SWG Grenchen
Building an intelligent foundation for improving power, water and gas utility services

Challenges
- Extend communications to the 80% of distribution substations without fiber and connect them to existing fiber IP core network
- Creating a field area network for backhaul of Automated Meter Reading (AMR) for power, water and gas meters across utility’s coverage area
- Scalability to leverage single communications network for multiple utility applications
- Cost effective and timely deployment of network

Solution
- Single high capacity, reliable wireless broadband mesh field area network capable of concurrently supporting AMR in addition to future utility applications
- IP-based wireless network easily integrates with existing fiber network

Systems and Services
- TropOS wireless mesh routers
  3 TropOS 6320 (gateways)
  8 TropOS 1410
- SuprOS wireless network management
- ABB Wireless training and customer support
- Landis and Gyr
  DC450 data concentrator
  Power meters
- GWF MessSysteme AG
  Water meters
  Gas meters

Results
- Wireless broadband network was fast to deploy and eliminated need for any costly trenching
- Accelerated rollout of AMR for power, water and gas utility customers

SWG Grenchen is the regional electrical utility partner for the city of Grenchen, Switzerland, and the surroundings. With 16,700 inhabitants, Grenchen is the second largest city in the county of Solothurn. The utility provides electricity, water and gas to its customers

The Challenge
SWG Grenchen was developing their “Smart Metering Grenchen” project to bring smart meters for power, water and gas, to customers. With the ability to collect metering data remotely, they expected to improve operational efficiencies, detect and pinpoint meter problems faster, improve billing accuracies and improve overall service to customers.

A key building block for the smart metering project is a communications network, which requires a reliable high capacity network providing bidirectional communications end-to-end between meters and the utility core network.

When the smart metering project was initiated, SWG Grenchen already had extended fiber connectivity to 20% of their substations with plans over the next few years to connect their remaining substations with fiber. However, they wanted to
rollout smart meters before fiber would be installed to the remaining 80% of substations, so they needed interim reliable and high capacity broadband communications between the remaining substations to connect them to the existing fiber network.

**ABB Wireless Solution**

ABB Wireless offers a full range of wireless communications solutions and the TropOS IP broadband mesh routers provided SWG Grenchen an ideal solution that delivers high performance and reliability in addition to cost effective and timely rollout. TropOS mesh routers combine sophisticated, patented mesh networking intelligence, designed from the ground up to optimize throughput. As a mesh architecture, the routers are self-organizing and automatically reroute around failures offering system level resiliency and reliability. The routers support multiple frequency bands (2.4 GHz and 5 GHz) and support failover between them helping ensure localized interference on any one frequency band, can be routed around. TropOS incorporates open standards-based security including AES encryption, IEEE 802.1x, IEEE 802.11i, RADIUS, IPSec, SSL/TLS and SSH.

TropOS networks are managed by SuprOS, a comprehensive network management system that provides full FCAPS (Fault, Configuration, Accounting, Performance and Security) features as well as comprehensive visibility for ensuring wireless network operations.

The SWG Grenchen substations without fiber connections have been equipped with TropOS routers and use 2.4 GHz. The routers form a mesh that enables each node to communicate with multiple nodes for increased system reliability.

SWG Grenchen plans to leverage their investment in TropOS routers for additional smart grid applications over time. Some of these applications are distribution automation, video surveillance and remote management and control of field equipment. In addition, mobile utility workers can securely use the network in the field, connecting from their laptops, smartphones and other Wi-Fi devices, improving their efficiencies and accessibility to information.

**Results**

The ABB Wireless solution met the communications requirements of the initial smart metering project and beyond for SWG Grenchen. They were able to quickly deploy a high capacity wireless broadband network that could easily integrate with the existing fiber infrastructure - without the time and expense of trenching. The existing network was quickly extended and the utility was able to begin realizing the operational benefits of smart meters and begin planning rollout of additional smart grid applications utilizing the same communications foundation built on ABB Wireless. More than 800 smart meter values are collected by the data concentrators and transmitted every 15 minutes over the TropOS network.

From the beginning of the project, ABB Wireless worked and planned closely with SWG Grenchen’s IT department. This was one of the key factors that assured the successful TropOS deployment. Once the end-to-end communications network was functional, the various systems including smart meters, data concentrators, firewall and virtual servers could were seamlessly integrated into the utility’s network.

“The TropOS mesh network is a powerful alternative to fiber and provides economical field area network for our smart grid foundation,” said Ronny Leuenberger, project leader, SWG Grenchen.

Contact your local service and sales support team to discuss your requirements further.

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