



Case study: Data is power in Korea

Smart TETRA network protects and manages KEPCO power grid

As South Korea's sole power distributor, Korea Electric Power Corp (KEPCO) is charged with keeping the lights on for 13 million families - plus the all country's companies, schools, farms and other institutions.

No matter what the weather.

Now Korea's power grid is more stable, thanks to KEPCO's new mobile TETRA base station equipped with satellite communications.

The new system "will support vital power supplies in situations such as typhoons, floods, earthquakes and fires," says KEPCO project leader Gyu Hwan Oh.

The mobile solution is just the latest innovation KEPCO has implemented since it launched its CASSIDIAN TETRA network in 2006. The vehicle-mounted base station is the first to provide a direct connection between a satellite and the TETRA network's switchboard using the TCP/IP protocol.

Data communications for power companies

The wireless communications system lets KEPCO automate and manage its power grid intelligently - even in remote locations, where the cost of deploying landlines would be prohibitive.

The system supports a range of applications, including:

- Remote meter reading
- Direct load control systems
- Power distribution automation
- Monitoring wind speed on transmission lines
- Undersea power cable monitoring
- Transformer monitoring

"We used to have an analog communications system for voice and data," says Mr. Oh. "In the case of data the system suffered from low reliability and a lot of coverage holes. The digital TETRA system can support KEPCO's required application solution, so we plan to keep expanding the digital TETRA network."

Data communications for stable energy supply

The TETRA network applications also help KEPCO:

- **Ensure a stable supply of electricity.** Direct load control helps KEPCO maintain an appropriate reserve ratio and control demand. KEPCO can also measure the effect of load control objectively because it can control the load in real time if necessary.
- **Respond remotely to power failures.** Power distribution automation monitors the status of power distribution switches and lets KEPCO respond when necessary.
- **Prevent large-scale blackouts.** The system monitors the wind speed on transmission lines and alerts KEPCO if a contingency plan needs to be brought into play. The system also transmits wind direction and speed data from all the transmission towers back to a central server.
- **Avoid power disruptions from undersea.** The system lets KEPCO monitor vessels approaching undersea power cables and send them warning signals if they get too close.
- **Prevent accidents.** Transformer monitoring lets KEPCO take precautions to avoid accidents by transmitting the load status of transformers back to the server.
- **Increase profits and improve satisfaction.** Remote meter-reading has a big impact on customer satisfaction. That's because it eliminates the main causes of customer complaints and financial losses, including:
 - Missing meter readings
 - Incorrect billing
 - Incorrect readings owing to human error
 - The surreptitious use of electricity
 - Manipulated meter information

Remote meter-reading also frees up field personnel to do other jobs and focus on improving customer service.

Power to the people

Across its network, KEPCO operates:

- Seven digital exchanges
- 121 CASSIDIAN TB3 base stations
- 2,900 TETRA modems

With so many applications running on the network, the extra capacity of the TETRA network and its efficient use of spectrum has been an important factor in the success of KEPCO's automation and remote monitoring strategy, says Mr. Oh.

The utility plans to add 86 base stations and 1,200 modems in 2010. And KEPCO will need more capacity and higher data speeds in the future.

"KEPCO facilities are evolving in complexity and intelligence, so we're looking to upgrade the speed of our TETRA network," Mr. Oh says. "In the medium term we're planning to implement the Fortecor TEDS solution from CASSIDIAN."

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