LOSS REDUCTION PROGRAM

Remote Metering, Control and Alarm System using NEXUS® Metering Technology

Empresa Nacional de Energía Eléctrica Utility, Honduras, Central America

May 2009

Created in Honduras on February 20 1957, Empresa Nacional de Energía Eléctrica (ENEE) is the government electrical utility responsible for all aspects of energy in the country, from generation to transmission and distribution. At the time the Nexus® meter project was approved ENEE was experiencing its worst crisis since its creation. The company's annual losses were nearly 100 Million USD, a large portion of which were due to one of the worst cases of fraud and energy theft in Latin America.

THE PROJECT

The project began with an official agreement signed by the president of Honduras on June 2006 as part of a recovery plan for the Honduran electrical sector. This plan established an anti-theft and AMR system for loss control, consisting of: locating points of electrical theft and measuring the amount of the theft, remote disconnection and connection capability, Demand control, Power Quality, remote billing and power balance capabilities at transmission and distribution levels.

THE GOAL

The project's goal was the reduction of overall yearly losses, especially those due to theft of electricity.

THE SOLUTION

The solution consisted of updating the current energy metering systems with anti-tampering, anti-fraud and anti-theft capabilities, as well as establishing a

Project Thumbnail

Application

The government electrical utility of Honduras establishes anti-theft and loss control measurements.

Equipment

Nexus® 1262/72 meters
PDA 1252

Benefits

- Non-technical loss savings and projected improvement of 5%.
- Improved reliability of energy use data, remote billing application, lower operating costs and improved accuracy.
- Anti-theft system with Remote Point Disconnection.
- Full-time connectivity via GPRS technology.

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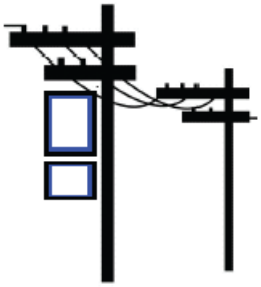
At the Industry (End User)

Remote Control Center

Customer's Facilities:
Loss Control/Fault Detection/PQ/
Trend/Event/Fraud & Theft

Remote Control: Connects or Disconnects Customer's Main Supply



centralized remote monitoring system with remote control capabilities.

The solution was composed of the following key areas, and was designed to address the most critical issues:

1. INDUSTRY (Customers)

From a base of customers ranging from those using 250 kW up to those using 13 MW of demand (from shopping malls to industrial customers like cement and mining companies), customers were selected using "the most critical measuring points" criteria, to control losses on the 20% that represents 80% of the total load.

The solution consisted of installing Nexus® 1262 Socket type meters at the service point (to upgrade billing accuracy and data reliance), complemented by a high voltage 3 Phase Recloser to cut off the power source immediately in case of confirmed fraud. In addition a GPRS communication solution panel was installed for for remote billing, PQ online monitoring, detection of meter cover removal, and enabling control commands being sent directly from the central utility's headquarters.

2. CRITICAL SUBSTATIONS (Transmission and Distribution)

For all Transmission and Distribution substations country-wide, the solution consisted of installing high-end Nexus® 1272 Switchboard meters for remote energy, power and demand, instantaneous and monthly balance readings, load-on-line monitoring, PQ analysis, and basic substation automation features (status and operation of Re-closers and circuit breakers, protection, and acting as the transformer's watchdog). The meters report and receive commands to and from the Control Station by means of cell phones and/or Ethernet network communications where available.

3. GENERATION STATIONS

For the most critical Generation station facilities above 10MW of generation capacity, the solution consisted of of upgrading the meters at the service point, enabling the analysis of load balance over the entire energy system chain from generation to end user.

The metering retrofit was made using high-end Nexus® 1272 Socket type meters, which provided remote monitoring (lowering operating costs) and accuracy improve-

ment (for better and more reliable readings), as well as PQ analysis (to easily locate and understand the nature of failures at the generation point), making a significant over all improvement in the station's operation.

