up

Cost Reduction with UMTS

The costs for the continuous data flow, however, were huge. Manfred Saß, Director IT of Enertrag: „Every five minutes, we currently receive the operational data of more than 900 wind power plants all over Europe. Over a whole day, this leads to a huge data volume. A DSL ac-

To implement the data transfer via the two mobile communications standards from a technical viewpoint, Manfred Saß and his colleague Jan-Erik Peters tested several UMTS-capable routers currently offered on the market with regard to fault tolerance, secure data transfer, and interface redundancy. The choice was made in favor of the bintec R1200wu of Funk-



Monitoring of the high-tech plants distributed across Europe with bintec R1200wu, the UMTS/GPRS router with ISDN fallback

cess would be able to cope with that, but, as a rule, we install the wind turbines at locations in the countryside and, thus, far away from the next DSL access. Moreover, there are still many failures with DSL connections in the field, which occur too frequently considering our requirements.“ In the end, the increasing costs for the transmission of the data were the incentive for Enertrag to look for a new, more cost-effective solution for the transfer of the operational data. As an alternative transmission path, Saß finally discovered the air, more precisely the UMTS GPRS network. This is an option which pays off: The connection costs only make up approximately a tenth compared to the previous solution via ISDN.

werk Enterprise Communications. The abundance of interfaces offered was the decisive feature which led to the selection of the multi-talented device developed by the Nuremberg-based network specialists. Manfred Saß: „We need a secure VPN connection to monitor and maintain the routers distributed across Europe. Apart from that, we knew that we would not be able to take UMTS for granted at every site. Because of that, we needed devices which are also able to transfer the data on alternative paths, via the GPRS network. But what can be done in the case of network outages? For us, the continuous availability of the connection is of the same importance as the fault tolerance of the devices themselves. In this context, the bintec router has convinced

us with its features—precisely speaking: its ISDN fallback.“

ISDN as Backup

Like all routers of the bintec series, the bintec R1200wu is also equipped with a classical interface to the ISDN world. Salesperson Torsten Schwarz, who is responsible for the Enertrag project at FEC, explains the reasons: „Many devices offered on the market no longer support ISDN. On the other hand, ISDN is a fully developed and widespread network in Germany and works very reliably. Our customers frequently choose our devices, because they do not want to do without the well-known fault tolerance offered by ISDN as a backup solution for a broadband connection.“ During the ISDN backup, the routers of the bintec series automatically switch over to the fallback connection via ISDN if failures occur on the primarily selected connection, for instance DSL or UMTS. The router checks in regular intervals whether the original, usually faster connection is available again. If so, it automatically sets up this connection again.

After opting for the FEC router, the project had to be prepared internally: The devices had to be configured and tested. Moreover, Enertrag examined the connection options of external antennas in combination with further vendors. Manfred Saß emphasizes the readiness of his project partner for cooperation: „Funkwerk Enterprise Communications have optimally supported us in the adaptation of the configuration.“

Starting Shot in Spring 2007

In spring 2007, Saß and Peters put the first routers into operation in the vicinity of the company site. In the course of the year, further 100 routers were ordered step by step and were commissioned at currently 78 locations. In spite of the rather fast roll-out of the infrastructure, the two IT specialists were able to perform minor adaptations of the router configurations at the various sites. Manfred Saß: „We are an ambitious company in a fast-growing market. Here, fast solutions must be trademark features offered by the IT departments. Moreover, our project partners of FEC supported us, whenever minor modifications of the router equipment were required.“

In the meantime, the wind turbines at 78 sites in Germany have been equipped with UMTS routers. Further sites abroad are to follow, as soon as the contracts are concluded for the corresponding countries. „The new solution for the fast and reliable data transfer with UMTS-capable routers is absolutely convincing in operation. We are currently planning to modify the rate for the transmission of the operational data due to the requests of the network operators, demanding to reduce the transfer interval of the line values from 5 to 1 minute. In a large-scale planning project, which we are currently managing as the responsible solution provider in cooperation with a major network operator, we have designed the UMTS router solution for the connected wind power plants and have already successfully implemented it in one object. There is no need to worry about the reliability or stability of the system.“

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