

Norway Utility Modernizes Power Grid



Executive Summary

- **Customer Name:** BKK Group
- **Industry:** Power & Energy
- **Location:** Bergen, Norway
- **Number of Employees:** 1100

Challenge

- Transition legacy utility communications network to packet-based IP network to improve efficiency
- Support business-critical teleprotection capabilities
- Provide greater flexibility as new grid applications require any-to-any communications flows

Solution

- Deployed Cisco MPLS PE routers to support new packet-based IP MPLS utility network
- Converting all utility communications and services to new network

Results

- Ability to offer new IP-based services, reducing utility operation cost
- Improved management efficiency
- Ready to benefit from interconnected devices in “Internet of Things”

BKK AS moves critical electrical grid services to next-generation IP-based utility network.

Challenge

BKK AS is the second largest power grid owner in Norway with 180,000 grid customers. The company also offers broadband solutions to the business market, FTTH (fiber-to-the-home) networks and provides the district heating system in Bergen.

Like most power utilities, BKK has traditionally operated its power grid over a time-division multiplexing (TDM) network using the synchronous digital hierarchy (SDH) transmission protocol. While it had been reliable, the networking technology was nearing end of life, and maintenance was becoming onerous. Operational costs were increasing, and BKK had to rely on just a few employees with specialized skill sets to keep the network running smoothly.

Due to the specialized nature and limited flexibility of TDM/SDH networks, the company wanted to prepare for the future and transition its utility network to packet-mode communications. Furthermore, new grid applications are requiring any-to-any communications flows and also pushing for IT and operations technology (OT) convergence. BKK, therefore, decided to build one reliable IP/Multiprotocol Label Switching (MPLS) network to ultimately securely connect all systems and grid devices.

Solution

BKK operates a separate IP network that supports its commercial broadband services. Having had a positive experience using Cisco® technology for the commercial IP network, BKK chose Cisco for the new utility network as well.

The new network needed to support a variety of grid applications, including very critical protection systems for the high-voltage grid. In addition, BKK is using teleprotection systems (both distance protection as well as current differential protection), which require the communications network to support extremely low latency (<10 ms), deterministic behavior as well as very high availability.

“The utility industry is changing fast as smart grids become reality and more devices become part of the Internet of Things. With our Cisco-based IP utility network, we’re ready to reap the benefits of this new paradigm.”

– Svein Kåre Grønås
Managing Director (CEO)
BKK Fiber AS

BKK deployed Cisco ME 3600X-24FS-M and ME 3600X-24TS-M MPLS routers to provide secure 10-Gigabit Ethernet access. With the support of specific features such as Synchronous Ethernet, dejitter buffers, as well as pseudo-wire and traffic engineering, which can reliably transport a variety of services toward the substations and control centers, critical services such as supervisory control and data acquisition (SCADA) systems and teleprotection relays are now running reliably over the Cisco wide-area network.

“Cisco offered the hardware and software features, as well as the reliability, that we needed to put our packet-based utility network into production,” says Svein Kåre Grønås, managing director/CEO, BKK Fiber AS. “It’s also reassuring that Cisco understands where the utility industry is heading, and is committed to connected grid services.”

Results

Moving to a next-generation, packet-based utility network will save BKK significant operational costs for the utility network due to the ability to use cost-effective, standardized IP networking gear and avoid maintaining two separate networks at substations.

“Building and operating a high-bandwidth, packet-based network has given us a lot more flexibility. In addition, we can leverage the same processes and skill sets that we use to operate our Cisco commercial broadband network,” says Grønås.

With the new IP-based utility network, BKK no longer needs to reserve bandwidth for TDM communications, and now has more bandwidth available because it can be dynamically allocated. As a result, BKK can now offer the same network resources at substations that are available at corporate office locations. Workers can securely access needed documentation and other network resources at substations and power plants, instead of printing documents beforehand or calling colleagues at the office to gather information as they did in the past. “This represents a major improvement in workforce enablement, productivity, and maintenance efficiency,” says Grønås.

Next Steps

Having an IP network backbone in place will allow BKK to provide new IP-based services and new capabilities in managing the power grid, such as advanced metering infrastructure (AMI) and distribution automation. In the future, BKK can assign IP addresses to sensors and relays to develop smart grid technologies and provide greater visibility into its electrical grid network.

“The utility industry is changing fast as smart grids become reality and more devices become part of the Internet of Things,” says Grønås. “With our Cisco-based IP utility network, we’re ready to reap the benefits of this new paradigm.”

For More Information

To find out more about how Cisco defines the Internet of Things, please visit:

www.cisco.com/go/iot.

To find out more about Cisco solutions for utilities/grid modernization, please visit:

www.cisco.com/go/smartgrid.

To find out more about Cisco ME 3600X Series Switches, please visit:

www.cisco.com/c/en/us/products/switches/me-3600x-series-ethernet-access-switches.

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Product List

Routing and Switching

- Cisco ME 3600X Series Ethernet Access Switches

Applications

- Supervisory control and data acquisition (SCADA) systems
- Teleprotection relay systems



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