4. MOBILE METERING

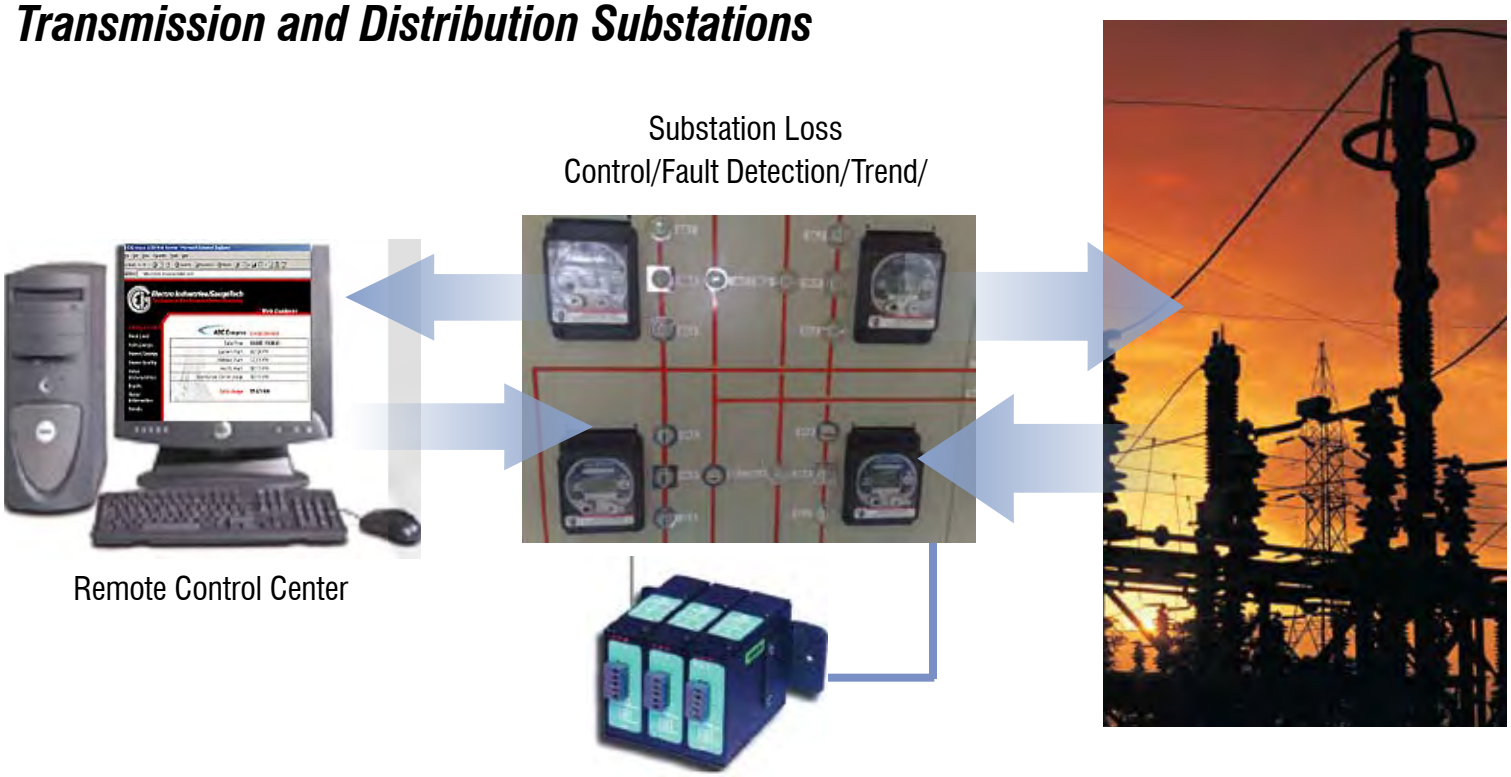
For event analysis, and critical failures, fault location, and independent studies, the project used PDA 1252 Mobile PQ monitoring device. These portable units were deployed as mobile solutions whenever measurements were needed for loss control, or for PQ and trending information from the energy chain ranging from generation to end-user facilities. This capability provided the end-user with the value-added service of a full facility diagnosis.

Caption here?

5. COMMUNICATION SOLUTION

Using the unique Modem Manager technology developed by EIG, a reliable wireless communication was made possible through GPRS, making communication both reliable and cost effective. All PQ, Historical logs and real-time data was available online from the meter's RS485 port (with support of internal Modem Manager technology) using EIG's UNICOM 2500 RS485/232 converter and external GPRS Modem.

Transmission and Distribution Substations



IN SUMMARY

Loss reduction Including anti-theft alarm system, remote billing, real time data sharing, remote digital control and portable measuring.

Equipment Used:

- Almost 500 Units of Nexus®1262/72 meters
- 15 Units of PDA 1252

BENEFITS

- Non-technical loss savings: annual projected improvement of 5% .
- Improved reliability of energy usage data: remote billing automation with improved accuracy (+/-0.06%) and lower operating costs, when comparing automated remote billing versus local manual readings.
- Anti Theft systems: Non-technical loss prevention with Remote Point Disconnection system (for any local violation to the metering system).
- PQ analysis: providing end user customers with a better understanding of the nature of failures and the appropriate way to handle event situations.
- Mobility: Portable meters with PQ analysis providing on-site measurement for troubleshooting.
- Full-time connectivity: remote connectivity by means of GPRS technology.

RESULT: By the end of 2008, the nation-wide losses were reduced by 5% (from 23% to 18%), which amounted to 35 Million USD worth of savings. “The AMR Project with NEXUS® meters has dramatically improved the way we bill and control end-users’ power usage. It has also reduced non-technical losses due to fraud and has made it possible to detect thefts in progress online and act on them immediately from the remote Control Station.”

Eng. Roberto Martinez
ENEE High Customers Manager