CASON DIWICON-E

Electricity Management System

CASE STUDY

GECOL - GENERAL ELECTRICITY COMPANY OF LIBYA

INVOLVING RESIDENTIAL CONSUMERS INTO AN ENERGY BALANCE SYSTEM BASED ON THE DATA OF RESIDENTIAL CONSUMERS

Customer profile

The General Electricity Company of Libya is the electric utility of the Great People's Libyan Arab Aljmahiriya. It is solely responsible for generation, transportation and distribution of electric power in the whole country The generated energy was 25.5 GWh for almost 2 million customers in 2007.
The length of the high-voltage (11..400kV) distribution system is more than 85.000 km.

Background

Future vision is focused on reinforcing the infrastructure of GECOL by utilizing modern technologies in the fields of Generation, Transmission and Distribution alongside exploring new avenues of renewable energy sources to support efforts for the global development in all aspects of life.

GECOL is in the process of deploying an Energy Balance Management System by CASON as part of its technical and commercial reduction strategic plan. Towards this goal, GECOL installed a number of AMR meters in power plants, substations and in specific some high potential customer locations.

The scope of this project includes the deployment of Energy Balance Management system that will enable GECOL a better control over the balance between the power generated and power consumed.

The customer is looking forward to a solution that will solve the balance of the electrical distribution network on the long run by means of automated meter readings and reliable functions of centralized network monitoring where the measured data will be collected and forwarded automatically.

It is an essential requirement for the customer to find such a solution where the data collection and management of industrial and residential consumers can be handled by using the same system.

Solution

For this challenge the optimal solution is the application of DIWICON technology enabling a completely wireless system structure.

As a start it was obvious to define the first groups of locations and to install meter reading devices within the frame of a

pilot project. GECOL defined locations well representing the overall characteristics of local consumers.

The pilot project was executed on three different types of areas in Tripoli.

- Storey block houses with meter cabinets on the ground floor
- Residential area with separate houses, where meters are installed outside the house on the street front on the wall.
- Multi storey block houses with meter room on the ground floor.

The endpoint devices collect data from the electricity meters and send it to a concentration point where it will be sent to the data center through the GPRS network on the same way as in the project connected to the industrial consumers.

Since not all of the existing electricity meters were provided with pulse output for remote connection - which is an essential requirement for automatic meter reading system - some of them had to be replaced.

At this project meter reading devices is installed directly into the case of the electricity meter and connected with short, internal wires. Thus they are able to read the impulses of electricity meters while being hidden and beside having double security against sabotage. Devices are operated by internal batteries even for five years and have self-diagnostic functions and are maintenance free.

As a result of the installation each consumer was equipped with autonomously operated wireless endpoint devices.

Installation did not need any specific preparations. There was no need of external wires, and no need of making additional room for the pieces of equipment. Meter reading devices became ready to use right after the process of checking and sealing without a further need of any local service.

Aim of installation was to forward each consumers' data to the center therefore we had to form a wireless network. This issue was solved by means of wireless routers installed at appropriate places. This network structure is self-organized,

which means that there is no need to define the access paths in advance. For enhancing security the communication is encoded, applies inbuilt redundancy and is flexible.

Data from the low range wireless network is forwarded to the so called network coordinators and then proceed also wireless further to the central database via GPRS.

The consumption data of households can be integrated into the Energy Balance Management System developed for the industrial consumers in the previous stage. By this means the households act with their own profile in the system and their consumption data gets in the automatic document handling process. There is a possibility to nominate their consumption, and the allocation based on their measured data can be automatic.

Thanks to synchronized measurements high precision data is available in different formats like spreadsheets, graphics, customizable report, interactive process displays and maps.

There is a possibility of the exact calculation of balance errors and the localization of losses by means of integrating measured data of consumers and main points into the balance application.

The system provides reliable and efficient operation through advanced remote management and vandal- proof design.

This complete DIWICON solution helped to fulfill the high expectations of the customer. The installed devices and applied solutions made GECOL capable of a more efficient network operation thus providing its customers a higher level of services on the long run.

Benefits

CASON DIWICON system, including Energy Balance and SCADA applications and wireless end devices is a complete, cost effective solution with industrial reliability especially developed for energy distributors and providers.

GECOL reached its goals by the installation of DIWICON-U system as follows:

- invented a solution for connecting household consumers to an up-to-date IT system and for operating its network more efficiently
- the deployed structure is flexible and easy to expand
- installation of system elements is fast and efficient
- maintenance-free operation
- easy connection of measured data even of industrial consumers within short

Full process of data collection is automated. The balance application has standard interfaces to other systems, just like ERPs.

DIWICON-U product family offers a wireless, easy-to-install, modular, flexible hardware and software solution. There is no need of additional hardware devices and/or software licenses. All the data is stored in SQL database. The user interface is totally web-based so that there is no need of any special client software, just a browser.